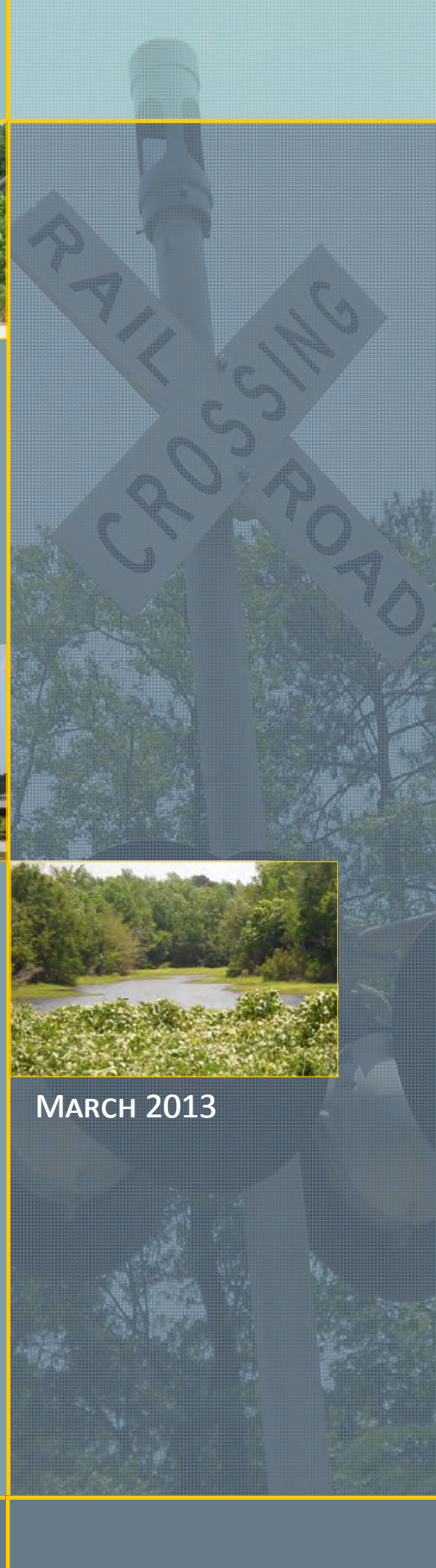


# *TRAFFIC OPERATION ANALYSIS REPORT*



## *INDEPENDENCE BOULEVARD EXTENSION*

*RANDALL PARKWAY TO US 74 (MARTIN LUTHER KING JR. PARKWAY)  
CITY OF WILMINGTON, NEW HANOVER COUNTY, NORTH CAROLINA  
STATE TRANSPORTATION IMPROVEMENT PROGRAM PROJECT NO. U-4434*

**MARCH 2013**

PREPARED FOR:  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS

PREPARED BY:  
URS CORPORATION—NORTH CAROLINA



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# INDEPENDENCE BOULEVARD EXTENSION PROJECT

NEW HANOVER COUNTY, NORTH CAROLINA

STATE PROJECT NO. 39894.1.1

WBS NO. 37764

## TRAFFIC OPERATION ANALYSIS REPORT

Prepared for:



Transportation Mobility and Safety Division  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Prepared by:

URS CORPORATION – NORTH CAROLINA  
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March 18, 2013

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## 1. Project Background

The North Carolina Department of Transportation (NCDOT) is proposing to construct a multi-lane facility, part on new location, in New Hanover County, North Carolina. Located in the northern part of the Wilmington city limits, the proposed 1.8-mile long project would be an extension of existing Independence Boulevard (SR 1209) from the intersection of Independence Boulevard and Covil Avenue with Randall Parkway and Mercer Avenue northward to a new interchange with US 74 (Martin Luther King Jr. Boulevard). The proposed project is designated in the 2013-2023 NCDOT STIP as Project Number U-4434 and described as “SR 1209 (Independence Boulevard Extension), Randall Parkway to US 74 (MLK, Jr. Parkway). Multi-Lanes on New Location<sup>1</sup>.”

The roadway network in the Wilmington area consists of two Interstate highways, primary US and NC routes, and secondary and local streets. Most roadways vary from two-lane to six-lane segments and carry both local and regional traffic. The primary north-south routes in the project vicinity are I-40/NC 132 (College Road), existing SR 1209 (Independence Boulevard), SR 1175 (Kerr Avenue), and 23<sup>rd</sup> Street while the primary east-west roadways are US 74 (Martin Luther King Jr. Boulevard), US 17 Business (Market Street), Randall Parkway, and US 76 (Oleander Drive). Princess Place Drive is a secondary route that carries east-west local traffic, and Covil Avenue carries north-south local traffic.

Land uses vary along the roadways and have varying levels of access control with portions of US 74 being the only controlled access roadway in the vicinity of the project. Land use at the southern project terminus (Randall Parkway/Mercer Avenue/existing Independence Boulevard) is made up mostly of residential development while the northern terminus (US 74) includes a park and mostly undeveloped forest. The area immediately to the northeast of the northern project terminus is the flight path for one of the main runways at Wilmington International Airport.

In addition to the roadways summarized in this section, CSX has a major rail line that crosses through the project area twice. This particular rail line begins at the Port of Wilmington and stretches westward to major train route intersections in Hamlet and Monroe before arriving in Charlotte.

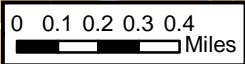
### 1.1. Purpose of Report

The purpose of this technical memorandum is to analyze the traffic operations in the vicinity of the proposed Independence Boulevard Extension Project (evaluation of U-4434 Preliminary Designs). This document includes analysis of the 2012 Base Year Conditions, 2040 No-Build Conditions, and 2040 Build Alternatives as well as the adjacent area.





Wilmington International Airport



**North Carolina Department of Transportation**

March 2013

**Legend**

# Intersection Identification Number	Proposed Kerr Ave Interchange (U-3338)	Railroad
● Intersection Volume	US Highway	Streams (non-delineated)
▬ Link Volume	State Route	Water
▬ U-4434 (Proposed)	Local Road	Wilmington Municipal Boundary

**Independence Boulevard Extension  
New Hanover County, NC  
STIP U-4434**

**Figure 1**

**Project Vicinity**



## 2. Description of Alternatives Analyzed

The following alternatives were evaluated for traffic operations.

### 2.1. 2012 Base Year Conditions

The 2012 Base Year Conditions analysis is based on the current traffic volumes and configuration of the transportation network within the project study area. No proposed improvements or projects have been included in this analysis.

### 2.2. 2040 No-Build Conditions

The 2040 No-Build Alternative assumes the local transportation system would evolve as currently planned, but without implementation of the proposed project. Projects assumed to be implemented are found in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*<sup>2</sup>.

### 2.3 2040 Build Alternatives

There are three proposed alignments for Independence Boulevard associated with the build alternatives. All of the alternatives begin at the current northern terminus of Independence Boulevard at Randall Parkway and Mercer Avenue. From there, the alignments head northward, crossing over US 17 Business (Market Street), Princess Place Drive, CSX Railroad, and Hurst Street before ending at a proposed interchange with US 74 (Martin Luther King Jr. Parkway).

Each of the proposed alternatives includes Independence Boulevard passing over US 17 Business and providing access between the roads via ramps from Independence Boulevard and ramp termini on US 17 Business in the form of signalized intersections. For each of the three proposed alignments, there are three proposed interchange configurations associated with the intersection of Independence Boulevard and US 17 Business (Market Street). The first is a quadrant configuration with ramps to and from Independence Boulevard located in the A and C quadrants of the interchange. The second configuration is also a quadrant configuration, but with ramps to and from Independence Boulevard located in the B and C quadrants. Lastly, there is a tight urban diamond interchange (TUDI) configuration. For all of the interchange configurations, the ramps from Independence Boulevard would terminate at signalized intersections on US 17 Business.

#### ALTERNATIVE 2

2040 Build Alternative 2 assumes Independence Boulevard will be extended on new alignment from its current terminus at Randall Parkway and Mercer Avenue northward to an interchange with existing US 74 (Martin Luther King Jr. Parkway). The alignment will roughly follow the existing alignments of Covil Avenue and Montgomery Avenue until reaching Princess Place Drive. At that point, Independence Boulevard will continue northward on new location until reaching US 74.

#### ALTERNATIVE 7

2040 Build Alternative 7 assumes Independence Boulevard will be extended on new alignment from its current terminus at Randall Parkway and Mercer Avenue northward to an interchange with existing US 74 (Martin Luther King Jr. Parkway). The alignment will be set between Covil Avenue and Mercer Avenue to the south of US 17 Business and slightly to the west of Montgomery Avenue north of US 17 Business until reaching Princess Place Drive. At that point, Independence Boulevard will continue northward on new location until reaching US 74.



## ALTERNATIVE 8

2040 Build Alternative 8 assumes Independence Boulevard will be extended on new alignment from its current terminus at Randall Parkway and Mercer Avenue northward to an interchange with existing US 74 (Martin Luther King Jr. Parkway). The alignment will be set just to the east of Mercer Avenue to the south of US 17 Business and slightly to the west of 31st Street north of US 17 Business until reaching Princess Place Drive. At that point, Independence Boulevard will continue northward on new location until reaching US 74.



### 3. Traffic Forecast

Traffic volumes for the 2012 Base Year, 2040 Future No-Build, and 2040 Future Build were obtained from forecasts in a technical memorandum prepared for NCDOT, entitled *Traffic Forecast Report (September 2012)*<sup>3</sup>. The traffic forecast for this project was prepared to include multiple scenarios. The forecast includes the projects that were determined to be fiscally constrained in the WMPO (Wilmington Urban Area Metropolitan Planning Organization) LRTP. However, a second scenario was also included in the forecast that included the construction of the Cape Fear Skyway. The Cape Fear Skyway currently does not have an identified funding source and is not considered fiscally constrained. Therefore, the traffic operations analysis included in this report is based on the “Without Skyway” traffic forecasts. In the event that the Cape Fear Skyway identifies a funding source, this analysis can be updated based on the “With Skyway” traffic forecast scenarios. The traffic forecast is included in Appendix A.

#### 3.1. Traffic Breakouts

The traffic volumes from the *Traffic Forecast Report* were used in the analyses performed for this report. The Average Annual Daily Traffic was converted to peak hour volumes utilizing NCDOT Congestion Management Section’s Intersection Analysis Utility (IAU) spreadsheet. The Intersection Analysis Utility output is included in Appendix B.

Mainline volumes on the freeway and multilane HCS segments were calculated directly from the forecast sheets, and were based on the traffic forecast volumes, Design Hour Factors, and Peak Hour Directional Splits. Volumes on the ramps, in both the ramp junction and weaving segment analyses, were taken from the intersection IAU Breakout Sheets.

#### 3.2 Traffic Adjustments and Balancing

At interchanges that included side streets opposite of ramp terminals it was necessary to use a modified procedure to obtain peak hour movements. At both instances in this analysis, a side street connects to a partial cloverleaf ramp terminal at an interchange. The two locations that required this special procedure were the intersection of 23<sup>rd</sup> Street with US 74 and One Tree Hill, and the intersection of US 17 Business (Market Street) with NC 132 (College Road) and Gingerwood Drive. In both instances, the fifth leg of the intersection (One Tree Hill and Gingerwood Drive) was treated as a separate intersection with the mainline for the creation of the daily forecasts. Daily forecast data was then entered into the IAU Breakout Sheets to create peak hour volumes. Those outputs were then merged based on the actual geometry. This process keeps the side street volumes provided by the IAU Breakout Sheets and allows the through volumes on the mainline to be adjusted to achieve volume balancing. Where necessary the side street trips were redistributed based on the actual geometry and observed turning movement ratios.

It was necessary to balance the through volumes along Market Street because the IAU Breakout Sheet does not provide perfectly balanced volumes along the corridor. Raw IAU output would produce unbalanced volumes between intersections. As such, Market Street was balanced from the intersection with Covil Avenue outwards in each direction. All turning movements along Market Street as well as all side street movements from the IAU Breakout Sheets were retained. Through movements outside of the Covil Avenue intersection were adjusted so that traffic was balanced between the intersections.

For the 2040 Build Conditions, due to the inclusion of a new interchange at US 17 Business (Market Street) and proposed Independence Boulevard, the configuration of traffic along US 17 Business has been adjusted. Each of the nine build alternatives causes certain closures and restrictions of access along US 17 Business, which requires traffic from altered intersections to be re-routed to other intersections, either by way of other streets or by turning right and utilizing a u-turn. These route



changes are shown in Appendix D and Appendix F. Table 1 lists the intersection and access modifications for each alternative.

A similar process to that used on Market Street was utilized on 23<sup>rd</sup> Street to balance through volumes. In this case the volumes calculated using the five-legged intersection procedure described above for the combined intersection of 23<sup>rd</sup> Street at US 74 and One Tree Hill was used as the basis for balancing and the through volumes along 23<sup>rd</sup> Street at Scientific Drive were adjusted to achieve balancing.

In the 2040 No-Build and Build Conditions, the intersection at Kerr Avenue and US 74 is improved to a partial cloverleaf interchange (U-3338), with all ramps located on the west side of Kerr Avenue. This interchange configuration includes two (2) three-leg intersections to accommodate the ramps between the two roads. The northern of the two intersections created by this construction includes a fourth leg on the east side, Greentree Road. Because this road was not included in the forecast for U-4434, the forecast for NCDOT Project U-3338 was utilized to provide traffic volumes and heavy vehicle percentages for Greentree Road. The Average Annual Daily Traffic (AADT) for Greentree Road (1,200 vehicles per day (vpd)) along with the Design Hour Factor and Peak Hour Directional Split were used to compute the volumes exiting Greentree Road onto Kerr Avenue in the AM Peak Hour and PM Peak Hour (46 vehicles per hour (vph) and 38 vph, respectively)<sup>8</sup>. It should be noted that the build year for the forecast for U-3338 is 2035. However, it is assumed that growth along Greentree Road between 2035 and 2040 would be negligible and traffic volumes would have minimal growth. Therefore, the 2035 traffic data for Greentree Road was assumed sufficient for this analysis.

The forecast shows Greentree Road as a separate leg on Kerr Avenue, unassociated with US 74, and shows an AADT of 200 vpd between Greentree Road and Kerr Avenue north of the intersection and an AADT of 1,000 vpd between Greentree Road and Kerr Avenue south of the intersection. Because the actual configuration of the interchange will include adding Greentree Road as part of the Kerr Avenue intersection at the US 74 WB Ramps, it is assumed that half of the AADT volume between Greentree Road and Kerr Avenue south of the intersection on the forecast would in fact travel through the intersection between Greentree Road and the US 74 WB Ramps.

The resultant AADT volumes are 500 between Greentree Road and the US 74 WB Ramps and 500 between Greentree Road and Kerr Avenue south of the intersection. These volume ratios are reflected in the AM Peak Hour and PM Peak Hour capacity analyses. Furthermore, the volumes entering Greentree Road from northbound Kerr Avenue match those entering Kerr Avenue southbound from Greentree Road in order to keep the traffic volumes balanced between the two intersections associated with the interchange. In order to keep the incoming and outgoing volumes on Greentree Road consistent with the U-3338 forecast, the trips between Greentree Road and the US 74 WB Ramps were adjusted accordingly. This results in a slightly higher number of trips on the US 74 WB Ramps than shown in the IAU Breakout Sheet. It is assumed that the inclusion of these volumes provides a worst-case scenario at this intersection.

The results of the traffic adjustments and balancing are included in Appendix C.





Table 1: 2040 Build Conditions – Intersection Access to Market Street

Roadway/Alternative	2 Quadrant AC	2 Quadrant BC	2 Tight Urban Diamond	7 Quadrant AC	7 Quadrant BC	7 Tight Urban Diamond	8 Quadrant AC	8 Quadrant BC	8 Tight Urban Diamond
<b>Colonial Dr. NB</b>	Full	Full	Full	Full	Full	Full	Full	Full	Full
<b>Barnard Dr. SB</b>	Full	Full	Full	Full	Full	Full	Full	Full	Full
<b>29<sup>th</sup> St. NB</b>	Full	Full	Full	Full	Full	Full	Ri-Ro	Ri-Ro	Full
<b>29<sup>th</sup> St. SB</b>	Full	Full	Full	Full	Full	Full	Ri-Ro	Ri-Ro	Full
<b>Wayne Dr. NB</b>	Ri-Ro	Ri-Ro	Full	Ri-Ro	Ri-Ro	Full	Full	CDS	Ri-Ro
<b>30<sup>th</sup> St. SB</b>	Ri-Ro	Ri-Ro	Full	Ri-Ro	Ri-Ro	Full	CDS	Full	CDS
<b>Mercer Ave. NB</b>	Ri-Ro	CDS	CDS	Ri-Ro	CDS	CDS	CDS	CDS	CDS
<b>31<sup>st</sup> St. SB</b>	CDS	Ri-Ro	CDS	CDS	Ri-Ro	CDS	CDS	CDS	CDS
<b>Covil Ave. NB</b>	CDS	CDS	CDS	CDS	CDS	CDS	CDS	CDS	CDS
<b>Montgomery Ave. SB</b>	CDS	CDS	CDS	CDS	CDS	CDS	CDS	CDS	CDS
<b>Evans St. SB</b>	Ri-Ro	Ri-Ro	CDS	Ri-Ro	Ri-Ro	CDS	CDS	CDS	Ri-Ro
<b>Clay St. SB</b>	CDS	CDS	CDS	CDS	CDS	CDS	Ri-Ro	Ri-Ro	Ri-Ro
<b>Henry St. SB</b>	Ri-Ro	Ri-Ro	Full	Ri-Ro	Ri-Ro	Full	Full	Full	Full
<b>Darlington Ave. NB</b>	Full*	Full*	Full	Full*	Full*	Full	Full	Full	Full
<b>Barclay Hills Dr. SB</b>	Ri-Ro	Ri-Ro	Ri-Ro	Ri-Ro	Ri-Ro	Ri-Ro	Ri-Ro	Ri-Ro	Ri-Ro

Full = Full Movement Intersection; Ri-Ro = Right-in/Right-out Intersection; CDS = Cul-de-Sac

\* Intersection relocated to accommodate full movement capabilities



## 4. Traffic Analysis Methodology

### 4.1. Traffic Operations Analysis General Methodology

The project has been analyzed utilizing the techniques contained in the 2010 Edition of the Highway Capacity Manual (HCM)<sup>4</sup> and its associated Highway Capacity Software (HCS 2010, version 6.3). Standard practices recommended in the NCDOT Congestion Management Section's "Capacity Analysis Guidelines"<sup>5</sup> were also utilized. The analysis of unsignalized and signalized intersections was completed utilizing Synchro Version 7 analysis software, which is consistent with the HCM methodologies. For the 2040 No-Build and 2040 Build Conditions, traffic operations on Martin Luther King Jr. Parkway were simulated utilizing TransModeler (version 3.0) due to the non-standard lane configurations associated with the corridor. The analysis includes the evaluation of Level of Service (LOS) for the 2012 Base Year, 2040 No-Build, and 2040 Build Conditions, as well as travel-time analysis and average speed data along Martin Luther King Jr. Parkway in the 2040 No-Build and 2040 Build Conditions.

### 4.2. Design Level of Service

The procedures used to define the operational qualities of the roadways are based on the concepts of capacity and LOS as set forth in the 2010 HCM. The LOS is defined with letter designations from A to F. LOS A represents the best operating conditions along a road or at an intersection, while LOS F represents the worst conditions. In order to be consistent with the 2010 version of the HCM, any lane groups at intersections with a v/c ratio 1.0 or greater was automatically given a LOS of F.

### 4.3 No-Build Travel-Time Analysis and Average Speed Data

For the 2040 No-Build Conditions, traffic operations on Martin Luther King Jr. Parkway were included in a microscopic simulation utilizing TransModeler software. This was done in an effort to provide an accurate representation of the traffic operations given the non-standard lane configurations associated with the corridor. Along this 3.5 mile stretch of freeway, there are 2 full-movement interchanges in the 2040 No-Build Scenario. Associated with these interchanges are various auxiliary lanes, ramp junctions, freeway segments, and lane additions, many of which included non-typical features. With so many atypical roadway characteristics interacting along a short stretch of roadway, it was determined that simulating the corridor in TransModeler would provide the best traffic operations analysis comparison, and that the most suitable measures of effectiveness (MOE's) for Martin Luther King Jr. Parkway would be average travel-time and average speed.

As of January 2013, there was no INRIX speed data available for Martin Luther King Jr. Parkway. In order to provide the most accurate driving data for Martin Luther King Jr. Parkway, travel-time runs were conducted along the corridor using the "floating-car method", and travel speeds were captured using a radar device. Because the only simulated models are of future year scenarios, the travel-time runs were used only as an approximate calibration check for the speeds utilized in the models. Naturally, as traffic volumes are projected to increase between the current year and 2040, travel-times are projected to increase slightly and average travel speeds will decrease. Travel speeds were captured for Martin Luther King Jr. Parkway in both directions, and the resulting speed distributions were applied to the corridor within the simulation models. Appendix E shows the results of the floating-car travel-time runs and vehicle speed collection.

Origin-destination (O-D) data was developed using the provided traffic forecasts, network traffic patterns, and knowledge of utilized travel routes in the area. In some circumstances, engineering judgment was used to develop the percentage of vehicles on certain O-D routes. In each peak hour, the O-D data was developed into balanced O-D matrices, with each O-D pair given a traffic volume value. Appendix E shows the figures and data associated with the O-D matrices.



Vehicle type distribution was based largely on the provided 2040 No-Build traffic forecast. The forecast provides the total number of vehicles as well as the percentage of Small Trucks and Tractor-Trailers. For the simulation model, six types of vehicles were selected for inclusion: Personal Car Type 1 (small car), Personal Car Type 2 (medium car), Personal Car Type 3 (large car), Pickup Truck (or Sport-Utility Vehicle), Small Truck, and Tractor-Trailer. The distributions for the Small Trucks and Tractor Trailers were based directly on the traffic forecasts. Distributions for the remaining four vehicle types were based on generally accepted model distributions for typical freeways, where the majority of the vehicles included are Type 2 Personal Cars and Pickup Trucks.

The roadway network used in the TransModeler analysis includes Martin Luther King Jr. Parkway (US 74) from west of College Road (NC 132) to east of NC 133, and includes the existing interchange at 23<sup>rd</sup> Street and the planned interchange at Kerr Avenue. The interchanges have been modeled to include signals at ramp terminals, streets crossing over or under Martin Luther King Jr. Parkway, and several close by side streets. All of these elements were included in the model to provide the most realistic model for the Martin Luther King Jr. Parkway. However, even though TransModeler is capable of evaluating traffic signals, stop-controlled intersections, and roadway that are not fully access-controlled, only Martin Luther King Jr. Parkway was evaluated in this model for travel-time and average travel speed. All other roadway elements (signals, stop controlled intersections) included in this model have been evaluated using either HCS or Synchro. As such, the traffic signals included in the network were based on the Synchro analysis and not on the existing signal plans.

#### 4.4 Design Travel-Time and Average Speed Data

For the 2040 Build Scenario, the proposed interchange of Independence Boulevard with Martin Luther King Jr. Parkway was added to the 2040 No-Build TransModeler model. The inclusion of this interchange introduces several traffic pattern changes, such as two freeway weaving segments, additional auxiliary lanes, and four additional ramp junctions along Martin Luther King Jr. Parkway. Independence Boulevard was modeled from approximately a half-mile south of the Martin Luther King Jr. Interchange, which meant that one additional origin and destination was added to the O-D matrices for this scenario. The 2040 Build Forecast was used to adjust the vehicle type distributions and to construct the O-D matrices, and the O-D pairs were adjusted to reflect the changes in driving patterns. Similar to the 2040 No-Build TransModeler analysis, traffic signal data for the 2040 Build TransModeler simulation was used from the 2040 Build Synchro analysis.

#### 4.5 Adjacent Projects Assumed to be in Place

During the preparation of the analysis, an investigation was performed to identify fiscally constrained projects shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)* to be included in the future year analysis. Projects assumed to be in place include the following:

##### U-3338: Kerr Avenue Widening

Roadway geometry for this NCDOT Project U-3338 was obtained from the Citizen Workshop Map, dated August 2011. This design calls for the construction of an interchange with MLK Boulevard with all ramps and loops located on the west side of Kerr Avenue. At the intersection with Market Street, the design utilizes two local roads to create a semi-quadrant intersection, which removes all of the left turning movements from Kerr Avenue and places them on the local streets, which then connect to Market Street downstream from the main intersection. Because of this, left turn volumes from Kerr Avenue to Market Street are removed from the capacity analysis at the main intersection. Kerr Avenue is also widened to four lanes through the intersection with Randall Parkway, and additional storage lanes for turning movements have been added based on the citizens workshop map.

R-2724 (FS-0203C): College Road Widening from MLK to Gordon Road

Roadway geometry for this project was obtained from Alternative 5 (Interim Solution) for FS-0203C. This alternative consists of upgrading College Road from four lanes to six lanes between Market Street and Gordon Road, converting full-access intersections to right-in/right-out intersections north of MLK Boulevard, and constructing auxiliary lanes between the newly formed right-in/right-out intersections. Currently, College Road has two lanes in each direction, with an additional lane of through traffic at the MLK Boulevard intersection to improve level of service. For this capacity analysis, College Road will be shown as having six lanes.

U-4902: Market Street Access Management; and WMPO LRTP No. Q11: Market Street Road Diet

The limits of the Market Street Access Management project extend from Barclay Hills Drive west to Colonial Drive, and the limits of the Market Street Road diet extend from Forest Hills Drive east to Covil Avenue. Because of this there is considerable overlap of the two projects within the study area for NCDOT Project U-4434. In 2009, the City of Wilmington provided conceptual plans that included a combination of both projects. These conceptual designs were used to create the Market Street roadway network. Market Street west of Wayne Drive and North 30<sup>th</sup> Street was reduced from four lanes to two lanes and a median was added to prohibit midstream traffic from turning left. At the intersection of Market Street and Barclay Hills Drive, a median is inserted to prohibit left-turning traffic to and from Barclay Hills. Because of this traffic that would have turned left from Barclay Hills onto Market is diverted eastward along Princess Place Drive to Birchwood Drive, and then turns left onto Market Street from Birchwood. Traffic that would have turned left onto Barclay Hills from Market is diverted east to Birchwood, where they take a left to access Barclay Hills Drive via Princess Place Drive.

W-5132: Westbound Oleander Drive Right-Turn Lane Addition at College Road

As a *Hazard Elimination Project* in the NCDOT STIP, W-5132 will add an exclusive westbound right-turn lane from Oleander Drive onto northbound College Road. It is assumed for this traffic capacity analysis that the storage length for this turn lane is 300 feet, and that the current shared thru-right turn lane will be converted into an exclusive thru lane.

WMPO LRTP No. Q19: Wrightsville Avenue Road Diet

The limits of the Wrightsville Avenue Road Diet project are Castle Street on the west and Independence Boulevard on the east. The project will reduce the number of thru lanes on Wrightsville from four to two. However, because the intersection of Wrightsville Avenue and Independence Boulevard is on the eastern end of the project, it is assumed that the same number of lanes currently will be provided on Wrightsville at the intersection with Independence. Because of this, the roadway geometry remains unchanged at this location for the capacity analysis.

WMPO LRTP No. 69: North 23<sup>rd</sup> Street Widening

The southern limits of the North 23<sup>rd</sup> Street Widening project are at the MLK Boulevard interchange. The project will increase the number of thru lanes on 23<sup>rd</sup> Street from two to four. However, 23<sup>rd</sup> Street is already four lanes in the vicinity of the interchange with MLK. Because of this, the roadway geometry remains unchanged at this location for the capacity analysis.

WMPO LRTP No. 105: Kerr Avenue Extension to Oleander

The Kerr Avenue Extension project will connect Kerr Avenue with Oleander Drive just west of College Rd. Traffic connecting from Kerr Avenue to Oleander Drive will be able to utilize this roadway to bypass College Road. This project was included in the traffic model for traffic forecasting purposes. However, the new intersections created at Kerr Avenue at Kerr Avenue Extension and Oleander Drive at Kerr



Avenue Extension are not included in the traffic forecast, and they are not included in the traffic capacity analysis.

#### Local Funding: Kornegay Avenue at Martin Luther King Jr. Parkway Intersection Closure

With the help from local funding, the Kornegay Avenue right-in/right-out access point to MLK Parkway will be closed permanently, eliminating all access points along MLK Parkway between 23<sup>rd</sup> Street and Kerr Avenue. It is also possible that the proposed project will include the closure of this intersection; however, regardless of the funding mechanism, this intersection is assumed to be closed for all future year scenarios.

#### Local Funding: Randall Parkway Widening

This project will widen Randall Parkway to four lanes from its western terminus at Independence Boulevard and Covil Avenue eastward to College Road. Additional storage lanes for turning movements have been added at three major intersections along the route, which would become a substantial east-west corridor between Independence Boulevard, Kerr Avenue, and College Road based on design plans from the City of Wilmington.

### 4.6 Analysis Assumptions

In addition to utilizing guidelines and values identified in the 2010 Edition of the Highway Capacity Manual (HCM) and the NCDOT Congestion Management Section's "Capacity Analysis Guidelines" the following assumptions were made in order to perform the capacity analysis:

- The segments of US 74 (Martin Luther King Jr. Parkway) between 23rd Street and NC 133 are technically weaving segments in both directions. However, because the traffic forecast does not include volumes for NC 133, these segments are treated as ramp junctions as part of the 23rd Street interchange. Lengths for acceleration and deceleration lanes are assumed to be minimum standard lengths provided in the 2004 edition of A Policy on Geometric Design of Highways and Streets<sup>7</sup>.
- Access points for Multilane Analyses were determined based upon aerial data.
- Turning movements of less than 4 vph were increased to 4 vph to ensure the movement's inclusion in the Synchro and SimTraffic analysis.
- Due to unconventional interchange configurations in the 2040 Build Scenario and limitations of the HCM, traffic operations on MLK Parkway for the 2040 No-Build and 2040 Build Scenarios have been simulated utilizing TransModeler rather than analyzed using HCS 2010.
- Independence Boulevard is assumed to operate as a multi-lane roadway to the south of Market Street and as a freeway at the Market Street Interchange and to the north.
- The intersection of Independence Boulevard and Randall Parkway / Mercer Avenue is within the study area for U-4434, while the two signals on Independence Boulevard to the south are outside of the study area. Similarly, the intersection of US 17 Business and Forest Hills Drive is outside of the study area of U-4434, while the neighboring intersections along US 17 Business to the east are within the study areas. In both of these circumstances, there are signalized intersections located within and outside of the study area that would be coordinated with each other. Typically, signals proposed to run in coordination with each other are shown as a coordinated network in the Synchro analysis.

Part of the capacity analysis involves proposing upgrades to any signalized intersections within the study area until an acceptable level of service is achieved. However, this process is not done to signals outside of the study area. In these cases, under current intersection configurations or





configurations proposed by other projects, the signalized intersections outside of the U-4434 study area are projected to have a LOS of F and a v/c ratio of greater than 1.0 in the future year build scenario.

Because these adjacent intersections are over capacity, the traffic simulation shows the queues along the corridors backing into the intersections within the U-4434 study area, resulting in inaccurate simulation results. Because of this, the coordinated signal systems in these cases have been cut off at the study area boundary during the SimTraffic analysis in order to properly assess the performance of the signals within the study area.



## 5. Traffic Capacity Analysis

### 5.1 2012 Base Year Conditions

The 2012 Base Year network was analyzed based on the current conditions of the network. No proposed roadway improvements were included in this analysis. Results of the analysis are listed in Table 2a and Table 2b as well as displayed in Figure 2.

**Table 2a: 2012 Base Year Conditions – Intersections**

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>1 – SR 1209 (Independence Blvd) and US 76 (Oleander Dr)</b>	<b>46.5 (53.5)</b>	<b>- (-)</b>	<b>D (D)</b>
Eastbound Left	93.3 (88.6)	0.86 (0.88)	F (F)
Eastbound Through/Right	41.1 (57.6)	0.76 (0.96)	D (E)
Westbound Left	73.6 (97.5)	0.84 (0.92)	E (F)
Westbound Through	51.8 (63.3)	0.95 (0.97)	D (E)
Westbound Right	14.2 (18.2)	0.33 (0.41)	B (B)
Northbound Left	69.8 (60.2)	0.71 (0.58)	E (E)
Northbound Through/Right	52.2 (51.8)	0.87 (0.92)	D (D)
Southbound Left	67.6 (72.7)	0.91 (0.90)	E (E)
Southbound Through	29.9 (24.5)	0.84 (0.57)	C (C)
Southbound Right	13.0 (7.9)	0.29 (0.19)	B (A)
<b>2 – SR 1209 (Independence Blvd) and SR 1411 (Wrightsville Ave)</b>	<b>39.8 (37.5)</b>	<b>- (-)</b>	<b>D (D)</b>
Eastbound Left	60.5 (57.0)	0.78 (0.80)	E (E)
Eastbound Through	50.0 (52.5)	0.75 (0.84)	D (D)
Eastbound Right	22.2 (27.5)	0.57 (0.45)	C (C)
Westbound Left	62.0 (64.4)	0.71 (0.69)	E (E)
Westbound Through	57.6 (55.8)	0.89 (0.82)	E (E)
Westbound Right	18.5 (21.4)	0.34 (0.40)	B (C)
Northbound Left	52.4 (44.2)	0.80 (0.70)	D (D)
Northbound Through	27.6 (22.0)	0.57 (0.70)	C (C)
Northbound Right	6.6 (5.3)	0.20 (0.27)	A (A)
Southbound Left	56.5 (65.3)	0.57 (0.67)	E (E)
Southbound Through	36.9 (28.9)	0.77 (0.63)	D (C)
Southbound Right	13.9 (11.4)	0.67 (0.47)	B (B)
<b>3 – SR 1209 (Independence Blvd) and Randall Pkwy / Mercer Ave</b>	<b>30.6 (30.6)</b>	<b>- (-)</b>	<b>C (C)</b>
Eastbound Left/Through	61.8 (66.5)	0.35 (0.48)	E (E)
Eastbound Right	61.5 (61.6)	0.35 (0.37)	E (E)
Westbound Left	52.7 (48.9)	0.83 (0.72)	D (D)
Westbound Through/Right	37.6 (39.3)	0.60 (0.61)	D (D)
Northbound Left	20.6 (23.1)	0.24 (0.16)	C (C)
Northbound Through	20.2 (24.9)	0.59 (0.69)	C (C)
Northbound Right	16.2 (17.8)	0.55 (0.70)	B (B)
Southbound Left	61.3 (65.5)	0.79 (0.82)	E (E)
Southbound Through/Right	15.9 (13.7)	0.44 (0.34)	B (B)
<b>6 – US 17 Business (Market St) and Forest Hills Dr</b>	<b>9.8 (9.2)</b>	<b>- (-)</b>	<b>A (A)</b>
Eastbound Through/Right	6.1 (6.6)	0.48 (0.58)	A (A)
Westbound Left/Through	6.0 (5.6)	0.71 (0.65)	A (A)
Northbound Left/Right	76.2 (75.1)	0.69 (0.64)	E (E)



<b>5 – US 17 Business (Market St) and Covil Ave / Montgomery Ave</b>	<b>73.6 (78.4)</b>	<b>- (-)</b>	<b>E (E)</b>
Eastbound Left	32.4 (25.7)	0.07 (0.06)	C (C)
Eastbound Through/Right	105.0 (102.9)	1.12 (1.13)	F (F)
Westbound Left	145.6 (148.0)	1.18 (1.17)	F (F)
Westbound Through/Right	5.2 (3.7)	0.58 (0.46)	A (A)
Northbound Left/Through	158.3 (166.2)	1.20 (1.22)	F (F)
Northbound Right	20.5 (31.5)	0.45 (0.65)	C (C)
Southbound Left	42.8 (47.1)	0.10 (0.15)	D (D)
Southbound Through/Right	42.3 (42.1)	0.23 (0.18)	D (D)
<b>15 – US 17 Business (Market St) and Barclay Hills Dr</b>	<b>10.2 (8.8)</b>	<b>- (-)</b>	<b>B (A)</b>
Eastbound Left	96.1 (84.5)	0.38 (0.52)	F (F)
Eastbound Through	2.0 (1.2)	0.56 (0.61)	A (A)
Westbound Through/Right	5.4 (6.6)	0.77 (0.72)	A (A)
Southbound Left/Right	71.5 (73.5)	0.70 (0.58)	E (E)
<b>16 – SR 1175 (Kerr Ave) and Randall Pkwy</b>	<b>62.0 (55.7)</b>	<b>- (-)</b>	<b>E (E)</b>
Eastbound Left	118.0 (77.5)	0.97 (0.78)	F (E)
Eastbound Through/Right	53.2 (65.5)	0.85 (0.97)	D (E)
Westbound Left	93.1 (105.8)	0.91 (0.97)	F (F)
Westbound Through/Right	77.2 (46.2)	1.03 (0.80)	F (D)
Northbound Left	35.9 (57.2)	0.46 (0.65)	D (E)
Northbound Through	70.7 (63.7)	0.99 (0.92)	E (E)
Northbound Right	11.2 (13.8)	0.28 (0.32)	B (B)
Southbound Left	131.8 (105.0)	1.03 (0.96)	F (F)
Southbound Through	24.4 (33.4)	0.56 (0.76)	C (C)
Southbound Right	9.9 (9.9)	0.16 (0.16)	A (A)
<b>17 – US 17 Business (Market St) and SR 1175 (Kerr Ave)</b>	<b>56.9 (67.8)</b>	<b>- (-)</b>	<b>E (E)</b>
Eastbound Left	91.8 (49.3)	0.98 (0.68)	F (D)
Eastbound Through	37.7 (61.1)	0.94 (1.05)	D (F)
Eastbound Right	7.6 (7.4)	0.29 (0.36)	A (A)
Westbound Left	105.9 (150.4)	0.95 (1.12)	F (F)
Westbound Through/Right	49.4 (44.0)	0.91 (0.77)	D (D)
Northbound Left	84.8 (135.7)	0.83 (1.04)	F (F)
Northbound Through	94.7 (96.1)	0.98 (0.94)	F (F)
Northbound Right	24.3 (31.2)	0.43 (0.52)	C (C)
Southbound Left	144.8 (136.8)	0.97 (0.99)	F (F)
Southbound Through	83.3 (141.2)	0.88 (1.14)	F (F)
Southbound Right	36.1 (29.0)	0.42 (0.37)	D (C)
<b>18 – US 74 (MLK Blvd) and SR 1175 (Kerr Ave)</b>	<b>39.8 (40.6)</b>	<b>- (-)</b>	<b>D (D)</b>
Eastbound Left	92.4 (59.6)	0.91 (0.72)	F (E)
Eastbound Through	41.8 (44.6)	0.73 (0.91)	D (D)
Eastbound Right	15.8 (15.2)	0.30 (0.40)	B (B)
Westbound Left	28.0 (60.4)	0.61 (0.86)	C (E)
Westbound Through	23.5 (20.7)	0.94 (0.67)	C (C)
Westbound Right	9.4 (8.3)	0.16 (0.11)	A (A)
Northbound Left	81.6 (74.4)	0.95 (0.85)	F (E)
Northbound Through	43.6 (43.9)	0.60 (0.51)	D (D)
Northbound Right	12.9 (19.4)	0.26 (0.39)	B (B)
Southbound Left	62.2 (63.2)	0.49 (0.60)	E (E)
Southbound Through	78.9 (68.9)	0.92 (0.90)	E (E)
Southbound Right	25.8 (17.4)	0.56 (0.39)	C (B)



<b>19 – US 117 (College Rd) and US 76 (Oleander Dr)</b>	<b>155.4 (90.8)</b>	<b>- (-)</b>	<b>F (F)</b>
Eastbound Left	215.3 (163.6)	1.29 (1.18)	F (F)
Eastbound Through	126.1 (119.2)	1.10 (1.09)	F (F)
Eastbound Right	29.0 (39.1)	0.21 (0.48)	C (D)
Westbound Left	135.5 (136.4)	1.06 (1.13)	F (F)
Westbound Through/Right	224.1 (135.1)	1.37 (1.16)	F (F)
Northbound Left	92.0 (140.1)	0.80 (0.93)	F (F)
Northbound Through/Right	235.6 (99.2)	1.45 (1.10)	F (F)
Southbound Left	225.6 (176.1)	1.34 (1.23)	F (F)
Southbound Through/Right	16.0 (29.2)	0.76 (0.96)	B (C)
<b>20 – US 117 (College Rd) and SR 1175 (Kerr Ave)</b>	<b>77.2 (40.7)</b>	<b>- (-)</b>	<b>E (D)</b>
Eastbound Left	209.9 (63.2)	1.07 (0.35)	F (E)
Eastbound Through/Right	65.9 (104.7)	0.62 (0.97)	E (F)
Westbound Left	72.9 (178.6)	0.57 (0.98)	E (F)
Westbound Through/Right	127.6 (70.5)	1.08 (0.69)	F (E)
Northbound Left	56.0 (63.8)	0.59 (0.58)	E (E)
Northbound Through/Right	106.7 (31.6)	1.05 (0.94)	F (C)
Southbound Left	159.1 (117.3)	1.00 (0.97)	F (F)
Southbound Through/Right	25.3 (25.2)	0.66 (0.76)	C (C)
<b>21 – US 117 (College Rd) and Randall Pkwy</b>	<b>94.8 (87.6)</b>	<b>- (-)</b>	<b>F (F)</b>
Eastbound Left	178.7 (154.5)	1.19 (1.11)	F (F)
Eastbound Through	101.8 (152.5)	0.93 (1.14)	F (F)
Eastbound Right	29.1 (40.3)	0.41 (0.58)	C (D)
Westbound Left	115.3 (188.5)	0.95 (1.19)	F (F)
Westbound Through	163.1 (141.3)	1.18 (1.07)	F (F)
Westbound Right	37.1 (32.3)	0.58 (0.43)	D (C)
Northbound Left	153.0 (199.0)	1.11 (1.21)	F (F)
Northbound Through	108.0 (61.5)	1.13 (0.96)	F (E)
Northbound Right	9.0 (12.2)	0.25 (0.29)	A (B)
Southbound Left	192.4 (134.3)	1.20 (1.02)	F (F)
Southbound Through	67.9 (86.4)	1.00 (1.08)	F (F)
Southbound Right	11.9 (8.4)	0.34 (0.29)	B (A)
<b>22 – US 117 (College Rd) SB Ramps and US 17 Business (Market St) / Gingerwood Dr</b>	<b>32.0 (44.8)</b>	<b>- (-)</b>	<b>C (D)</b>
Eastbound Left	66.9 (65.8)	0.53 (0.51)	E (E)
Eastbound Through/Right	34.5 (48.1)	0.59 (0.92)	C (D)
Westbound Left	57.2 (69.7)	0.83 (0.99)	E (E)
Westbound Through	16.7 (8.0)	0.66 (0.41)	B (A)
Westbound Right	13.4 (7.3)	0.25 (0.17)	B (A)
Northbound Left	62.5 (63.1)	0.80 (0.55)	E (E)
Northbound Through	33.5 (45.7)	0.06 (0.08)	C (D)
Northbound Right	9.8 (11.2)	0.05 (0.03)	A (B)
Southbound Left	46.1 (128.1)	0.55 (1.05)	D (F)
Southbound Through/Right	37.3 (56.2)	0.24 (0.52)	D (E)
<b>23 – US 117 (College Rd) NB Ramps and US 17 Business (Market St)</b>	<b>13.7 (10.5)</b>	<b>- (-)</b>	<b>B (B)</b>
Eastbound Through	7.1 (7.3)	0.58 (0.64)	A (A)
Eastbound Right	3.9 (2.9)	0.12 (0.25)	A (A)
Westbound Left	38.6 (49.7)	0.07 (0.23)	D (D)
Westbound Through	7.1 (4.9)	0.67 (0.62)	A (A)
Northbound Left	55.7 (55.4)	0.44 (0.27)	E (E)
Northbound Right	37.8 (43.3)	0.71 (0.59)	D (D)



<b>24 – US 117 (College Rd) and US 74 (MLK Pkwy)</b>	<b>49.7 (44.8)</b>	<b>- (-)</b>	<b>D (D)</b>
Eastbound Left	76.5 (62.6)	0.99 (1.01)	E (F)
Eastbound Through	18.0 (21.0)	0.54 (0.79)	B (C)
Eastbound Right	15.1 (8.0)	0.61 (0.48)	B (A)
Westbound Left	55.6 (58.4)	0.34 (0.28)	E (E)
Westbound Through	101.2 (70.4)	1.09 (0.91)	F (E)
Westbound Right	23.7 (50.2)	0.60 (0.86)	C (D)
Northbound Left	131.4 (55.9)	1.10 (0.68)	F (E)
Northbound Through	35.7 (50.7)	0.70 (0.98)	D (D)
Northbound Right	15.5 (9.0)	0.05 (0.08)	B (A)
Southbound Left	50.3 (101.2)	0.56 (0.99)	D (F)
Southbound Through	43.0 (34.6)	0.94 (0.69)	D (C)
Southbound Right	18.3 (15.2)	0.73 (0.42)	B (B)
<b>26 – US 74 (MLK Pkwy) EB Ramps and 23<sup>rd</sup> St / One Tree Hill</b>	<b>13.2 (14.9)</b>	<b>- (-)</b>	<b>B (B)</b>
Eastbound Left/Through/Right	35.8 (42.2)	0.17 (0.46)	D (D)
Westbound Left/Through	47.6 (49.1)	0.55 (0.60)	D (D)
Westbound Right	17.4 (18.6)	0.06 (0.12)	B (B)
Northbound Left	19.2 (12.3)	0.19 (0.06)	B (B)
Northbound Through	16.6 (16.0)	0.42 (0.58)	B (B)
Northbound Right	15.5 (13.5)	0.21 (0.31)	B (B)
Southbound Left	49.4 (35.2)	0.56 (0.57)	D (D)
Southbound Through/Right	3.0 (2.8)	0.53 (0.32)	A (A)
<b>27 – US 74 (MLK Pkwy) WB Ramps and 23<sup>rd</sup> St</b>	<b>17.0 (12.2)</b>	<b>- (-)</b>	<b>B (B)</b>
Eastbound Left	48.8 (40.6)	0.58 (0.54)	D (D)
Eastbound Right	31.0 (19.1)	0.55 (0.30)	C (B)
Northbound Left	49.4 (33.4)	0.49 (0.36)	D (C)
Northbound Through	0.8 (1.7)	0.27 (0.45)	A (A)
Southbound Through	17.0 (17.3)	0.62 (0.49)	B (B)
Southbound Right	3.4 (4.0)	0.05 (0.03)	A (A)
<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>4 – Covil Ave and Darlington Ave</b>	<b>-(-)</b>	<b>-(-)</b>	<b>-(-)</b>
Westbound Left	913.5 (725.4)	2.77 (2.33)	F (F)
Westbound Right	15.8 (19.1)	0.03 (0.04)	C (C)
Southbound Left	10.2 (11.3)	0.02 (0.02)	B (B)
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	<b>-(-)</b>	<b>-(-)</b>	<b>-(-)</b>
Eastbound Left/Through/Right	0.4 (0.5)	0.01 (0.02)	A (A)
Westbound Left/Through/Right	1.6 (1.0)	0.06 (0.03)	A (A)
Northbound Left/Through/Right	1226.53 (836.6)	2.24 (2.11)	F (F)
Southbound Left/Through/Right	1008.6 (2046.9)	2.06 (2.89)	F (F)
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	<b>-(-)</b>	<b>-(-)</b>	<b>-(-)</b>
Eastbound Left	14.3 (12.3)	0.02 (0.04)	B (B)
Westbound Left	12.2 (14.4)	0.04 (0.02)	B (B)
Northbound Left/Through/Right	390.6 (730.2)	0.86 (1.75)	F (F)
Southbound Left/Through/Right	711.6 (412.1)	1.72 (0.89)	F (F)
<b>9 – US 17 Business (Market St) and 30<sup>th</sup> St / Wayne Dr</b>	<b>-(-)</b>	<b>-(-)</b>	<b>-(-)</b>
Eastbound Left	13.9 (12.0)	0.09 (0.09)	B (B)
Westbound Left	12.2 (15.2)	0.05 (0.12)	B (C)
Northbound Left/Through/Right	*Err (*Err)	3.41 (6.25)	F (F)
Southbound Left/Through/Right	*Err (*Err)	7.52 (4.72)	F (F)
<b>10 – US 17 Business (Market St) and Mercer Ave</b>	<b>-(-)</b>	<b>-(-)</b>	<b>-(-)</b>
Westbound Left	12.6 (14.9)	0.05 (0.07)	B (B)
Northbound Left/Right	75.4 (101.7)	0.47 (0.51)	F (F)





<b>11 – US 17 Business (Market St) and 31<sup>st</sup> St</b>	-(-)	-(-)	-(-)
Eastbound Left	13.6 (11.9)	0.02 (0.02)	B (B)
Southbound Left/Right	97.4 (71.3)	0.37 (0.25)	F (F)
<b>12 – US 17 Business (Market St) and Evans St</b>	-(-)	-(-)	-(-)
Eastbound Left/Through	1.0 (0.6)	0.03 (0.02)	A (A)
Southbound Left/Right	98.9 (57.7)	0.26 (0.20)	F (F)
<b>13 – US 17 Business (Market St) and Clay St</b>	-(-)	-(-)	-(-)
Eastbound Left	16.3 (13.3)	0.02 (0.04)	C (B)
Southbound Left/Right	316.2 (92.9)	1.02 (0.28)	F (F)
<b>14 – US 17 Business (Market St) and Henry St / Darlington Ave</b>	-(-)	-(-)	-(-)
Eastbound Left	15.2 (12.8)	0.01 (0.03)	C (B)
Westbound Left	13.2 (21.7)	0.27 (0.47)	B (C)
Northbound Left/Through	*Err (*Err)	*Err (*Err)	F (F)
Northbound Right	11.8 (12.4)	0.27 (0.25)	B (B)
Southbound Left/Through/Right	*Err (*Err)	*Err (*Err)	F (F)
<b>25 – 23<sup>rd</sup> St and Scientific Park Dr</b>	-(-)	-(-)	-(-)
Westbound Left	*Err (1202.2)	556.47 (2.51)	F (F)
Westbound Right	12.7 (17.5)	0.09 (0.26)	B (C)
Southbound Left	11.1 (13.2)	0.14 (0.10)	B (B)
<b>28 – US 74 (MLK Pkwy) and Kornegay Ave</b>	-(-)	-(-)	-(-)
Northbound Right	12.6 (16.3)	0.07 (0.09)	B (C)

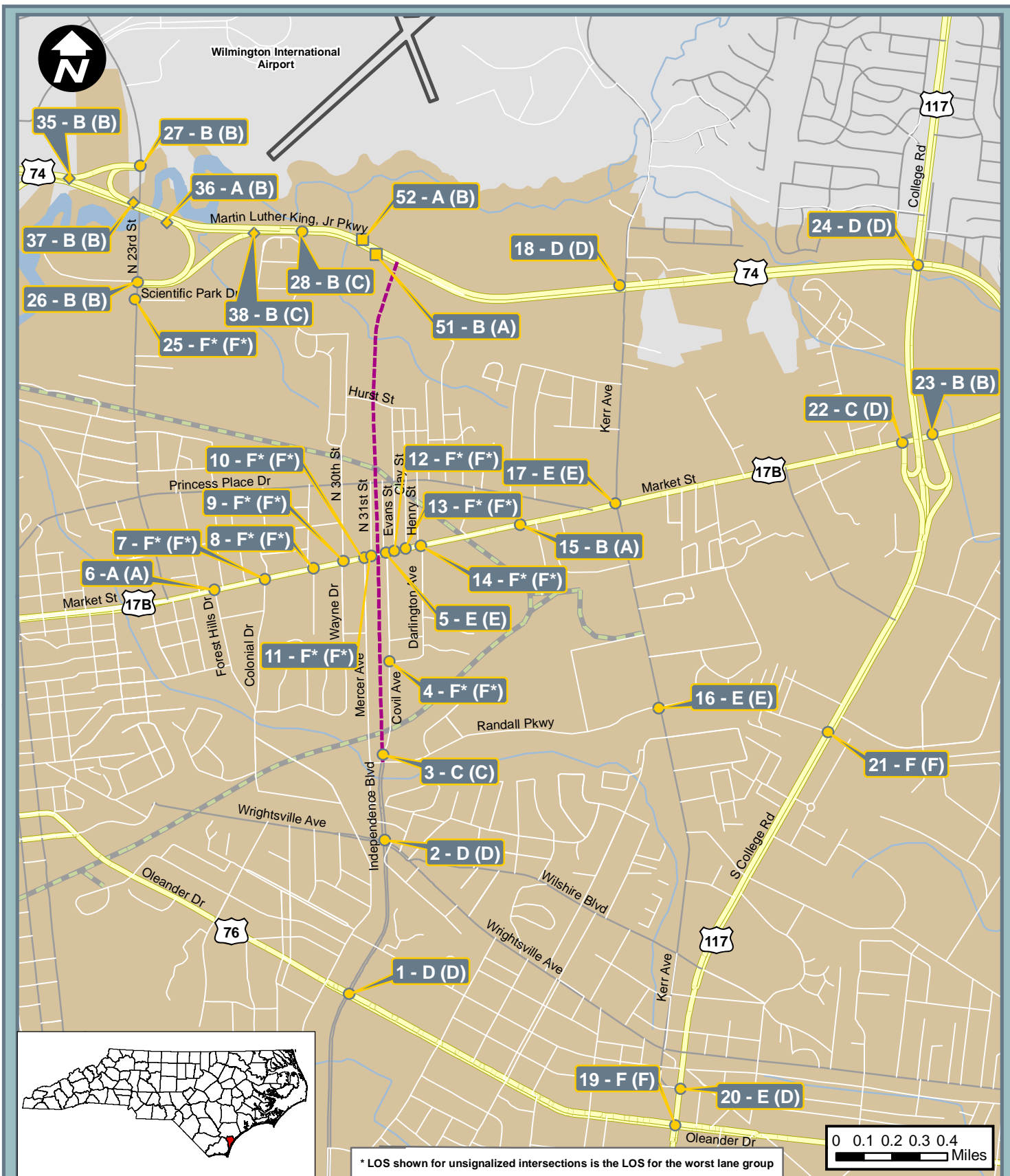
Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

\* "Err" denotes movements where the analysis shows a capacity of zero. Therefore, delay would theoretically be infinite and v/c cannot be calculated.

**Table 2b: 2012 Base Year Conditions - Highway Segments**

Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>RAMP JUNCTIONS</u></b>		
<b>35 – US 74 (MLK Pkwy) WB – from 23<sup>rd</sup> St</b>	<b>18.1 (12.9)</b>	<b>B (B)</b>
<b>36 – US 74 (MLK Pkwy) EB – to 23<sup>rd</sup> St</b>	<b>9.3 (15.1)</b>	<b>A (B)</b>
<b>37 – US 74 (MLK Pkwy) WB – to 23<sup>rd</sup> St</b>	<b>17.5 (10.9)</b>	<b>B (B)</b>
<b>38 – US 74 (MLK Pkwy) EB – from 23<sup>rd</sup> St</b>	<b>14.3 (20.2)</b>	<b>B (C)</b>
<b><u>MULTILANE SEGMENTS</u></b>		
<b>51 – US 74 (MLK Pkwy) EB – east of 23<sup>rd</sup> St</b>	<b>12.8 (8.6)</b>	<b>B (A)</b>
<b>52 – US 74 (MLK Pkwy) WB – east of 23<sup>rd</sup> St</b>	<b>8.6 (12.8)</b>	<b>A (B)</b>

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.





### 5.2 2040 No-Build Conditions

The 2040 No Build network was analyzed based on the current conditions of the network with the addition of fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. However, this project (U-4434) was omitted from the 2040 No-Build analysis. Results from the 2040 No Build analysis are listed in Table 3 as well as displayed in Figure 3.

**Table 3a: 2040 No Build Conditions - Intersections**

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>1 – SR 1209 (Independence Blvd) and US 76 (Oleander Dr)</b>	<b>94.4 (107.2)</b>	<b>- (-)</b>	<b>F (F)</b>
Eastbound Left	209.8 (186.8)	1.25 (1.21)	F (F)
Eastbound Through/Right	88.5 (134.8)	1.05 (1.19)	F (F)
Westbound Left	137.6 (193.5)	1.09 (1.23)	F (F)
Westbound Through	132.2 (102.2)	1.18 (1.09)	F (F)
Westbound Right	21.0 (21.9)	0.33 (0.37)	C (C)
Northbound Left	201.8 (84.3)	1.28 (0.85)	F (F)
Northbound Through/Right	67.2 (118.0)	0.97 (1.15)	E (F)
Southbound Left	109.4 (121.3)	1.08 (1.08)	F (F)
Southbound Through	46.3 (42.4)	1.02 (0.83)	D (D)
Southbound Right	9.5 (14.7)	0.37 (0.26)	A (B)
<b>2 – SR 1209 (Independence Blvd) and SR 1411 (Wrightsville Ave)</b>	<b>67.8 (57.7)</b>	<b>- (-)</b>	<b>E (E)</b>
Eastbound Left	106.9 (95.3)	1.01 (0.99)	F (F)
Eastbound Through	63.0 (73.8)	0.88 (0.99)	E (E)
Eastbound Right	24.9 (23.2)	0.59 (0.51)	C (C)
Westbound Left	92.2 (120.0)	0.88 (0.97)	F (F)
Westbound Through	91.9 (80.0)	1.05 (0.98)	F (F)
Westbound Right	31.7 (27.4)	0.33 (0.42)	C (C)
Northbound Left	115.4 (69.9)	1.09 (0.96)	F (E)
Northbound Through	35.8 (33.9)	0.81 (0.97)	D (C)
Northbound Right	8.2 (8.4)	0.23 (0.33)	A (A)
Southbound Left	77.5 (108.2)	0.79 (0.96)	E (F)
Southbound Through	85.8 (45.9)	1.07 (0.86)	F (D)
Southbound Right	29.7 (24.7)	0.83 (0.61)	C (C)
<b>3 – SR 1209 (Independence Blvd) and Randall Pkwy / Mercer Ave</b>	<b>56.7 (71.3)</b>	<b>- (-)</b>	<b>E (E)</b>
Eastbound Left/Through	120.5 (133.3)	0.96 (1.06)	F (F)
Eastbound Right	68.9 (63.0)	0.43 (0.37)	E (E)
Westbound Left	82.3 (62.2)	1.01 (0.86)	F (E)
Westbound Through/Right	43.7 (39.2)	0.77 (0.70)	D (D)
Northbound Left	46.1 (40.3)	0.68 (0.48)	D (D)
Northbound Through	42.1 (83.6)	0.91 (1.07)	D (F)
Northbound Right	44.3 (78.3)	0.89 (1.12)	D (E)
Southbound Left	108.1 (149.4)	1.01 (1.15)	F (F)
Southbound Through/Right	30.1 (27.6)	0.61 (0.48)	C (C)
<b>6 – US 17 Business (Market St) and Forest Hills Dr</b>	<b>85.9 (105.5)</b>	<b>- (-)</b>	<b>F (F)</b>
Eastbound Through/Right	48.4 (137.4)	1.03 (1.25)	F (F)
Westbound Left	397.1 (435.1)	1.74 (1.82)	F (F)
Westbound Through	74.7 (16.6)	1.12 (0.89)	F (B)
Northbound Left/Right	209.3 (185.9)	1.32 (1.24)	F (F)



<b>5 – US 17 Business (Market St) and Covil Ave / Montgomery Ave</b>	<b>114.4 (115.5)</b>	<b>- (-)</b>	<b>F (F)</b>
Eastbound Left	25.4 (18.8)	0.16 (0.14)	C (B)
Eastbound Through/Right	165.0 (157.0)	1.29 (1.28)	F (F)
Westbound Left	227.1 (220.5)	1.39 (1.37)	F (F)
Westbound Through/Right	16.7 (13.8)	0.63 (0.50)	B (B)
Northbound Left/Through	232.1 (229.3)	1.40 (1.40)	F (F)
Northbound Right	16.4 (26.7)	0.49 (0.71)	B (C)
Southbound Left	39.1 (51.9)	0.24 (0.35)	D (D)
Southbound Through/Right	33.7 (33.3)	0.31 (0.25)	C (C)
<b>16 – SR 1175 (Kerr Ave) and Randall Pkwy</b>	<b>80.4 (93.9)</b>	<b>- (-)</b>	<b>F (F)</b>
Eastbound Left	143.0 (87.8)	1.09 (0.81)	F (F)
Eastbound Through	85.8 (151.5)	1.01 (1.21)	F (F)
Eastbound Right	24.2 (45.4)	0.65 (0.89)	C (D)
Westbound Left	109.8 (165.3)	1.03 (1.19)	F (F)
Westbound Through	93.6 (65.6)	1.07 (0.90)	F (E)
Westbound Right	23.6 (22.0)	0.40 (0.31)	C (C)
Northbound Left	116.6 (172.8)	1.06 (1.20)	F (F)
Northbound Through	75.4 (52.1)	1.03 (0.84)	F (D)
Northbound Right	18.6 (24.8)	0.57 (0.63)	B (C)
Southbound Left	116.4 (94.1)	0.93 (0.83)	F (F)
Southbound Through	89.8 (116.5)	1.05 (1.13)	F (F)
Southbound Right	25.4 (18.9)	0.49 (0.41)	C (B)
<b>17 – US 17 Business (Market St) and SR 1175 (Kerr Ave)</b>	<b>46.1 (57.3)</b>	<b>- (-)</b>	<b>D (E)</b>
Eastbound Left	71.9 (54.1)	0.88 (0.69)	E (D)
Eastbound Through	46.3 (70.2)	0.92 (1.05)	D (F)
Eastbound Right	41.8 (46.4)	0.77(0.88)	D (D)
Westbound Left	76.5 (103.0)	0.95 (1.05)	E (F)
Westbound Through/Right	37.8 (30.0)	0.88 (0.68)	D (C)
Northbound Through	59.3 (47.9)	0.96 (0.81)	E (D)
Northbound Right	25.5 (32.4)	0.66 (0.73)	C (C)
Southbound Through	41.1 (91.1)	0.73 (1.07)	D (F)
Southbound Right	23.6 (23.9)	0.51 (0.52)	C (C)
<b>181 – US 74 (MLK Blvd) EB Ramps and SR 1175 (Kerr Ave)</b>	<b>27.2 (60.3)</b>	<b>- (-)</b>	<b>C (E)</b>
Eastbound Left	82.4 (128.0)	0.87 (1.06)	F (F)
Eastbound Right	41.6 (108.3)	0.88 (1.15)	D (F)
Northbound Left	62.8 (51.4)	0.92 (0.88)	E (D)
Northbound Through	8.4 (5.1)	0.70 (0.51)	A (A)
Southbound Through	25.4 (78.7)	0.89 (1.10)	C (F)
Southbound Right	6.1 (8.8)	0.08 (0.13)	A (A)
<b>182 – US 74 (MLK Blvd) WB Ramps / Greentree Rd and SR 1175 (Kerr Ave)</b>	<b>41.6 (32.1)</b>	<b>- (-)</b>	<b>D (C)</b>
Eastbound Left/Through	146.7 (86.4)	1.04 (0.77)	F (F)
Eastbound Right	11.3 (19.4)	0.53 (0.57)	B (B)
Westbound Left/Through	67.0 (56.2)	0.44 (0.28)	E (E)
Westbound Right	38.2 (37.3)	0.03 (0.02)	D (D)
Northbound Left	50.2 (43.7)	1.00 (0.92)	F (D)
Northbound Through	12.0 (9.3)	0.82 (0.68)	B (A)
Northbound Right	4.6 (4.7)	0.01 (0.01)	A (A)
Southbound Left	55.2 (54.6)	0.16 (0.14)	E (D)
Southbound Through	75.2 (44.6)	0.98 (0.85)	E (D)
Southbound Right	52.5 (33.0)	0.66 (0.39)	D (C)



<b>19 – US 117 (College Rd) and US 76 (Oleander Dr)</b>	<b>162.7 (124.1)</b>	<b>- (-)</b>	<b>F (F)</b>
Eastbound Left	81.8 (76.8)	0.70 (0.76)	F (E)
Eastbound Through	236.9 (207.0)	1.42 (1.35)	F (F)
Eastbound Right	16.5 (76.1)	0.40 (1.02)	B (F)
Westbound Left	236.4 (206.1)	1.38 (1.34)	F (F)
Westbound Through	172.0 (58.7)	1.26 (0.91)	F (E)
Westbound Right	27.0 (25.1)	0.11 (0.10)	C (C)
Northbound Left	116.1 (218.8)	1.09 (1.33)	F (F)
Northbound Through/Right	220.6 (138.0)	1.42 (1.22)	F (F)
Southbound Left	95.6 (62.4)	0.58 (0.41)	F (E)
Southbound Through/Right	53.6 (77.4)	1.01 (1.09)	F (F)
<b>20 – US 117 (College Rd) and SR 1175 (Kerr Ave)</b>	<b>80.0 (33.1)</b>	<b>- (-)</b>	<b>E (C)</b>
Eastbound Left	158.7 (93.5)	0.94 (0.65)	F (F)
Eastbound Through/Right	39.6 (62.8)	0.33 (0.73)	D (E)
Westbound Left	37.3 (52.5)	0.16 (0.28)	D (D)
Westbound Through/Right	119.8 (99.7)	1.11 (0.99)	F (F)
Northbound Left	48.9 (30.5)	0.49 (0.46)	D (C)
Northbound Through/Right	109.7 (20.0)	1.09 (0.96)	F (B)
Southbound Left	167.2 (91.9)	1.15 (0.98)	F (F)
Southbound Through/Right	23.7 (15.1)	0.58 (0.58)	C (B)
<b>21 – US 117 (College Rd) and Randall Pkwy</b>	<b>174.9 (162.2)</b>	<b>- (-)</b>	<b>F (F)</b>
Eastbound Left	305.9 (250.2)	1.54 (1.40)	F (F)
Eastbound Through	131.0 (236.0)	1.09 (1.38)	F (F)
Eastbound Right	28.6 (41.7)	0.36 (0.49)	C (D)
Westbound Left	179.1 (234.6)	1.19 (1.33)	F (F)
Westbound Through	322.0 (251.5)	1.60 (1.40)	F (F)
Westbound Right	80.9 (32.9)	1.04 (0.74)	F (C)
Northbound Left	228.5 (229.9)	1.31 (1.28)	F (F)
Northbound Through	265.1 (216.5)	1.50 (1.37)	F (F)
Northbound Right	13.8 (19.4)	0.34 (0.39)	B (B)
Southbound Left	303.8 (254.5)	1.55 (1.43)	F (F)
Southbound Through	62.6 (113.6)	1.00 (1.15)	F (F)
Southbound Right	11.5 (9.1)	0.45 (0.39)	B (A)
<b>22 – US 117 (College Rd) SB Ramps and US 17 Business (Market St) / Gingerwood Dr</b>	<b>85.0 (99.7)</b>	<b>- (-)</b>	<b>F (F)</b>
Eastbound Left	167.7 (66.5)	1.21 (0.81)	F (E)
Eastbound Through/Right	53.4 (120.6)	0.88 (1.16)	D (F)
Westbound Left	151.4 (182.7)	1.22 (1.30)	F (F)
Westbound Through	101.0 (34.1)	1.13 (0.68)	F (C)
Westbound Right	66.7 (35.4)	0.99 (0.65)	E (D)
Northbound Left	167.2 (216.9)	1.25 (1.29)	F (F)
Northbound Through	22.1 (34.0)	0.07 (0.08)	C (C)
Northbound Right	9.3 (10.6)	0.34 (0.22)	A (B)
Southbound Left	37.4 (143.4)	0.70 (1.18)	D (F)
Southbound Through/Right	30.4 (59.3)	0.53 (0.83)	C (E)
<b>23 – US 117 (College Rd) NB Ramps and US 17 Business (Market St)</b>	<b>19.4 (17.8)</b>	<b>- (-)</b>	<b>B (B)</b>
Eastbound Through	15.9 (16.7)	0.81 (0.89)	B (B)
Eastbound Right	7.7 (4.2)	0.24 (0.49)	A (A)
Westbound Left	57.7 (72.1)	0.68 (0.88)	E (E)
Westbound Through	9.8 (4.6)	0.76 (0.64)	A (A)
Northbound Left	62.3 (78.8)	0.66 (0.62)	E (E)
Northbound Right	36.7 (35.9)	0.69 (0.50)	D (D)



<b>24 – US 117 (College Rd) and US 74 (MLK Pkwy)</b>	<b>271.9 (221.1)</b>	<b>- (-)</b>	<b>F (F)</b>
Eastbound Left	239.2 (396.3)	1.41 (1.79)	F (F)
Eastbound Through	44.8 (56.0)	0.51 (0.85)	D (E)
Eastbound Right	45.9 (33.4)	0.81 (0.77)	D (C)
Westbound Left	99.7 (96.0)	0.54 (0.38)	F (F)
Westbound Through	354.0 (263.0)	1.69 (1.46)	F (F)
Westbound Right	95.0 (132.4)	1.00 (1.15)	F (F)
Northbound Left	371.2 (320.3)	1.70 (1.58)	F (F)
Northbound Through	77.1 (333.0)	1.01 (1.66)	F (F)
Northbound Right	17.8 (19.2)	0.05 (0.09)	B (B)
Southbound Left	329.4 (284.6)	1.59 (1.48)	F (F)
Southbound Through	389.9 (116.2)	1.79 (1.12)	F (F)
Southbound Right	432.7 (86.4)	1.91 (1.12)	F (F)
<b>26 – US 74 (MLK Pkwy) EB Ramps and 23<sup>rd</sup> St / One Tree Hill</b>	<b>16.8 (26.6)</b>	<b>- (-)</b>	<b>B (C)</b>
Eastbound Left/Through/Right	43.1 (80.5)	0.46 (0.91)	D (F)
Westbound Left/Through	56.4 (54.3)	0.73 (0.71)	E (D)
Westbound Right	14.2 (16.6)	0.11 (0.18)	B (B)
Northbound Left	39.4 (16.6)	0.46 (0.14)	D (B)
Northbound Through	21.9 (30.6)	0.62 (0.88)	C (C)
Northbound Right	21.3 (26.8)	0.48 (0.72)	C (C)
Southbound Left	48.5 (56.1)	0.79 (0.90)	D (E)
Southbound Through/Right	3.4 (3.5)	0.76 (0.50)	A (A)
<b>27 – US 74 (MLK Pkwy) WB Ramps and 23<sup>rd</sup> St</b>	<b>31.9 (16.2)</b>	<b>- (-)</b>	<b>C (B)</b>
Eastbound Left	97.4 (45.3)	1.02 (0.77)	F (D)
Eastbound Right	54.3 (21.3)	0.94 (0.52)	D (C)
Northbound Left	51.5 (33.0)	0.61 (0.60)	D (C)
Northbound Through	1.0 (2.1)	0.37 (0.66)	A (A)
Southbound Through	30.6 (23.8)	0.93 (0.73)	C (C)
Southbound Right	3.4 (3.2)	0.11 (0.07)	A (A)
<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>4 – Covil Ave and Darlington Ave</b>	<b>-(-)</b>	<b>-(-)</b>	<b>-(-)</b>
Westbound Left	*Err (*Err)	7.82 (6.83)	F (F)
Westbound Right	20.3 (27.7)	0.19 (0.26)	C (D)
Southbound Left	11.6 (13.6)	0.09 (0.12)	B (B)
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	<b>-(-)</b>	<b>-(-)</b>	<b>-(-)</b>
Eastbound Left/Through/Right	3.1 (0.2)	0.04 (0.06)	A (A)
Westbound Left/Through/Right	0.5 (159.7)	0.17 (0.38)	A (F)
Northbound Left/Through/Right	*Err (*Err)	*Err (*Err)	F (F)
Southbound Left/Through/Right	*Err (*Err)	*Err (*Err)	F (F)
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	<b>-(-)</b>	<b>-(-)</b>	<b>-(-)</b>
Eastbound Left	15.4 (12.7)	0.02 (0.04)	C (B)
Westbound Left	12.6 (15.4)	0.03 (0.02)	B (C)
Northbound Left/Through/Right	*Err (*Err)	*Err (8.09)	F (F)
Southbound Left/Through/Right	*Err (*Err)	9.99 (*Err)	F (F)
<b>9 – US 17 Business (Market St) and 30<sup>th</sup> St / Wayne Dr</b>	<b>-(-)</b>	<b>-(-)</b>	<b>-(-)</b>
Eastbound Left	63.8 (17.9)	0.50 (0.23)	F (C)
Westbound Left	12.5 (16.3)	0.06 (0.15)	B (C)
Northbound Left/Through	*Err (*Err)	*Err (*Err)	F (F)
Northbound Right	31.7 (45.0)	0.29 (0.26)	D (E)
Southbound Left/Through/Right	*Err (*Err)	*Err (*Err)	F (F)
<b>10 – US 17 Business (Market St) and Mercer Ave</b>	<b>-(-)</b>	<b>-(-)</b>	<b>-(-)</b>
Westbound Left	13.6 (16.8)	0.11 (0.15)	B (C)
Northbound Left/Right	847.7 (1031.3)	2.48 (2.77)	F (F)





<b>11 – US 17 Business (Market St) and 31<sup>st</sup> St</b>	-(-)	-(-)	-(-)
Eastbound Left	14.2 (12.3)	0.03 (0.03)	B (B)
Southbound Left/Right	232.5 (141.5)	0.85 (0.58)	F (F)
<b>12 – US 17 Business (Market St) and Evans St</b>	-(-)	-(-)	-(-)
Eastbound Left/Through	1.2 (0.2)	0.03 (0.02)	A (A)
Southbound Left/Right	637.8 (362.4)	1.40 (1.05)	F (F)
<b>13 – US 17 Business (Market St) and Clay St</b>	-(-)	-(-)	-(-)
Eastbound Left	17.7 (14.5)	0.05 (0.10)	C (B)
Southbound Left/Right	841.2 (227.3)	2.21 (0.73)	F (F)
<b>14 – US 17 Business (Market St) and Henry St / Darlington Ave</b>	-(-)	-(-)	-(-)
Eastbound Left	15.8 (13.6)	0.04 (0.09)	C (B)
Westbound Left	24.4 (108.6)	0.66 (1.09)	C (F)
Northbound Left/Through	*Err (*Err)	*Err (*Err)	F (F)
Northbound Right	14.3 (15.0)	0.50 (0.48)	B (B)
Southbound Left/Through/Right	*Err (*Err)	*Err (*Err)	F (F)
<b>15 – US 17 Business (Market St) and Barclay Hills Dr</b>	-(-)	-(-)	-(-)
Southbound Right	34.8 (25.4)	0.43 (0.19)	D (D)
<b>25 – 23<sup>rd</sup> St and Scientific Park Dr</b>	-(-)	-(-)	-(-)
Westbound Left	*Err (*Err)	*Err (*Err)	F (F)
Westbound Right	16.7 (40.4)	0.21 (0.65)	C (E)
Southbound Left	16.3 (20.1)	0.36 (0.26)	C (C)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

\* “Err” denotes movements where the analysis shows a capacity of zero. Therefore, delay would theoretically be infinite and v/c cannot be calculated.

**Table 3b: 2040 No Build Conditions – MLK Parkway EB Simulation**

Segment	Travel Time (m:ss)	Avg. Speed (mph)
	AM (PM)	AM (PM)
US 74 (MLK Pkwy.) EB – NC 133 to 23 <sup>rd</sup> St. Interchange	0:55 (1:03)	49.96 (43.49)
US 74 (MLK Pkwy.) EB – Within 23 <sup>rd</sup> St. Interchange	0:27 (0:35)	47.51 (36.43)
US 74 (MLK Pkwy.) EB – 23 <sup>rd</sup> St. Interchange to Kerr Ave. Interchange	1:14 (3:36)	51.84 (17.84)
US 74 (MLK Pkwy.) EB – Within Kerr Ave. Interchange	0:17 (0:19)	52.03 (47.50)
US 74 (MLK Pkwy.) EB – Kerr Ave. Interchange to NC 132 (College Rd.)	1:13 (1:11)	52.58 (54.01)
<b>TOTAL US 74 (MLK Pkwy) EB *</b>	<b>4:06 (6:44)</b>	<b>51.17 (31.20)</b>

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound.

\* Figures in the “TOTAL” row may vary from the sum of the segment travel times due to rounding.

**Table 3c: 2040 No Build Conditions – MLK Parkway WB Simulation**

Segment	Travel Time (m:ss)	Avg. Speed (mph)
	AM (PM)	AM (PM)
US 74 (MLK Pkwy.) WB – NC 132 (College Rd.) to Kerr Ave. Interchange	1:12 (1:10)	52.85 (54.12)
US 74 (MLK Pkwy.) WB – Within Kerr Ave. Interchange	0:16 (0:15)	51.36 (53.06)
US 74 (MLK Pkwy.) WB – Kerr Ave. Interchange to 23 <sup>rd</sup> St. Interchange	2:03 (1:58)	48.11 (50.24)
US 74 (MLK Pkwy.) WB – Within 23 <sup>rd</sup> St. Interchange	0:20 (0:19)	43.45 (45.05)
US 74 (MLK Pkwy.) WB – 23 <sup>rd</sup> St. Interchange to NC 133	0:26 (0:26)	45.52 (47.16)
<b>TOTAL US 74 (MLK Pkwy) WB *</b>	<b>4:17 (4:08)</b>	<b>49.00 (50.79)</b>

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound.

\* Figures in the “TOTAL” row may vary from the sum of the segment travel times due to rounding.







### 5.3 2040 Build – Common to All Build Alternatives

The 2040 Build – Common to All Build Alternatives analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. These segments have the same traffic volumes and lane configurations regardless of the build alternative chosen. Results from the 2040 Build – Common to All Build Alternatives analysis are listed in Tables 4a-4e as well as displayed in Figure 4.

**Table 4a: 2040 Build Conditions – Common to All Build Alternatives – Intersections**

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>3 – SR 1209 (Independence Blvd) and Randall Pkwy / Mercer Ave</b>	<b>50.5 (49.2)</b>	<b>0.96 (0.98)</b>	<b>D (D)</b>
Eastbound Left/Through	99.3 (131.7)	0.46 (0.70)	F (F)
Eastbound Right	44.3 (56.6)	0.12 (0.12)	D (E)
Westbound Left	99.5 (133.4)	0.93 (0.98)	F (F)
Westbound Left/Through	101.4 (134.1)	0.94 (0.99)	F (F)
Westbound Right	32.8 (45.7)	0.65 (0.70)	C (D)
Northbound Left	82.6 (103.7)	0.20 (0.22)	F (F)
Northbound Through	38.3 (42.1)	0.89 (0.97)	D (D)
Northbound Right	11.6 (11.6)	0.53 (0.73)	B (B)
Southbound Left	83.2 (93.8)	0.96 (0.98)	F (F)
Southbound Through/Right	25.1 (16.9)	0.65 (0.47)	C (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 4b: 2040 Build Conditions – Common to All Build Alternatives – Recommended Storage Lengths**

Intersection	95 <sup>th</sup> Percent Queue	Recommended Storage Length
<b>3 – SR 1209 (Independence Blvd) and Randall Pkwy / Mercer Ave</b>		
Eastbound Right	83'	100'
Westbound Left	621'	675'
Westbound Right	624'	625'
Northbound Left	54'	300'
Northbound Right	608'	625'
Southbound Left	798' (487' SimTraffic)*	400'

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures. 95<sup>th</sup> Percent Queue refers to the greatest 95<sup>th</sup> percentile queue length from the Synchro results and SimTraffic results.

\* Structural elements associated with the railroad bridge crossing limit this storage length to 400'. SimTraffic Simulation only showed minor congestion as a result of the shortened storage lanes.



**Table 4c: 2040 Build Conditions – Common to All Build Alternatives – Highway Segments**

Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>BASIC FREEWAY SEGMENTS</u></b>		
<b>33 – Independence Blvd SB – North of US 17 Business (Market St)</b>	27.2 (22.2)	D (C)
<b>34 – Independence Blvd NB – North of US 17 Business (Market St)</b>	22.2 (27.2)	C (D)
<b><u>MULTILANE HIGHWAYS</u></b>		
<b>55 – Independence Blvd SB – South of US 17 Business (Market St)</b>	25.5 (20.7)	C (C)
<b>56 – Independence Blvd NB – South of Darlington Ave</b>	20.7 (25.5)	C (C)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 4d: 2040 Build Conditions – MLK Parkway EB Simulation**

Segment	Travel Time (m:ss)	Avg. Speed (mph)
	AM (PM)	AM (PM)
US 74 (MLK Pkwy.) EB – NC 133 to 23 <sup>rd</sup> St. Interchange	0:56 (1:02)	49.60 (44.65)
US 74 (MLK Pkwy.) EB – Within 23 <sup>rd</sup> St. Interchange	0:29 (0:33)	44.93 (38.65)
US 74 (MLK Pkwy.) EB – 23 <sup>rd</sup> St. Interchange to U-4434 Interchange	0:29 (0:29)	49.44 (49.69)
US 74 (MLK Pkwy.) EB – Within U-4434 Interchange	0:23 (0:23)	53.27 (53.60)
US 74 (MLK Pkwy.) EB – U-4434 Interchange to Kerr Ave. Interchange	0:23 (0:23)	52.14 (50.98)
US 74 (MLK Pkwy.) EB – Within Kerr Ave. Interchange	0:17 (0:18)	51.27 (50.68)
US 74 (MLK Pkwy.) EB – Kerr Ave. Interchange to NC 132 (College Rd.)	1:14 (1:15)	51.70 (50.64)
<b>TOTAL US 74 (MLK Pkwy) EB *</b>	<b>4:10 (4:23)</b>	<b>50.36 (47.91)</b>

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound.

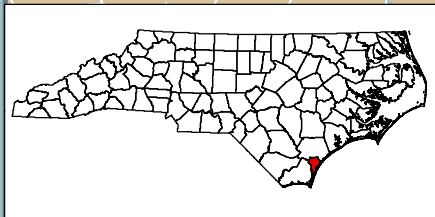
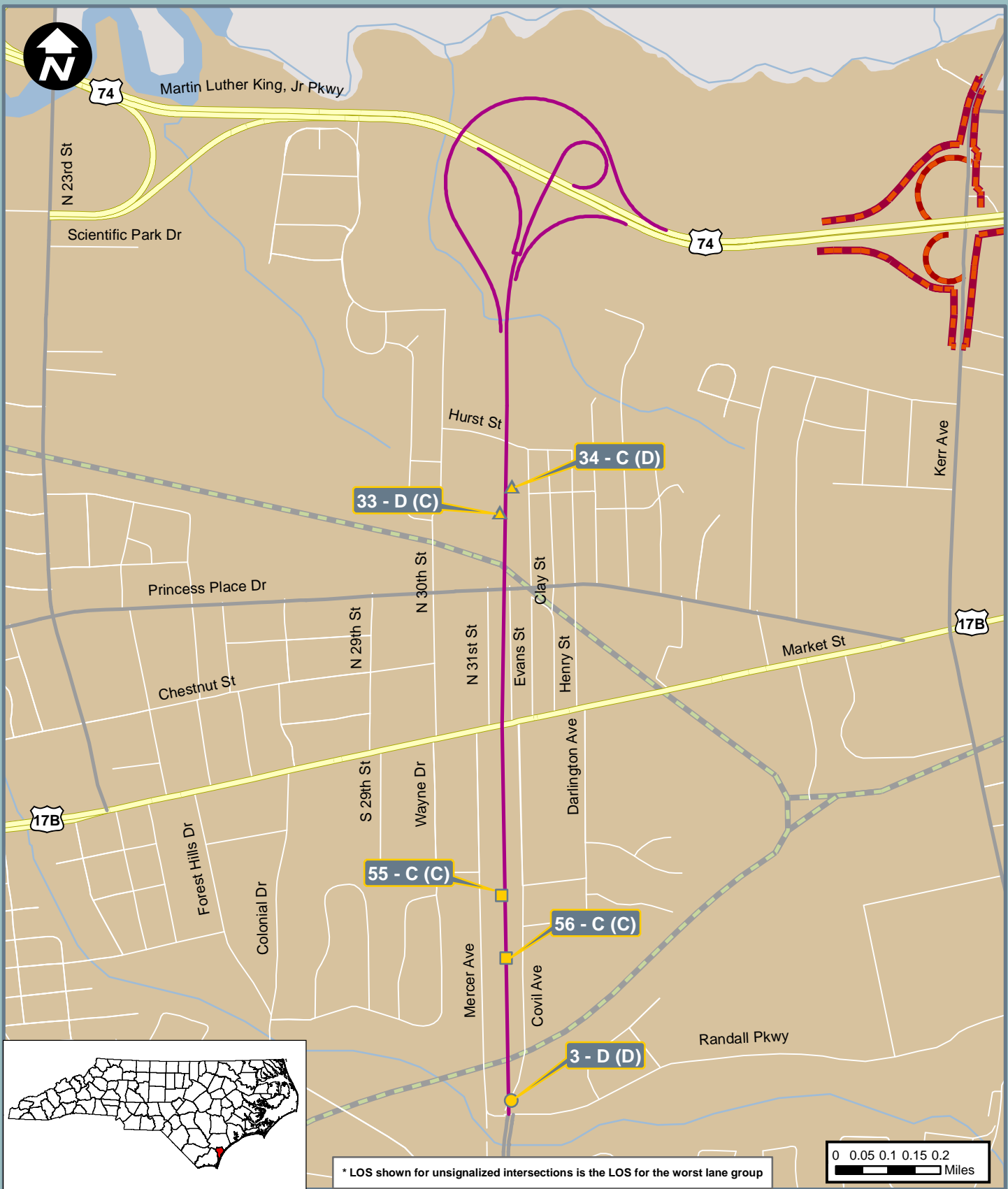
\* Figures in the “TOTAL” row may vary from the sum of the segment travel times due to rounding.

**Table 4e: 2040 Build Conditions – MLK Parkway WB Simulation**

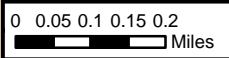
Segment	Travel Time (m:ss)	Avg. Speed (mph)
	AM (PM)	AM (PM)
US 74 (MLK Pkwy.) WB – NC 132 (College Rd.) to Kerr Ave. Interchange	1:12 (1:09)	52.77 (54.72)
US 74 (MLK Pkwy.) WB – Within Kerr Ave. Interchange	0:19 (0:16)	42.26 (50.68)
US 74 (MLK Pkwy.) WB – Kerr Ave. Interchange to U-4434 Interchange	0:27 (0:24)	43.09 (48.48)
US 74 (MLK Pkwy.) WB – Within U-4434 Interchange	0:15 (0:15)	53.03 (52.82)
US 74 (MLK Pkwy.) WB – U-4434 Interchange to 23 <sup>rd</sup> St. Interchange	1:27 (1:23)	45.32 (47.93)
US 74 (MLK Pkwy.) WB – Within 23 <sup>rd</sup> St. Interchange	0:20 (0:20)	43.75 (43.56)
US 74 (MLK Pkwy.) WB – 23 <sup>rd</sup> St. Interchange to NC 133	0:26 (0:26)	46.11 (46.06)
<b>TOTAL US 74 (MLK Pkwy) WB *</b>	<b>4:27 (4:13)</b>	<b>47.27 (49.77)</b>

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound.

\* Figures in the “TOTAL” row may vary from the sum of the segment travel times due to rounding.



\* LOS shown for unsignalized intersections is the LOS for the worst lane group



**North Carolina  
Department of Transportation**



March 2013

**Legend**

# - C (C)	Intersection Identification Number - LOS AM (PM)	U-4434 (Proposed)	Railroad
▲	Basic Freeway Segment	US Highway	Streams (non-delineated)
●	Intersection	State Route	Water
■	Multilane Segment	Local Road	Wilmington Municipal Boundary
		Proposed Kerr Ave Interchange (U-3338)	

**Independence Boulevard  
Extension  
New Hanover County, NC  
STIP U-4434**

**Figure 4**  
**2040 Build Common to All  
Alternatives Level of Service**



### 5.4 2040 Build – Adjacent Segments

The 2040 Build – Adjacent Segments analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. These segments are not located within the project study area and have the same traffic volumes and lane configurations regardless of the build alternative chosen. These segments were analyzed in order to provide a level of service comparison based on the traffic volumes in the No-Build and Build Scenarios. Results from the 2040 Build – Adjacent Segments analysis are listed in Table 5 as well as displayed in Figure 5.

**Table 5: 2040 Build Conditions – Adjacent Intersections**

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>1 – SR 1209 (Independence Blvd) and US 76 (Oleander Dr)</b>	<b>96.9 (117.7)</b>	<b>1.26 (1.29)</b>	<b>F (F)</b>
Eastbound Left	213.2 (184.2)	1.26 (1.19)	F (F)
Eastbound Through/Right	80.4 (144.5)	1.01 (1.20)	F (F)
Westbound Left	129.4 (189.1)	1.05 (1.20)	F (F)
Westbound Through	121.3 (124.6)	1.15 (1.13)	F (F)
Westbound Right	20.4 (28.6)	0.41 (0.50)	C (C)
Northbound Left	193.0 (96.6)	1.23 (0.84)	F (F)
Northbound Through/Right	92.8 (123.9)	1.06 (1.16)	F (F)
Southbound Left	174.3 (197.3)	1.23 (1.29)	F (F)
Southbound Through	60.7 (47.0)	1.06 (0.78)	F (D)
Southbound Right	11.2 (16.2)	0.34 (0.24)	B (B)
<b>2 – SR 1209 (Independence Blvd) and SR 1411 (Wrightsville Ave)</b>	<b>72.7 (79.1)</b>	<b>1.08 (1.09)</b>	<b>E (E)</b>
Eastbound Left	110.7 (124.5)	1.02 (1.08)	F (F)
Eastbound Through	80.2 (115.6)	0.93 (1.09)	F (F)
Eastbound Right	31.4 (33.2)	0.51 (0.44)	C (C)
Westbound Left	113.6 (151.8)	0.99 (1.09)	F (F)
Westbound Through	100.4 (111.3)	1.05 (1.05)	F (F)
Westbound Right	35.9 (53.4)	0.71 (0.84)	D (D)
Northbound Left	129.3 (72.4)	1.08 (0.82)	F (E)
Northbound Through	46.4 (73.4)	0.96 (1.09)	D (F)
Northbound Right	7.4 (8.7)	0.27 (0.38)	A (A)
Southbound Left	108.4 (132.6)	0.98 (1.07)	F (F)
Southbound Through	79.5 (46.0)	1.04 (0.79)	F (D)
Southbound Right	27.2 (12.9)	0.69 (0.53)	C (B)
<b>6 – US 17 Business (Market St) and Forest Hills Dr</b>	<b>78.8 (98.6)</b>	<b>1.10 (1.28)</b>	<b>F (F)</b>
Eastbound Through/Right	63.3 (141.7)	1.05 (1.25)	F (F)
Westbound Left	166.6 (236.3)	1.04 (1.28)	F (F)
Westbound Through	74.3 (14.6)	1.10 (0.86)	F (B)
Northbound Left/Right	162.2 (203.2)	1.10 (1.20)	F (F)



<b>16 – SR 1175 (Kerr Ave) and Randall Pkwy</b>	<b>74.1 (83.9)</b>	<b>1.04 (1.32)</b>	<b>E (F)</b>
Eastbound Left	125.0 (88.6)	0.94 (0.79)	F (F)
Eastbound Through	65.8 (126.2)	0.93 (1.17)	E (F)
Eastbound Right	20.4 (28.4)	0.52 (0.71)	C (C)
Westbound Left	97.5 (220.6)	0.88 (1.32)	F (F)
Westbound Through	84.4 (59.8)	1.04 (0.93)	F (E)
Westbound Right	21.5 (19.2)	0.28 (0.24)	C (B)
Northbound Left	112.7 (169.3)	1.02 (1.20)	F (F)
Northbound Through	74.8 (43.3)	1.01 (0.80)	F (D)
Northbound Right	19.2 (21.1)	0.38 (0.41)	B (C)
Southbound Left	100.4 (84.9)	0.78 (0.77)	F (F)
Southbound Through	84.0 (89.0)	1.01 (1.07)	F (F)
Southbound Right	24.4 (16.7)	0.31 (0.26)	C (B)
<b>17 – US 17 Business (Market St) and SR 1175 (Kerr Ave)</b>	<b>37.6 (41.7)</b>	<b>0.88 (0.95)</b>	<b>D (D)</b>
Eastbound Left	57.4 (60.1)	0.57 (0.61)	E (E)
Eastbound Through	36.4 (39.1)	0.78 (0.89)	D (D)
Eastbound Right	38.7 (40.7)	0.73 (0.83)	D (D)
Westbound Left	55.6 (72.3)	0.78 (0.91)	E (E)
Westbound Through/Right	26.4 (20.5)	0.70 (0.51)	C (C)
Northbound Through	52.1 (45.5)	0.88 (0.73)	D (D)
Northbound Right	24.4 (30.8)	0.62 (0.68)	C (C)
Southbound Through	41.6 (62.8)	0.68 (0.95)	D (E)
Southbound Right	23.3 (26.2)	0.31 (0.33)	C (C)
<b>181 – US 74 (MLK Blvd) EB Ramps and SR 1175 (Kerr Ave)</b>	<b>21.2 (25.6)</b>	<b>0.78 (0.86)</b>	<b>C (C)</b>
Eastbound Left	56.3 (66.3)	0.78 (0.86)	E (E)
Eastbound Right	25.4 (35.5)	0.64 (0.85)	C (D)
Northbound Left	49.5 (46.1)	0.63 (0.64)	D (D)
Northbound Through	12.7 (9.2)	0.63 (0.46)	B (A)
Southbound Through	14.5 (21.1)	0.64 (0.77)	B (C)
Southbound Right	2.7 (2.0)	0.09 (0.14)	A (A)
<b>182 – US 74 (MLK Blvd) WB Ramps / Greentree Rd and SR 1175 (Kerr Ave)</b>	<b>32.5 (30.7)</b>	<b>0.90 (0.86)</b>	<b>C (C)</b>
Eastbound Left/Through	98.5 (70.7)	0.90 (0.70)	F (E)
Eastbound Right	10.9 (17.2)	0.30 (0.32)	B (B)
Westbound Left/Through	51.3 (48.3)	0.26 (0.19)	D (D)
Westbound Right	34.4 (33.5)	0.02 (0.02)	C (C)
Northbound Left	34.1 (56.1)	0.87 (0.86)	C (E)
Northbound Through	14.9 (11.1)	0.84 (0.71)	B (B)
Northbound Right	5.1 (5.5)	0.01 (0.01)	A (A)
Southbound Left	55.2 (54.6)	0.16 (0.14)	E (D)
Southbound Through	42.8 (33.4)	0.70 (0.66)	D (C)
Southbound Right	51.4 (32.4)	0.75 (0.51)	D (C)
<b>19 – US 117 (College Rd) and US 76 (Oleander Dr)</b>	<b>149.5 (122.1)</b>	<b>1.38 (1.31)</b>	<b>F (F)</b>
Eastbound Left	127.6 (78.2)	0.89 (0.61)	F (E)
Eastbound Through	207.9 (155.3)	1.32 (1.20)	F (F)
Eastbound Right	18.5 (59.1)	0.39 (0.97)	B (E)
Westbound Left	214.5 (181.1)	1.30 (1.26)	F (F)
Westbound Through	117.1 (60.8)	1.08 (0.86)	F (E)
Westbound Right	35.1 (30.5)	0.13 (0.13)	D (C)
Northbound Left	117.1 (217.3)	1.06 (1.31)	F (F)
Northbound Through/Right	208.2 (154.5)	1.38 (1.24)	F (F)
Southbound Left	174.2 (83.0)	0.94 (0.63)	F (F)
Southbound Through/Right	60.0 (94.1)	1.00 (1.11)	F (F)





<b>20 – US 117 (College Rd) and SR 1175 (Kerr Ave)</b>	<b>99.9 (40.9)</b>	<b>1.23 (0.96)</b>	<b>F (D)</b>
Eastbound Left	257.7 (120.5)	1.23 (0.76)	F (F)
Eastbound Through/Right	46.1 (70.4)	0.29 (0.68)	D (E)
Westbound Left	44.8 (64.5)	0.20 (0.35)	D (E)
Westbound Through/Right	106.3 (102.9)	1.04 (0.96)	F (F)
Northbound Left	61.8 (99.8)	0.52 (0.48)	E (F)
Northbound Through/Right	150.9 (33.9)	1.09 (0.95)	F (C)
Southbound Left	172.1 (91.6)	1.13 (0.94)	F (F)
Southbound Through/Right	31.4 (16.7)	0.59 (0.56)	C (B)
<b>21 – US 117 (College Rd) and Randall Pkwy</b>	<b>168.7 (169.1)</b>	<b>1.44 (1.47)</b>	<b>F (F)</b>
Eastbound Left	253.9 (264.8)	1.40 (1.43)	F (F)
Eastbound Through	143.0 (267.4)	1.14 (1.47)	F (F)
Eastbound Right	24.0 (35.7)	0.46 (0.64)	C (D)
Westbound Left	259.8 (267.1)	1.43 (1.44)	F (F)
Westbound Through	252.8 (124.8)	1.44 (1.09)	F (F)
Westbound Right	30.9 (23.0)	0.64 (0.46)	C (C)
Northbound Left	257.2 (275.0)	1.42 (1.44)	F (F)
Northbound Through	209.0 (144.0)	1.37 (1.20)	F (F)
Northbound Right	15.6 (18.4)	0.46 (0.51)	B (B)
Southbound Left	265.3 (252.4)	1.42 (1.41)	F (F)
Southbound Through	135.3 (199.7)	1.18 (1.35)	F (F)
Southbound Right	17.8 (15.7)	0.47 (0.43)	B (B)
<b>22 – US 117 (College Rd) SB Ramps and US 17 Business (Market St) / Gingerwood Dr</b>	<b>50.2 (101.1)</b>	<b>0.97 (1.35)</b>	<b>D (F)</b>
Eastbound Left	74.4 (69.0)	0.90 (0.86)	E (E)
Eastbound Through/Right	49.9 (117.6)	0.78 (1.15)	D (F)
Westbound Left	59.7 (173.8)	0.97 (1.28)	E (F)
Westbound Through	42.2 (27.0)	0.92 (0.57)	D (C)
Westbound Right	42.5 (29.8)	0.85 (0.60)	D (C)
Northbound Left	91.5 (57.2)	0.93 (0.54)	F (E)
Northbound Through	30.3 (33.7)	0.09 (0.08)	C (C)
Northbound Right	8.0 (7.5)	0.32 (0.20)	A (A)
Southbound Left	75.6 (209.3)	0.95 (1.35)	E (F)
Southbound Through/Right	46.5 (63.5)	0.70 (0.87)	D (E)
<b>23 – US 117 (College Rd) NB Ramps and US 17 Business (Market St)</b>	<b>17.5 (18.5)</b>	<b>0.80 (0.90)</b>	<b>B (B)</b>
Eastbound Through	14.1 (19.1)	0.79 (0.90)	B (B)
Eastbound Right	6.6 (3.0)	0.12 (0.26)	A (A)
Westbound Left	43.1 (65.6)	0.49 (0.86)	D (E)
Westbound Through	6.7 (5.5)	0.74 (0.67)	A (A)
Northbound Left	68.9 (59.7)	0.60 (0.34)	E (E)
Northbound Right	39.6 (34.5)	0.80 (0.60)	D (C)
<b>24 – US 117 (College Rd) and US 74 (MLK Pkwy)</b>	<b>331.0 (249.7)</b>	<b>2.39 (1.89)</b>	<b>F (F)</b>
Eastbound Left	167.9 (432.4)	1.26 (1.89)	F (F)
Eastbound Through	27.0 (48.5)	0.35 (0.71)	C (D)
Eastbound Right	22.9 (24.3)	0.58 (0.62)	C (C)
Westbound Left	89.7 (74.3)	0.47 (0.14)	F (E)
Westbound Through	382.3 (231.8)	1.76 (1.37)	F (F)
Westbound Right	160.5 (178.3)	1.23 (1.26)	F (F)
Northbound Left	394.7 (322.9)	1.76 (1.58)	F (F)
Northbound Through	116.9 (346.5)	1.12 (1.68)	F (F)
Northbound Right	24.4 (20.1)	0.05 (0.07)	C (C)
Southbound Left	340.7 (292.2)	1.62 (1.50)	F (F)
Southbound Through	425.3 (98.1)	1.87 (1.05)	F (F)
Southbound Right	645.7 (223.0)	2.39 (1.44)	F (F)





<b>26 – US 74 (MLK Pkwy) EB Ramps and 23<sup>rd</sup> St / One Tree Hill</b>	<b>16.6 (26.8)</b>	<b>0.86 (0.92)</b>	<b>B (C)</b>
Eastbound Left/Through/Right	69.8 (85.1)	0.64 (0.92)	E (F)
Westbound Left/Through	58.5 (39.4)	0.45 (0.33)	E (D)
Westbound Right	14.2 (12.4)	0.13 (0.20)	B (B)
Northbound Left	36.4 (21.5)	0.37 (0.15)	D (C)
Northbound Through	26.2 (35.5)	0.50 (0.87)	C (D)
Northbound Right	24.7 (26.0)	0.30 (0.51)	C (C)
Southbound Left	29.5 (38.0)	0.86 (0.92)	C (D)
Southbound Through/Right	1.2 (0.7)	0.52 (0.37)	A (A)
<b>27 – US 74 (MLK Pkwy) WB Ramps and 23<sup>rd</sup> St</b>	<b>37.6 (23.5)</b>	<b>1.03 (0.92)</b>	<b>D (C)</b>
Eastbound Left	88.5 (52.0)	1.03 (0.92)	F (D)
Eastbound Right	28.3 (14.4)	0.50 (0.28)	C (B)
Northbound Left	47.1 (27.8)	0.43 (0.33)	D (C)
Northbound Through	2.5 (4.5)	0.38 (0.71)	A (A)
Southbound Through	44.7 (35.0)	0.98 (0.89)	D (C)
Southbound Right	2.1 (2.3)	0.13 (0.08)	A (A)
<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>15 – US 17 Business (Market St) and Barclay Hills Dr</b>	- (-)	- (-)	- (-)
Southbound Right	18.9 (17.4)	0.08 (0.04)	C (C)
<b>25 – 23<sup>rd</sup> St and Scientific Park Dr</b>	- (-)	- (-)	- (-)
Westbound Left	Err (Err)	Err (Err)	F (F)
Westbound Right	13.6 (21.4)	0.16 (0.44)	B (C)
Southbound Left	12.4 (13.8)	0.26 (0.16)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

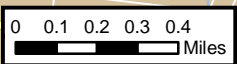
\* “Err” denotes movements where the analysis shows a capacity of zero. Therefore, delay would theoretically be infinite and v/c cannot be calculated.



Wilmington International Airport



\* LOS shown for unsignalized intersections is the LOS for the worst lane group



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### Legend

Intersection Identification Number - LOS AM (PM)	U-4434 (Proposed)	Railroad
Basic Freeway Segment	US Highway	Streams (non-delineated)
Intersection	State Route	Water
Multilane Segment	Local Road	Wilmington Municipal Boundary
	Proposed Kerr Ave Interchange (U-3338)	

Independence Boulevard  
Extension  
New Hanover County, NC  
STIP U-4434

Figure 5  
2040 Build Adjacent Intersections  
Level of Service



5.5 2040 Build – Alternative 2, Quadrant AC Interchange

The 2040 Build – Alternative 2, Quadrant AC analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. Results from the 2040 Build – Alternative 2, Quadrant AC analysis are listed in Tables 6a-6c as well as displayed in Figure 6.

Table 6a: 2040 Build Conditions – Alternative 2, Quadrant AC Interchange - Intersections

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	<b>10.9 (14.9)</b>	<b>0.73 (0.91)</b>	<b>B (B)</b>
Eastbound Left	12.8 (9.6)	0.09 (0.10)	B (A)
Eastbound Through/Right	12.5 (18.2)	0.72 (0.91)	B (B)
Westbound U-Turn/Left	64.1 (79.0)	0.63 (0.76)	E (E)
Westbound Through/Right	4.1 (2.8)	0.73 (0.57)	A (A)
Northbound Left/Through/Right	55.7 (61.8)	0.18 (0.39)	E (E)
Southbound Left/Through/Right	65.2 (56.6)	0.46 (0.22)	E (E)
<b>291 – Independence Blvd SB Ramps and US 17 Business (Market St)</b>	<b>22.2 (17.7)</b>	<b>0.85 (0.77)</b>	<b>C (B)</b>
Eastbound U-Turn/Left	47.3 (32.9)	0.83 (0.67)	D (C)
Eastbound Through	4.9 (3.7)	0.63 (0.77)	A (A)
Westbound U-Turn	69.8 (69.2)	0.48 (0.46)	E (E)
Westbound Through	16.8 (14.2)	0.85 (0.72)	B (B)
Westbound Right	3.0 (3.4)	0.21 (0.17)	A (A)
Southbound Left	46.7 (49.4)	0.50 (0.55)	D (D)
Southbound Right	60.3 (55.9)	0.81 (0.71)	E (E)
<b>292 – Independence Blvd NB Ramps and US 17 Business (Market St)</b>	<b>20.0 (22.2)</b>	<b>0.68 (0.79)</b>	<b>B (C)</b>
Eastbound U-Turn	50.8 (52.5)	0.34 (0.49)	D (D)
Eastbound Through	13.4 (18.8)	0.68 (0.79)	B (B)
Eastbound Right	3.5 (5.6)	0.28 (0.34)	A (A)
Westbound U-Turn/Left	59.7 (56.9)	0.68 (0.70)	E (E)
Westbound Through	9.5 (7.2)	0.66 (0.53)	A (A)
Northbound Left	55.2 (54.2)	0.61 (0.59)	E (D)
Northbound Right	54.5 (58.7)	0.55 (0.67)	D (E)
<b>142 – US 17 Business (Market St) and Darlington Ave</b>	<b>19.6 (18.3)</b>	<b>0.79 (0.88)</b>	<b>B (B)</b>
Eastbound U-Turn	43.8 (62.5)	0.15 (0.38)	D (E)
Eastbound Through/Right	12.7 (9.5)	0.79 (0.88)	B (A)
Westbound Left	65.6 (69.7)	0.71 (0.75)	E (E)
Westbound Through	9.9 (9.3)	0.59 (0.53)	A (A)
Northbound Left	60.7 (66.3)	0.76 (0.77)	E (E)
Northbound Right	33.2 (37.0)	0.36 (0.38)	C (D)
<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	<b>- (-)</b>	<b>- (-)</b>	<b>- (-)</b>
Eastbound Left	16.0 (13.3)	0.03 (0.06)	C (B)
Westbound Left	14.3 (18.7)	0.20 (0.13)	B (C)
Northbound Left/Through/Right	51.8 (88.9)	0.41 (0.79)	F (F)
Southbound Left/Through/Right	145.8 (137.0)	0.75 (0.50)	F (F)
<b>9 – US 17 Business (Market St) and 30<sup>th</sup> St / Wayne Dr</b>	<b>- (-)</b>	<b>- (-)</b>	<b>- (-)</b>
Northbound Right	13.3 (14.3)	0.22 (0.15)	B (B)
Southbound Right	12.9 (10.9)	0.28 (0.20)	B (B)



<b>10 – US 17 Business (Market St) and Mercer Ave</b>	-(-)	-(-)	-(-)
Northbound Right	11.0 (10.6)	0.06 (0.04)	B (B)
<b>12 – US 17 Business (Market St) and Evans St</b>	-(-)	-(-)	-(-)
Southbound Right	12.3 (12.3)	0.19 (0.14)	B (B)
<b>141 – US 17 Business (Market St) and Henry St</b>	-(-)	-(-)	-(-)
Southbound Right	13.0 (11.8)	0.14 (0.06)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 6b: 2040 Build – Alternative 2, Quadrant AC – Recommended Storage Lengths**

Intersection	95 <sup>th</sup> Percent Queue	Recommended Storage Length
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>		
Eastbound Left	38'	100'
Westbound Left	97'	100'
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>		
Eastbound Left	11'	100'
Westbound U-Turn/Left	215'	225'
<b>291 – US 17 Business (Market St) and Independence Blvd SB Ramps</b>		
Eastbound U-Turn/Left (including Int. #9 EB Through)	263'	425'
Westbound U-Turn	94'	250'
Westbound Right	114'	250'
Southbound Left	162'	275'
Southbound Right	253'	275'
<b>292 – US 17 Business (Market St) and Independence Blvd NB Ramps</b>		
Eastbound U-Turn	136'	300'
Eastbound Right	188'	300'
Westbound U-Turn/Left (including Int. #141 WB Through)	234'	325'
Northbound Left	163'	175'
Northbound Right	156'	175'
<b>142 – US 17 Business (Market St) and Darlington Ave</b>		
Eastbound U-Turn	81'	150'
Westbound Left	235'	275'
Northbound Left	193'	225'
Northbound Right	171'	225'

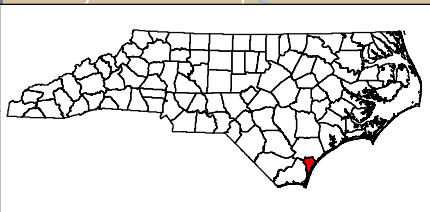
Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures. 95<sup>th</sup> Percent Queue refers to the greatest 95<sup>th</sup> percentile queue length from the Synchro results and SimTraffic results.



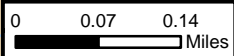
**Table 6c: 2040 Build Conditions – Alternative 2, Quadrant AC Interchange – Highway Segments**

Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>RAMP JUNCTIONS</u></b>		
45 – Independence Blvd SB – to US 17 Business (Market St)	25.1 (20.0)	C (B)
46 – Independence Blvd NB – from US 17 Business (Market St)	16.9 (21.5)	B (C)
47 – Independence Blvd SB – from US 17 Business (Market St)	19.9 (15.6)	B (B)
48 – Independence Blvd NB – to Darlington Ave	18.5 (23.3)	B (C)
<b><u>WEAVING SEGMENTS</u></b>		
49 – Independence Blvd NB – Darlington Ave to US 17 Business (Market St)	16.0 (19.9)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.



\* LOS shown for unsignalized intersections is the LOS for the worst lane group



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### Legend

# - C (C)	Intersection Identification Number - LOS AM (PM)		Alternative 2 Quadrant AC		Railroad
	Intersection		US Highway		Streams (non-delineated)
	Ramp Junction		State Route		Water
	Weave Segment		Local Road		Wilmington Municipal Boundary

Independence Boulevard  
Extension  
New Hanover County, NC  
STIP U-4434

Figure 6  
2040 Build Alternative 2 AC  
Level of Service



5.6 2040 Build – Alternative 2, Quadrant BC Interchange

The 2040 Build – Alternative 2, Quadrant BC analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. Results from the 2040 Build – Alternative 2, Quadrant BC analysis are listed in Tables 7a-7c as well as displayed in Figure 7.

Table 7a: 2040 Build Conditions – Alternative 2, Quadrant BC Interchange - Intersections

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	<b>8.9 (13.0)</b>	<b>0.73 (0.90)</b>	<b>A (B)</b>
Eastbound Left	6.8 (5.3)	0.09 (0.10)	A (A)
Eastbound Through/Right	6.4 (13.5)	0.71 (0.90)	A (B)
Westbound U-Turn/Left	64.2 (81.9)	0.62 (0.76)	E (F)
Westbound Through/Right	5.3 (4.2)	0.73 (0.57)	A (A)
Northbound Left/Through/Right	55.7 (61.8)	0.18 (0.39)	E (E)
Southbound Left/Through/Right	65.2 (56.6)	0.46 (0.22)	E (E)
<b>291 – Independence Blvd SB Ramps and US 17 Business (Market St)</b>	<b>24.7 (19.3)</b>	<b>0.80 (0.81)</b>	<b>C (B)</b>
Eastbound U-Turn	41.8 (37.4)	0.59 (0.55)	D (D)
Eastbound Through	7.7 (5.9)	0.69 (0.81)	A (A)
Eastbound Right	1.7 (1.1)	0.22 (0.21)	A (A)
Westbound U-Turn/Left	59.9 (68.6)	0.69 (0.73)	E (E)
Westbound Through	20.4 (10.3)	0.80 (0.64)	C (B)
Northbound Left	55.5 (53.7)	0.73 (0.64)	E (D)
Northbound Right	55.0 (60.8)	0.68 (0.76)	E (E)
<b>292 – Independence Blvd NB Ramps and US 17 Business (Market St)</b>	<b>18.4 (19.3)</b>	<b>0.68 (0.79)</b>	<b>B (B)</b>
Eastbound U-Turn	52.4 (50.0)	0.28 (0.49)	D (D)
Eastbound Through	13.0 (12.0)	0.68 (0.79)	B (B)
Eastbound Right	4.3 (1.2)	0.28 (0.34)	A (A)
Westbound U-Turn/Left	51.0 (62.6)	0.68 (0.70)	D (E)
Westbound Through	7.4 (6.6)	0.63 (0.53)	A (A)
Northbound Left	55.2 (54.2)	0.61 (0.59)	E (D)
Northbound Right	54.5 (58.7)	0.55 (0.67)	D (E)
<b>142 – US 17 Business (Market St) and Darlington Ave</b>	<b>19.1 (20.7)</b>	<b>0.68 (0.76)</b>	<b>B (C)</b>
Eastbound U-Turn	59.6 (47.3)	0.15 (0.38)	E (D)
Eastbound Through	9.2 (13.6)	0.68 (0.76)	A (B)
Eastbound Right	5.8 (10.8)	0.33 (0.40)	A (B)
Westbound Left	61.3 (62.0)	0.67 (0.69)	E (E)
Westbound Through	12.4 (12.9)	0.62 (0.56)	B (B)
Northbound Left	51.4 (50.3)	0.63 (0.54)	D (D)
Northbound Right	60.3 (63.4)	0.68 (0.70)	E (E)
<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	<b>- (-)</b>	<b>- (-)</b>	<b>- (-)</b>
Eastbound Left	16.0 (13.3)	0.03 (0.06)	C (B)
Westbound Left	13.8 (18.0)	0.19 (0.12)	B (C)
Northbound Left/Through/Right	30.5 (81.9)	0.27 (0.76)	D (F)
Southbound Left/Through/Right	61.4 (128.1)	0.45 (0.48)	F (F)
<b>9 – US 17 Business (Market St) and 30<sup>th</sup> St / Wayne Dr</b>	<b>- (-)</b>	<b>- (-)</b>	<b>- (-)</b>
Northbound Right	10.7 (13.1)	0.20 (0.18)	B (B)
Southbound Right	11.8 (11.9)	0.21 (0.19)	B (B)





<b>11 – US 17 Business (Market St) and 31<sup>st</sup> St</b>	- (-)	- (-)	- (-)
Southbound Right	12.5 (11.4)	0.07 (0.05)	B (B)
<b>12 – US 17 Business (Market St) and Evans St</b>	- (-)	- (-)	- (-)
Southbound Right	12.6 (12.3)	0.19 (0.14)	B (B)
<b>141 – US 17 Business (Market St) and Henry St</b>	- (-)	- (-)	- (-)
Southbound Right	13.0 (11.8)	0.14 (0.06)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 7b: 2040 Build – Alternative 2, Quadrant BC – Recommended Storage Lengths**

Intersection	95 <sup>th</sup> Percent Queue	Recommended Storage Length
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>		
Eastbound Left	42'	100'
Westbound Left	82'	100'
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>		
Eastbound Left	42'	100'
Westbound Left	241'	300'
<b>291 – US 17 Business (Market St) and Independence Blvd SB Ramps</b>		
Eastbound U-Turn (including Int. #9 EB Through)	179'	525'
Eastbound Right	187'	225'
Westbound U-Turn/Left (including Int. #11 WB Through)	179'	325'
Northbound Left	214'	250'
Northbound Right	192'	250'
<b>292 – US 17 Business (Market St) and Independence Blvd NB Ramps</b>		
Eastbound U-Turn (including #12 EB Through)	91'	350'
Eastbound Right	133'	200'
Westbound U-Turn/Left (including #141 WB Through)	184'	375'
Northbound Left	156'	225'
Northbound Right	156'	225'
<b>141 – US 17 Business (Market St) and Henry St</b>		
Westbound Through (2 Left Lanes)	90'	125'
<b>142 – US 17 Business (Market St) and Darlington Ave</b>		
Eastbound U-Turn	108'	125'
Eastbound Right	244'	250'
Westbound Left	221'	225'
Northbound Left	197'	250'
Northbound Right	213'	250'

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures. 95<sup>th</sup> Percent Queue refers to the greatest 95<sup>th</sup> percentile queue length from the Synchro results and SimTraffic results.



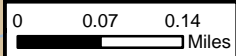
**Table 7c: 2040 Build Conditions – Alternative 2, Quadrant BC Interchange – Highway Segments**

Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>RAMP JUNCTIONS</u></b>		
45 – Independence Blvd SB – to US 17 Business (Market St)	25.1 (20.0)	C (B)
46 – Independence Blvd NB – from US 17 Business (Market St)	16.9 (21.5)	B (C)
47 – Independence Blvd SB – from US 17 Business (Market St)	19.9 (15.6)	B (B)
48 – Independence Blvd NB – to Darlington Ave	18.5 (23.3)	B (C)
<b><u>WEAVING SEGMENTS</u></b>		
49 – Independence Blvd NB – Darlington Ave to US 17 Business (Market St)	16.0 (19.9)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.



\* LOS shown for unsignalized intersections is the LOS for the worst lane group



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**Legend**

# - C (C)	Intersection Identification Number - LOS AM (PM)	Alternative 2 Quadrant BC	Railroad
●	Intersection	US Highway	Streams (non-delineated)
◆	Ramp Junction	State Route	Water
○	Weave	Local Road	Wilmington Municipal Boundary

**Independence Boulevard Extension  
New Hanover County, NC  
STIP U-4434**

**Figure 7**  
**2040 Build Alternative 2 BC  
Level of Service**



5.7 2040 Build – Alternative 2, Tight Urban Diamond Interchange

The 2040 Build – Alternative 2, Tight Urban Diamond analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. Results from the 2040 Build – Alternative 2, Tight Urban Diamond analysis are listed in Tables 8a-8c as well as displayed in Figure 8.

**Table 8a: 2040 Build Conditions – Alternative 2, Tight Urban Diamond Interchange - Intersections**

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>9 – US 17 Business (Market St) and 30<sup>th</sup> St / Wayne Dr</b>	<b>12.2 (11.3)</b>	<b>0.78 (0.76)</b>	<b>B (B)</b>
Eastbound Left	78.9 (81.6)	0.46 (0.56)	E (F)
Eastbound Through/Right	4.2 (4.6)	0.59 (0.76)	A (A)
Westbound Left	49.6 (61.7)	0.38 (0.56)	D (E)
Westbound Through	8.4 (7.5)	0.78 (0.62)	A (A)
Westbound Right	4.7 (4.8)	0.06 (0.07)	A (A)
Northbound Left/Through	65.3 (55.5)	0.56 (0.32)	E (E)
Northbound Right	39.4 (38.2)	0.24 (0.16)	D (D)
Southbound Left/Through	67.4 (65.4)	0.59 (0.55)	E (E)
Southbound Right	39.6 (37.0)	0.28 (0.20)	D (D)
<b>291 – Independence Blvd SB Ramps and US 17 Business (Market St)</b>	<b>20.7 (16.1)</b>	<b>0.72 (0.67)</b>	<b>C (B)</b>
Eastbound Through	19.1 (9.3)	0.54 (0.53)	B (A)
Eastbound Right	19.3 (8.6)	0.42 (0.33)	B (A)
Westbound Left	36.0 (74.9)	0.55 (0.66)	D (E)
Westbound Through	7.8 (1.6)	0.66 (0.52)	A (A)
Southbound Left	42.7 (47.2)	0.44 (0.52)	D (D)
Southbound Right	51.3 (52.5)	0.72 (0.67)	D (D)
<b>292 – Independence Blvd NB Ramps and US 17 Business (Market St)</b>	<b>20.4 (15.7)</b>	<b>0.62 (0.62)</b>	<b>C (B)</b>
Eastbound Left	70.6 (35.2)	0.62 (0.53)	E (D)
Eastbound Through	6.7 (5.0)	0.51 (0.62)	A (A)
Westbound Through	14.0 (9.7)	0.55 (0.51)	B (A)
Westbound Right	11.5 (9.8)	0.35 (0.41)	B (A)
Northbound Left	53.5 (51.2)	0.58 (0.54)	D (D)
Northbound Right	52.9 (54.3)	0.52 (0.62)	D (D)
<b>14 – US 17 Business (Market St) and Henry St / Darlington Ave</b>	<b>29.3 (28.8)</b>	<b>0.80 (0.79)</b>	<b>C (C)</b>
Eastbound Left	50.9 (47.8)	0.37 (0.49)	D (D)
Eastbound Through	13.6 (20.7)	0.78 (0.79)	B (C)
Eastbound Right	5.3 (5.3)	0.29 (0.33)	A (A)
Westbound Left	68.0 (69.7)	0.73 (0.75)	E (E)
Westbound Through/Right	27.3 (23.8)	0.80 (0.70)	C (C)
Northbound Left	63.2 (63.6)	0.78 (0.72)	E (E)
Northbound Through/Right	38.7 (48.0)	0.42 (0.55)	D (D)
Southbound Left	69.4 (72.7)	0.57 (0.53)	E (E)
Southbound Through/Right	73.2 (64.1)	0.69 (0.45)	E (E)



UNSIGNALIZED INTERSECTIONS			
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	- (-)	- (-)	- (-)
Eastbound Left	18.1 (14.3)	0.04 (0.06)	C (B)
Westbound Left	14.5 (18.2)	0.20 (0.13)	B (C)
Northbound Left/Through/Right	Err (Err)	Err (Err)	F (F)
Southbound Left/Through/Right	Err (Err)	Err (Err)	F (F)
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	- (-)	- (-)	- (-)
Eastbound Left	17.9 (13.3)	0.02 (0.04)	C (B)
Westbound Left	14.3 (19.0)	0.04 (0.03)	B (C)
Northbound Left/Through/Right	Err (Err)	Err (Err)	F (F)
Southbound Left/Through/Right	Err (Err)	Err (Err)	F (F)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 8b: 2040 Build – Alternative 2, Tight Urban Diamond – Recommended Storage Lengths**

Intersection	95 <sup>th</sup> Percent Queue	Recommended Storage Length
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>		
Eastbound Left	33'	100'
Westbound Left	96'	100'
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>		
Eastbound Left	3'	100'
Westbound Left	12'	100'
<b>9 – US 17 Business (Market St) and 30<sup>th</sup> St / Wayne Dr</b>		
Eastbound Left	173'	175'
Westbound Left	148'	300'
Westbound Right	41'	300'
Northbound Right	91'	125'
Southbound Right	124'	125'
<b>291 – US 17 Business (Market St) and Independence Blvd SB Ramps</b>		
Eastbound Through (2 Left Lanes)	166'	200'
Eastbound Right	254'	300'
Westbound Left (including Int. #292 WB Through)	235'	525'
Southbound Left	170'	300'
Southbound Right	223'	300'
<b>292 – US 17 Business (Market St) and Independence Blvd NB Ramps</b>		
Eastbound Left (including Int. #291 EB Through)	225'	525'
Westbound Through (Left Lane)	84'	200'
Westbound Right	160'	275'
Northbound Left	158'	250'
Northbound Right	149'	250'
<b>14 – US 17 Business (Market St) and Darlington Ave/Henry St</b>		
Eastbound Left	128'	200'
Eastbound Right	178'	300'
Westbound Left	292'	350'
Northbound Left	206'	225'
Southbound Left	112'	125'

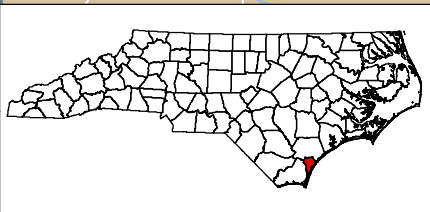
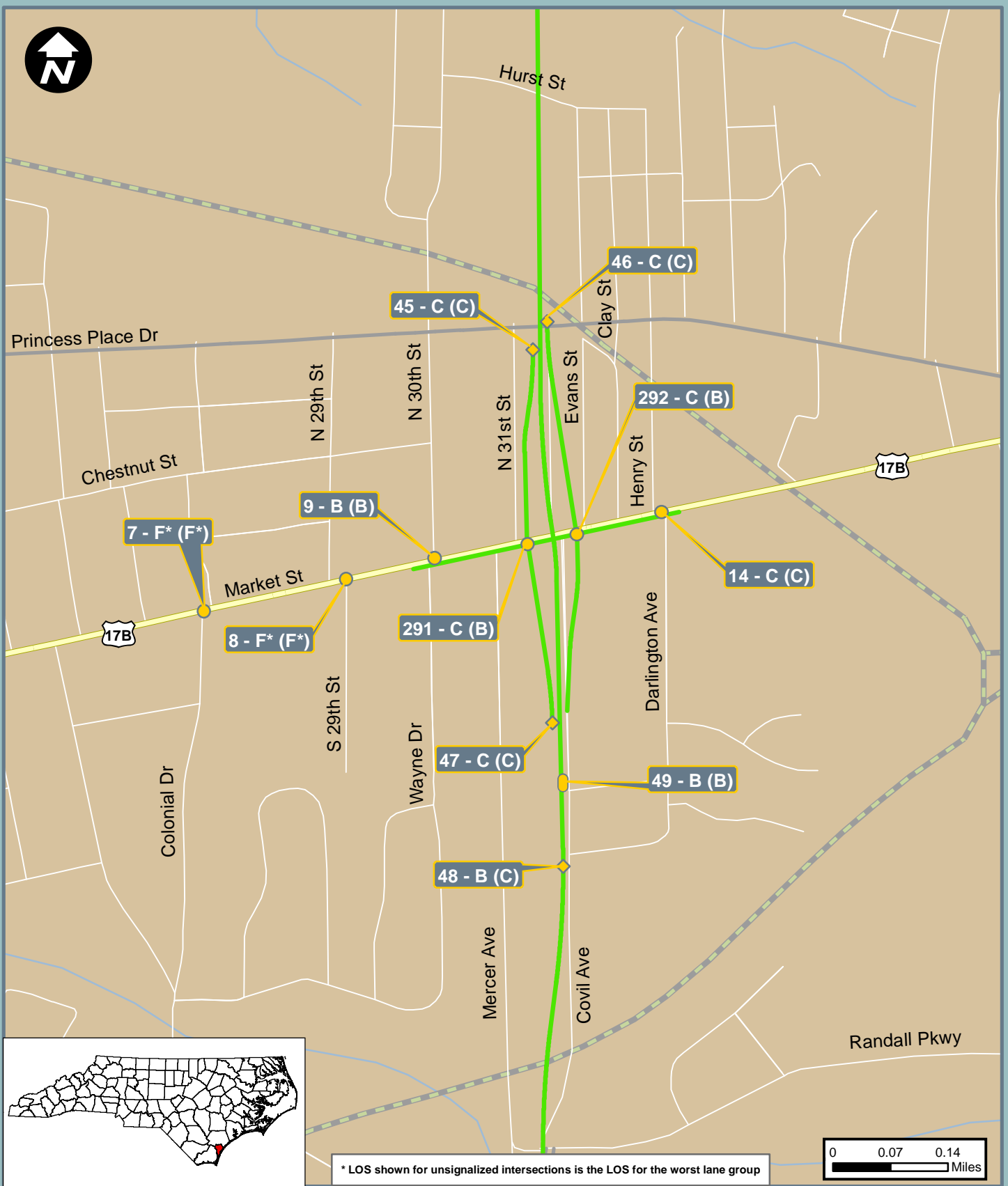
Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures. 95<sup>th</sup> Percent Queue refers to the greatest 95<sup>th</sup> percentile queue length from the Synchro results and SimTraffic results.



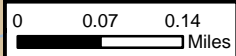
**Table 8c: 2040 Build Conditions – Alternative 2, Tight Urban Diamond Interchange – Highway Segments**

Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>RAMP JUNCTIONS</u></b>		
45 – Independence Blvd SB – to US 17 Business (Market St)	27.4 (22.3)	C (C)
46 – Independence Blvd NB – from US 17 Business (Market St)	22.9 (27.5)	C (C)
47 – Independence Blvd SB – from US 17 Business (Market St)	25.9 (21.6)	C (C)
48 – Independence Blvd NB – to Darlington Ave	18.5 (23.3)	B (C)
<b><u>WEAVING SEGMENTS</u></b>		
49 – Independence Blvd NB – Darlington Ave to US 17 Business (Market St)	16.0 (20.0)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.



\* LOS shown for unsignalized intersections is the LOS for the worst lane group



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### Legend

# - C (C)	Intersection Identification Number - LOS AM (PM)		Alternative 2 TUDI		Railroad
	Intersection		US Highway		Streams (non-delineated)
	Ramp Junction		State Route		Water
	Weave		Local Road		Wilmington Municipal Boundary

Independence Boulevard  
Extension  
New Hanover County, NC  
STIP U-4434

Figure 8  
2040 Build Alternative 2 TUDI  
Level of Service





5.8 2040 Build – Alternative 7, Quadrant AC Interchange

The 2040 Build – Alternative 7, Quadrant AC analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. Results from the 2040 Build – Alternative 7, Quadrant AC analysis are listed in Tables 9a-9c as well as displayed in Figure 9.

Table 9a: 2040 Build Conditions – Alternative 7, Quadrant AC Interchange - Intersections

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	<b>10.9 (14.9)</b>	<b>0.73 (0.91)</b>	<b>B (B)</b>
Eastbound Left	12.8 (9.6)	0.09 (0.10)	B (A)
Eastbound Through/Right	12.5 (18.2)	0.72 (0.91)	B (B)
Westbound U-Turn/Left	64.1 (79.0)	0.63 (0.76)	E (E)
Westbound Through/Right	4.1 (2.8)	0.73 (0.57)	A (A)
Northbound Left/Through/Right	55.7 (61.8)	0.18 (0.39)	E (E)
Southbound Left/Through/Right	65.2 (56.6)	0.46 (0.22)	E (E)
<b>291 – Independence Blvd SB Ramps and US 17 Business (Market St)</b>	<b>22.2 (17.7)</b>	<b>0.85 (0.77)</b>	<b>C (B)</b>
Eastbound U-Turn/Left	47.3 (32.9)	0.83 (0.67)	D (C)
Eastbound Through	4.9 (3.7)	0.63 (0.77)	A (A)
Westbound U-Turn	69.8 (69.2)	0.48 (0.46)	E (E)
Westbound Through	16.8 (14.2)	0.85 (0.72)	B (B)
Westbound Right	3.0 (3.4)	0.21 (0.17)	A (A)
Southbound Left	46.7 (49.4)	0.50 (0.55)	D (D)
Southbound Right	60.3 (55.9)	0.81 (0.71)	E (E)
<b>292 – Independence Blvd NB Ramps and US 17 Business (Market St)</b>	<b>20.0 (22.2)</b>	<b>0.68 (0.79)</b>	<b>B (C)</b>
Eastbound U-Turn	50.8 (52.5)	0.34 (0.49)	D (D)
Eastbound Through	13.4 (18.8)	0.68 (0.79)	B (B)
Eastbound Right	3.5 (5.6)	0.28 (0.34)	A (A)
Westbound U-Turn/Left	59.7 (56.9)	0.68 (0.70)	E (E)
Westbound Through	9.5 (7.2)	0.66 (0.53)	A (A)
Northbound Left	55.2 (54.2)	0.61 (0.59)	E (D)
Northbound Right	54.5 (58.7)	0.55 (0.67)	D (E)
<b>142 – US 17 Business (Market St) and Darlington Ave</b>	<b>19.6 (18.3)</b>	<b>0.79 (0.88)</b>	<b>B (B)</b>
Eastbound U-Turn	43.8 (62.5)	0.15 (0.38)	D (E)
Eastbound Through/Right	12.7 (9.5)	0.79 (0.88)	B (A)
Westbound Left	65.6 (69.7)	0.71 (0.75)	E (E)
Westbound Through	9.9 (9.3)	0.59 (0.53)	A (A)
Northbound Left	60.7 (66.3)	0.76 (0.77)	E (E)
Northbound Right	33.2 (37.0)	0.36 (0.38)	C (D)
<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	<b>- (-)</b>	<b>- (-)</b>	<b>- (-)</b>
Eastbound Left	16.0 (13.3)	0.03 (0.06)	C (B)
Westbound Left	14.3 (18.7)	0.20 (0.13)	B (C)
Northbound Left/Through/Right	51.8 (88.9)	0.41 (0.79)	F (F)
Southbound Left/Through/Right	145.8 (137.0)	0.75 (0.50)	F (F)
<b>9 – US 17 Business (Market St) and 30<sup>th</sup> St / Wayne Dr</b>	<b>- (-)</b>	<b>- (-)</b>	<b>- (-)</b>
Northbound Right	13.3 (14.3)	0.22 (0.15)	B (B)
Southbound Right	12.9 (10.9)	0.28 (0.20)	B (B)



<b>10 – US 17 Business (Market St) and Mercer Ave</b>	-(-)	-(-)	-(-)
Northbound Right	11.0 (10.6)	0.06 (0.04)	B (B)
<b>12 – US 17 Business (Market St) and Evans St</b>	-(-)	-(-)	-(-)
Southbound Right	12.3 (12.3)	0.19 (0.14)	B (B)
<b>141 – US 17 Business (Market St) and Henry St</b>	-(-)	-(-)	-(-)
Southbound Right	13.0 (11.8)	0.14 (0.06)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 9b: 2040 Build – Alternative 7, Quadrant AC – Recommended Storage Lengths**

Intersection	95 <sup>th</sup> Percent Queue	Recommended Storage Length
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>		
Eastbound Left	38'	100'
Westbound Left	94'	100'
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>		
Eastbound Left	11'	100'
Westbound Left	215'	225'
<b>291 – US 17 Business (Market St) and Independence Blvd SB Ramps</b>		
Eastbound U-Turn/Left (including Int. #9 EB Through)	263'	425'
Westbound U-Turn	94'	250'
Westbound Right	114'	250'
Southbound Left	162'	275'
Southbound Right	253'	275'
<b>292 – US 17 Business (Market St) and Independence Blvd NB Ramps</b>		
Eastbound U-Turn	136'	300'
Eastbound Right	188'	300'
Westbound Left (including Int. #141 WB Through)	234'	225'
Northbound Left	163'	175'
Northbound Right	156'	175'
<b>142 – US 17 Business (Market St) and Darlington Ave</b>		
Eastbound U-Turn	81'	150'
Westbound Left	235'	275'
Northbound Left	193'	225'
Northbound Right	171'	225'

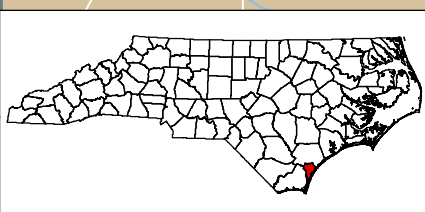
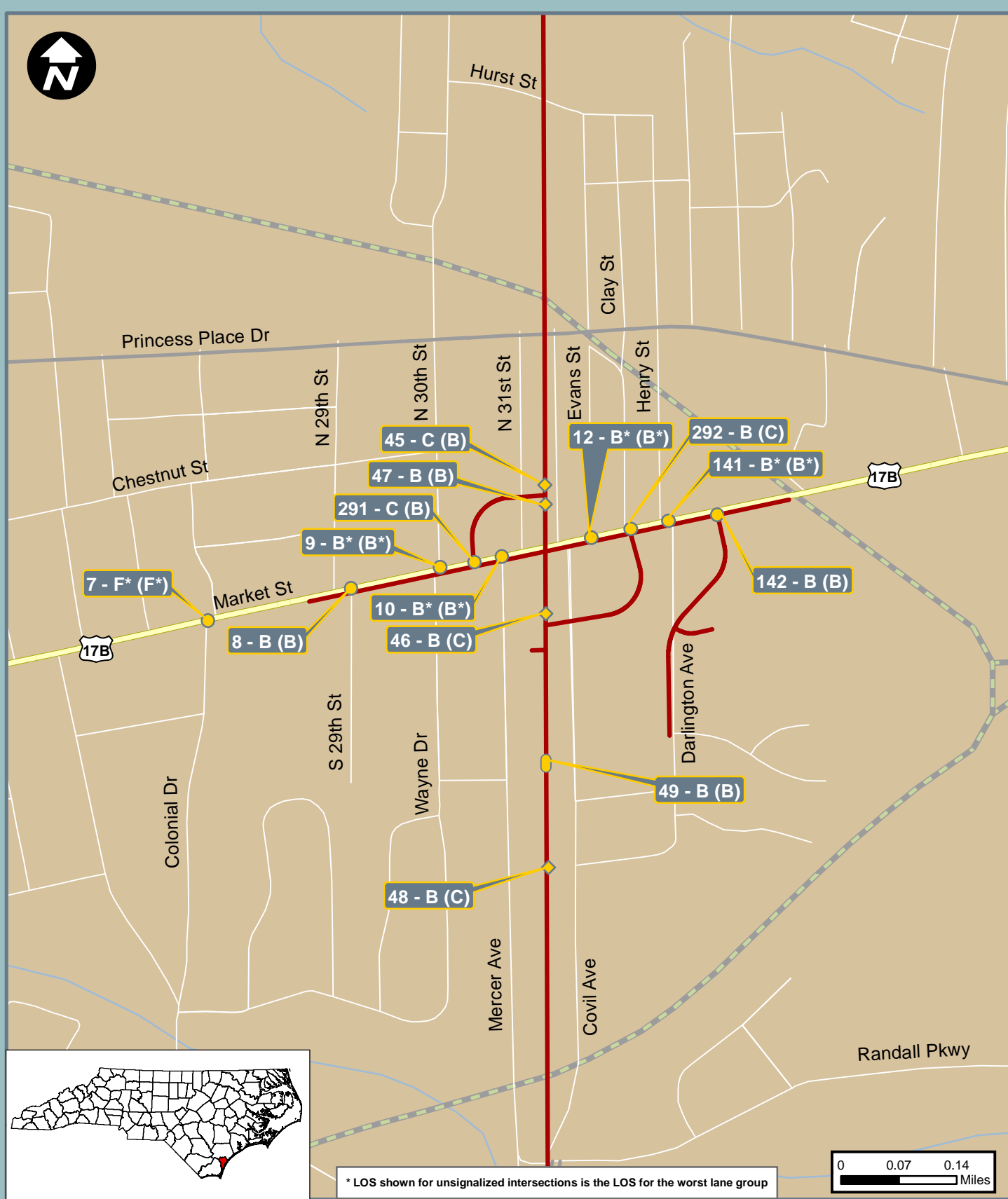
Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures. 95<sup>th</sup> Percent Queue refers to the greatest 95<sup>th</sup> percentile queue length from the Synchro results and SimTraffic results.



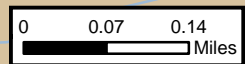
**Table 9c: 2040 Build Conditions – Alternative 7, Quadrant AC Interchange – Highway Segments**

Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>RAMP JUNCTIONS</u></b>		
45 – Independence Blvd SB – to US 17 Business (Market St)	25.1 (20.0)	C (B)
46 – Independence Blvd NB – from US 17 Business (Market St)	16.9 (21.5)	B (C)
47 – Independence Blvd SB – from US 17 Business (Market St)	19.9 (15.6)	B (B)
48 – Independence Blvd NB – to Darlington Ave	18.5 (23.3)	B (C)
<b><u>WEAVING SEGMENTS</u></b>		
49 – Independence Blvd NB – Darlington Ave to US 17 Business (Market St)	16.0 (19.9)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.



\* LOS shown for unsignalized intersections is the LOS for the worst lane group






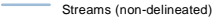

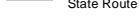


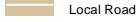



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### Legend

 # - C (C)	Intersection Identification Number - LOS AM (PM)	 Alternative 7 Quadrant AC	 Railroad
	Intersection	 US Highway	 Streams (non-delineated)
	Ramp Junction	 State Route	 Water
	Weave	 Local Road	 Wilmington Municipal Boundary

Independence Boulevard  
Extension  
New Hanover County, NC  
STIP U-4434

**Figure 9**  
2040 Build Alternative 7 AC  
Level of Service



5.9 2040 Build – Alternative 7, Quadrant BC Interchange

The 2040 Build – Alternative 7, Quadrant BC analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. Results from the 2040 Build – Alternative 7, Quadrant BC analysis are listed in Tables 10a-10c as well as displayed in Figure 10.

Table 10a: 2040 Build Conditions – Alternative 7, Quadrant BC Interchange - Intersections

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	<b>8.9 (13.0)</b>	<b>0.73 (0.90)</b>	<b>A (B)</b>
Eastbound Left	6.8 (5.3)	0.09 (0.10)	A (A)
Eastbound Through/Right	6.4 (13.5)	0.71 (0.90)	A (B)
Westbound U-Turn/Left	64.2 (81.9)	0.62 (0.76)	E (F)
Westbound Through/Right	5.3 (4.2)	0.73 (0.57)	A (A)
Northbound Left/Through/Right	55.7 (61.8)	0.18 (0.39)	E (E)
Southbound Left/Through/Right	65.2 (56.6)	0.46 (0.22)	E (E)
<b>291 – Independence Blvd SB Ramps and US 17 Business (Market St)</b>	<b>24.7 (19.3)</b>	<b>0.80 (0.81)</b>	<b>C (B)</b>
Eastbound U-Turn	41.8 (37.4)	0.59 (0.55)	D (D)
Eastbound Through	7.7 (5.9)	0.69 (0.81)	A (A)
Eastbound Right	1.7 (1.1)	0.22 (0.21)	A (A)
Westbound U-Turn/Left	59.9 (68.6)	0.69 (0.73)	E (E)
Westbound Through	20.4 (10.3)	0.80 (0.64)	C (B)
Northbound Left	55.5 (53.7)	0.73 (0.64)	E (D)
Northbound Right	55.0 (60.8)	0.68 (0.76)	E (E)
<b>292 – Independence Blvd NB Ramps and US 17 Business (Market St)</b>	<b>18.4 (19.3)</b>	<b>0.68 (0.79)</b>	<b>B (B)</b>
Eastbound U-Turn	52.4 (50.0)	0.28 (0.49)	D (D)
Eastbound Through	13.0 (12.0)	0.68 (0.79)	B (B)
Eastbound Right	4.3 (1.2)	0.28 (0.34)	A (A)
Westbound U-Turn/Left	51.0 (62.6)	0.68 (0.70)	D (E)
Westbound Through	7.4 (6.6)	0.63 (0.53)	A (A)
Northbound Left	55.2 (54.2)	0.61 (0.59)	E (D)
Northbound Right	54.5 (58.7)	0.55 (0.67)	D (E)
<b>142 – US 17 Business (Market St) and Darlington Ave</b>	<b>19.1 (20.7)</b>	<b>0.68 (0.76)</b>	<b>B (C)</b>
Eastbound U-Turn	59.6 (47.3)	0.15 (0.38)	E (D)
Eastbound Through	9.2 (13.6)	0.68 (0.76)	A (B)
Eastbound Right	5.8 (10.8)	0.33 (0.40)	A (B)
Westbound Left	61.3 (62.0)	0.67 (0.69)	E (E)
Westbound Through	12.4 (12.9)	0.62 (0.56)	B (B)
Northbound Left	51.4 (50.3)	0.63 (0.54)	D (D)
Northbound Right	60.3 (63.4)	0.68 (0.70)	E (E)
<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	<b>- (-)</b>	<b>- (-)</b>	<b>- (-)</b>
Eastbound Left	16.0 (13.3)	0.03 (0.06)	C (B)
Westbound Left	13.8 (18.0)	0.19 (0.12)	B (C)
Northbound Left/Through/Right	30.5 (81.9)	0.27 (0.76)	D (F)
Southbound Left/Through/Right	61.4 (128.1)	0.45 (0.48)	F (F)
<b>9 – US 17 Business (Market St) and 30<sup>th</sup> St / Wayne Dr</b>	<b>- (-)</b>	<b>- (-)</b>	<b>- (-)</b>
Northbound Right	10.7 (13.1)	0.20 (0.18)	B (B)
Southbound Right	11.8 (11.9)	0.21 (0.19)	B (B)



<b>11 – US 17 Business (Market St) and 31<sup>st</sup> St</b>	- (-)	- (-)	- (-)
Southbound Right	12.5 (11.4)	0.07 (0.05)	B (B)
<b>12 – US 17 Business (Market St) and Evans St</b>	- (-)	- (-)	- (-)
Southbound Right	12.6 (12.3)	0.19 (0.14)	B (B)
<b>141 – US 17 Business (Market St) and Henry St</b>	- (-)	- (-)	- (-)
Southbound Right	13.0 (11.8)	0.14 (0.06)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 10b: 2040 Build – Alternative 7, Quadrant BC – Recommended Storage Lengths**

Intersection	95 <sup>th</sup> Percent Queue	Recommended Storage Length
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>		
Eastbound Left	42'	100'
Westbound Left	82'	100'
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>		
Eastbound Left	42'	100'
Westbound Left	241'	300'
<b>291 – US 17 Business (Market St) and Independence Blvd SB Ramps</b>		
Eastbound U-Turn (including Int. #9 EB Through)	179'	525'
Eastbound Right	187'	225'
Westbound U-Turn/Left (including Int. #11 WB Through)	179'	325'
Northbound Left	214'	250'
Northbound Right	192'	250'
<b>292 – US 17 Business (Market St) and Independence Blvd NB Ramps</b>		
Eastbound U-Turn	91'	350'
Eastbound Right	133'	200'
Westbound U-Turn/Left (including #141 WB Through)	184'	375'
Northbound Left	156'	225'
Northbound Right	156'	225'
<b>142 – US 17 Business (Market St) and Darlington Ave</b>		
Eastbound U-Turn	108'	125'
Eastbound Right	244'	250'
Westbound Left	221'	225'
Northbound Left	197'	250'
Northbound Right	213'	250'

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures. 95<sup>th</sup> Percent Queue refers to the greatest 95<sup>th</sup> percentile queue length from the Synchro results and SimTraffic results.

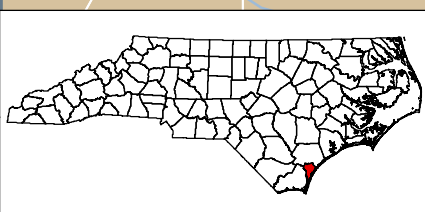
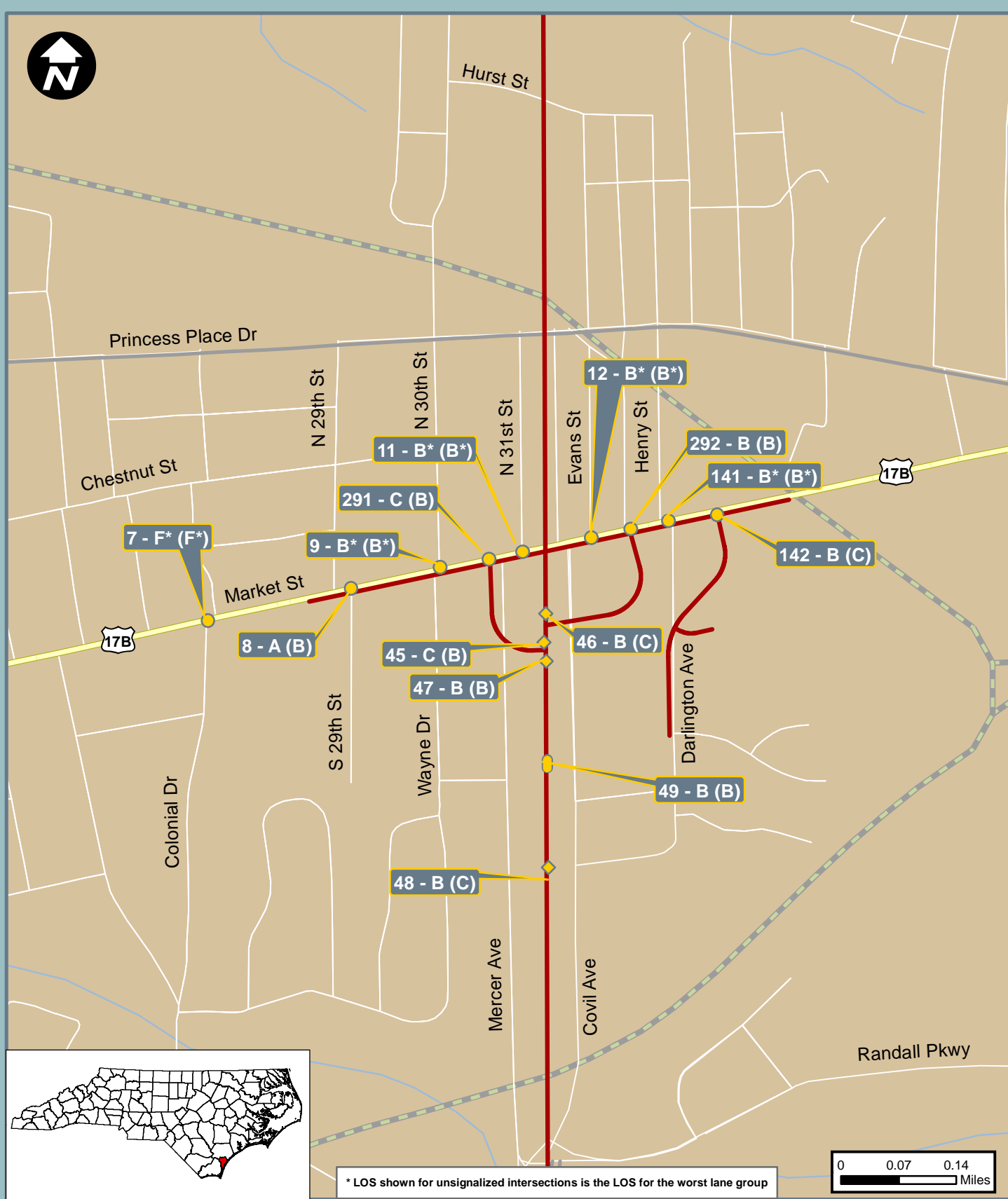


**Table 10c: 2040 Build Conditions – Alternative 7, Quadrant BC Interchange – Highway Segments**

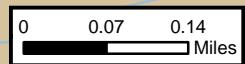
Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>RAMP JUNCTIONS</u></b>		
45 – Independence Blvd SB – to US 17 Business (Market St)	25.1 (20.0)	C (B)
46 – Independence Blvd NB – from US 17 Business (Market St)	16.9 (21.5)	B (C)
47 – Independence Blvd SB – from US 17 Business (Market St)	19.9 (15.6)	B (B)
48 – Independence Blvd NB – to Darlington Ave	18.5 (23.3)	B (C)
<b><u>WEAVING SEGMENTS</u></b>		
49 – Independence Blvd NB – Darlington Ave to US 17 Business (Market St)	16.0 (19.9)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.





\* LOS shown for unsignalized intersections is the LOS for the worst lane group



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### Legend

# - C (C)	Intersection Identification Number - LOS AM (PM)	—	Alternative 7 Quadrant BC	—	Railroad
●	Intersection	—	US Highway	—	Streams (non-delineated)
◆	Ramp Junction	—	State Route	—	Water
○	Weave	—	Local Road	—	Wilmington Municipal Boundary

Independence Boulevard  
Extension  
New Hanover County, NC  
STIP U-4434

Figure 10  
2040 Build Alternative 7 BC  
Level of Service



5.10 2040 Build – Alternative 7, Tight Urban Diamond Interchange

The 2040 Build – Alternative 7, Tight Urban Diamond analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. Results from the 2040 Build – Alternative 7, Tight Urban Diamond analysis are listed in Tables 11a-11c as well as displayed in Figure 11.

**Table 11a: 2040 Build Conditions – Alternative 7, Tight Urban Diamond Interchange - Intersections**

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>9 – US 17 Business (Market St) and 30<sup>th</sup> St / Wayne Dr</b>	<b>12.7 (11.5)</b>	<b>0.76 (0.76)</b>	<b>B (B)</b>
Eastbound Left	83.6 (80.3)	0.49 (0.56)	F (F)
Eastbound Through/Right	4.1 (5.0)	0.59 (0.76)	A (A)
Westbound Left	50.7 (62.5)	0.38 (0.56)	D (E)
Westbound Through	9.0 (7.4)	0.76 (0.62)	A (A)
Westbound Right	5.1 (4.7)	0.06 (0.07)	A (A)
Northbound Left/Through	68.7 (55.5)	0.59 (0.32)	E (E)
Northbound Right	40.2 (38.2)	0.24 (0.16)	D (D)
Southbound Left/Through	71.2 (65.4)	0.63 (0.55)	E (E)
Southbound Right	41.2 (37.0)	0.29 (0.20)	D (D)
<b>291 – Independence Blvd SB Ramps and US 17 Business (Market St)</b>	<b>20.3 (16.5)</b>	<b>0.72 (0.67)</b>	<b>C (B)</b>
Eastbound Through	19.2 (9.2)	0.54 (0.53)	B (A)
Eastbound Right	19.2 (8.2)	0.42 (0.33)	B (A)
Westbound Left	33.0 (77.5)	0.55 (0.66)	C (E)
Westbound Through	7.3 (2.7)	0.66 (0.52)	A (A)
Southbound Left	42.7 (47.2)	0.44 (0.52)	D (D)
Southbound Right	51.3 (52.5)	0.72 (0.67)	D (D)
<b>292 – Independence Blvd NB Ramps and US 17 Business (Market St)</b>	<b>19.3 (16.5)</b>	<b>0.62 (0.62)</b>	<b>B (B)</b>
Eastbound Left	63.2 (35.2)	0.62 (0.53)	E (D)
Eastbound Through	7.6 (5.0)	0.51 (0.62)	A (A)
Westbound Through	12.1 (11.8)	0.55 (0.51)	B (B)
Westbound Right	10.3 (11.2)	0.35 (0.41)	B (B)
Northbound Left	53.5 (51.2)	0.58 (0.54)	D (D)
Northbound Right	52.9 (54.3)	0.52 (0.62)	D (D)
<b>14 – US 17 Business (Market St) and Henry St / Darlington Ave</b>	<b>28.6 (29.6)</b>	<b>0.80 (0.79)</b>	<b>C (C)</b>
Eastbound Left	52.5 (50.4)	0.37 (0.49)	D (D)
Eastbound Through	11.5 (22.1)	0.78 (0.79)	B (C)
Eastbound Right	4.5 (7.5)	0.29 (0.33)	A (A)
Westbound Left	68.0 (69.7)	0.73 (0.75)	E (E)
Westbound Through/Right	27.3 (23.8)	0.80 (0.70)	C (C)
Northbound Left	63.2 (63.6)	0.78 (0.72)	E (E)
Northbound Through/Right	38.7 (48.0)	0.42 (0.55)	D (D)
Southbound Left	69.4 (72.7)	0.57 (0.53)	E (E)
Southbound Through/Right	73.2 (64.1)	0.69 (0.45)	E (E)



<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	- (-)	- (-)	- (-)
Eastbound Left	18.1 (14.3)	0.04 (0.06)	C (B)
Westbound Left	14.5 (18.2)	0.20 (0.13)	B (C)
Northbound Left/Through/Right	Err (Err)	Err (Err)	F (F)
Southbound Left/Through/Right	Err (Err)	Err (Err)	F (F)
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	- (-)	- (-)	- (-)
Eastbound Left	18.0 (13.3)	0.02 (0.04)	C (B)
Westbound Left	14.3 (19.0)	0.04 (0.03)	B (C)
Northbound Left/Through/Right	Err (Err)	Err (Err)	F (F)
Southbound Left/Through/Right	Err (Err)	Err (Err)	F (F)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 11b: 2040 Build – Alternative 7, Tight Urban Diamond – Recommended Storage Lengths**

<b>Intersection</b>	<b>95<sup>th</sup> Percent Queue</b>	<b>Recommended Storage Length</b>
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>		
Eastbound Left	39'	100'
Westbound Left	84'	100'
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>		
Eastbound Left	8'	100'
Westbound Left	8'	100'
<b>9 – US 17 Business (Market St) and 30<sup>th</sup> St / Wayne Dr</b>		
Eastbound Left	165'	175'
Westbound Left	119'	200'
Westbound Right	43'	300'
Northbound Right	94'	125'
Southbound Right	105'	125'
<b>291 – US 17 Business (Market St) and Independence Blvd SB Ramps</b>		
Eastbound Through (2 Left Lanes)	200'	200'
Eastbound Right	266'	300'
Westbound Left (including Int. #292 WB Through)	241'	525'
Southbound Left	181'	225'
Southbound Right	223'	225'
<b>292 – US 17 Business (Market St) and Independence Blvd NB Ramps</b>		
Eastbound Left (including Int. #291 EB Through)	205'	525'
Westbound Through (Left Lane)	110'	200'
Westbound Right	184'	225'
Northbound Left	161'	175'
Northbound Right	149'	175'
<b>14 – US 17 Business (Market St) and Darlington Ave/Henry St</b>		
Eastbound Left	165'	300'
Eastbound Right	235'	300'
Westbound Left	339'	375'
Northbound Left	223'	225'
Southbound Left	112'	125'

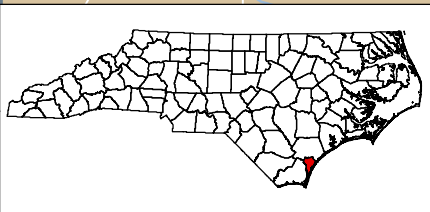
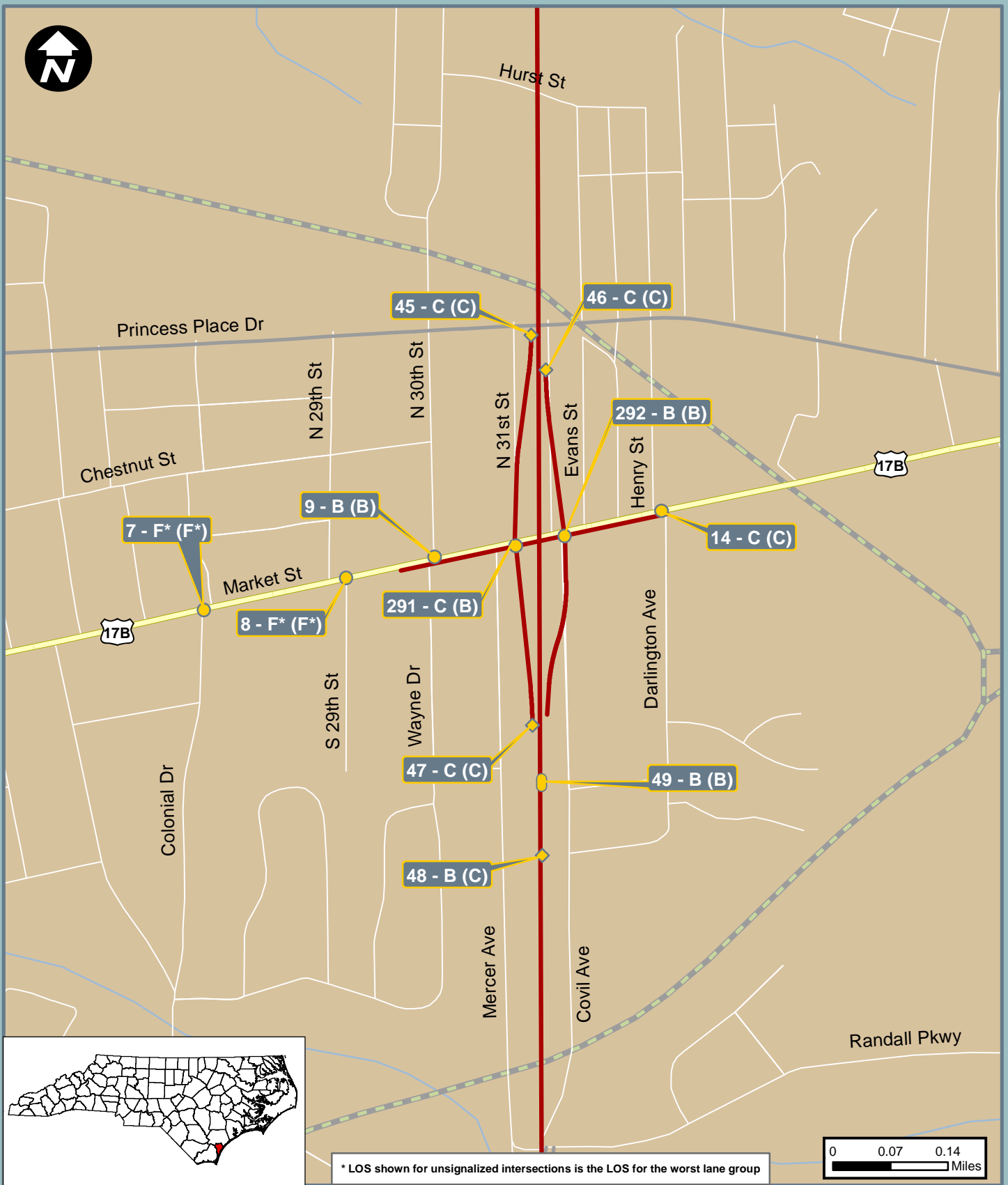
Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures. 95<sup>th</sup> Percent Queue refers to the greatest 95<sup>th</sup> percentile queue length from the Synchro results and SimTraffic results.



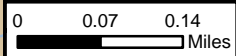
**Table 11c: 2040 Build Conditions – Alternative 7, Tight Urban Diamond Interchange – Highway Segments**

Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>RAMP JUNCTIONS</u></b>		
45 – Independence Blvd SB – to US 17 Business (Market St)	27.4 (22.3)	C (C)
46 – Independence Blvd NB – from US 17 Business (Market St)	22.9 (27.5)	C (C)
47 – Independence Blvd SB – from US 17 Business (Market St)	25.9 (21.6)	C (C)
48 – Independence Blvd NB – to Darlington Ave	18.5 (23.3)	B (C)
<b><u>WEAVING SEGMENTS</u></b>		
49 – Independence Blvd NB – Darlington Ave to US 17 Business (Market St)	16.0 (20.0)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.



\* LOS shown for unsignalized intersections is the LOS for the worst lane group



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### Legend

# - C (C)	Intersection Identification Number - LOS AM (PM)		Alternative 7 TUDI		Railroad
	Intersection		US Highway		Streams (non-delineated)
	Ramp Junction		State Route		Water
	Weave		Local Road		Wilmington Municipal Boundary

Independence Boulevard  
Extension  
New Hanover County, NC  
STIP U-4434

Figure 11  
2040 Build Alternative 7 TUDI  
Level of Service



5.11 2040 Build – Alternative 8, Quadrant AC Interchange

The 2040 Build – Alternative 8, Quadrant AC analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. Results from the 2040 Build – Alternative 8, Quadrant AC analysis are listed in Tables 12a-12c as well as displayed in Figure 12.

Table 12a: 2040 Build Conditions – Alternative 8, Quadrant AC Interchange - Intersections

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	<b>13.5 (20.3)</b>	<b>0.77 (0.92)</b>	<b>B (C)</b>
Eastbound Left	13.3 (8.6)	0.11 (0.16)	B (A)
Eastbound Through/Right	15.8 (18.4)	0.77 (0.92)	B (B)
Westbound U-Turn/Left	67.3 (66.5)	0.77 (0.74)	E (E)
Westbound Through/Right	3.4 (14.5)	0.72 (0.60)	A (B)
Northbound Left/Through/Right	63.5 (80.4)	0.41 (0.73)	E (F)
Southbound Left/Through/Right	62.4 (55.8)	0.39 (0.19)	E (E)
<b>291 – Independence Blvd SB Ramps and US 17 Business (Market St) / Wayne Dr</b>	<b>34.2 (23.8)</b>	<b>0.91 (0.77)</b>	<b>C (C)</b>
Eastbound U-Turn/Left	59.8 (60.5)	0.89 (0.77)	E (E)
Eastbound Through/Right	19.3 (6.5)	0.58 (0.77)	B (A)
Westbound Left	15.9 (21.1)	0.11 (0.27)	B (C)
Westbound Through	28.8 (19.7)	0.90 (0.77)	C (B)
Westbound Right	7.1 (5.8)	0.25 (0.24)	A (A)
Northbound Left/Through	68.3 (58.3)	0.53 (0.28)	E (E)
Northbound Right	66.8 (58.5)	0.47 (0.27)	E (E)
Southbound Left	55.9 (57.9)	0.59 (0.63)	E (E)
Southbound Through/Right	55.7 (57.6)	0.59 (0.62)	E (E)
Southbound Right	73.6 (58.9)	0.91 (0.74)	E (E)
<b>292 – Independence Blvd NB Ramps and US 17 Business (Market St)</b>	<b>16.5 (20.1)</b>	<b>0.69 (0.80)</b>	<b>B (C)</b>
Eastbound Through	13.2 (14.2)	0.69 (0.80)	B (B)
Eastbound Right	3.1 (3.1)	0.29 (0.35)	A (A)
Westbound U-Turn/Left	44.0 (60.6)	0.65 (0.75)	D (E)
Westbound Through	3.0 (4.3)	0.59 (0.46)	A (A)
Northbound Left	54.5 (54.8)	0.61 (0.61)	D (D)
Northbound Right	54.5 (60.7)	0.58 (0.71)	D (E)
<b>14 – US 17 Business (Market St) and Henry St / Darlington Ave</b>	<b>24.9 (23.3)</b>	<b>0.75 (0.78)</b>	<b>C (C)</b>
Eastbound U-Turn/Left	74.4 (40.6)	0.44 (0.55)	E (D)
Eastbound Through	10.1 (11.7)	0.75 (0.78)	B (B)
Eastbound Right	3.6 (3.1)	0.25 (0.32)	A (A)
Westbound Left	65.6 (69.4)	0.71 (0.75)	E (E)
Westbound Through/Right	22.6 (21.6)	0.74 (0.67)	C (C)
Northbound Left	60.1 (59.9)	0.75 (0.67)	E (E)
Northbound Through/Right	44.3 (52.7)	0.51 (0.61)	D (D)
Southbound Left	55.3 (53.6)	0.12 (0.07)	E (D)
Southbound Through/Right	68.5 (56.9)	0.51 (0.22)	E (E)



<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	- (-)	- (-)	- (-)
Northbound Right	10.6 (13.5)	0.04 (0.11)	B (B)
Southbound Right	14.0 (11.0)	0.33 (0.20)	B (B)
<b>13 – US 17 Business (Market St) and Clay St</b>	- (-)	- (-)	- (-)
Southbound Right	10.9 (10.1)	0.20 (0.13)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 12b: 2040 Build – Alternative 8, Quadrant AC – Recommended Storage Lengths**

<b>Intersection</b>	<b>95<sup>th</sup> Percent Queue</b>	<b>Recommended Storage Length</b>
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>		
Eastbound Left	83'	125'
Westbound Left	197'	250'
<b>291 – US 17 Business (Market St) and Independence Blvd SB Ramps / Wayne Dr</b>		
Eastbound U-Turn/Left	283'	375'
Westbound Left	37'	200'
Westbound Right	272'	400'
Northbound Right	77'	125'
Southbound Left	208'	300'
Southbound Right	284'	300'
<b>292 – US 17 Business (Market St) and Independence Blvd NB Ramps</b>		
Eastbound Right	190'	250'
Westbound U-Turn/Left (including Int. #13 WB Through)	262'	400'
Northbound Left	162'	200'
Northbound Right	136'	200'
<b>14 – US 17 Business (Market St) and Henry St / Darlington Ave</b>		
Eastbound U-Turn/Left	163'	250'
Eastbound Right	89'	450'
Westbound Left	287'	350'
Northbound Left	184'	225'
Southbound Left	30'	100'

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures. 95<sup>th</sup> Percent Queue refers to the greatest 95<sup>th</sup> percentile queue length from the Synchro results and SimTraffic results.

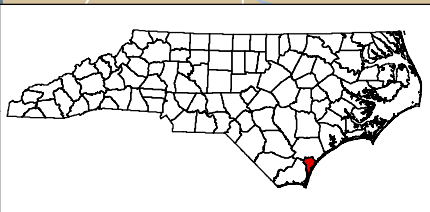
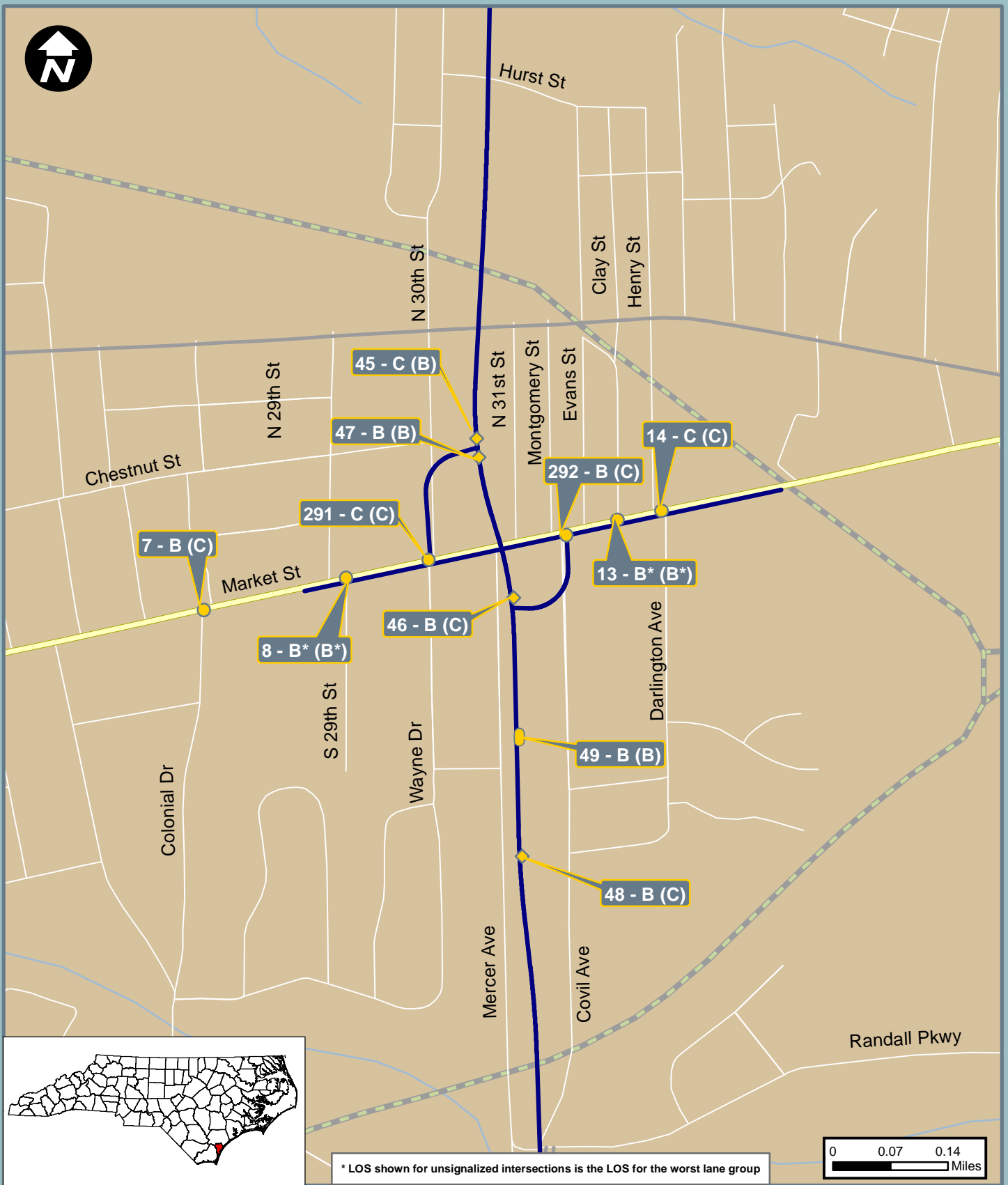




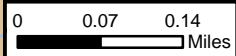
**Table 12c: 2040 Build Conditions – Alternative 8, Quadrant AC Interchange – Highway Segments**

Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>RAMP JUNCTIONS</u></b>		
45 – Independence Blvd SB – to US 17 Business (Market St)	25.1 (20.0)	C (B)
46 – Independence Blvd NB – from US 17 Business (Market St)	16.9 (21.5)	B (C)
47 – Independence Blvd SB – from US 17 Business (Market St)	19.9 (15.6)	B (B)
48 – Independence Blvd NB – to Darlington Ave	18.5 (23.3)	B (C)
<b><u>WEAVING SEGMENTS</u></b>		
49 – Independence Blvd NB – Darlington Ave to US 17 Business (Market St)	16.0 (19.9)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.



\* LOS shown for unsignalized intersections is the LOS for the worst lane group



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### Legend

# - C (C)	Intersection Identification Number - LOS AM (PM)	Blue line	Alternative 8 Quadrant AC	Green dashed line	Railroad
Yellow circle	Intersection	Yellow line	US Highway	Blue line	Streams (non-delineated)
Yellow diamond	Ramp Junction	Grey line	State Route	Blue area	Water
Yellow oval	Weave	Brown area	Local Road	Brown area	Wilmington Municipal Boundary

Independence Boulevard  
Extension  
New Hanover County, NC  
STIP U-4434

Figure 12  
2040 Build Alternative 8 AC  
Level of Service



5.12 2040 Build – Alternative 8, Quadrant BC Interchange

The 2040 Build – Alternative 8, Quadrant BC analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. Results from the 2040 Build – Alternative 8, Quadrant BC analysis are listed in Tables 13a-13c as well as displayed in Figure 13.

Table 13a: 2040 Build Conditions – Alternative 8, Quadrant BC Interchange - Intersections

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	<b>18.0 (16.1)</b>	<b>0.80 (0.89)</b>	<b>B (B)</b>
Eastbound Left	13.7 (9.2)	0.13 (0.16)	B (A)
Eastbound Through/Right	17.1 (16.8)	0.80 (0.89)	B (B)
Westbound U-Turn/Left	63.0 (59.5)	0.69 (0.48)	E (E)
Westbound Through/Right	10.9 (6.8)	0.76 (0.60)	B (A)
Northbound Left/Through/Right	69.7 (80.2)	0.66 (0.79)	E (F)
Southbound Left/Through/Right	62.4 (55.8)	0.39 (0.19)	E (E)
<b>291 – Independence Blvd SB Ramps and US 17 Business (Market St) / 30<sup>th</sup> St</b>	<b>33.2 (29.3)</b>	<b>0.91 (0.90)</b>	<b>C (C)</b>
Eastbound U-Turn/Left	59.4 (37.2)	0.75 (0.59)	E (D)
Eastbound Through	13.6 (15.4)	0.76 (0.90)	B (B)
Eastbound Right	3.6 (2.1)	0.31 (0.32)	A (A)
Westbound Left	64.0 (76.2)	0.81 (0.87)	E (E)
Westbound Through/Right	30.7 (21.4)	0.91 (0.76)	C (C)
Northbound Left	63.2 (60.6)	0.82 (0.74)	E (E)
Northbound Through/Right	68.5 (81.8)	0.74 (0.82)	E (F)
Northbound Right	36.1 (40.2)	0.37 (0.42)	D (D)
Southbound Left/Through/Right	80.3 (95.4)	0.78 (0.83)	F (F)
<b>292 – Independence Blvd NB Ramps and US 17 Business (Market St)</b>	<b>16.9 (17.5)</b>	<b>0.69 (0.80)</b>	<b>B (B)</b>
Eastbound Through	10.7 (9.8)	0.69 (0.80)	B (A)
Eastbound Right	2.6 (2.0)	0.29 (0.35)	A (A)
Westbound U-Turn/Left	42.2 (48.4)	0.65 (0.75)	D (D)
Westbound Through	6.0 (4.5)	0.60 (0.46)	A (A)
Northbound Left	50.2 (52.8)	0.54 (0.57)	D (D)
Northbound Right	54.1 (61.6)	0.64 (0.75)	D (E)
<b>14 – US 17 Business (Market St) and Henry St / Darlington Ave</b>	<b>26.7 (24.2)</b>	<b>0.76 (0.80)</b>	<b>C (C)</b>
Eastbound U-Turn/Left	71.0 (64.2)	0.44 (0.60)	E (E)
Eastbound Through	14.9 (12.8)	0.76 (0.80)	B (B)
Eastbound Right	8.9 (6.8)	0.35 (0.42)	A (A)
Westbound Left	61.1 (62.4)	0.66 (0.68)	E (E)
Westbound Through/Right	22.6 (20.9)	0.74 (0.66)	C (C)
Northbound Left	60.1 (59.9)	0.75 (0.67)	E (E)
Northbound Through/Right	44.3 (52.7)	0.51 (0.61)	D (D)
Southbound Left	55.3 (53.6)	0.12 (0.07)	E (D)
Southbound Through/Right	68.5 (56.9)	0.51 (0.22)	E (E)



<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	- (-)	- (-)	- (-)
Northbound Right	10.7 (13.7)	0.04 (0.11)	B (B)
Southbound Right	11.5 (9.9)	0.10 (0.04)	B (A)
<b>13 – US 17 Business (Market St) and Clay St</b>	- (-)	- (-)	- (-)
Southbound Right	10.9 (10.0)	0.20 (0.13)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 13b: 2040 Build – Alternative 8, Quadrant BC – Recommended Storage Lengths**

<b>Intersection</b>	<b>95<sup>th</sup> Percent Queue</b>	<b>Recommended Storage Length</b>
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>		
Eastbound Left	41'	150'
Westbound Left	194'	300'
<b>291 – US 17 Business (Market St) and Independence Blvd SB Ramps / N. 30<sup>th</sup> St</b>		
Eastbound U-Turn/Left	148'	300'
Eastbound Right	270'	450'
Westbound Left	301'	400'
Northbound Left	237'	275'
Northbound Right	183'	275'
<b>292 – US 17 Business (Market St) and Independence Blvd NB Ramps</b>		
Eastbound Right	124'	200'
Westbound U-Turn/Left (including Int. #13 WB Through)	272'	400'
Northbound Left	152'	200'
Northbound Right	182'	200'
<b>14 – US 17 Business (Market St) and Henry St / Darlington Ave</b>		
Eastbound U-Turn/Left	132'	250'
Eastbound Right	82'	400'
Westbound Left	256'	300'
Northbound Left	196'	225'
Southbound Left	31'	125'

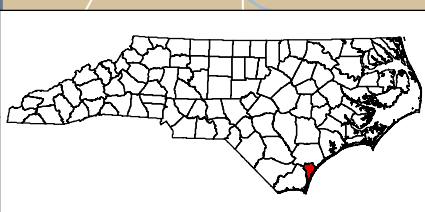
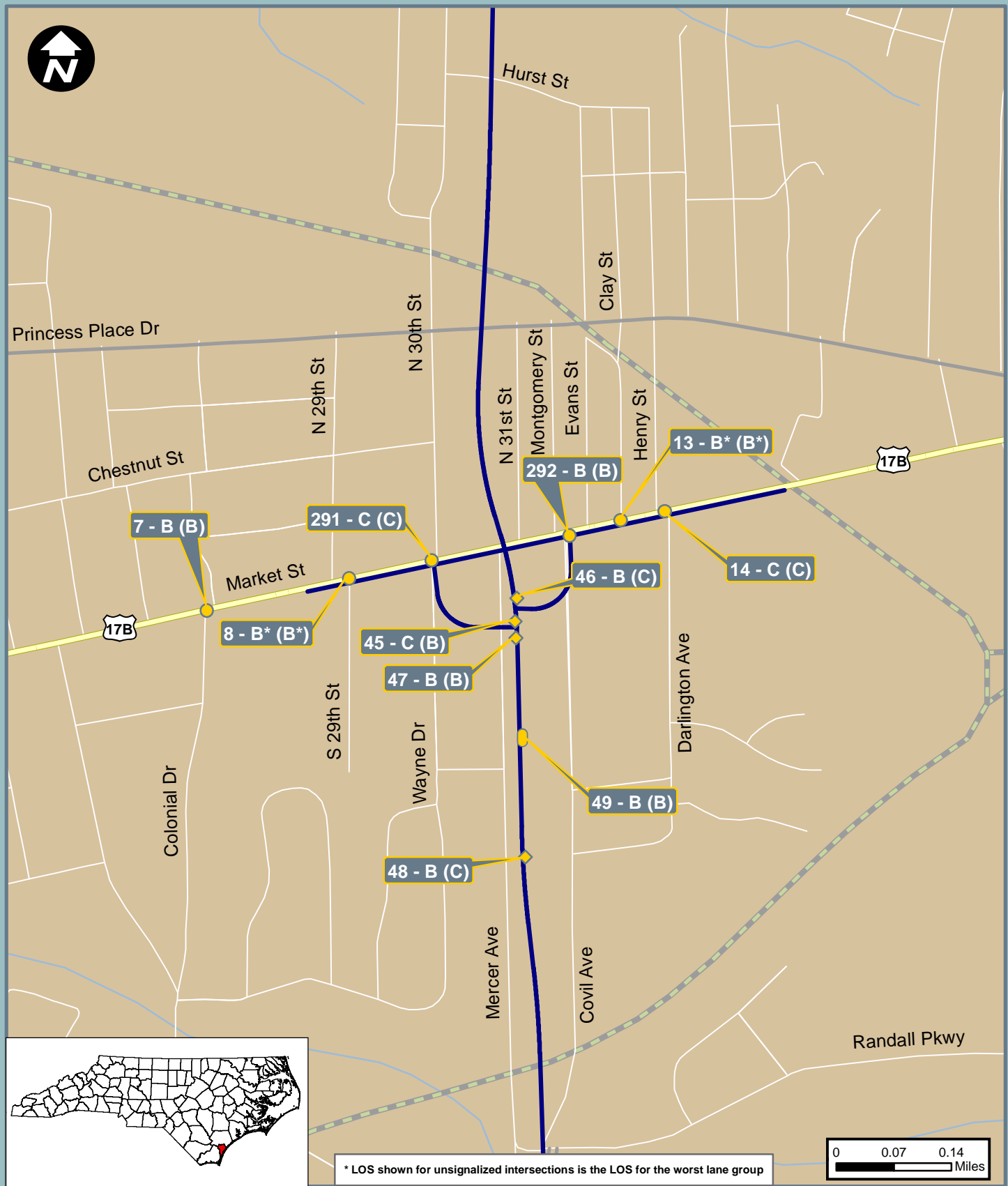
Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures. 95<sup>th</sup> Percent Queue refers to the greatest 95<sup>th</sup> percentile queue length from the Synchro results and SimTraffic results.



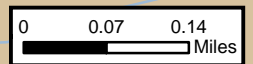
**Table 13c: 2040 Build Conditions – Alternative 8, Quadrant BC Interchange – Highway Segments**

Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>RAMP JUNCTIONS</u></b>		
45 – Independence Blvd SB – to US 17 Business (Market St)	25.1 (20.0)	C (B)
46 – Independence Blvd NB – from US 17 Business (Market St)	16.9 (21.5)	B (C)
47 – Independence Blvd SB – from US 17 Business (Market St)	19.9 (15.6)	B (B)
48 – Independence Blvd NB – to Darlington Ave	18.5 (23.3)	B (C)
<b><u>WEAVING SEGMENTS</u></b>		
49 – Independence Blvd NB – Darlington Ave to US 17 Business (Market St)	16.0 (19.9)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.



\* LOS shown for unsignalized intersections is the LOS for the worst lane group



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### Legend

# - C (C) Intersection Identification Number - LOS AM (PM)	Alternative 8 Quadrant BC	Railroad
Intersection	US Highway	Streams (non-delineated)
Ramp Junction	State Route	Water
Weave	Local Road	Wilmington Municipal Boundary

**Independence Boulevard  
Extension  
New Hanover County, NC  
STIP U-4434**

**Figure 13**  
**2040 Build Alternative 8 BC  
Level of Service**



5.13 2040 Build – Alternative 8, Tight Urban Diamond Interchange

The 2040 Build – Alternative 8, Tight Urban Diamond analysis was analyzed based on the current conditions of the network with the addition of STIP Project U-4434 and fiscally constrained roadway projects as shown in the *Cape Fear Communities 2035 Transportation Plan (LRTP)*. Results from the 2040 Build – Alternative 8, Tight Urban Diamond analysis are listed in Tables 14a-14c as well as displayed in Figure 14.

**Table 14a: 2040 Build Conditions – Alternative 8, Tight Urban Diamond Interchange - Intersections**

Intersection	Delay (s) AM(PM)	V/C AM(PM)	LOS AM(PM)
<b>SIGNALIZED INTERSECTIONS</b>			
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>	<b>11.9 (18.5)</b>	<b>0.80 (0.90)</b>	<b>B (B)</b>
Eastbound Left	12.3 (8.3)	0.11 (0.13)	B (A)
Eastbound Through/Right	10.5 (17.2)	0.70 (0.90)	B (B)
Westbound U-Turn/Left	67.2 (65.0)	0.47 (0.61)	E (E)
Westbound Through/Right	5.1 (12.1)	0.80 (0.65)	A (B)
Northbound Left/Through/Right	55.7 (62.1)	0.18 (0.39)	E (E)
Southbound Left/Through	67.0 (72.4)	0.60 (0.59)	E (E)
Southbound Right	72.9 (72.8)	0.66 (0.57)	E (E)
<b>291 – Independence Blvd SB Ramps and US 17 Business (Market St)</b>	<b>20.9 (18.1)</b>	<b>0.77 (0.69)</b>	<b>C (B)</b>
Eastbound Through	17.4 (13.7)	0.57 (0.67)	B (B)
Eastbound Right	17.6 (10.9)	0.41 (0.39)	B (B)
Westbound U-Turn/Left	53.6 (38.2)	0.77 (0.59)	D (D)
Westbound Through	6.5 (6.7)	0.71 (0.56)	A (A)
Southbound Left	43.4 (48.1)	0.45 (0.54)	D (D)
Southbound Right	52.6 (53.9)	0.74 (0.69)	D (D)
<b>292 – Independence Blvd NB Ramps and US 17 Business (Market St)</b>	<b>18.6 (20.3)</b>	<b>0.66 (0.73)</b>	<b>B (C)</b>
Eastbound U-Turn/Left	31.7 (46.4)	0.60 (0.73)	C (D)
Eastbound Through	4.9 (9.7)	0.53 (0.64)	A (A)
Westbound Through	17.5 (12.7)	0.66 (0.52)	B (B)
Westbound Right	13.4 (12.4)	0.40 (0.40)	B (B)
Northbound Left	55.2 (51.1)	0.61 (0.54)	E (D)
Northbound Right	54.6 (54.3)	0.55 (0.62)	D (D)
<b>14 – US 17 Business (Market St) and Henry St</b>	<b>27.8 (23.0)</b>	<b>0.76 (0.78)</b>	<b>C (C)</b>
Eastbound U-Turn/Left	65.2 (56.5)	0.44 (0.57)	E (E)
Eastbound Through	19.4 (10.2)	0.76 (0.78)	B (B)
Eastbound Right	4.6 (2.7)	0.27 (0.33)	A (A)
Westbound Left	61.1 (69.7)	0.66 (0.75)	E (E)
Westbound Through/Right	22.6 (21.2)	0.74 (0.67)	C (C)
Northbound Left	60.1 (59.9)	0.75 (0.67)	E (E)
Northbound Through/Right	44.3 (52.7)	0.51 (0.61)	D (D)
Southbound Left	55.3 (53.6)	0.12 (0.07)	E (D)
Southbound Through/Right	68.5 (56.9)	0.51 (0.22)	E (E)
<b>UNSIGNALIZED INTERSECTIONS</b>			
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>	<b>- (-)</b>	<b>- (-)</b>	<b>- (-)</b>
Eastbound Left	15.9 (13.1)	0.03 (0.05)	C (B)
Westbound Left	14.3 (18.7)	0.20 (0.13)	B (C)
Northbound Left/Through/Right	51.7 (55.6)	0.40 (0.64)	F (F)
Southbound Left/Through/Right	144.5 (95.1)	0.74 (0.39)	F (F)





<b>9 – US 17 Business (Market St) and Wayne Dr</b> Northbound Right	- (-) 14.1 (15.3)	- (-) 0.29 (0.22)	- (-) B (C)
<b>12 – US 17 Business (Market St) and Evans St</b> Southbound Right	- (-) 10.8 (10.2)	- (-) 0.12 (0.10)	- (-) B(B)
<b>13 – US 17 Business (Market St) and Clay St</b> Southbound Right	- (-) 10.5 (9.8)	- (-) 0.09 (0.04)	- (-) B (A)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.

**Table 14b: 2040 Build – Alternative 8, Tight Urban Diamond – Recommended Storage Lengths**

Intersection	95 <sup>th</sup> Percent Queue	Recommended Storage Length
<b>7 – US 17 Business (Market St) and Barnard Dr / Colonial Dr</b>		
Eastbound Left	38'	100'
Westbound Left	89'	100'
<b>8 – US 17 Business (Market St) and 29<sup>th</sup> St</b>		
Eastbound Left	73'	100'
Westbound U-Turn/Left	121'	200'
Southbound Right	163'	200'
<b>291 – US 17 Business (Market St) and Independence Blvd SB Ramps</b>		
Eastbound Through (2 Left Lanes)	166'	375'
Eastbound Right	224'	250'
Westbound U-Turn/Left (including Int. #292 WB Through)	289'	625'
Southbound Left	170'	250'
Southbound Right	246'	250'
<b>292 – US 17 Business (Market St) and Independence Blvd NB Ramps</b>		
Eastbound U-Turn/Left (including Int. #9, #291 EB Through)	247'	700'
Westbound Through (Left Lane)	150'	300'
Westbound Right	223'	325'
Northbound Left	158'	200'
Northbound Right	149'	200'
<b>14 – US 17 Business (Market St) and Darlington Ave/Henry St</b>		
Eastbound U-Turn/Left	155'	300'
Eastbound Right	127'	400'
Westbound Left	263'	325'
Northbound Left	266'	325'
Southbound Left	36'	100'

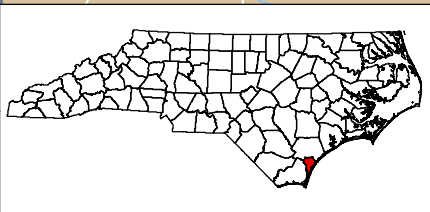
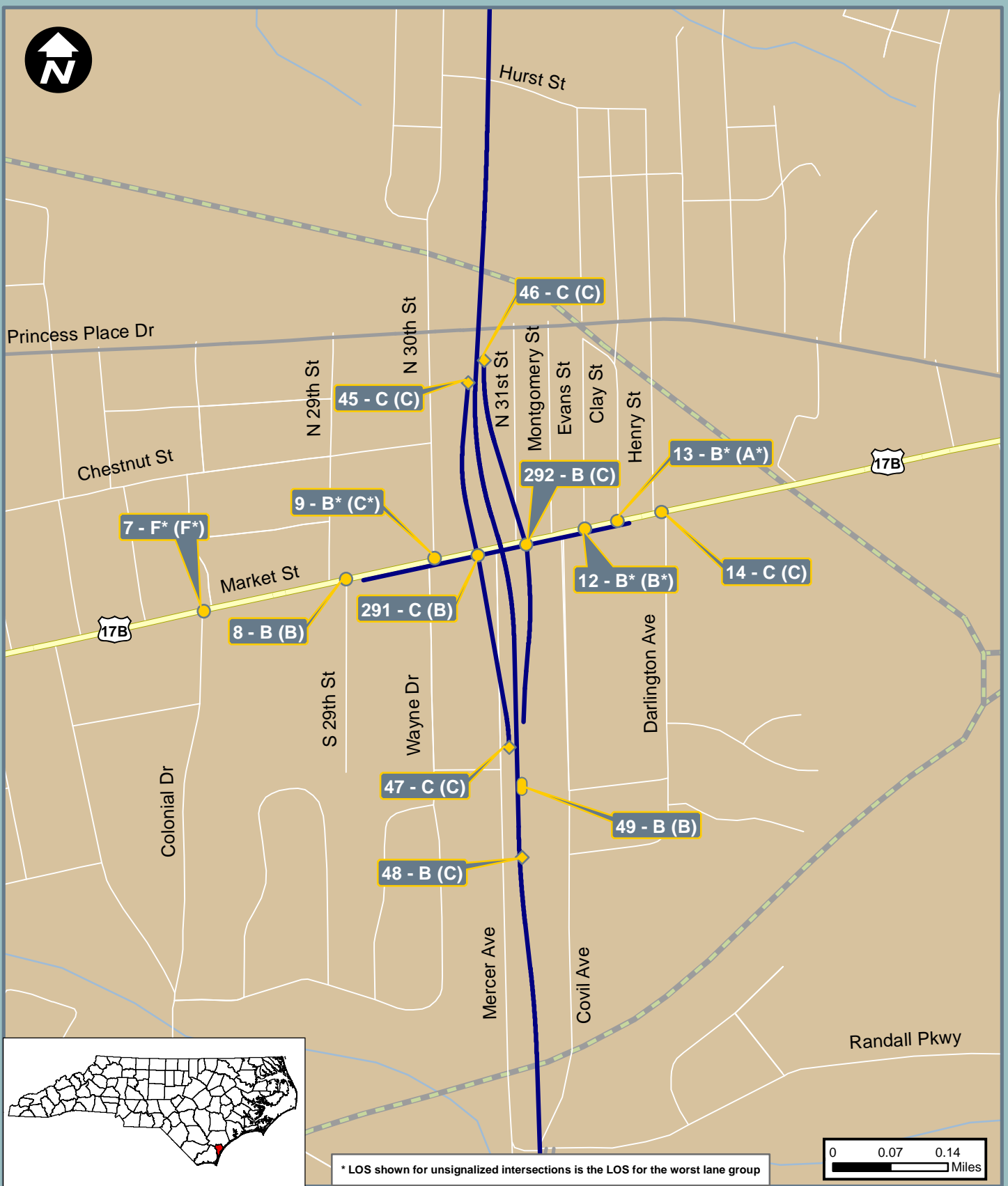
Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures. 95<sup>th</sup> Percent Queue refers to the greatest 95<sup>th</sup> percentile queue length from the Synchro results and SimTraffic results.



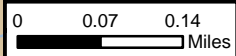
**Table 14c: 2040 Build Conditions – Alternative 8, Tight Urban Diamond Interchange – Highway Segments**

Segment	Density (pc/mi/ln) AM(PM)	LOS AM(PM)
<b><u>RAMP JUNCTIONS</u></b>		
45 – Independence Blvd SB – to US 17 Business (Market St)	27.4 (22.3)	C (C)
46 – Independence Blvd NB – from US 17 Business (Market St)	22.9 (27.5)	C (C)
47 – Independence Blvd SB – from US 17 Business (Market St)	25.9 (21.6)	C (C)
48 – Independence Blvd NB – to Darlington Ave	18.5 (23.3)	C (C)
<b><u>WEAVING SEGMENTS</u></b>		
49 – Independence Blvd NB – Darlington Ave to US 17 Business (Market St)	16.0 (20.0)	B (B)

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound. The analysis reference number shown prior to the analysis description corresponds with the analysis reports and Level of Service Figures.



\* LOS shown for unsignalized intersections is the LOS for the worst lane group



North Carolina  
Department of Transportation



March 2013

### Legend

# - C (C)	Intersection Identification Number - LOS AM (PM)	Alternative 8 TUDI	Railroad
	Intersection	US Highway	Streams (non-delineated)
	Ramp Junction	State Route	Water
	Weave	Local Road	Wilmington Municipal Boundary

Independence Boulevard  
Extension  
New Hanover County, NC  
STIP U-4434

Figure 14  
2040 Build Alternative 8 TUDI  
Level of Service



## 6. Conclusions

A summary of the traffic operations for all scenarios analyzed is shown below. Table 15a compares the levels of service at the uninterrupted flow highway segments analyzed in HCS, Table 15b compares the levels of service resulting at the signalized intersections analyzed in Synchro, and table 15c compares the levels of service found at the unsignalized intersections analyzed in Synchro. These tables were broken out to provide a side by side comparison between all of the different scenarios and alternatives.

Below the first three tables, Table 15d and Table 15e show a comparative analysis between the 2040 No-Build and 2040 Build Scenarios for the TransModeler Simulation of Martin Luther King Jr. Parkway. The tables show the travel-time differences as well as differences in average speed.

**Table 15a: Level of Service Summary – Roadway Segments**

Alternative	A	B	C	D	E	F
<b>2012 Base Year Conditions</b>	0	5	1	0	0	0
<b>2040 No Build Conditions</b>	0	0	0	0	0	0
<b>2040 Build – Segments Common to All Alternatives</b>	0	0	2	2	0	0
<b>2040 Build – Adjacent Segments</b>	0	0	0	0	0	0
<b>2040 Build Alternative 2 - Quadrant AC</b>	0	2	3	0	0	0
<b>2040 Build Alternative 2 - Quadrant BC</b>	0	2	3	0	0	0
<b>2040 Build Alternative 2 - Tight Urban Diamond</b>	0	1	4	0	0	0
<b>2040 Build Alternative 7 - Quadrant AC</b>	0	2	3	0	0	0
<b>2040 Build Alternative 7 - Quadrant BC</b>	0	2	3	0	0	0
<b>2040 Build Alternative 7 - Tight Urban Diamond</b>	0	1	4	0	0	0
<b>2040 Build Alternative 8 - Quadrant AC</b>	0	2	3	0	0	0
<b>2040 Build Alternative 8 - Quadrant BC</b>	0	2	3	0	0	0
<b>2040 Build Alternative 8 - Tight Urban Diamond</b>	0	1	4	0	0	0

- Note: Level of Service reported for basic freeway segments, ramp junctions, weaving segments, and multilane segments is worse overall Peak Hour LOS.

**Table 15b: Level of Service Summary – Signalized Intersections**

Alternative	A	B	C	D	E	F
<b>2012 Base Year Conditions</b>	1	4	1	5	4	2
<b>2040 No Build Conditions</b>	0	1	2	1	5	8
<b>2040 Build – Segments Common to All Alternatives</b>	0	0	0	1	0	0
<b>2040 Build – Adjacent Segments</b>	0	1	3	2	1	8
<b>2040 Build Alternative 2 - Quadrant AC</b>	0	2	2	0	0	0
<b>2040 Build Alternative 2 - Quadrant BC</b>	0	2	2	0	0	0
<b>2040 Build Alternative 2 - Tight Urban Diamond</b>	0	1	3	0	0	0
<b>2040 Build Alternative 7 - Quadrant AC</b>	0	2	2	0	0	0
<b>2040 Build Alternative 7 - Quadrant BC</b>	0	2	2	0	0	0
<b>2040 Build Alternative 7 - Tight Urban Diamond</b>	0	2	2	0	0	0
<b>2040 Build Alternative 8 - Quadrant AC</b>	0	0	4	0	0	0
<b>2040 Build Alternative 8 - Quadrant BC</b>	0	2	2	0	0	0
<b>2040 Build Alternative 8 - Tight Urban Diamond</b>	0	1	3	0	0	0

- Note: Level of Service reported for signalized intersections is worse overall Peak Hour LOS.



**Table 15c: Level of Service Summary – Unsignalized Intersections**

Alternative	A	B	C	D	E	F
<b>2012 Base Year Conditions</b>	0	0	1	0	0	10
<b>2040 No Build Conditions</b>	0	0	0	1	0	10
<b>2040 Build – Segments Common to All Alternatives</b>	0	0	0	0	0	0
<b>2040 Build – Adjacent Segments</b>	0	0	1	0	0	1
<b>2040 Build Alternative 2 - Quadrant AC</b>	0	4	0	0	0	1
<b>2040 Build Alternative 2 - Quadrant BC</b>	0	4	0	0	0	1
<b>2040 Build Alternative 2 - Tight Urban Diamond</b>	0	0	0	0	0	2
<b>2040 Build Alternative 7 - Quadrant AC</b>	0	4	0	0	0	1
<b>2040 Build Alternative 7 - Quadrant BC</b>	0	4	0	0	0	1
<b>2040 Build Alternative 7 - Tight Urban Diamond</b>	0	0	0	0	0	2
<b>2040 Build Alternative 8 - Quadrant AC</b>	0	2	0	0	0	0
<b>2040 Build Alternative 8 - Quadrant BC</b>	0	2	0	0	0	0
<b>2040 Build Alternative 8 - Tight Urban Diamond</b>	0	3	0	0	0	1

- Note: Level of Service reported for unsignalized intersections is the worst movement LOS from the worse Peak Hour.

**Table 15d: MLK Parkway EB Simulation – 2040 Build vs. 2040 No-Build**

Segment	Travel Time (m:ss)	Avg. Speed (mph)
	AM (PM)	AM (PM)
US 74 (MLK Pkwy.) EB – NC 133 to 23 <sup>rd</sup> St. Interchange	+0:01 (-0:01)	-0.36 (+1.16)
US 74 (MLK Pkwy.) EB – Within 23 <sup>rd</sup> St. Interchange	+0:02 (-0:02)	-2.58 (+2.22)
US 74 (MLK Pkwy.) EB – 23 <sup>rd</sup> St. Interchange to Kerr Ave. Interchange	+0:01 (-2:21)	-0.48 (+33.42)
US 74 (MLK Pkwy.) EB – Within Kerr Ave. Interchange	0:00 (-0:01)	-0.76 (+3.19)
US 74 (MLK Pkwy.) EB – Kerr Ave. Interchange to NC 132 (College Rd.)	+0:01 (+0:04)	-0.88 (-3.36)
<b>TOTAL US 74 (MLK Pkwy) EB *</b>	<b>+0:04 (-2:21)</b>	<b>-0.82 (+16.71)</b>

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound.  
 \* Figures in the “TOTAL” row may vary from the sum of the segment travel times due to rounding.

**Table 15e: MLK Parkway WB Simulation – 2040 Build vs. 2040 No-Build**

Segment	Travel Time (m:ss)	Avg. Speed (mph)
	AM (PM)	AM (PM)
US 74 (MLK Pkwy.) WB – NC 132 (College Rd.) to Kerr Ave. Interchange	0:00 (-0:01)	-0.08 (+0.61)
US 74 (MLK Pkwy.) WB – Within Kerr Ave. Interchange	+0:03 (+0:01)	-9.10 (-2.38)
US 74 (MLK Pkwy.) WB – Kerr Ave. Interchange to 23 <sup>rd</sup> St. Interchange	+0:06 (+0:04)	-2.07 (-1.55)
US 74 (MLK Pkwy.) WB – Within 23 <sup>rd</sup> St. Interchange	0:00 (+0:01)	+0.30 (-1.49)
US 74 (MLK Pkwy.) WB – 23 <sup>rd</sup> St. Interchange to NC 133	0:00 (0:00)	+0.58 (-1.10)
<b>TOTAL US 74 (MLK Pkwy) WB *</b>	<b>+0:10 (+0:05)</b>	<b>-1.73 (-1.02)</b>

Note: WB means westbound, EB means eastbound, NB means northbound, SB means southbound.  
 \* Figures in the “TOTAL” row may vary from the sum of the segment travel times due to rounding.



## 7. References

1. North Carolina Department of Transportation. *From Policy to Projects*. Raleigh, North Carolina. 2011.
2. Wilmington Urban Area Metropolitan Planning Organization. *Cape Fear Communities 2035 Transportation Plan*. Wilmington, North Carolina. December 2010.
3. North Carolina Department of Transportation. *Traffic Forecast Report*, September 2012.
4. Transportation Research Board, National Research Council. *Highway Capacity Manual 2010*. Washington, DC. 2010.
5. North Carolina Department of Transportation. *NCDOT Congestion Management Capacity Analysis Guidelines*. 01-01-2012.
6. Transportation Research Board, National Research Council. *Highway Capacity Manual*. Washington, DC. 2000.
7. American Association of State Highway and Transportation Officials. *A Policy on Geometric Design of Highways and Streets*. Washington, DC. 2004.
8. North Carolina Department of Transportation. *Traffic Forecast: 3338*. Shane York, NCDOT, October 2009.

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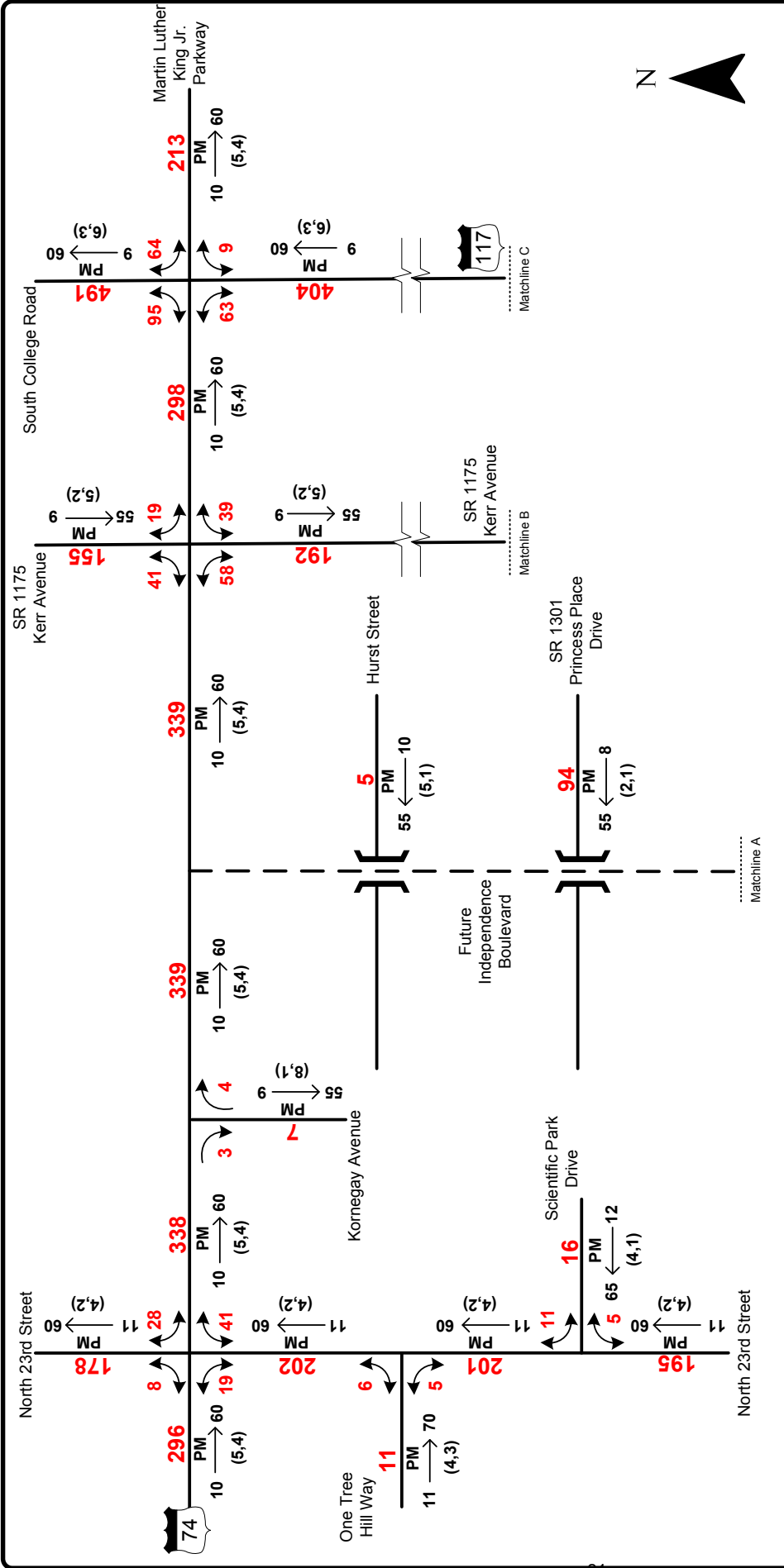


## APPENDICES

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# Appendix A: Traffic Forecast

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# No-Build Traffic Forecast SHEET 1 OF 4

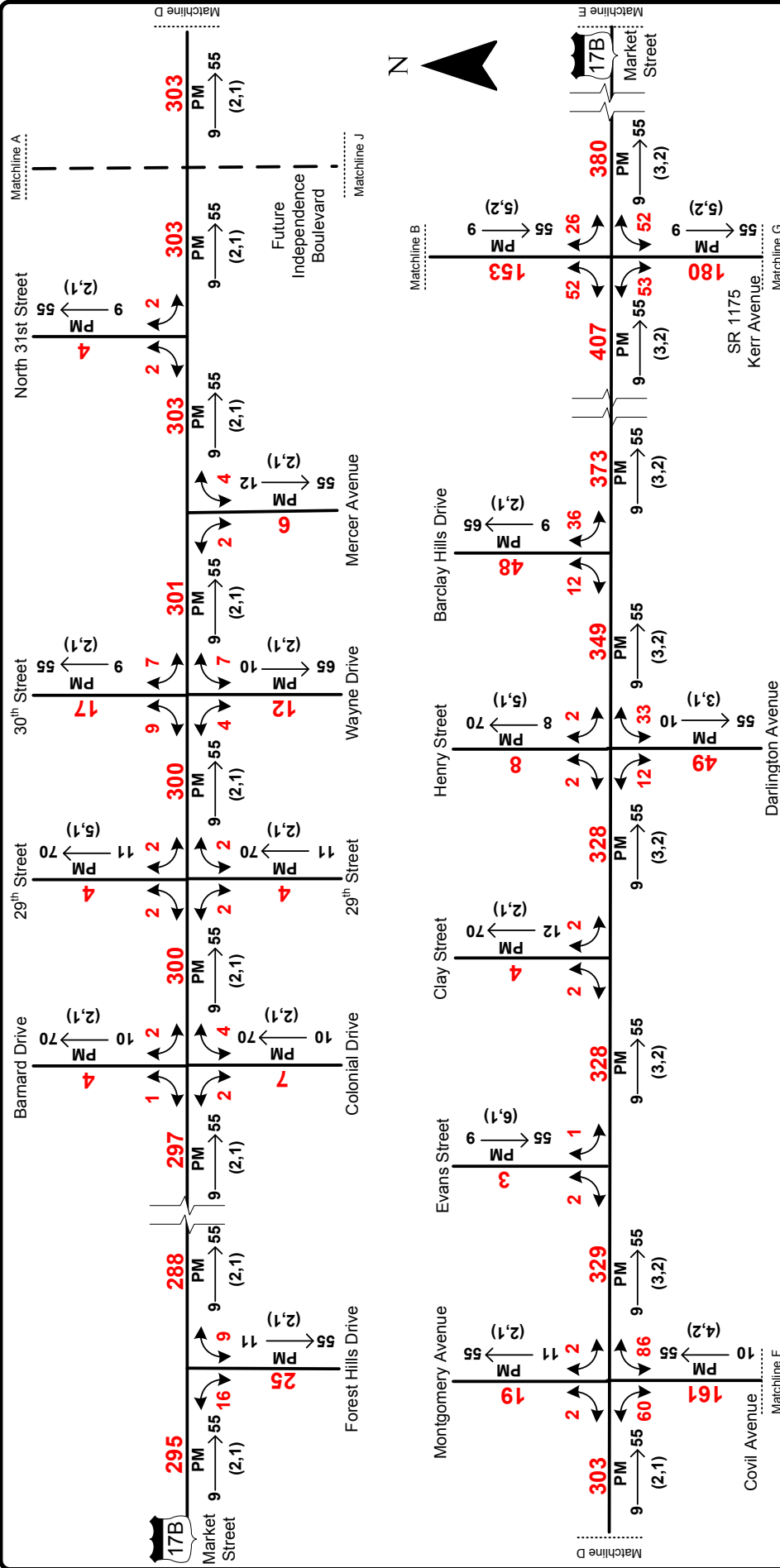
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<b>COUNTY:</b> New Hanover	<b>DIVISION:</b> 3
<b>DATE:</b> September 2012	
<b>PREPARED BY:</b> URS Corporation	
<b>LOCATION:</b> Randall Parkway to Martin Luther King Junior Parkway	
<b>PROJECT:</b> Independence Boulevard Extension	

## 2012

AVERAGE ANNUAL  
DAILY TRAFFIC

#### No. of Vehicles Per Day in 100s  
Less than 50 vpd  
Movement Prohibited

K  $\frac{PM}{(d,t)} \rightarrow D$   
Design Hour Factor (%)  
PM Peak Hour Period  
D Peak Hour Directional Split (%)  
→ Indicates Direction of D  
(d,t) Duals, TT-STs (%)



## No-Build Traffic Forecast SHEET 2 OF 4

<b>TIP:</b> U-4434	<b>WBS:</b> 37764.1.1
<b>COUNTY:</b> New Hanover	<b>DIVISION:</b> 3
<b>DATE:</b> September 2012	
<b>PREPARED BY:</b> URS Corporation	
<b>LOCATION:</b> Randall Parkway to Martin Luther King Junior Parkway	
<b>PROJECT:</b> Independence Boulevard Extension	

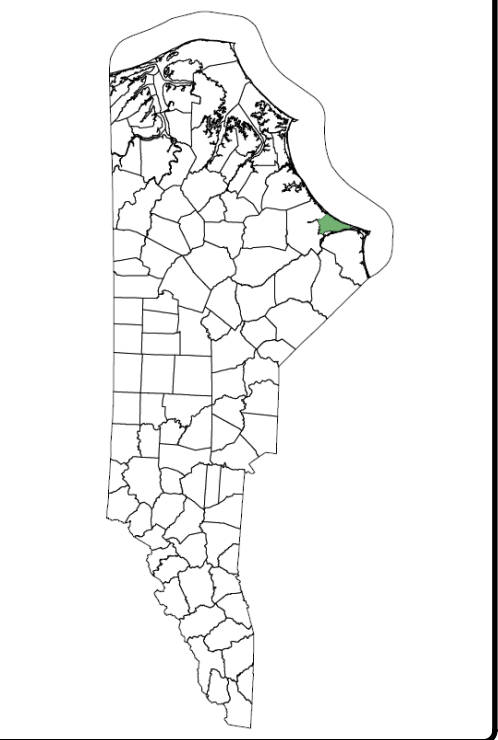
# 2012

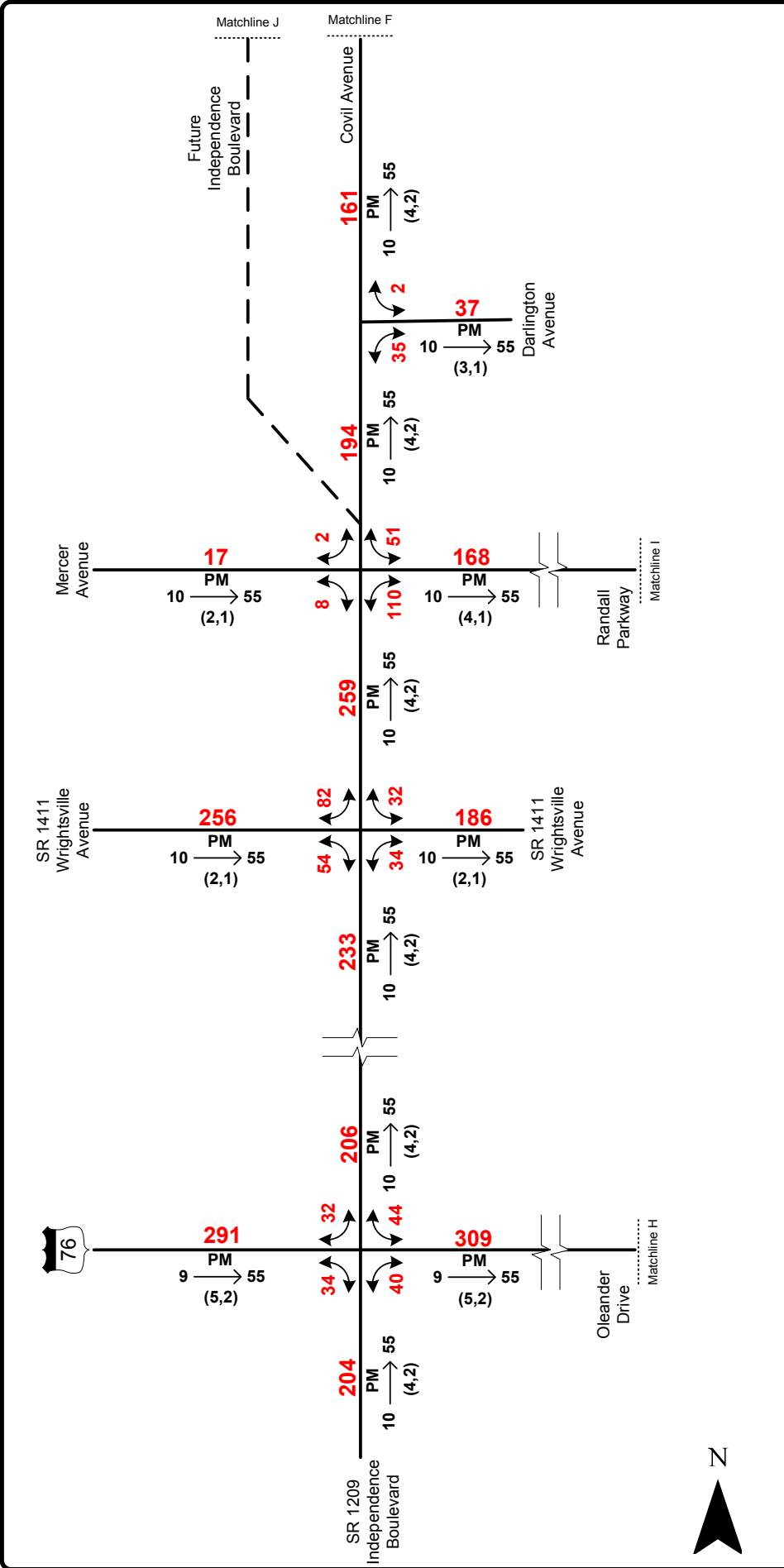
## AVERAGE ANNUAL DAILY TRAFFIC

### No. of Vehicles Per Day in 100s  
Less than 50 vpd  
X Movement Prohibited

K Design Hour Factor (%)  
PM Peak Period  
D Peak Hour Directional Split (%)  
→ Indicates Direction of D  
(d, t) Duals, TT-STs (%)

K PM → D  
(d, t)





**No-Build Traffic Forecast**  
**SHEET 3 OF 4**

**TIP:** U-4434      **WBS:** 37764.1.1

**COUNTY:** New Hanover      **DIVISION:** 3

**DATE:** September 2012

**PREPARED BY:** URS Corporation

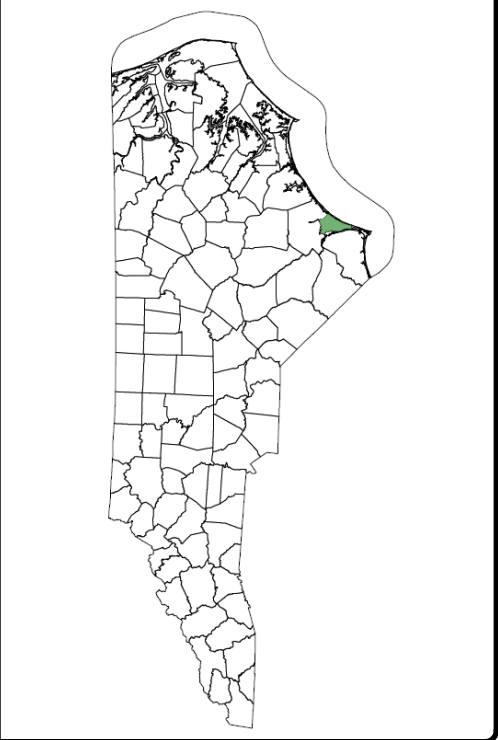
**LOCATION:** Randall Parkway to Martin Luther King Junior Parkway

**PROJECT:** Independence Boulevard Extension

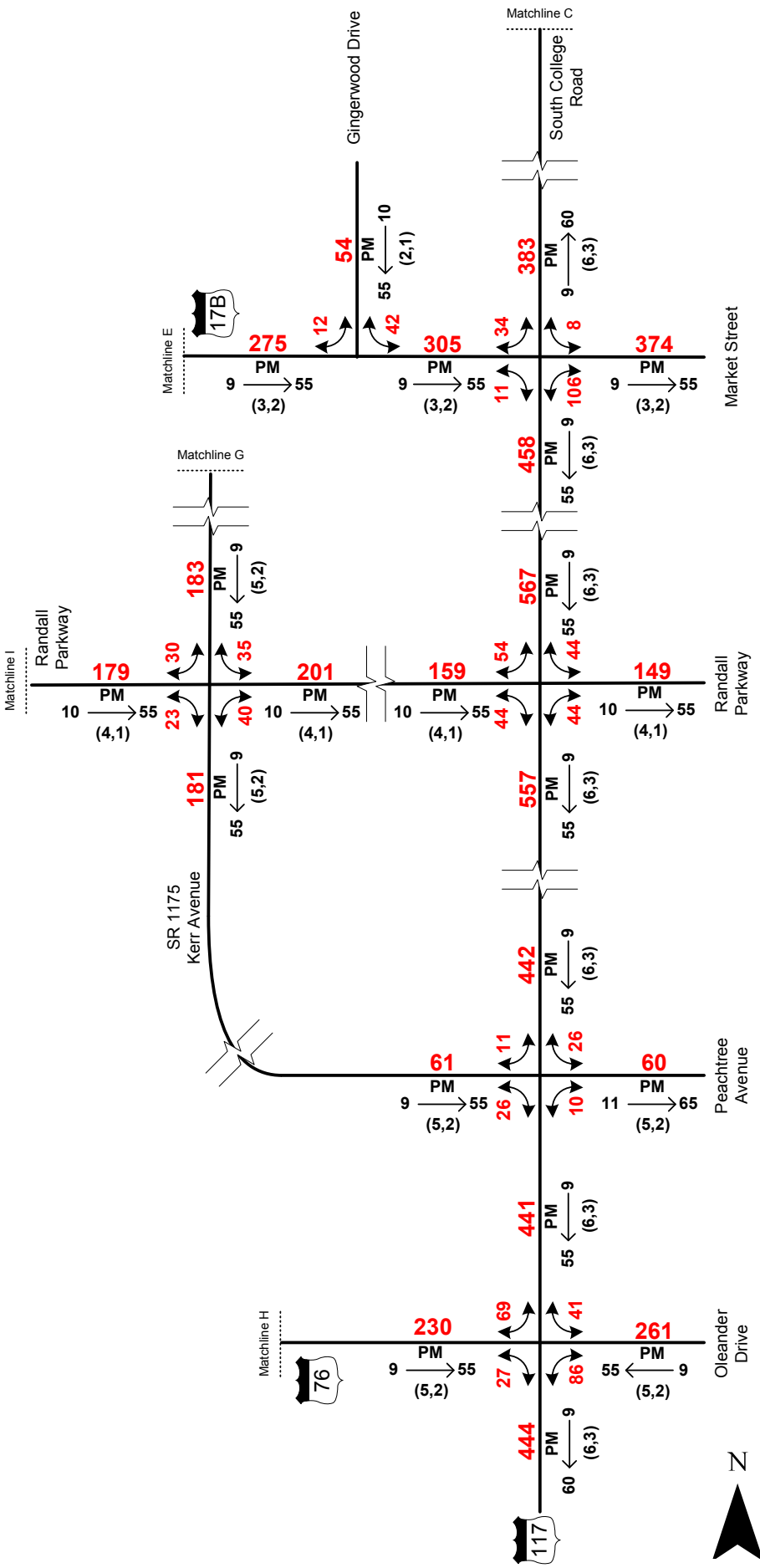
**2012** AVERAGE ANNUAL DAILY TRAFFIC

### No. of Vehicles Per Day in 100s  
 1- Less than 50 vpd  
 X Movement Prohibited

K  $\begin{matrix} \text{PM} \\ \rightarrow \end{matrix}$  (d, t) D  
 Design Hour Factor (%)  
 PM Peak Period  
 D Peak Hour Directional Split (%)  
 → Indicates Direction of D  
 (d, t) Duals, TT-STs (%)





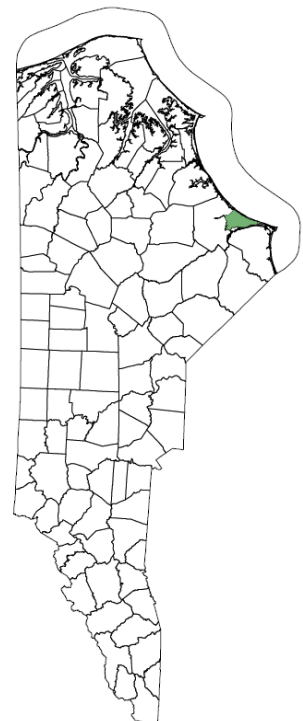


**No-Build Traffic Forecast  
SHEET 4 OF 4**

**2012 AVERAGE ANNUAL  
DAILY TRAFFIC**

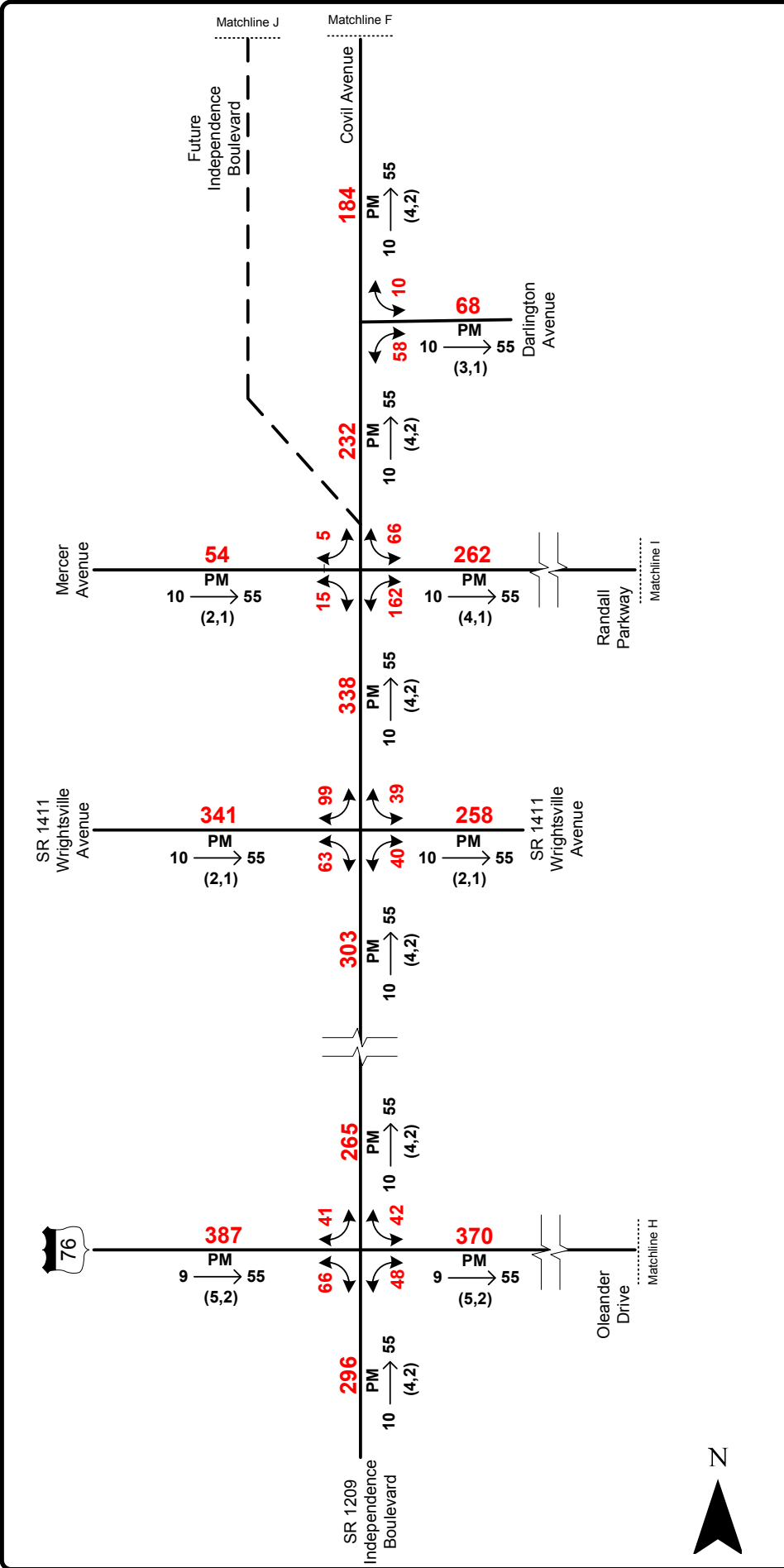
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<b>COUNTY:</b> New Hanover	<b>DIVISION:</b> 3
<b>DATE:</b> September 2012	
<b>PREPARED BY:</b> URS Corporation	
<b>LOCATION:</b> Randall Parkway to Martin Luther King Junior Parkway	
<b>PROJECT:</b> Independence Boulevard Extension	

### No. of Vehicles Per Day in 100s  
 Less than 50 vpd  
 Movement Prohibited  
 K Design Hour Factor (%)  
 PM Peak Period  
 D Peak Hour Directional Split (%)  
 → Indicates Direction of D  
 (d, t) Duals, TT-STs (%)









**No-Build Traffic Forecast**  
**SHEET 3 OF 4**

**TIP:** U-4434      **WBS:** 37764.1.1

**COUNTY:** New Hanover      **DIVISION:** 3

**DATE:** September 2012

**PREPARED BY:** URS Corporation

**LOCATION:** Randall Parkway to Martin Luther King Junior Parkway

**PROJECT:** Independence Boulevard Extension

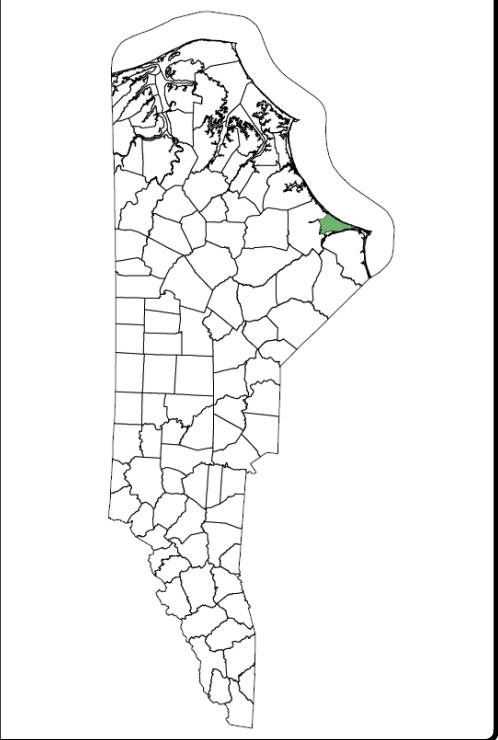
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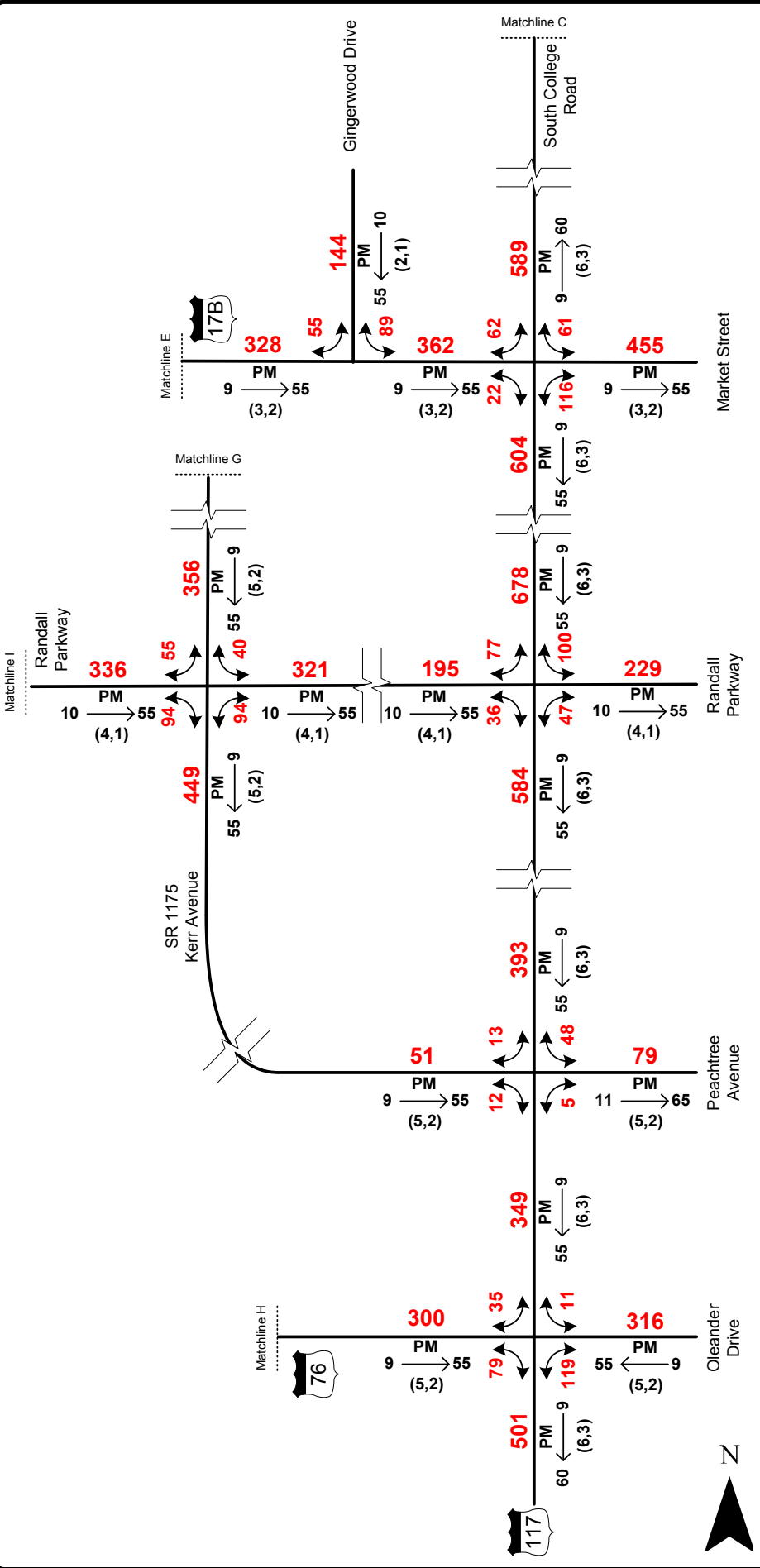
### No. of Vehicles Per Day in 100s  
 1- Less than 50 vpd  
 X Movement Prohibited

K  $\begin{matrix} \text{PM} \\ \rightarrow \end{matrix}$  (d, t) D

K Design Hour Factor (%)  
 PM Peak Period  
 D Peak Hour Directional Split (%)

↑ Indicates Direction of D  
 (d, t) Duals, TT-STs (%)





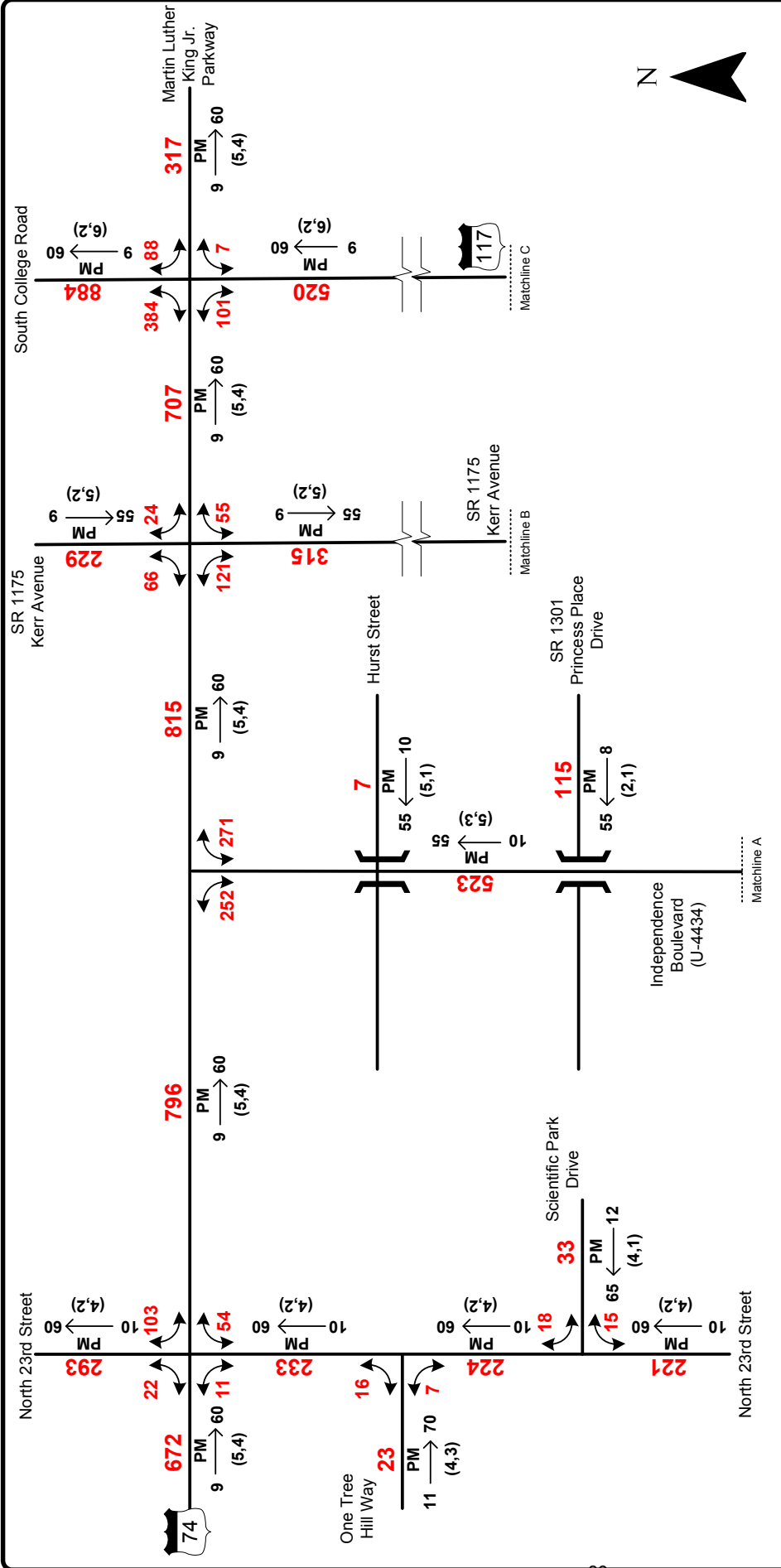
## 2040 AVERAGE ANNUAL DAILY TRAFFIC

### No-Build Traffic Forecast SHEET 4 OF 4

<b>TIP:</b> U-4434	<b>WBS:</b> 37764.1.1
<b>COUNTY:</b> New Hanover	<b>DIVISION:</b> 3
<b>DATE:</b> September 2012	
<b>PREPARED BY:</b> URS Corporation	
<b>LOCATION:</b> Randall Parkway to Martin Luther King Junior Parkway	
<b>PROJECT:</b> Independence Boulevard Extension	

**###** No. of Vehicles Per Day in 100s  
**1-** Less than 50 vpd  
**X** Movement Prohibited  
**K** Design Hour Factor (%)  
**PM** PM Peak Period  
**D** Peak Hour Directional Split (%)  
**→** Indicates Direction of D  
**(d, t)** Duals, TT-STs (%)

K  $\begin{matrix} \text{PM} \\ \rightarrow \end{matrix}$  D  
(d, t)



## 2040

AVERAGE ANNUAL  
DAILY TRAFFIC

## Build Traffic Forecast

### SHEET 1 OF 4

**TIP:** U-4434

**COUNTY:** New Hanover

**DATE:** September 2012

**PREPARED BY:** URS Corporation

**LOCATION:** Randall Parkway to Martin Luther King Junior Parkway

**PROJECT:** Independence Boulevard Extension

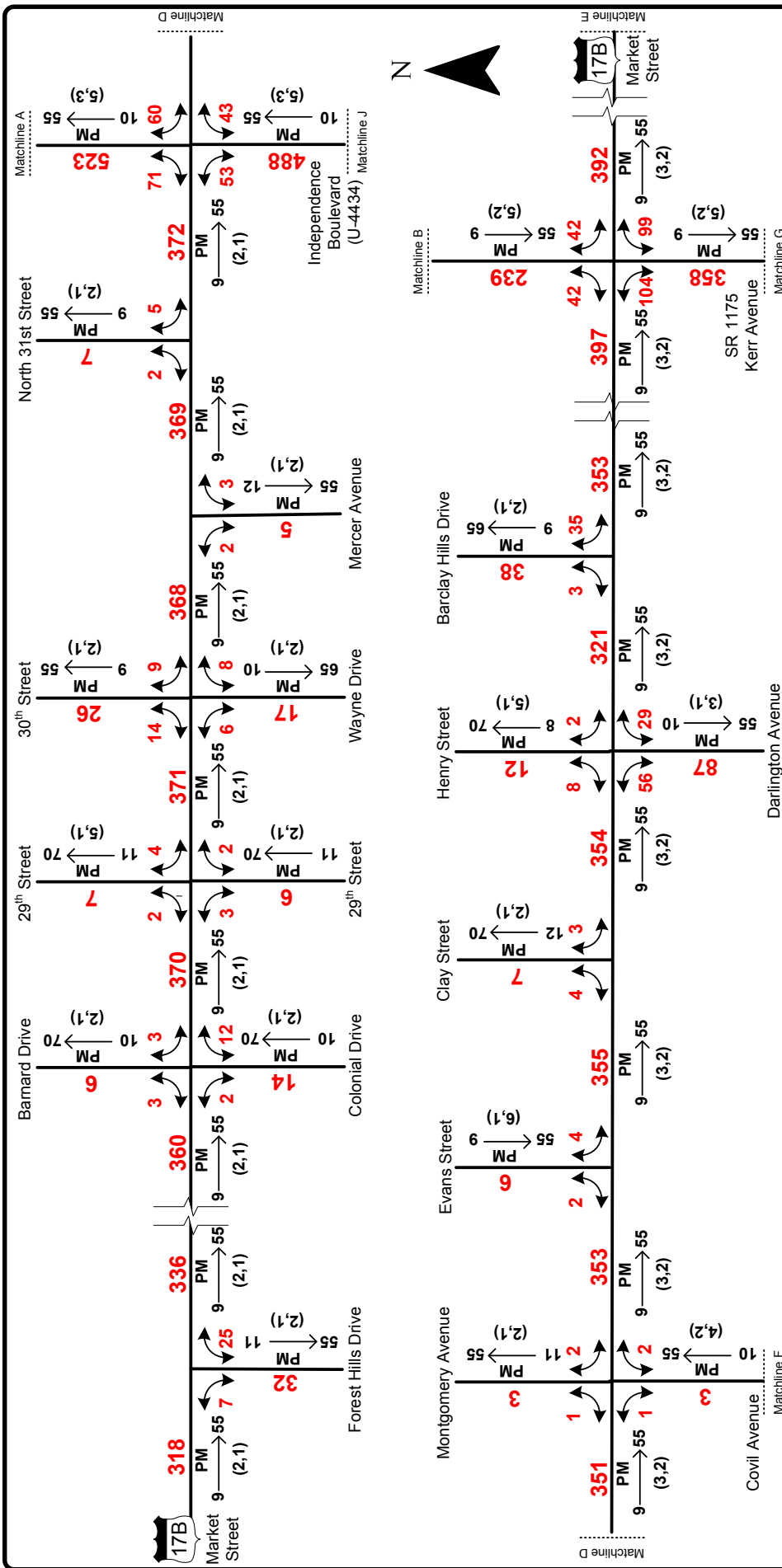
**WBS:** 37764.1.1

**DIVISION:** 3

**###** No. of Vehicles Per Day in 100s  
**1-** Less than 50 vpd  
**X** Movement Prohibited

**K** Design Hour Factor (%)  
**PM** PM Peak Period  
**D** Peak Hour Directional Split (%)  
**→** Indicates Direction of D  
**(d, t)** Duals, TT-STs (%)

$$K \frac{PM}{(d, t)} \rightarrow D$$



## 2040 AVERAGE ANNUAL DAILY TRAFFIC

## Build Traffic Forecast

### SHEET 2 OF 4

**TIP:** U-4434

**COUNTY:** New Hanover

**DATE:** September 2012

**PREPARED BY:** URS Corporation

**LOCATION:** Randall Parkway to Martin Luther King Junior Parkway

**PROJECT:** Independence Boulevard Extension

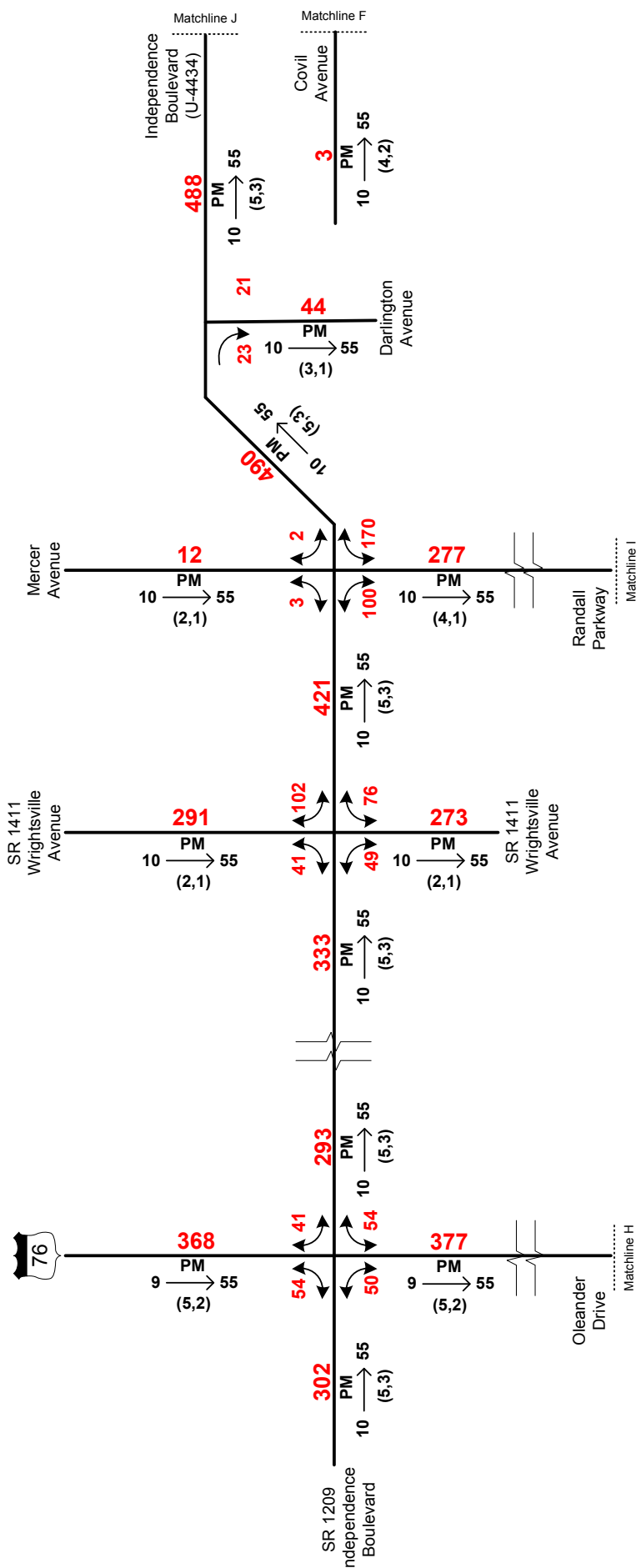
**WBS:** 37764.1.1

**DIVISION:** 3

### No. of Vehicles Per Day in 100s  
 Less than 50 vpd  
 X Movement Prohibited

K Design Hour Factor (%)  
 PM Peak Period  
 D Peak Hour Directional Split (%)  
 → Indicates Direction of D  
 (d, t) Duals, TT-STs (%)



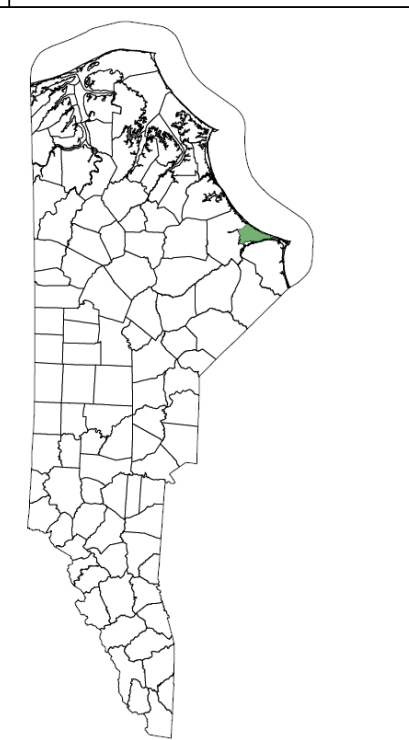


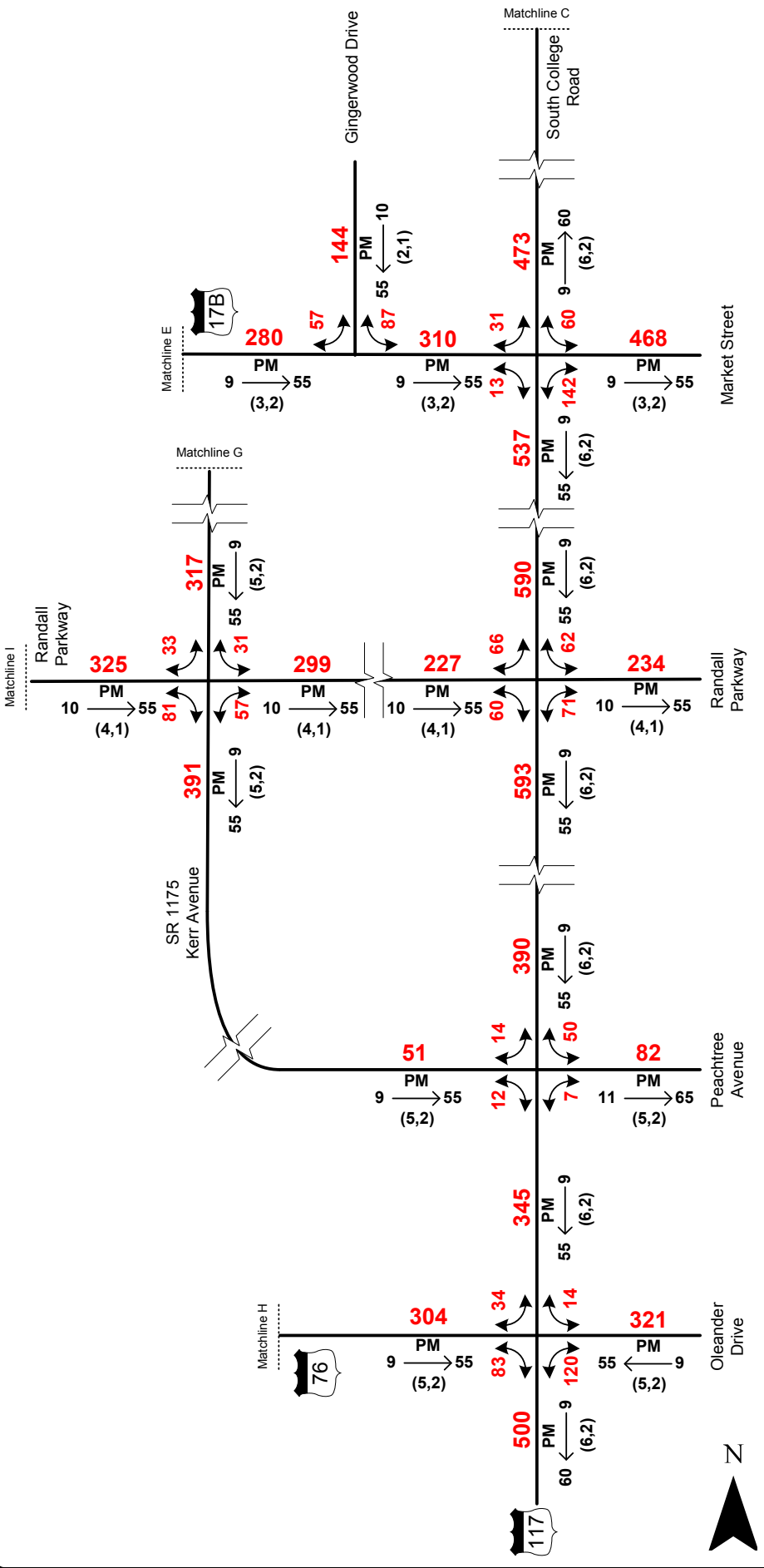
# 2040 AVERAGE ANNUAL DAILY TRAFFIC

## Build Traffic Forecast SHEET 3 OF 4

<b>TIP:</b> U-4434	<b>WBS:</b> 37764.1.1
<b>COUNTY:</b> New Hanover	<b>DIVISION:</b> 3
<b>DATE:</b> September 2012	
<b>PREPARED BY:</b> URS Corporation	
<b>LOCATION:</b> Randall Parkway to Martin Luther King Junior Parkway	
<b>PROJECT:</b> Independence Boulevard Extension	

**###** No. of Vehicles Per Day in 100s  
**1-** Less than 50 vpd  
**X** Movement Prohibited  
**K** Design Hour Factor (%)  
**PM** PM Peak Period  
**D** Peak Hour Directional Split (%)  
**→** Indicates Direction of D  
**(d, t)** Duals, TT-STs (%)





## 2040 AVERAGE ANNUAL DAILY TRAFFIC

### Build Traffic Forecast SHEET 4 OF 4

**TIP:** U-4434

**COUNTY:** New Hanover

**DATE:** September 2012

**PREPARED BY:** URS Corporation

**LOCATION:** Randall Parkway to Martin Luther King Junior Parkway

**PROJECT:** Independence Boulevard Extension

**WBS:** 37764.1.1

**DIVISION:** 3

**###** No. of Vehicles Per Day in 100s  
**1-** Less than 50 vpd  
**X** Movement Prohibited

**K** Design Hour Factor (%)  
**PM** PM Peak Period  
**D** Peak Hour Directional Split (%)  
**→** Indicates Direction of D  
**(d, t)** Duals, TT-STs (%)

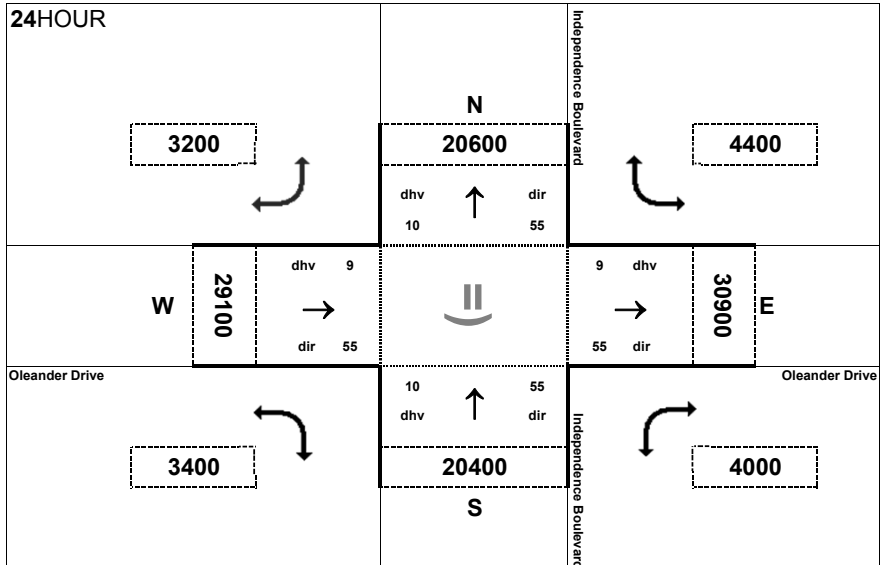
K  $\frac{PM}{(d, t)}$  → D

**Appendix B: IAU Volume Breakout Sheets**

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## 2012 Base Year Conditions

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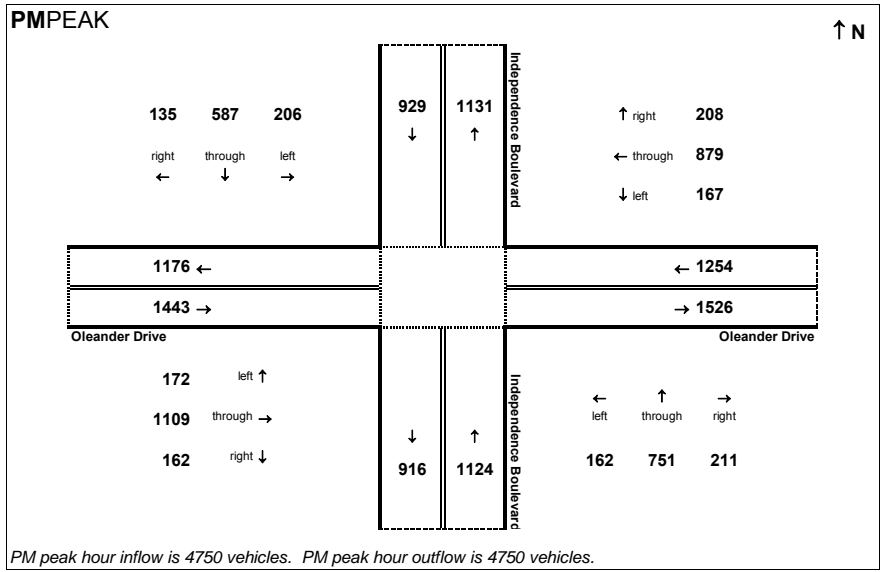
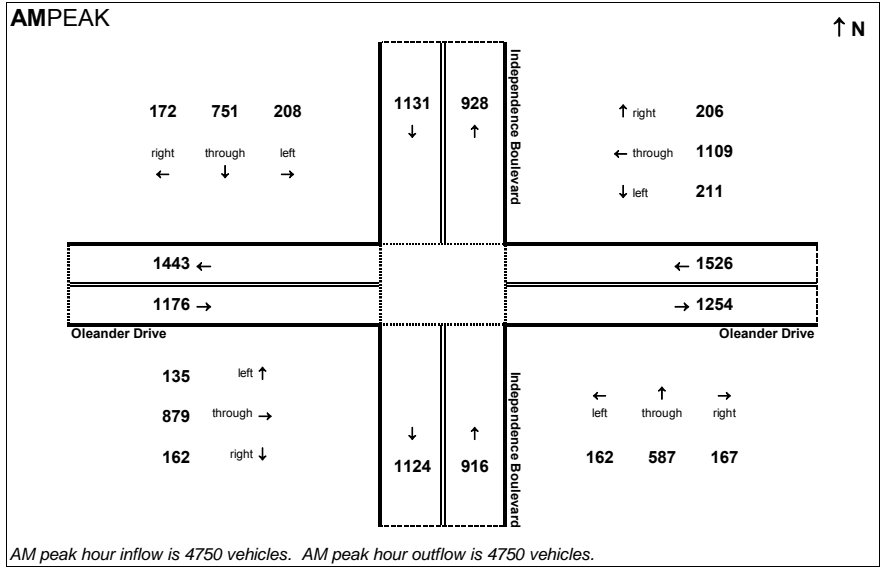


**Peak Hour Volume Breakouts Report:**  
 (1) Oleander Drive @ Independence Boulevard

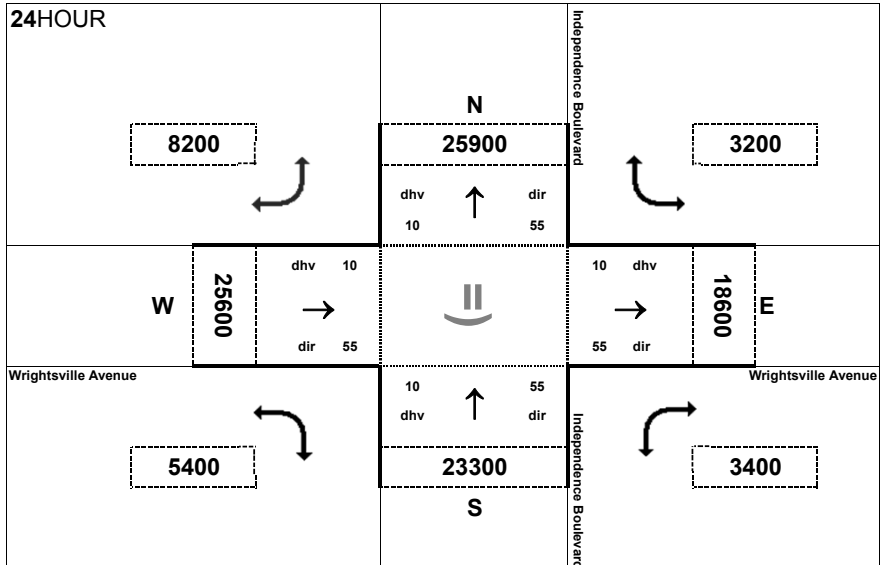
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434





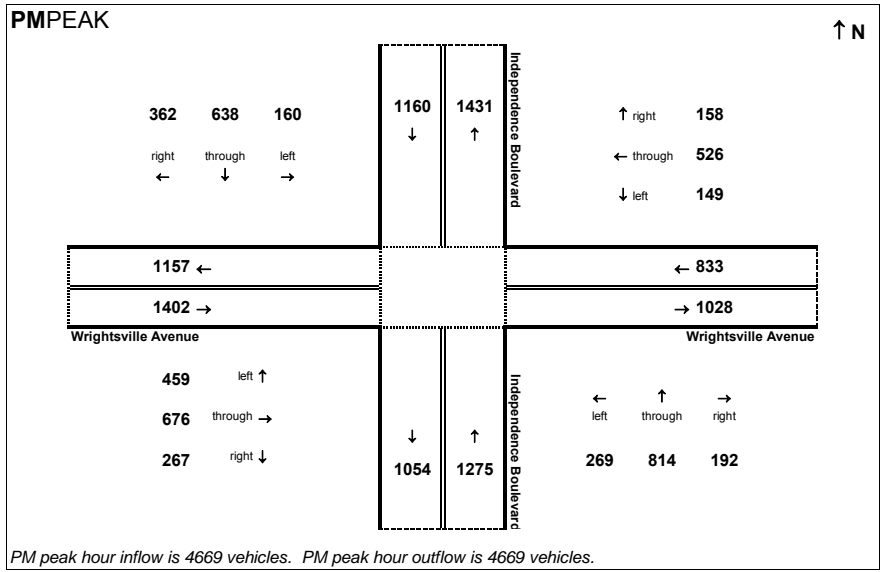
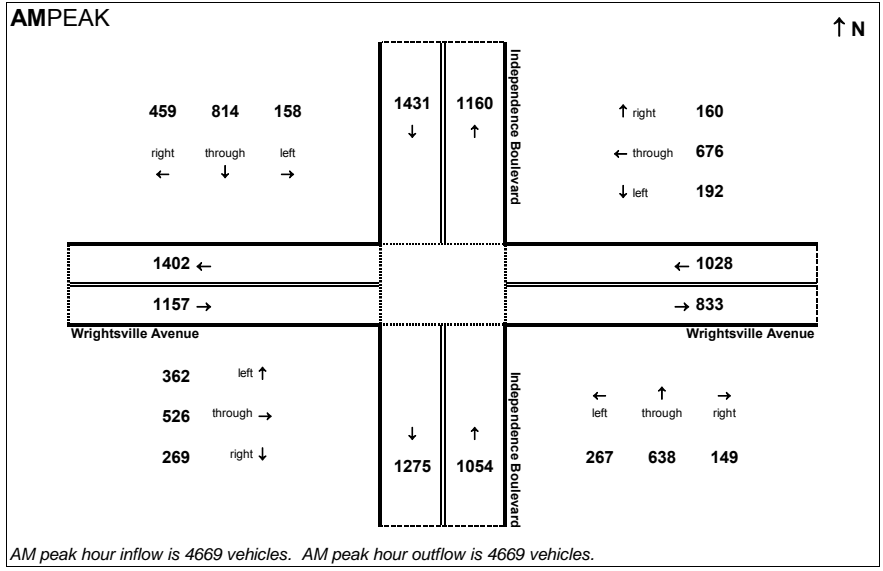


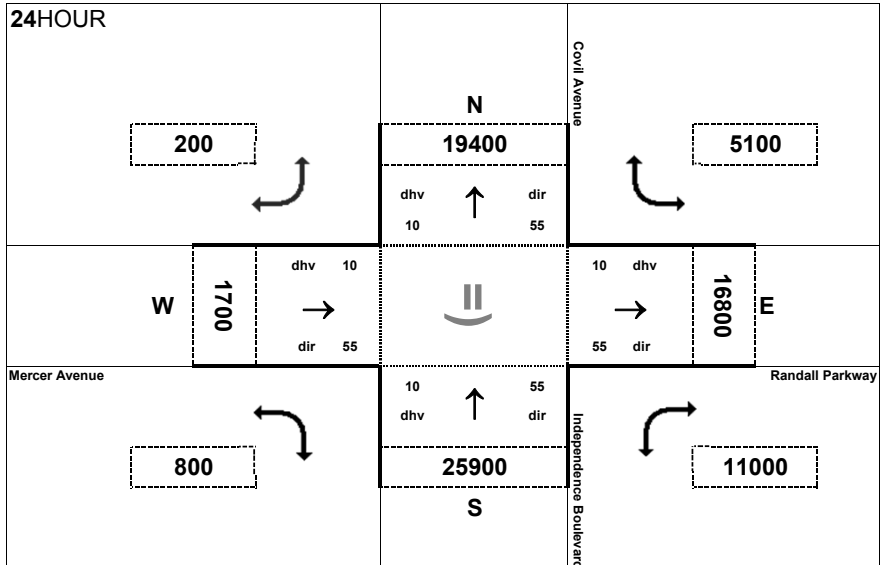
**Peak Hour Volume Breakouts Report:**  
 (2) Independence Boulevard @ Wrightsville Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



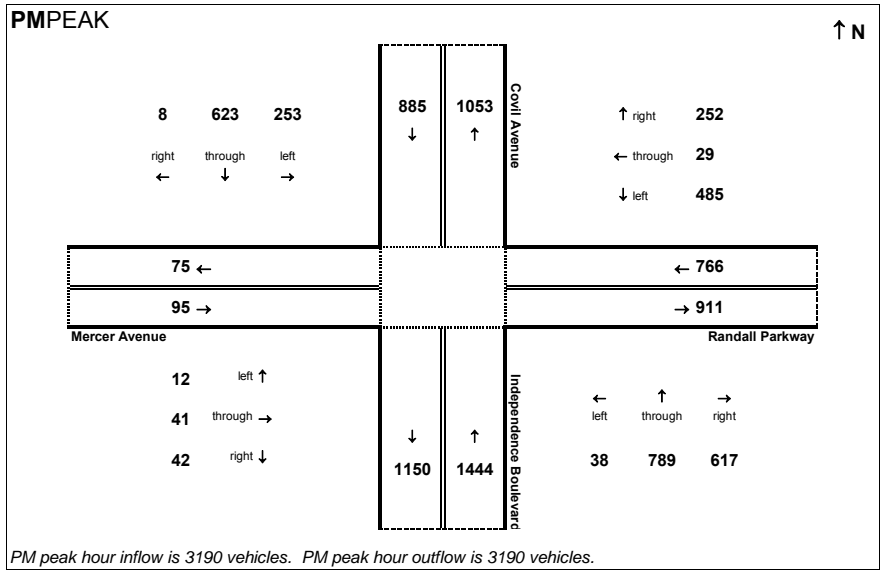
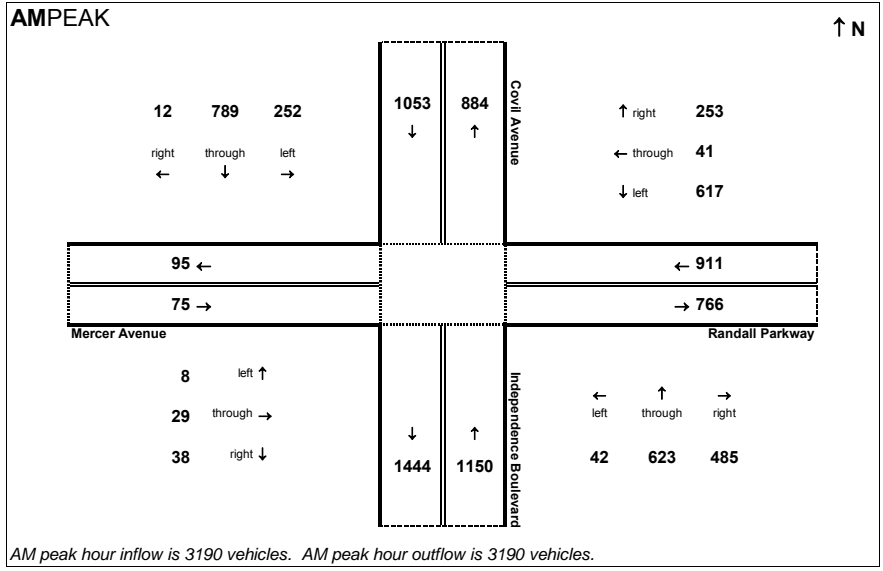


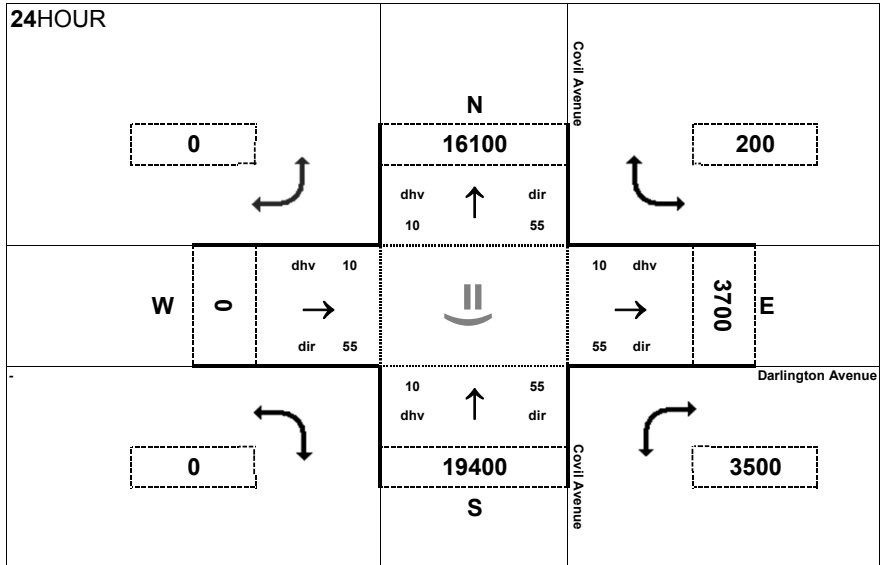
**Peak Hour Volume Breakouts Report:**  
 (3) Independence Boulevard @ Randall Parkway

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



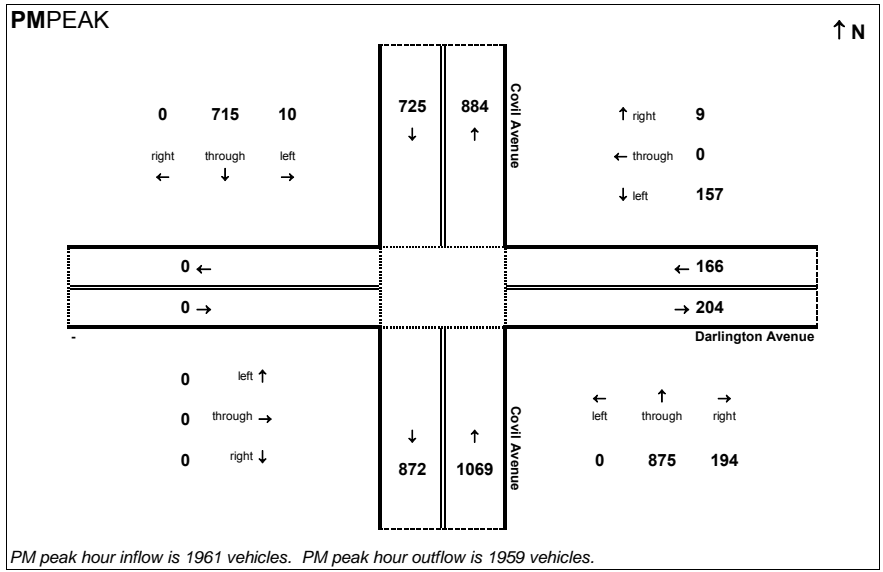
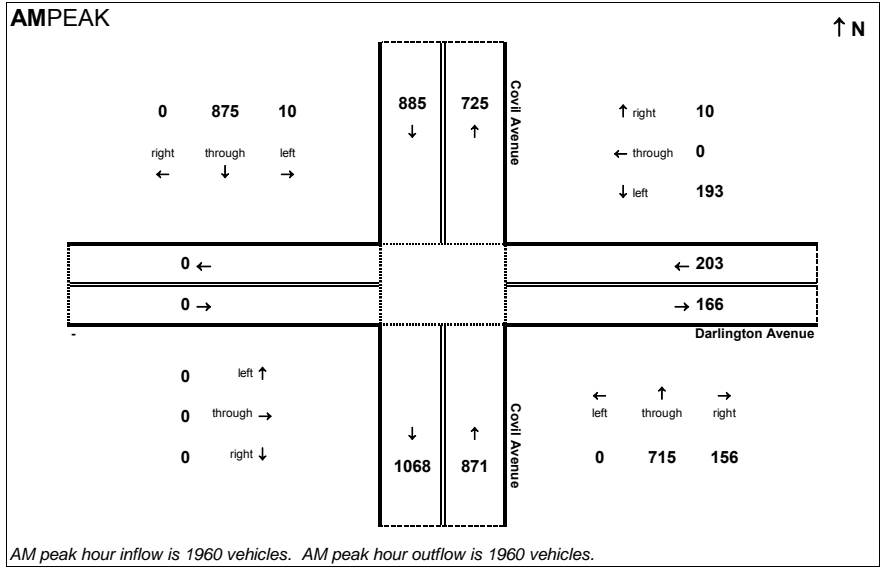


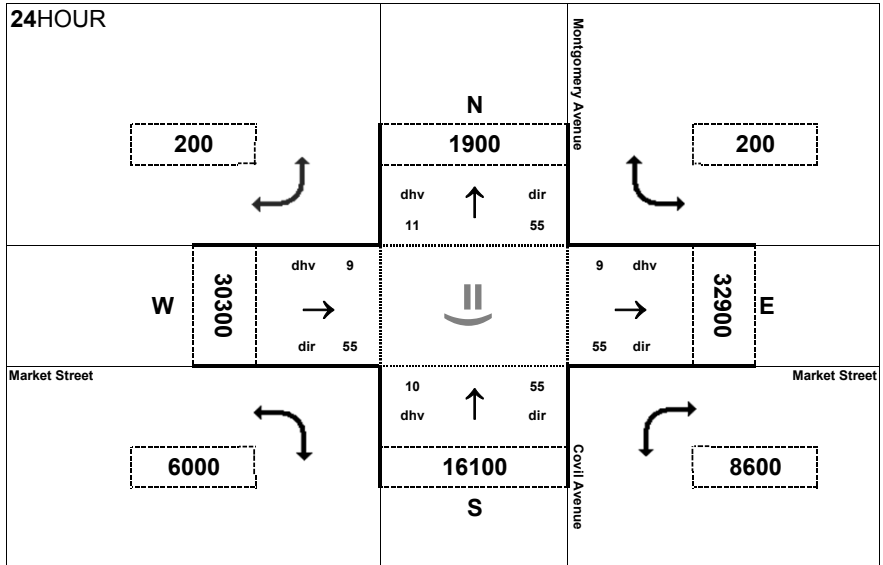
**Peak Hour Volume Breakouts Report:**  
 (4) Covil Avenue @ Darlington Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



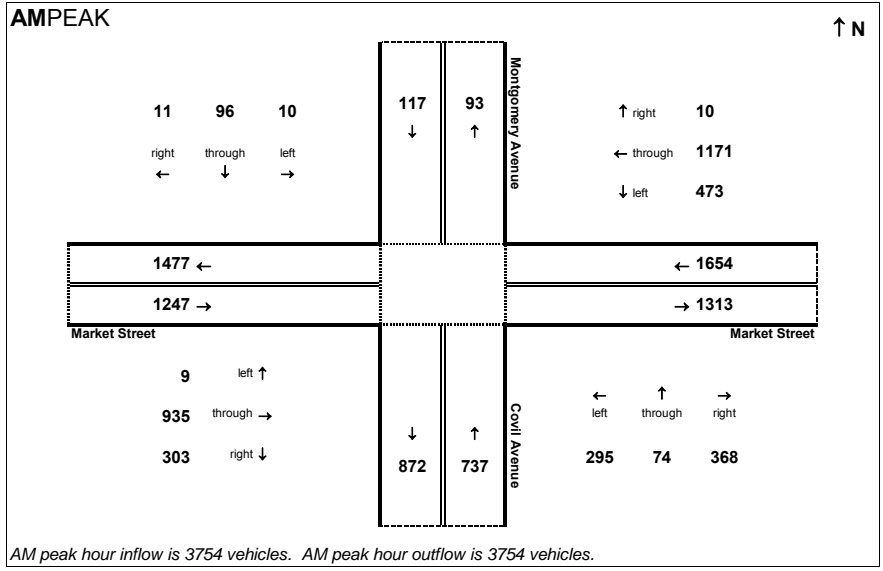


**Peak Hour Volume Breakouts Report:**  
 (5) Market Street @ Covil Avenue

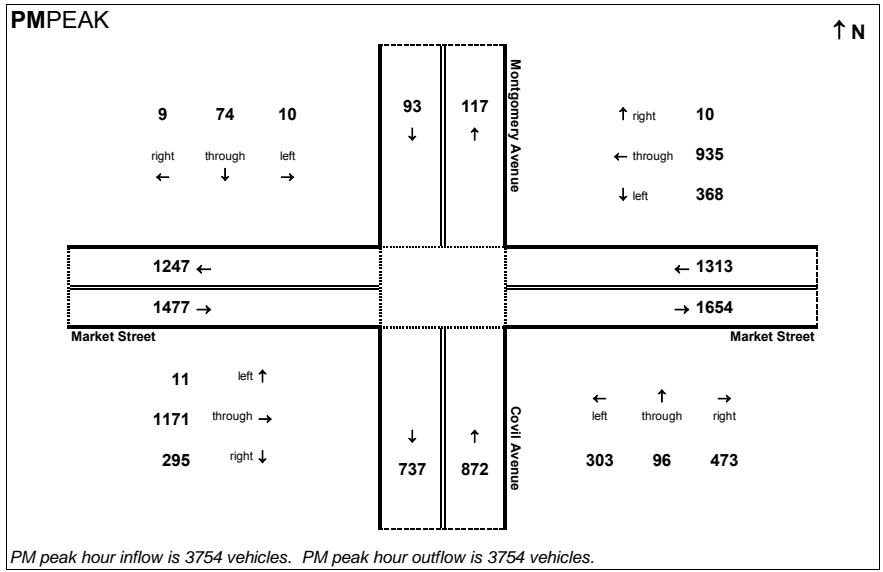
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

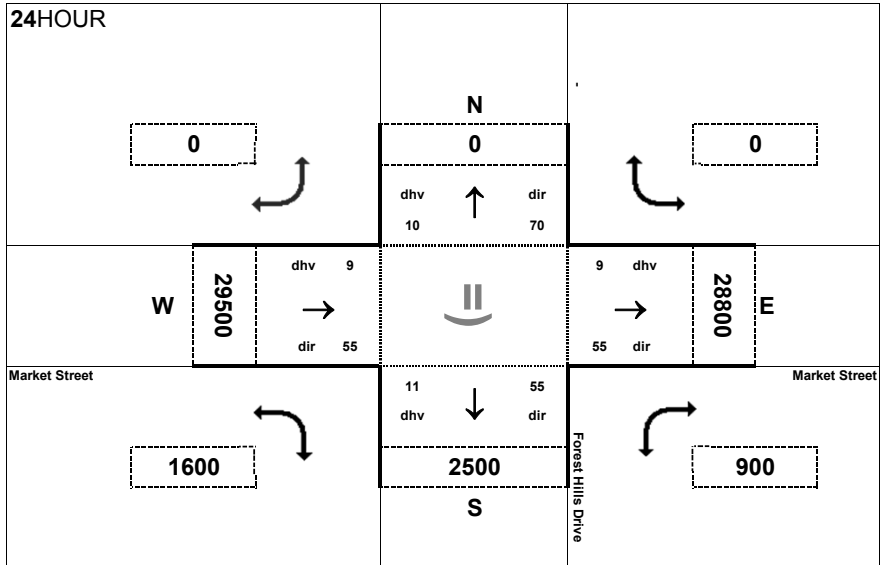
**Project:**  
 TIP: U-4434



AM peak hour inflow is 3754 vehicles. AM peak hour outflow is 3754 vehicles.



PM peak hour inflow is 3754 vehicles. PM peak hour outflow is 3754 vehicles.

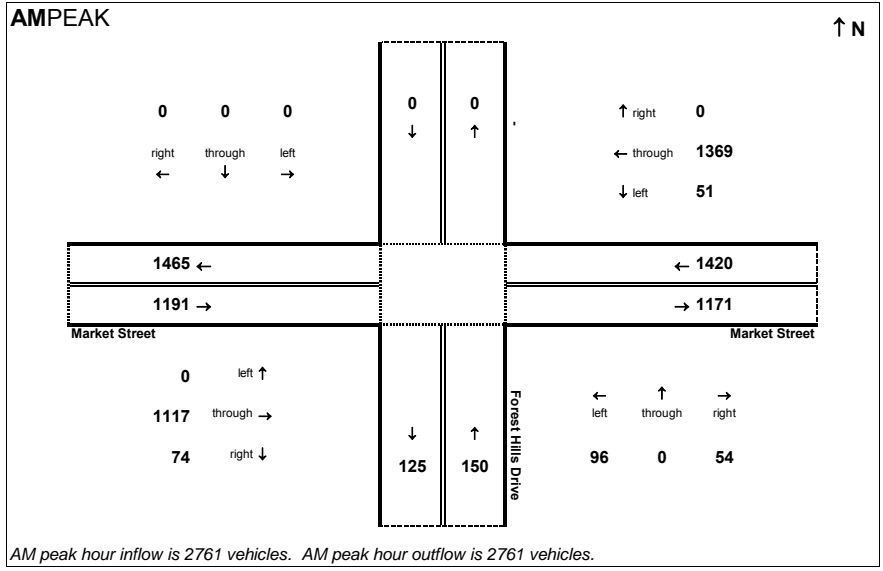


**Peak Hour Volume Breakouts Report:**  
 (6) Market Street @ Forest Hills Drive

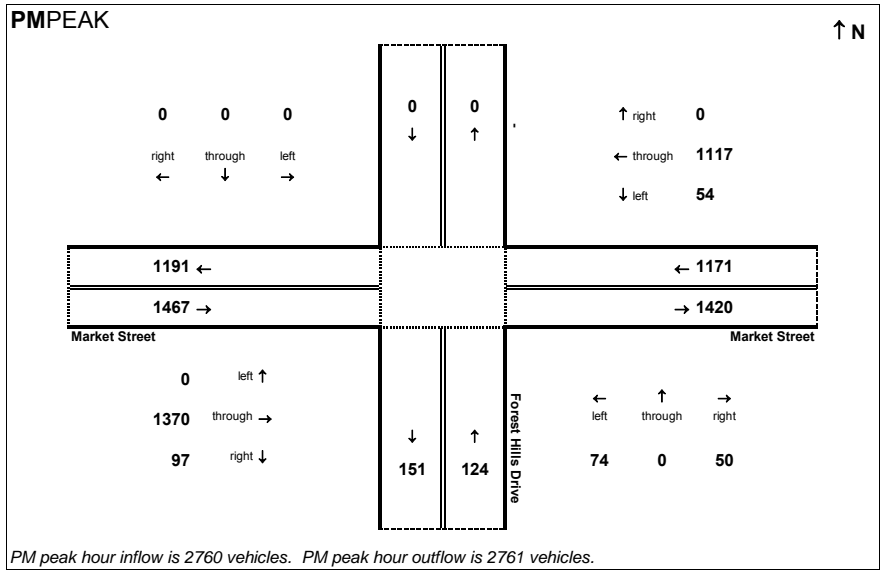
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

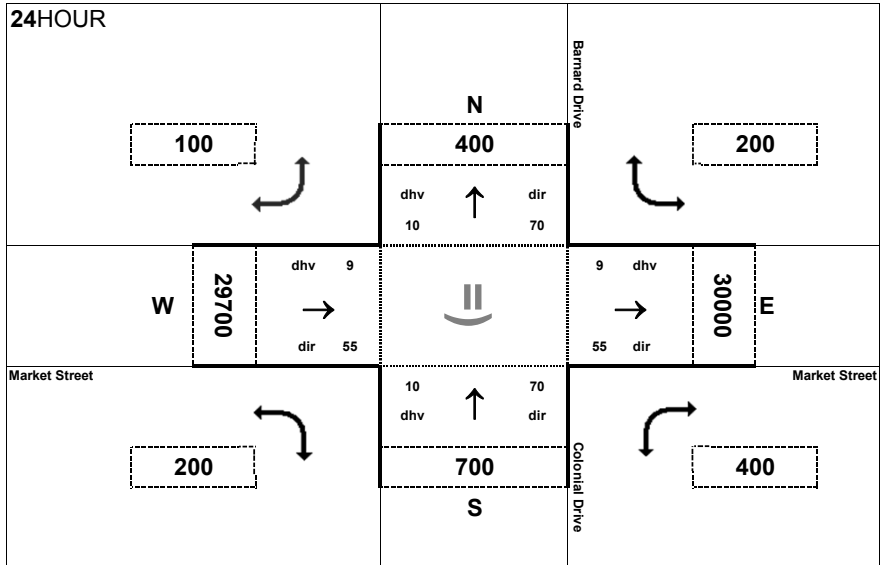
**Project:**  
 TIP: U-4434



AM peak hour inflow is 2761 vehicles. AM peak hour outflow is 2761 vehicles.



PM peak hour inflow is 2760 vehicles. PM peak hour outflow is 2761 vehicles.

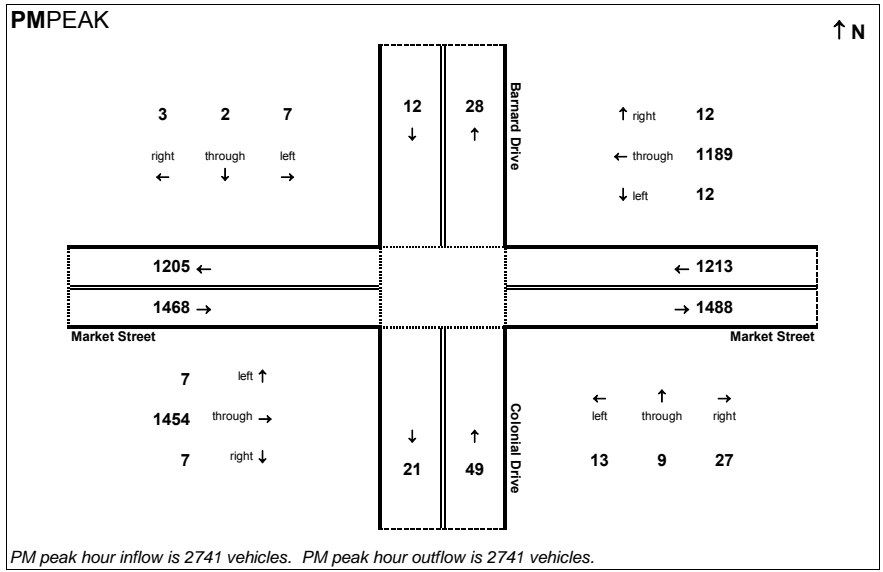
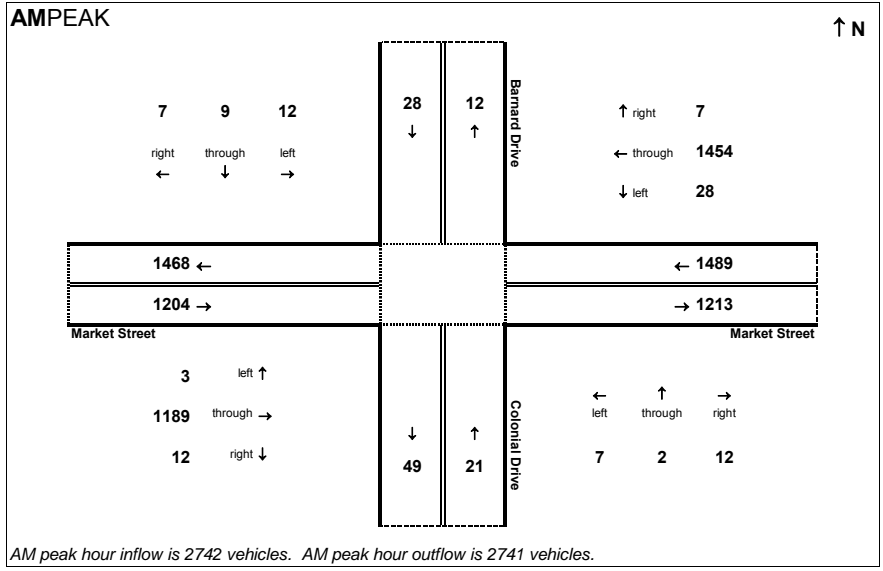


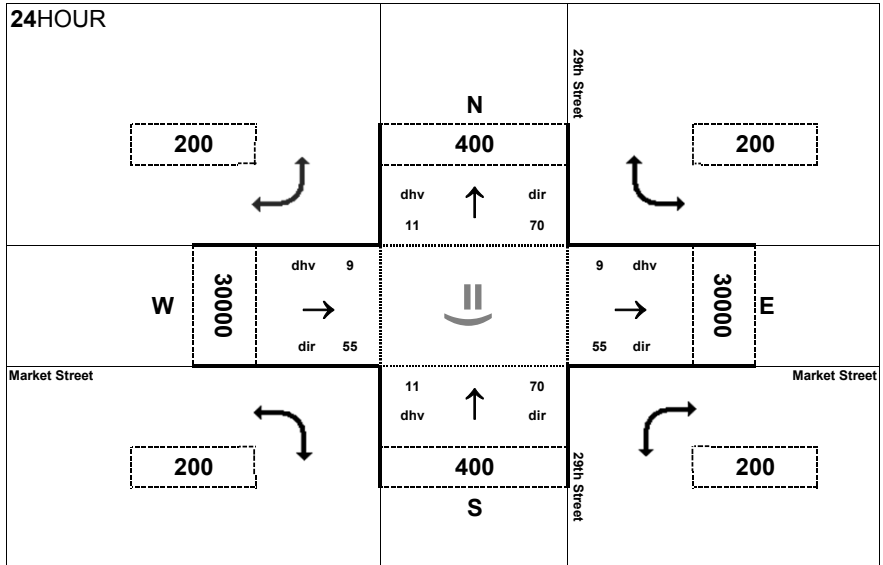
**Peak Hour Volume Breakouts Report:**  
 (7) Market Street @ Colonial Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



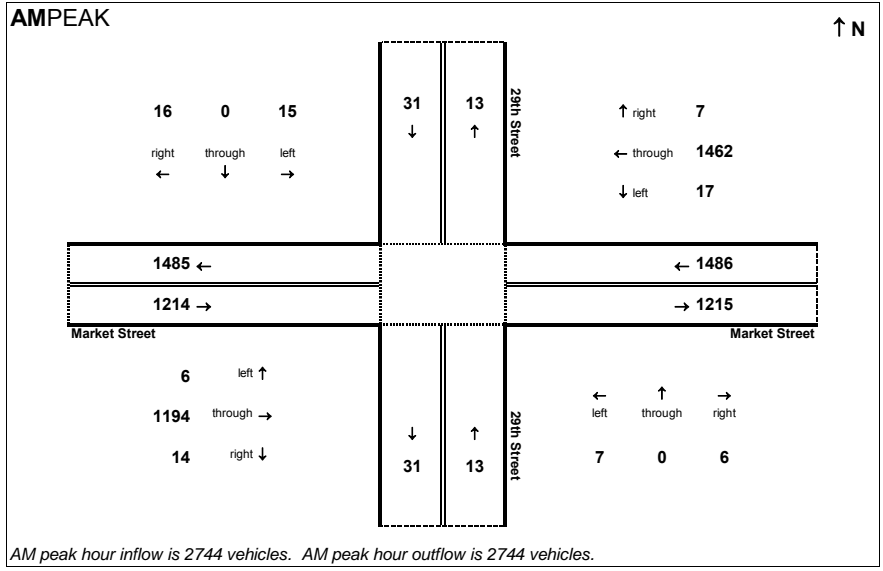


**Peak Hour Volume Breakouts Report:**  
 (8) Market Street @ 29th Street

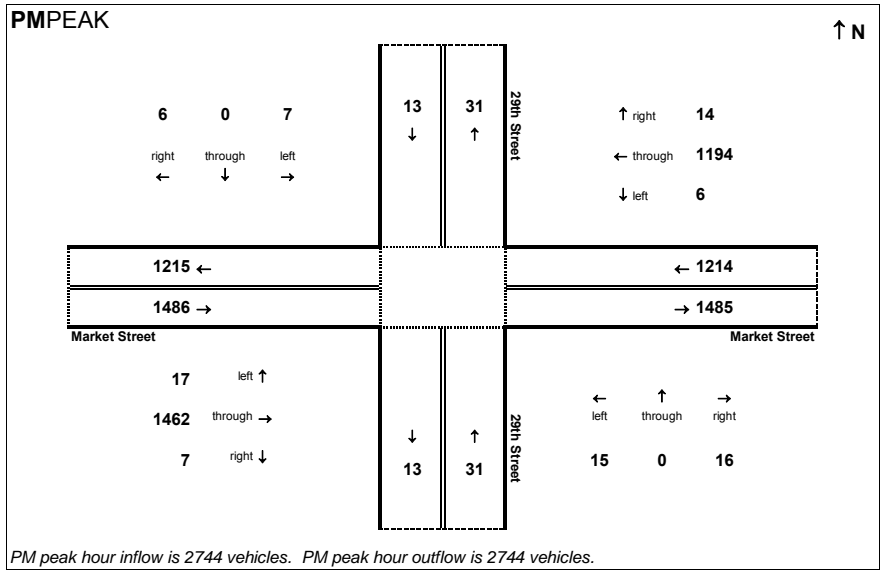
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434

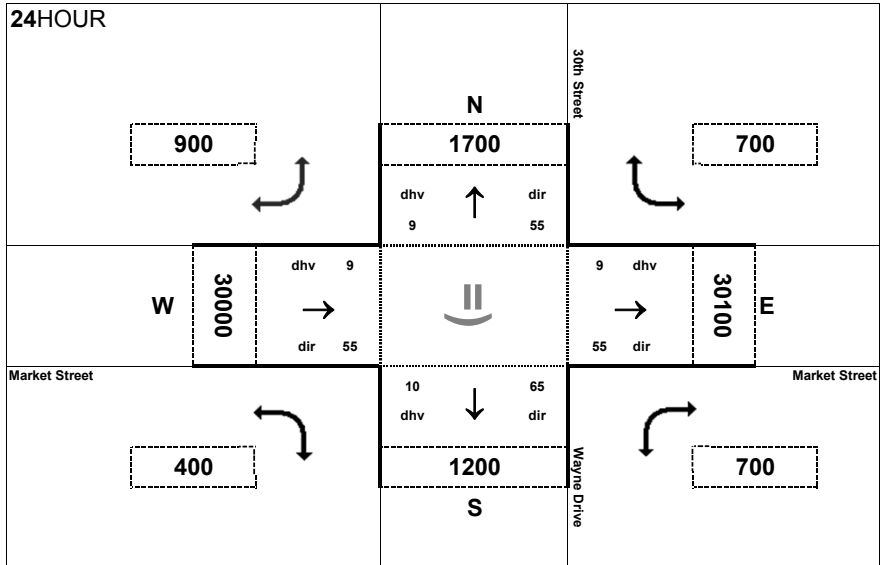


AM peak hour inflow is 2744 vehicles. AM peak hour outflow is 2744 vehicles.



PM peak hour inflow is 2744 vehicles. PM peak hour outflow is 2744 vehicles.



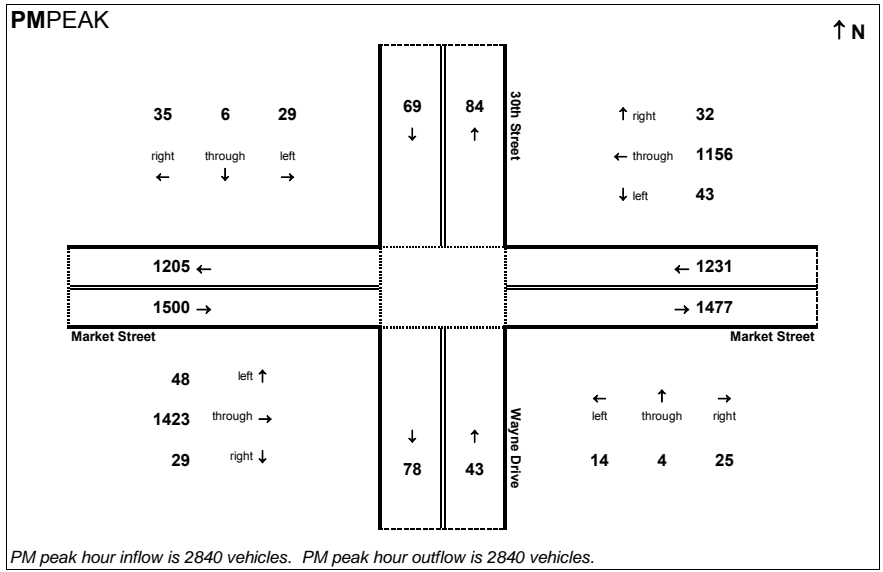
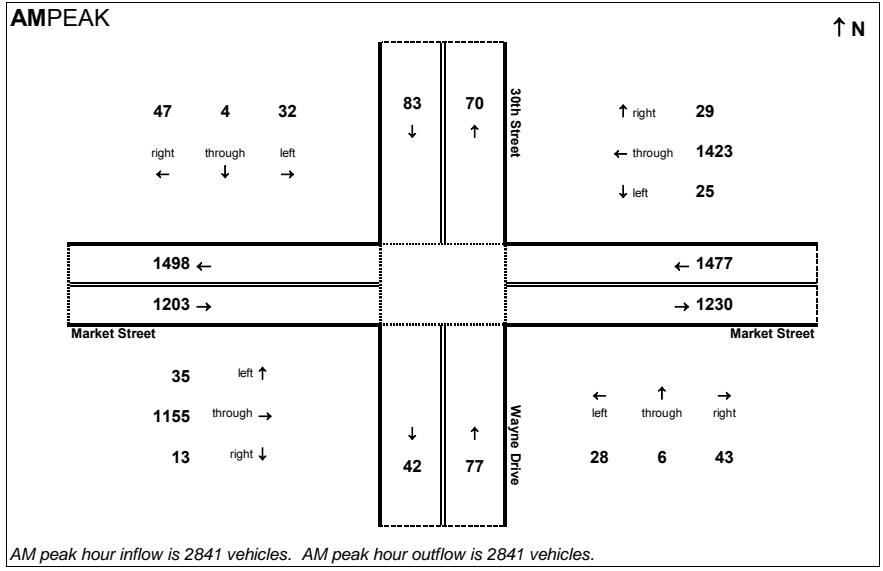


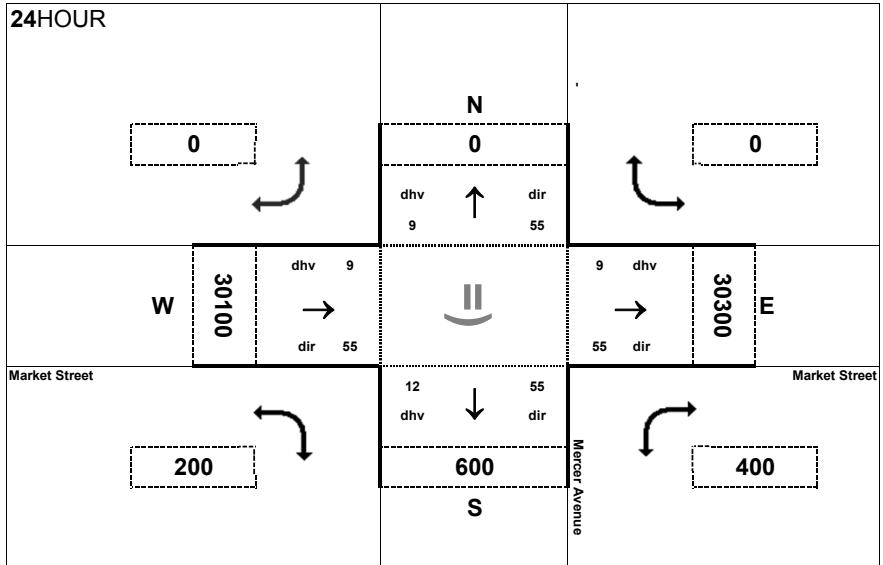
**Peak Hour Volume Breakouts Report:**  
 (9) Market Street @ Wayne Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



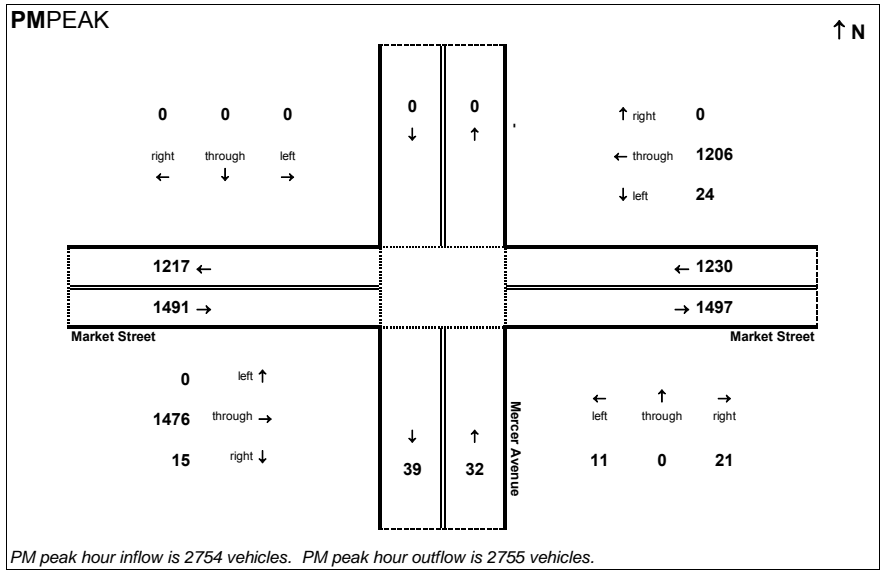
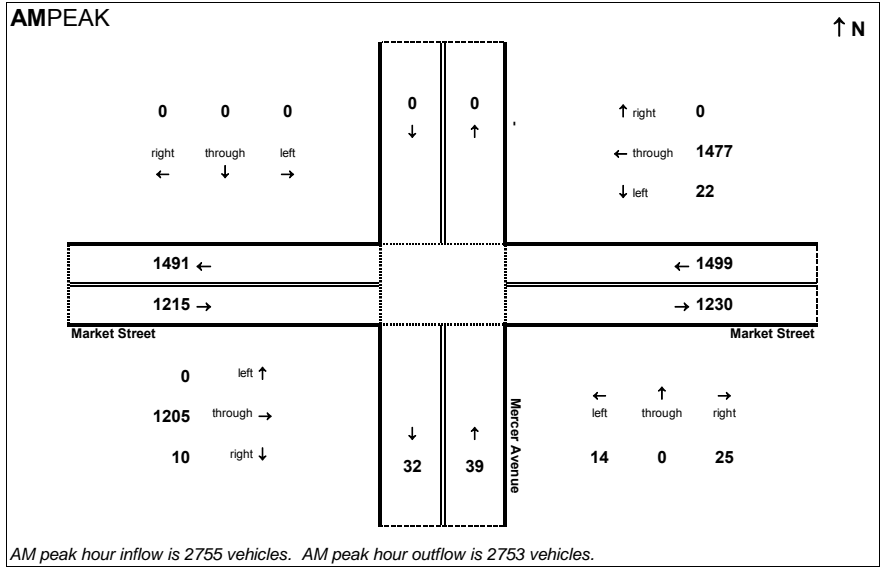


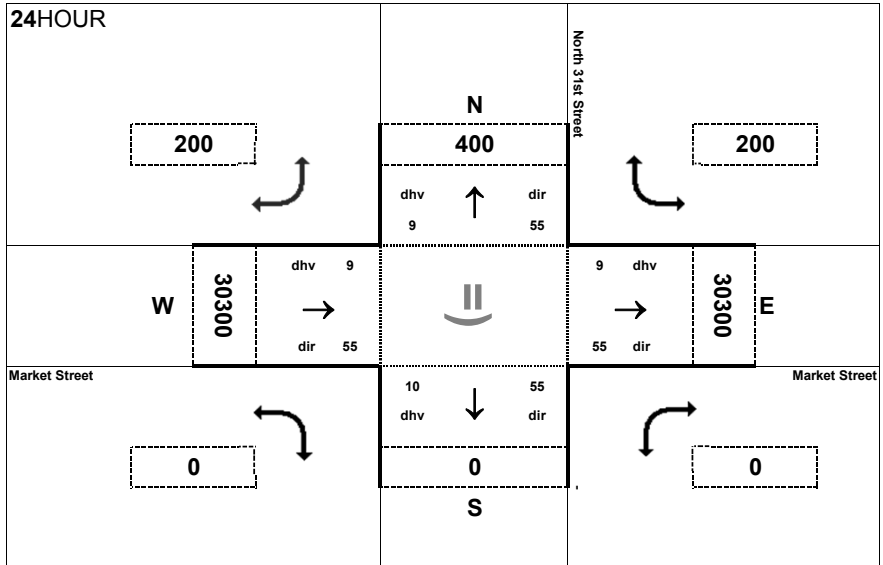
**Peak Hour Volume Breakouts Report:**  
 (10) Market Street @ Mercer Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



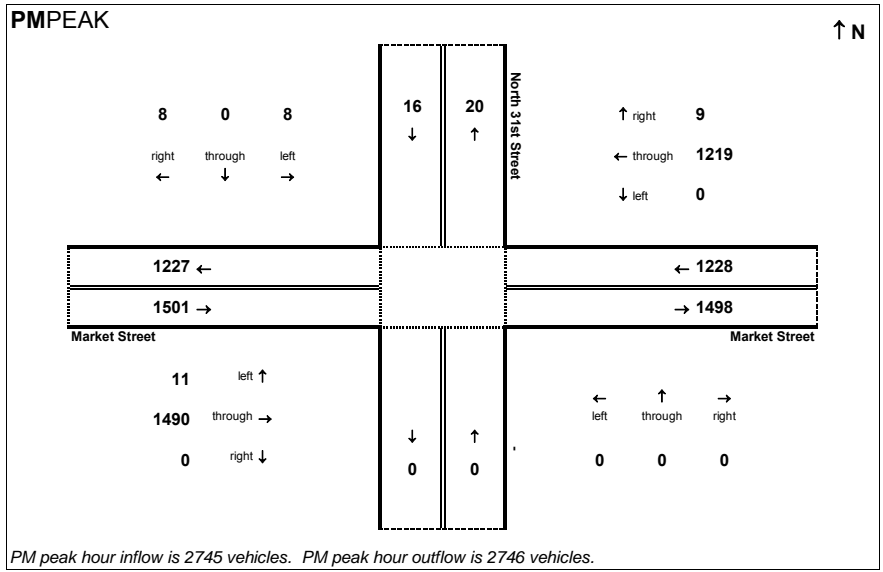
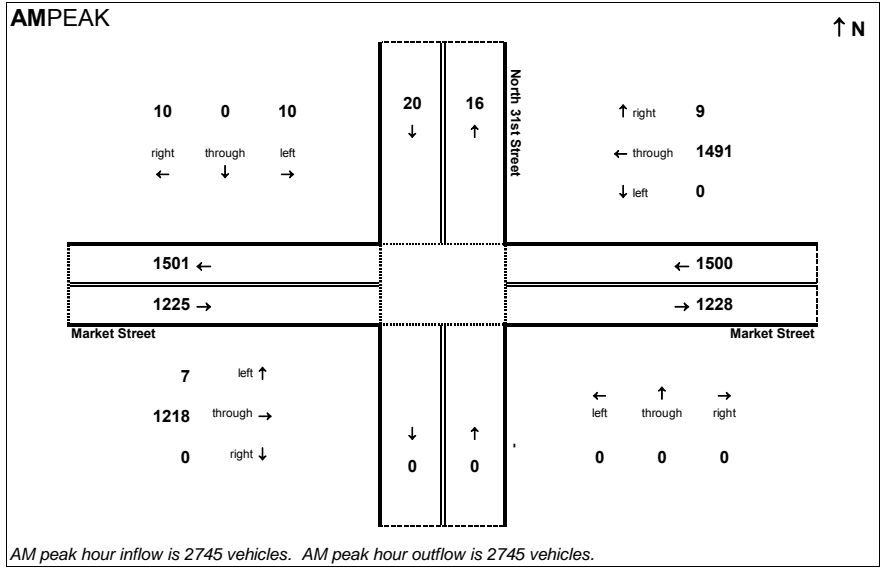


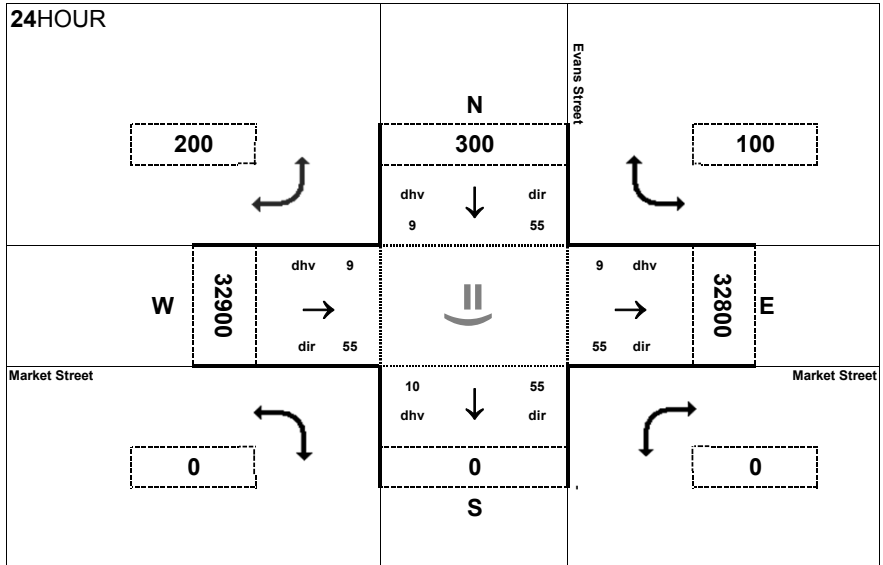
**Peak Hour Volume Breakouts Report:**  
 (11) Market Street @ North 31st Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



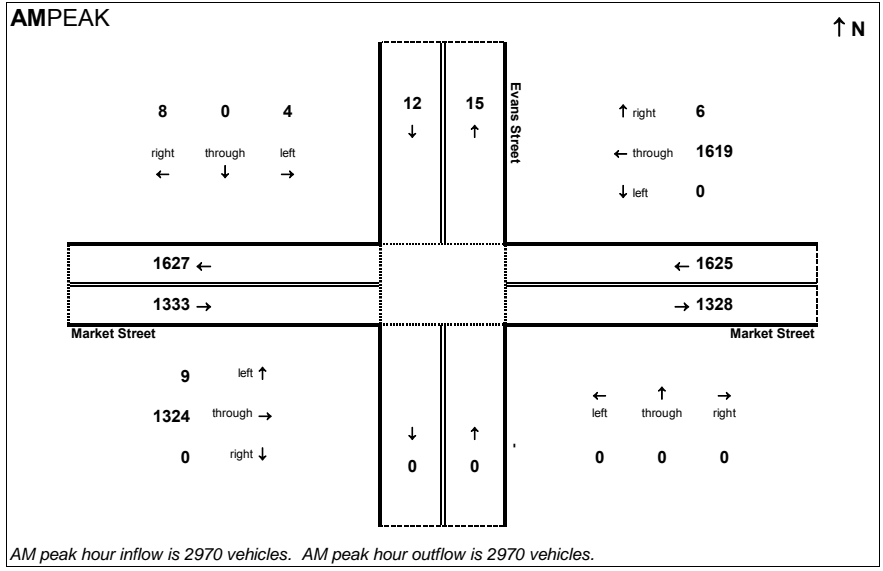


**Peak Hour Volume Breakouts Report:**  
 (12) Market Street @ Evans Street

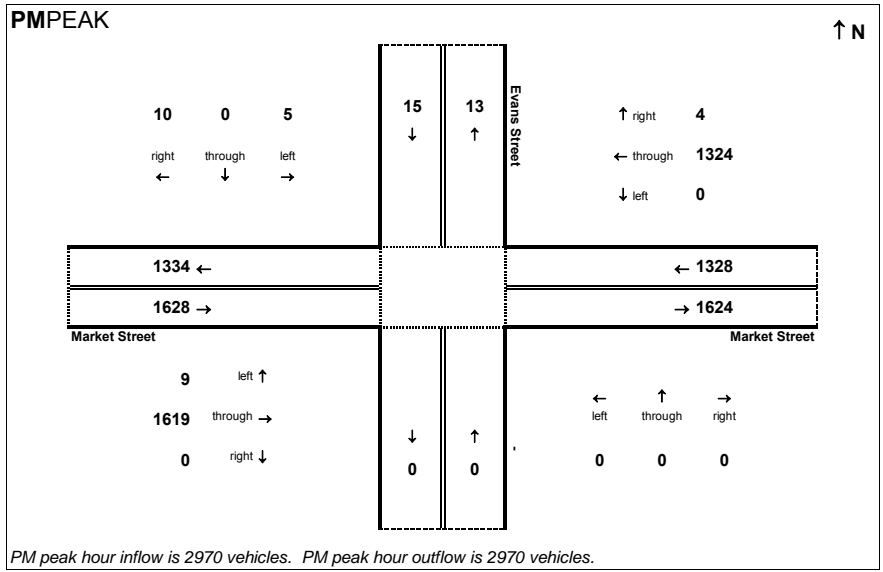
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

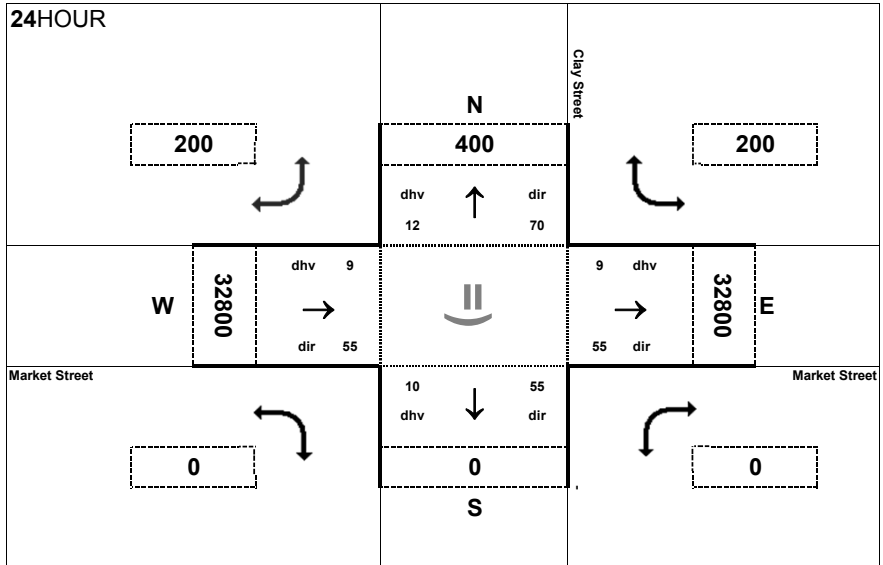
**Project:**  
 TIP: U-4434



AM peak hour inflow is 2970 vehicles. AM peak hour outflow is 2970 vehicles.



PM peak hour inflow is 2970 vehicles. PM peak hour outflow is 2970 vehicles.

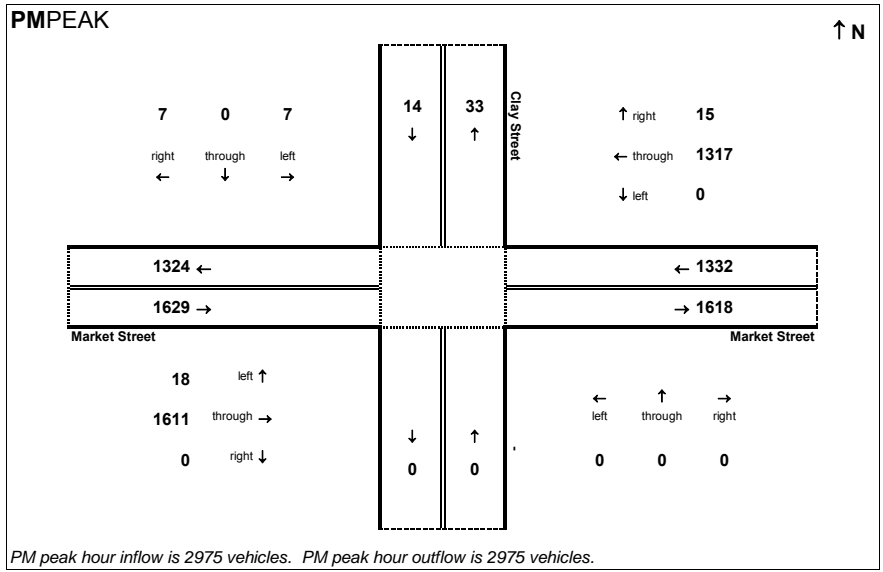
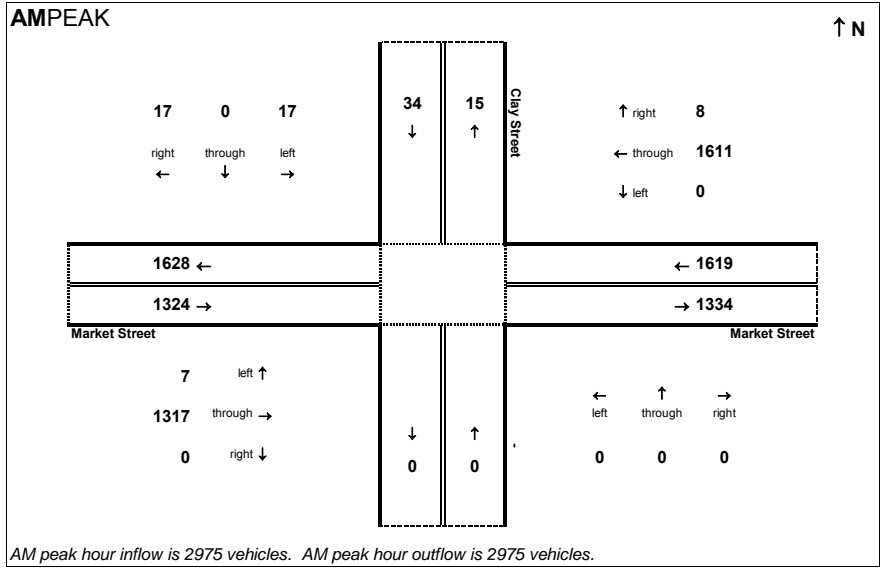


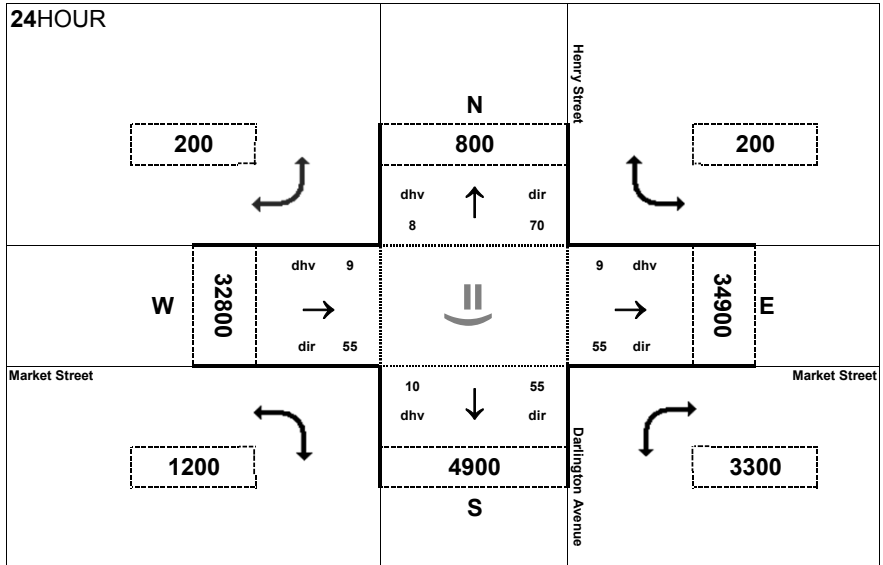
**Peak Hour Volume Breakouts Report:**  
 (13) Market Street @ Clay Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



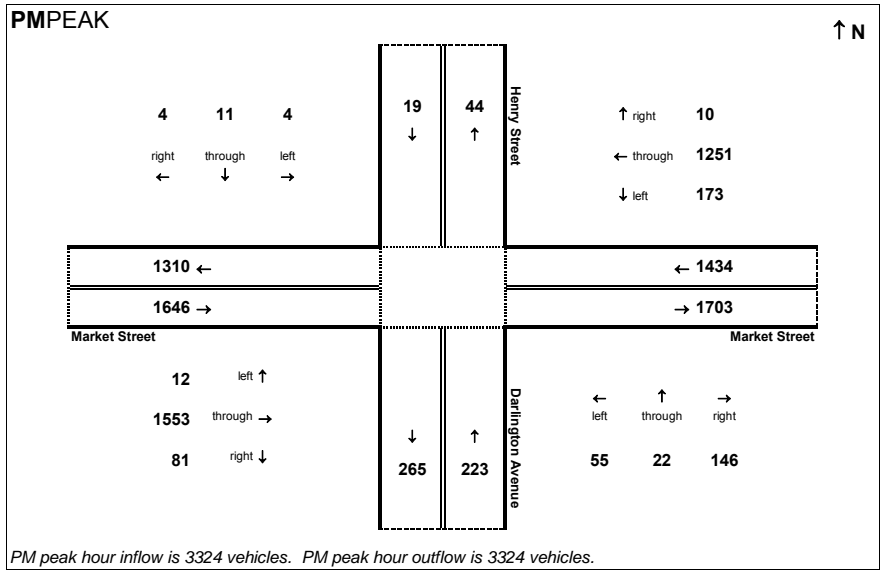
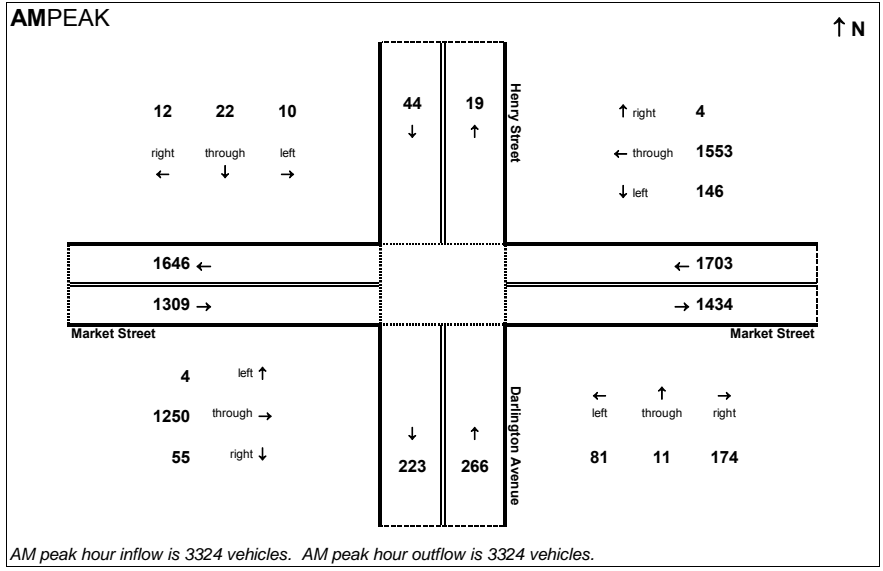


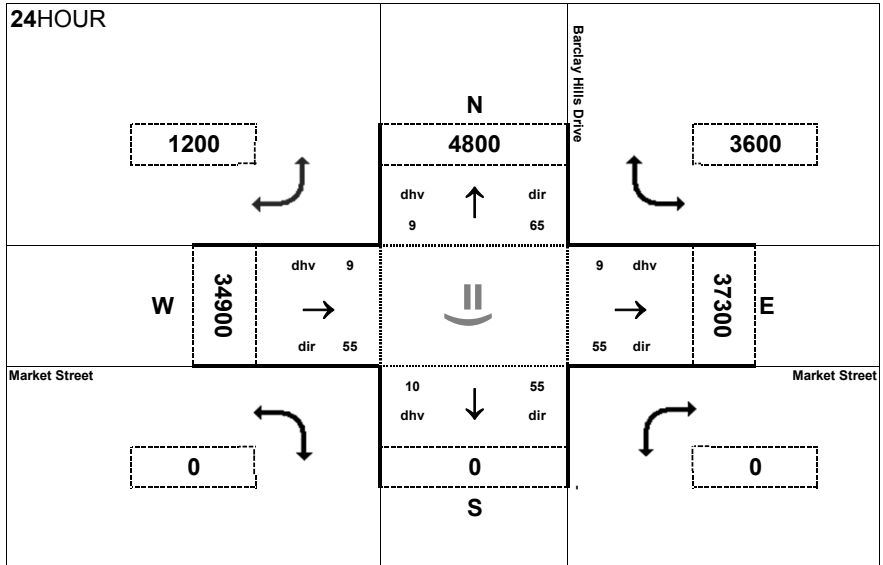
**Peak Hour Volume Breakouts Report:**  
 (14) Market Street @ Darlington Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



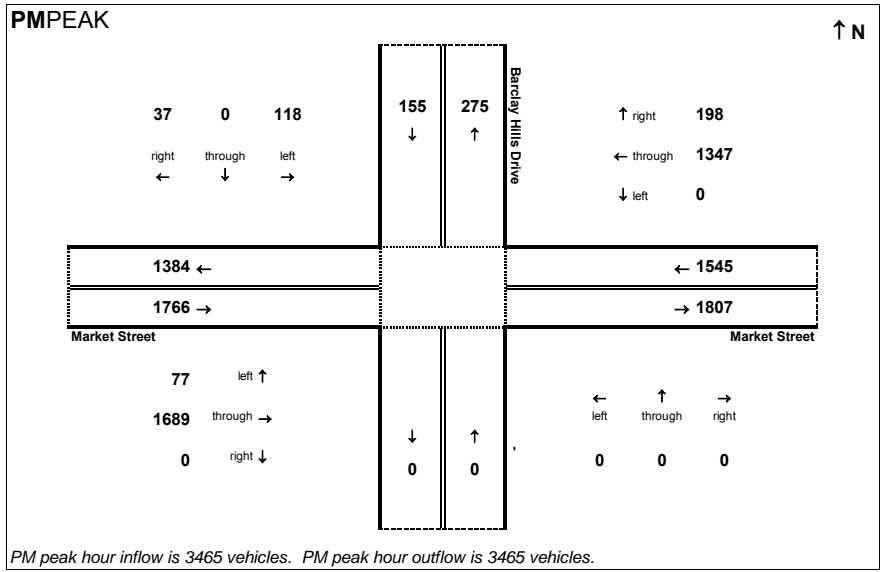
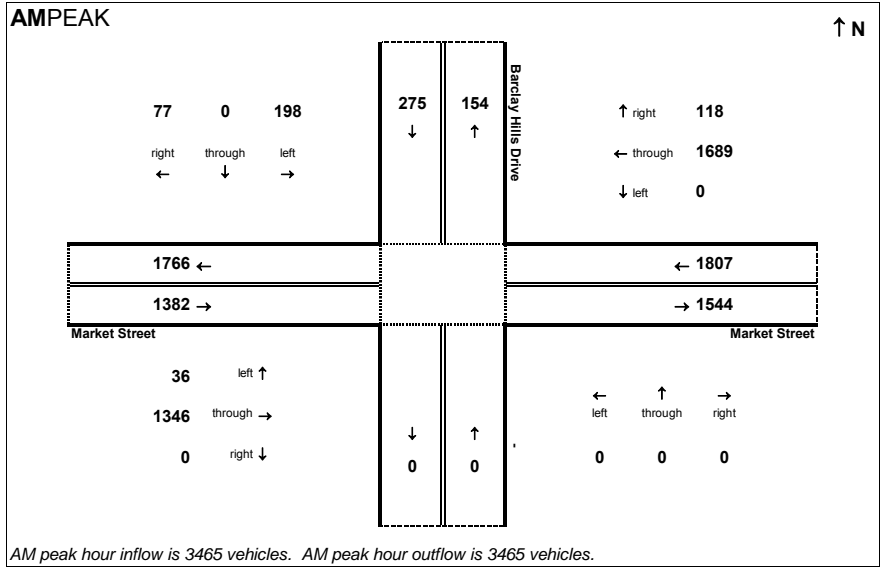


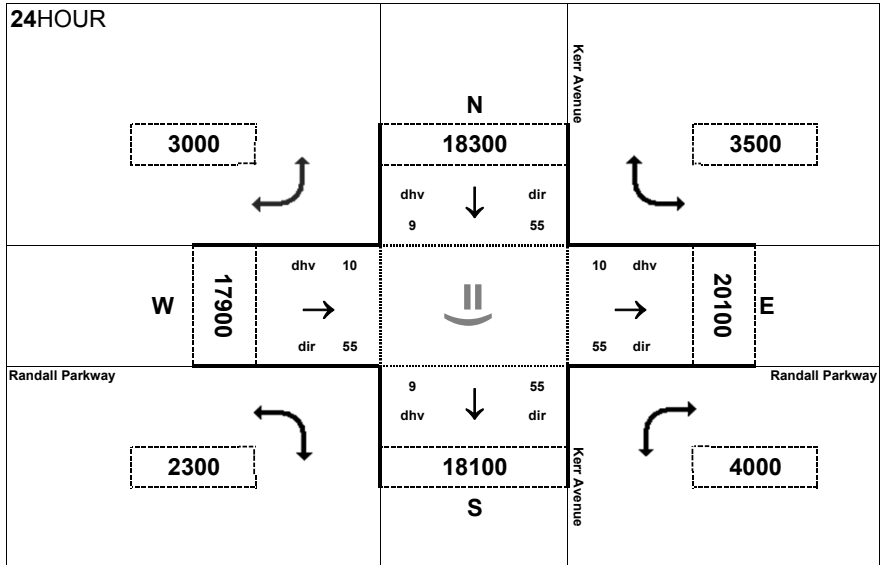
**Peak Hour Volume Breakouts Report:**  
 (15) Market Street @ Barclay Hills Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



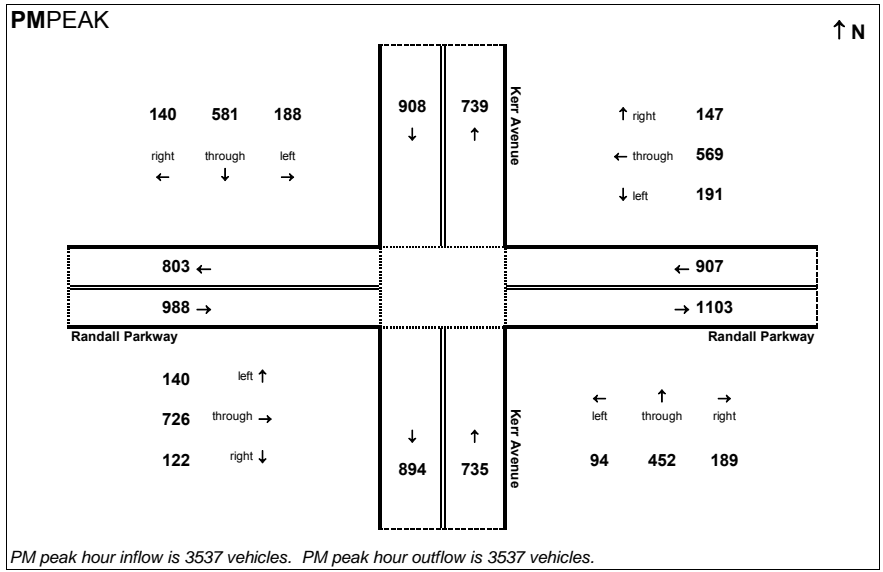
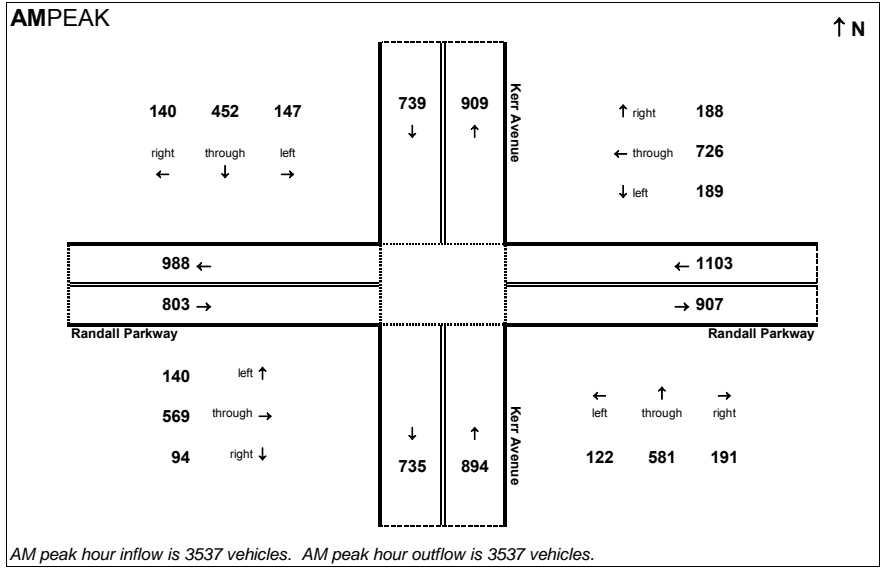


**Peak Hour Volume Breakouts Report:**  
 (16) Kerr Avenue @ Randall Parkway

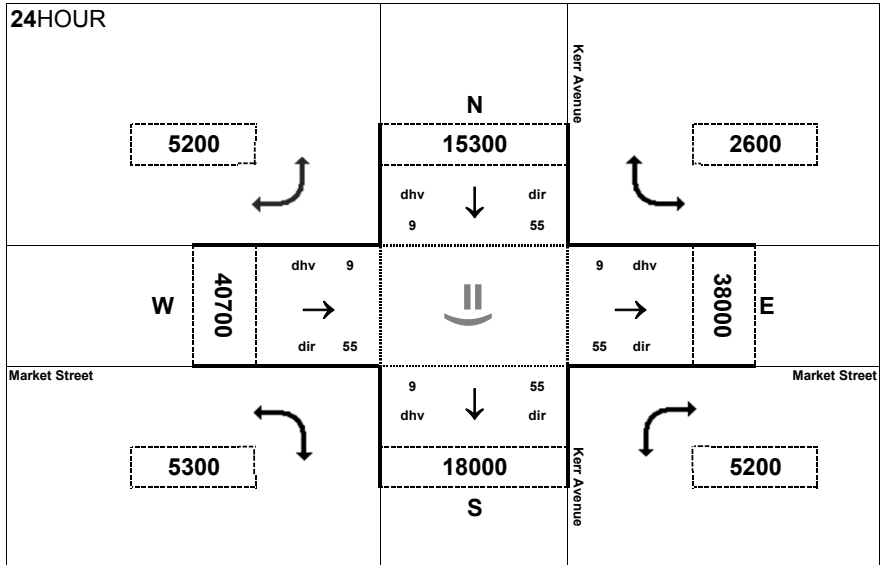
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434





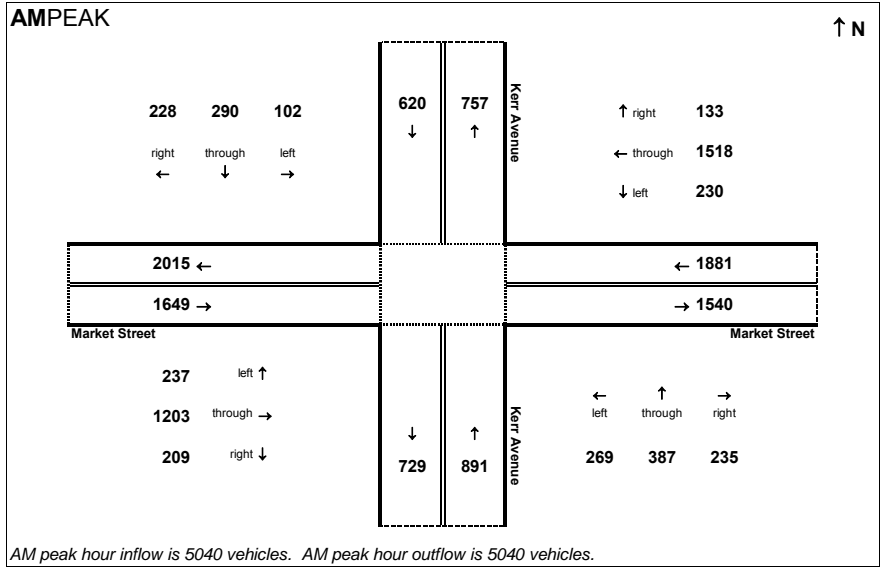


**Peak Hour Volume Breakouts Report:**  
 (17) Kerr Avenue @ Market Street

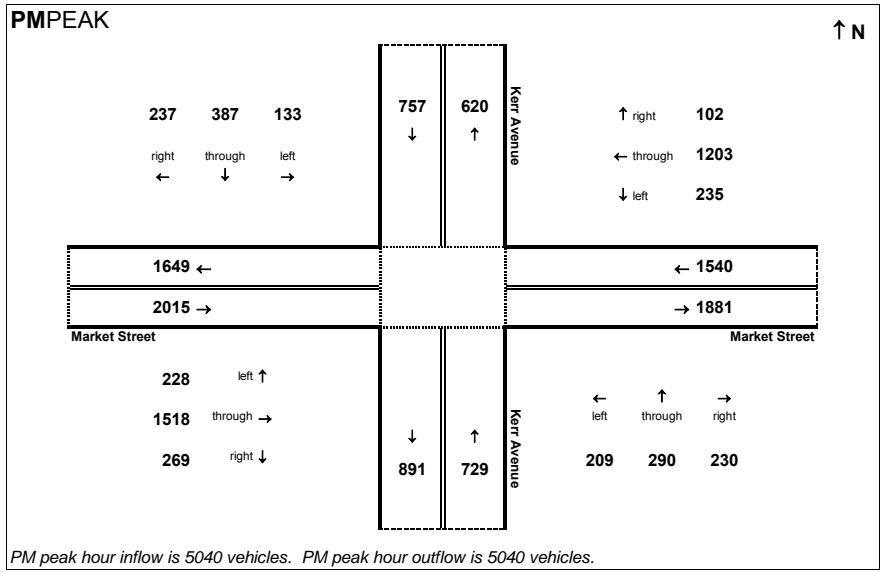
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

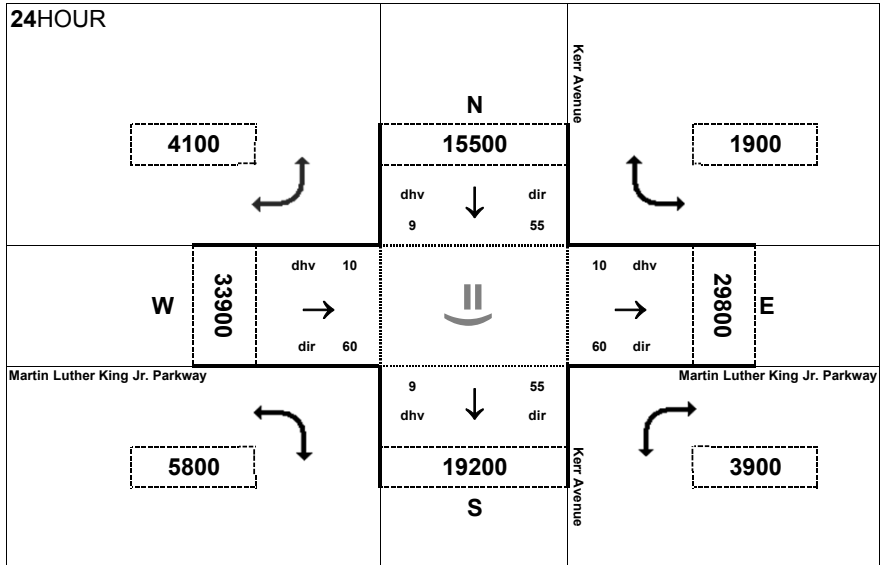
**Project:**  
 TIP: U-4434



AM peak hour inflow is 5040 vehicles. AM peak hour outflow is 5040 vehicles.



PM peak hour inflow is 5040 vehicles. PM peak hour outflow is 5040 vehicles.

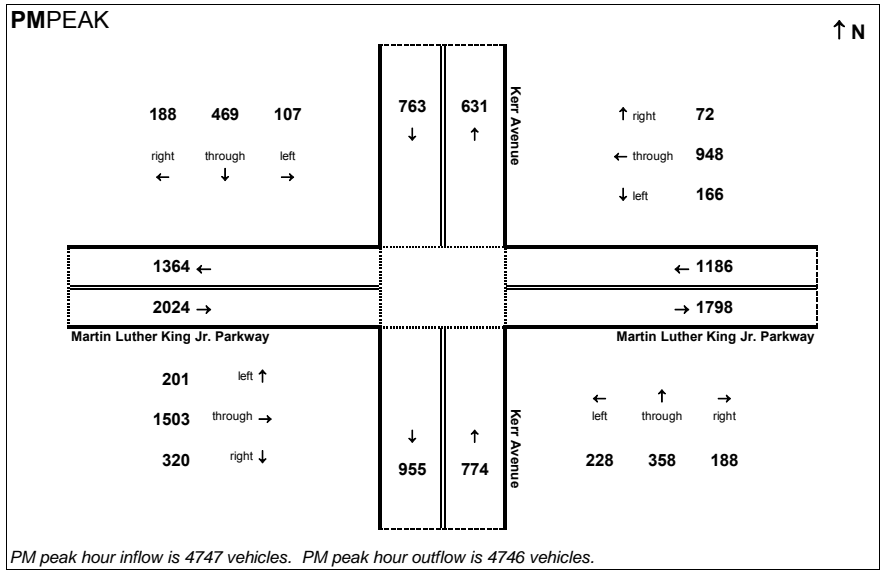
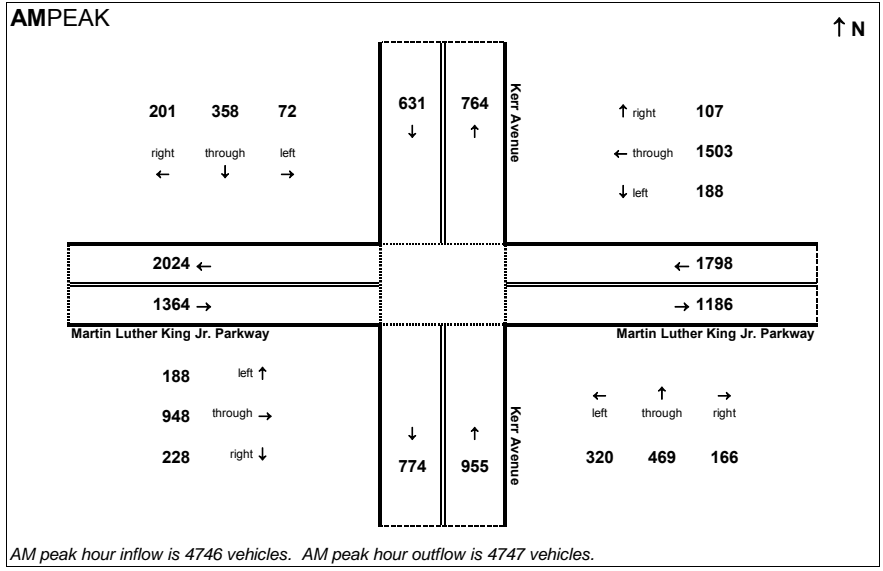


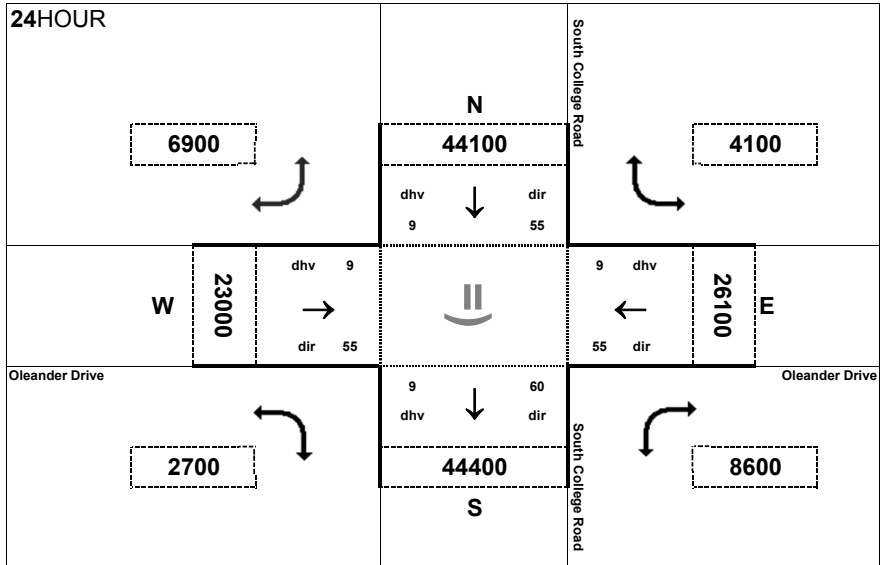
**Peak Hour Volume Breakouts Report:**  
 (18) Kerr Avenue @ Martin Luther King Jr. Parkway

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



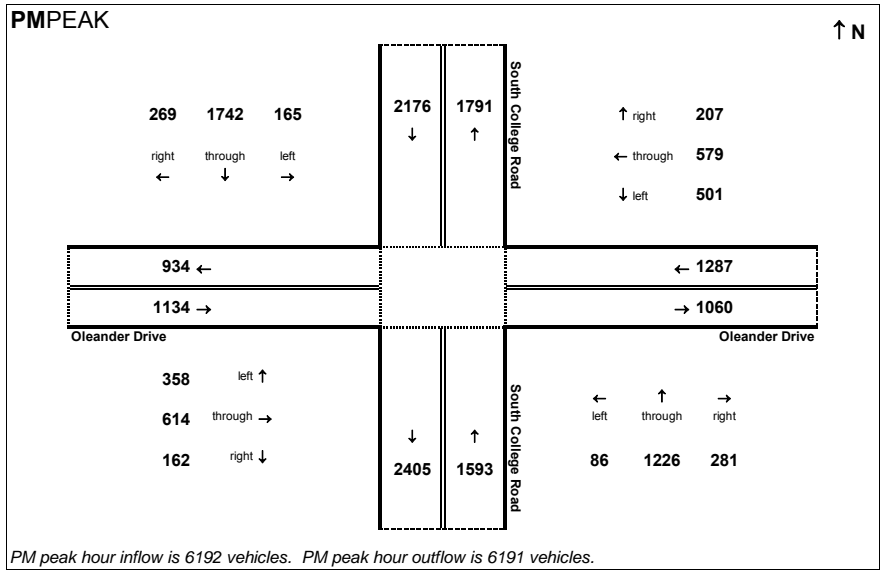
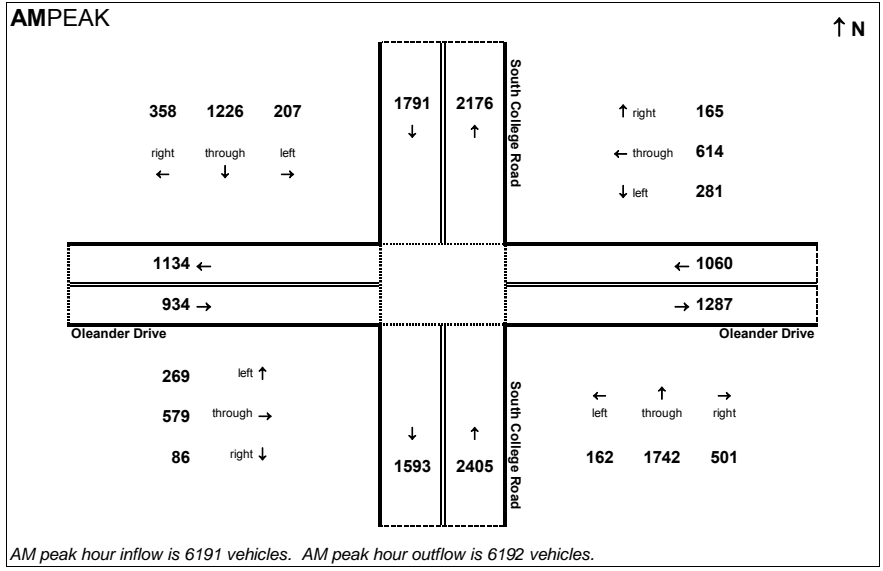


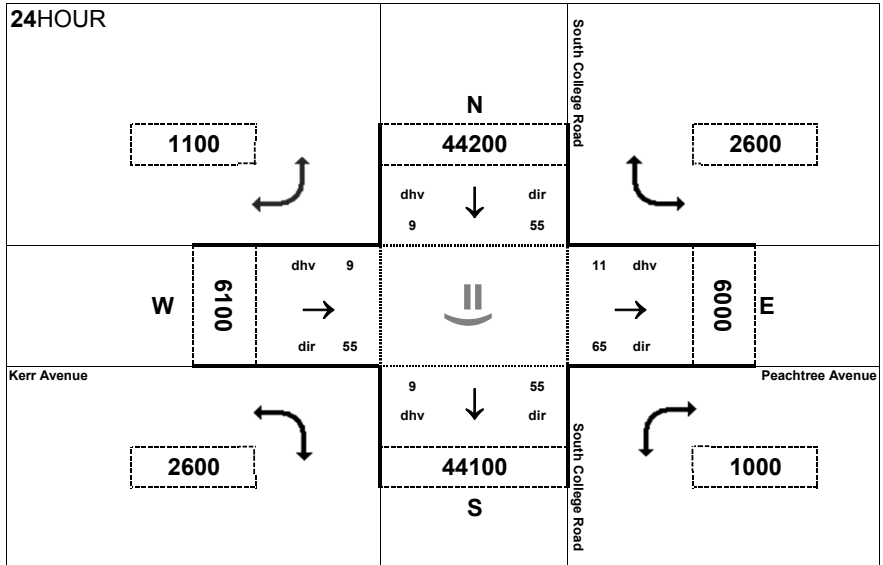
**Peak Hour Volume Breakouts Report:**  
 (19) South College Road @ Oleander Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



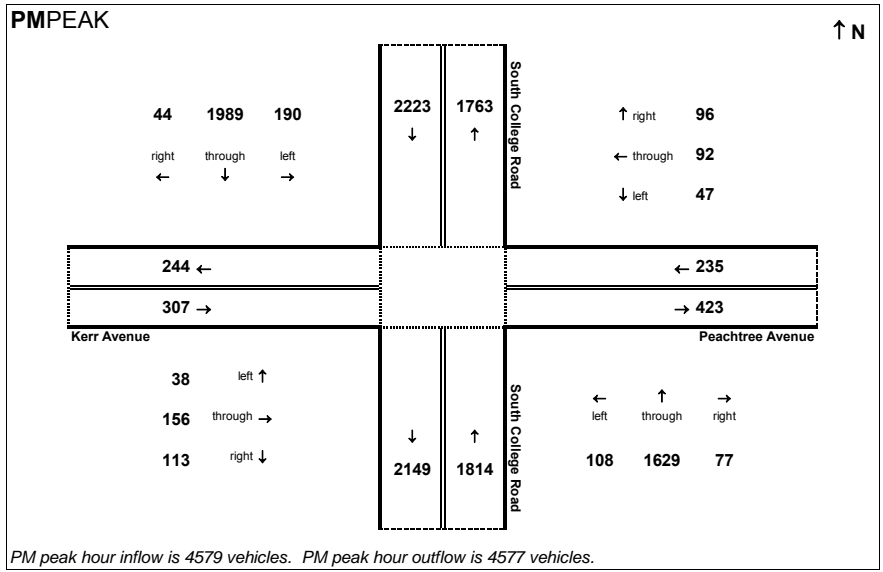
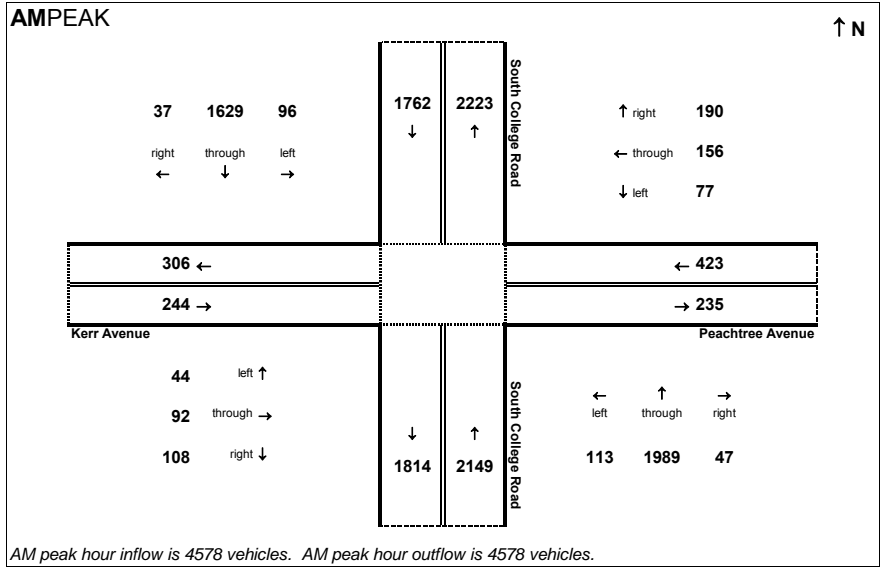


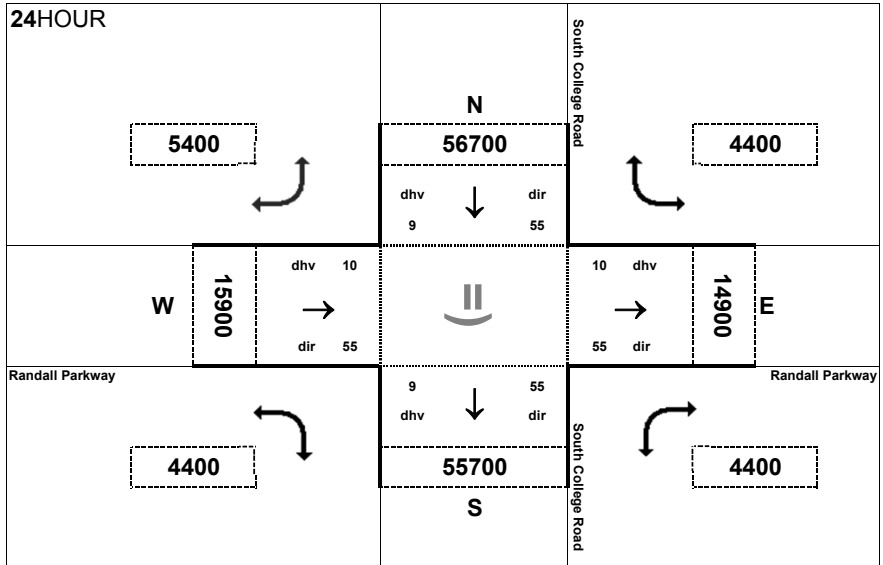
**Peak Hour Volume Breakouts Report:**  
 (20) South College Road @ Kerr Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



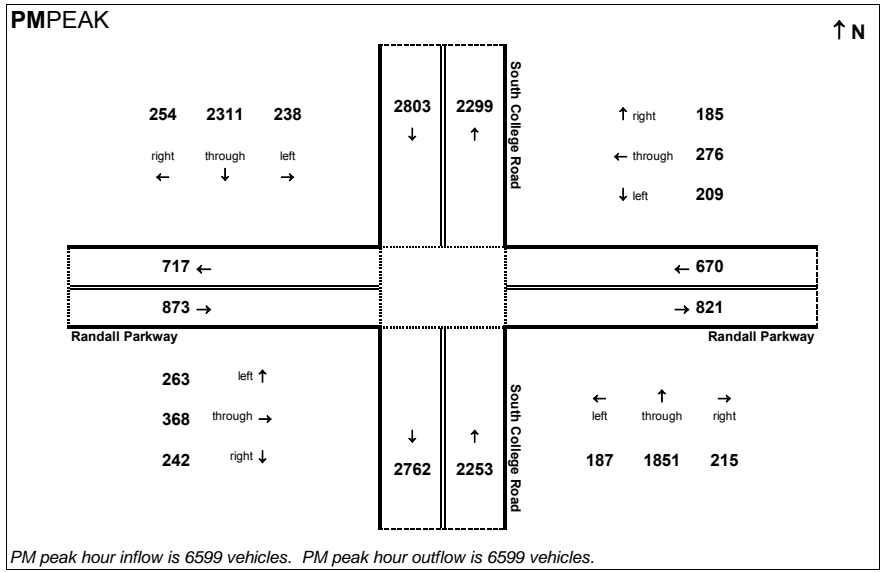
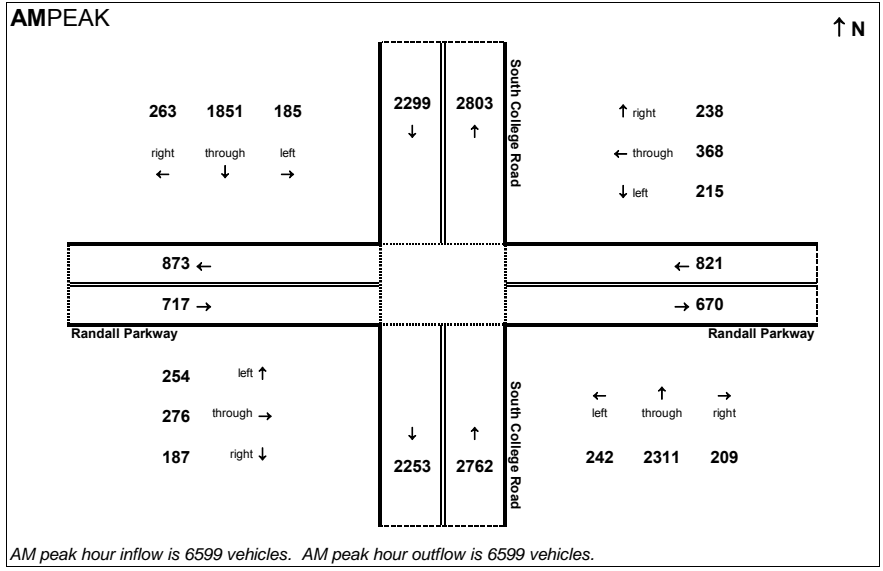


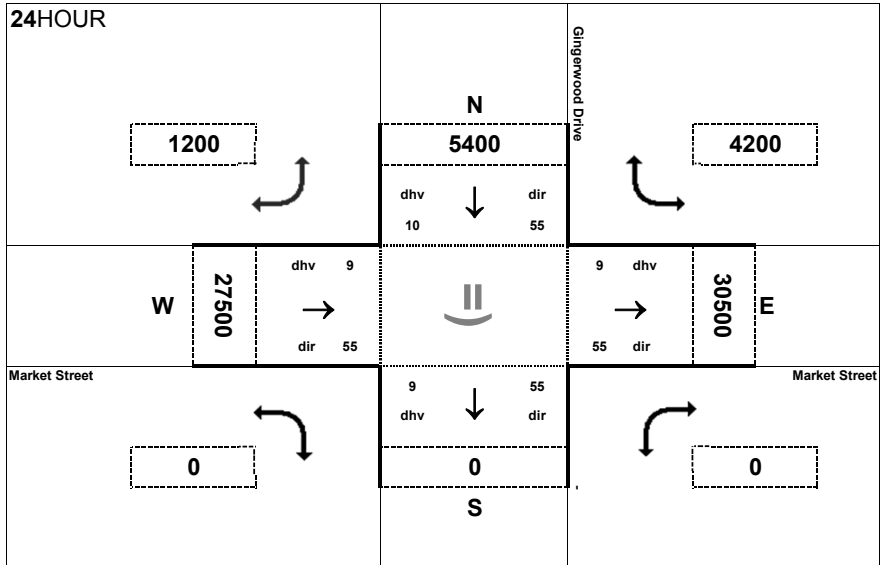
**Peak Hour Volume Breakouts Report:**  
 (21) South College Road @ Randall Parkway

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



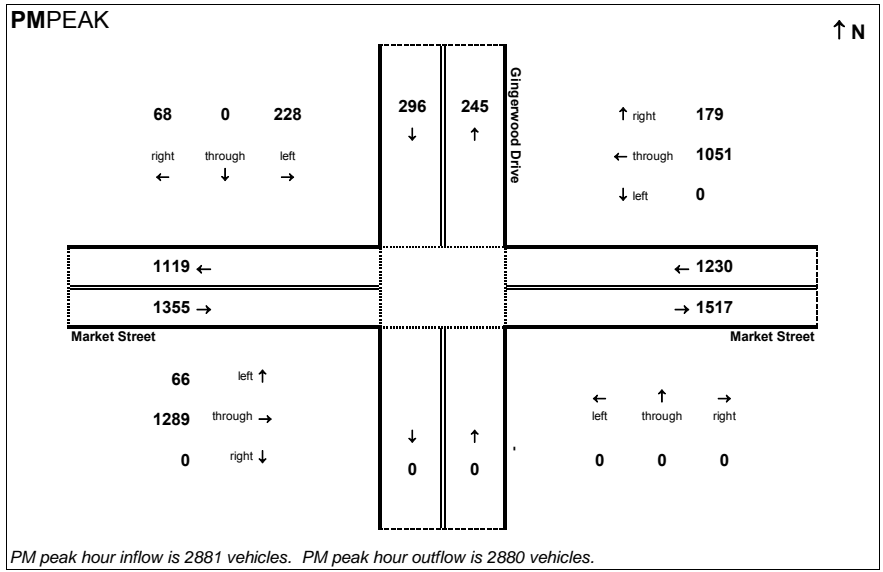
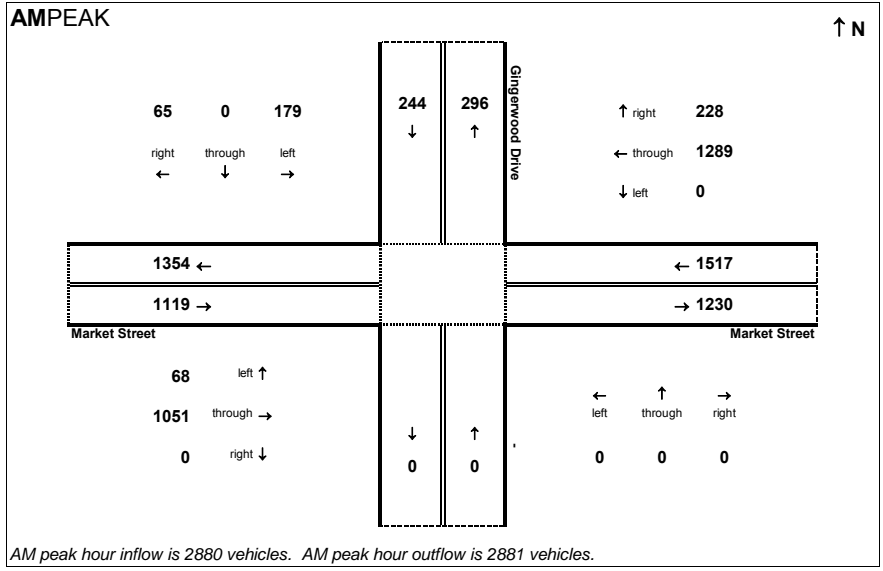


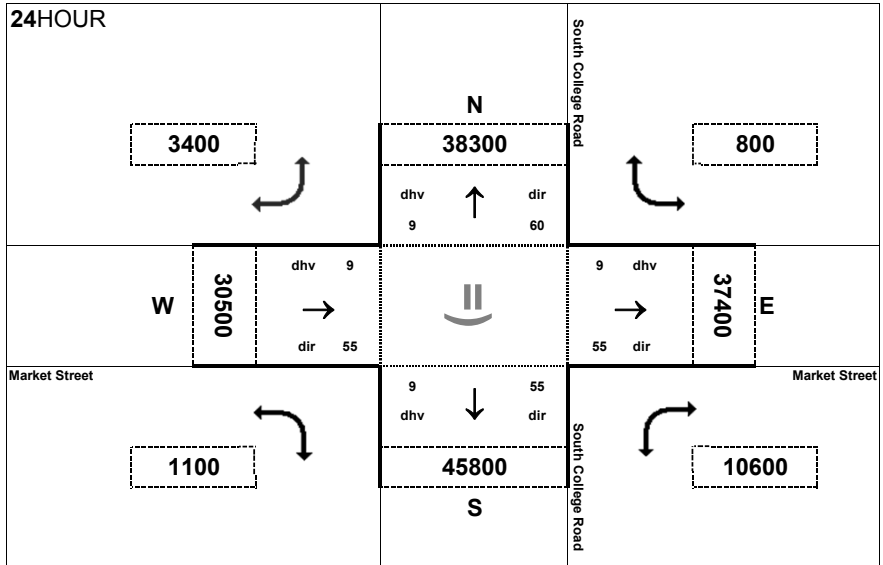
**Peak Hour Volume Breakouts Report:**  
 (22) Market Street @ Gingerwood Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



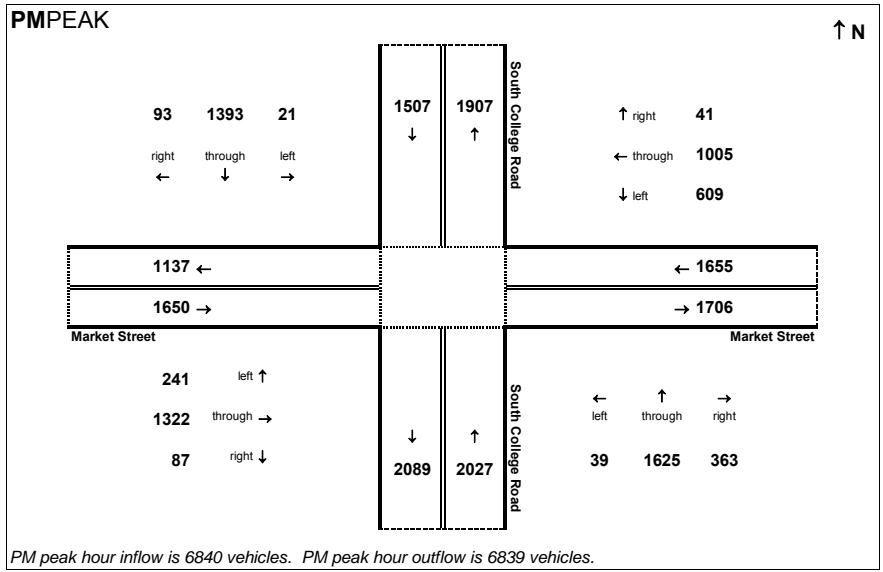
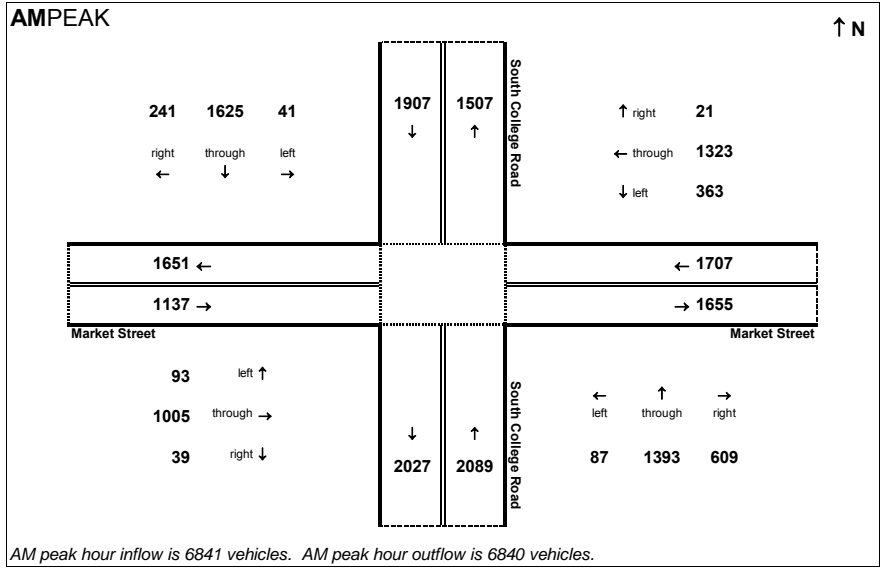


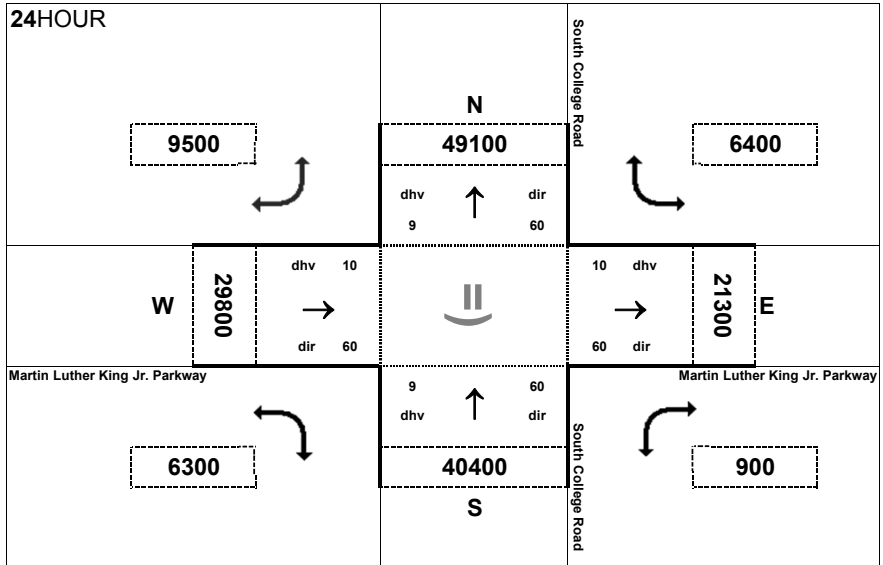
**Peak Hour Volume Breakouts Report:**  
 (23) South College Road @ Market Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



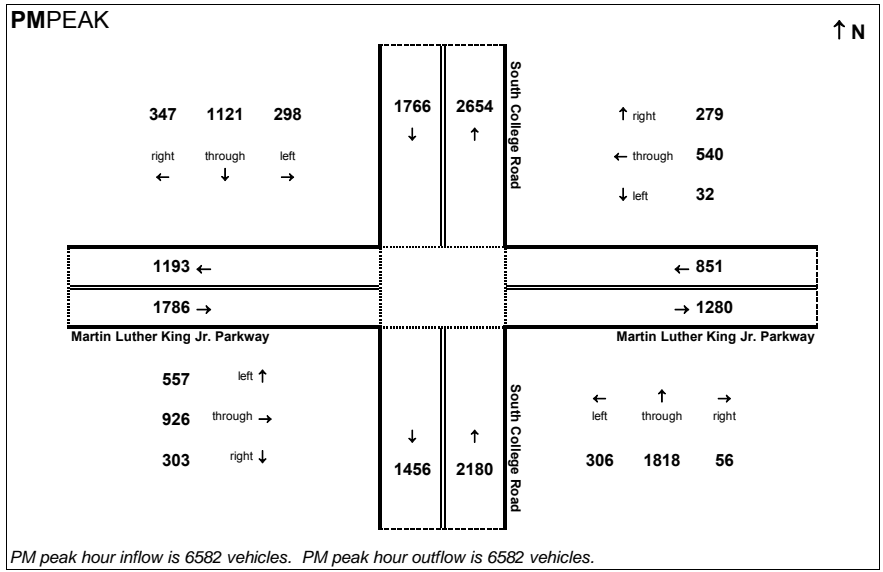
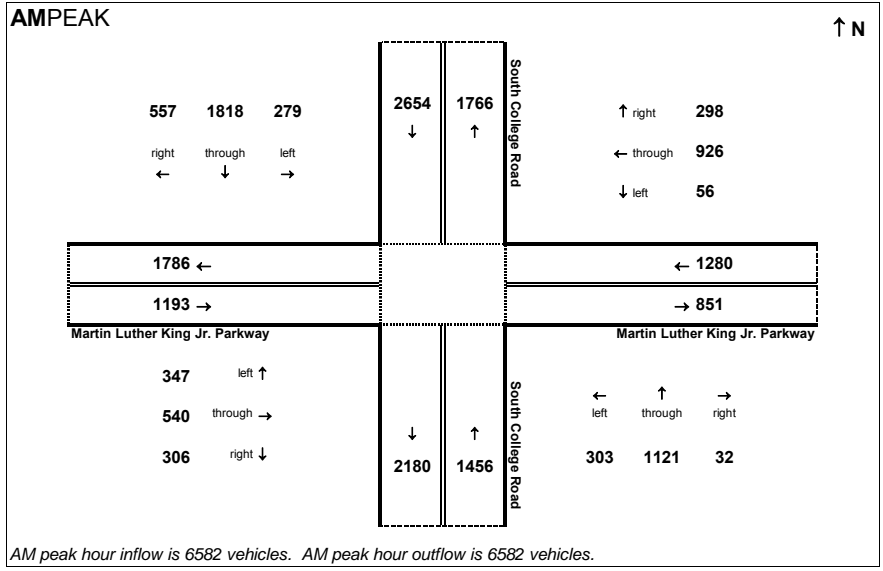


**Peak Hour Volume Breakouts Report:**  
 (24) South College Road @ Martin Luther King Jr. Parkway

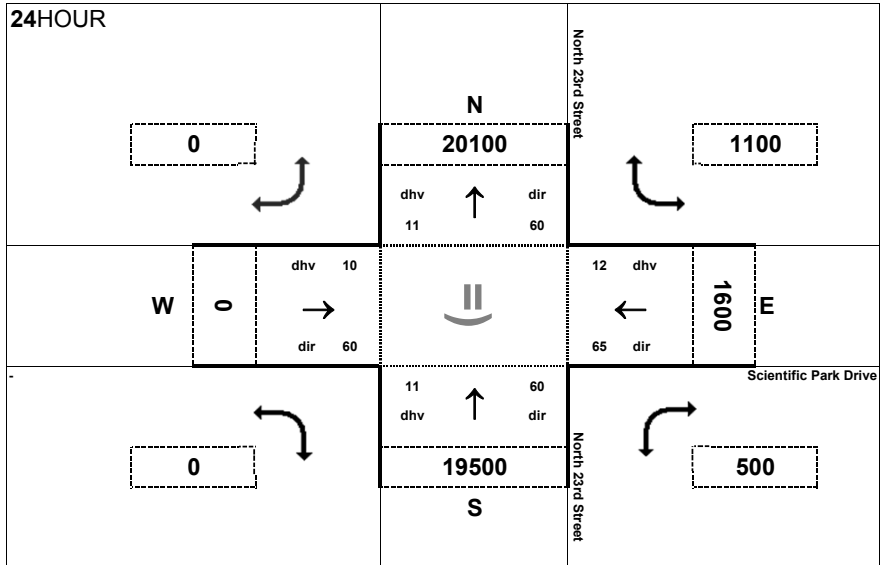
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434





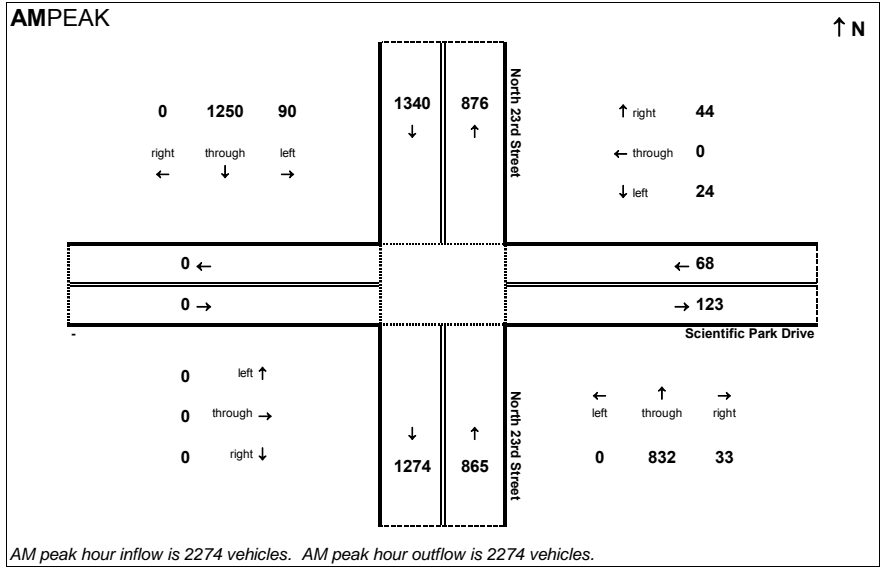


**Peak Hour Volume Breakouts Report:**  
 (25) North 23rd Street @ Scientific Park Drive

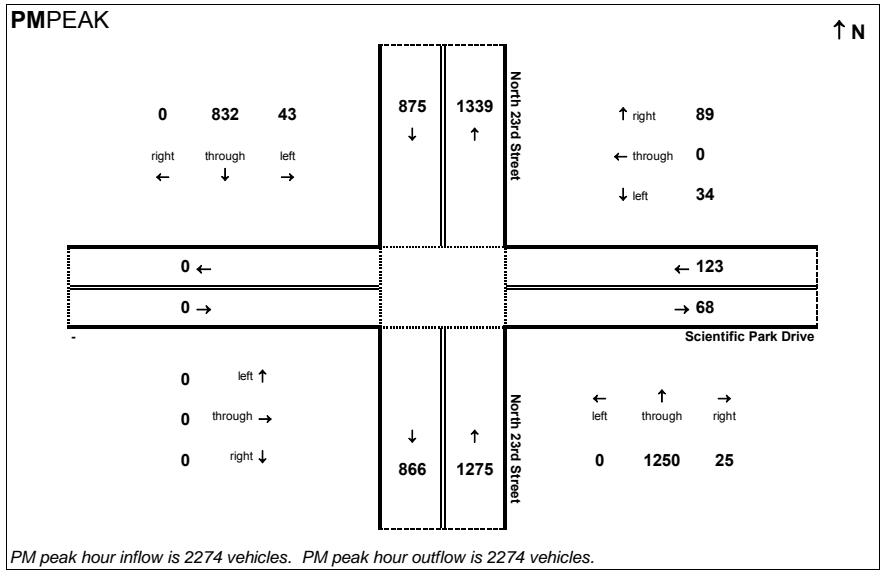
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

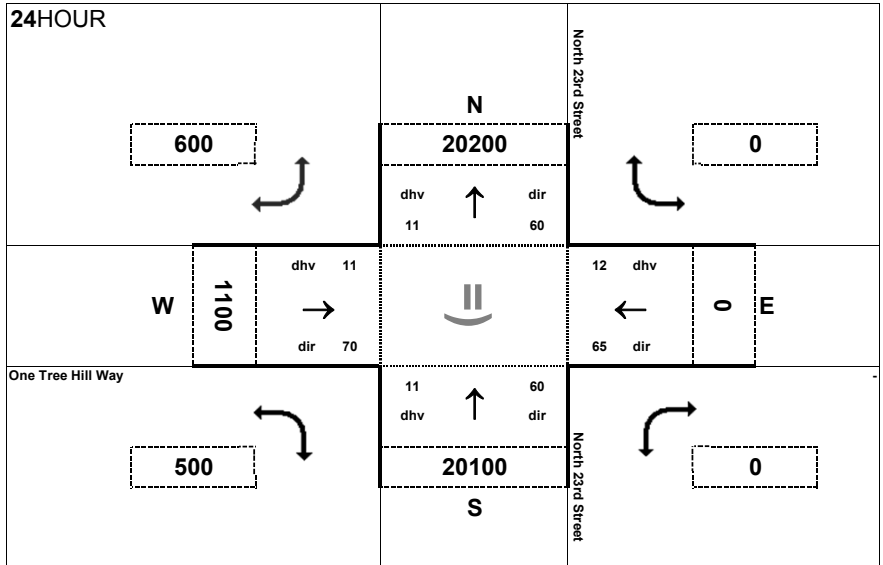
**Project:**  
 TIP: U-4434



AM peak hour inflow is 2274 vehicles. AM peak hour outflow is 2274 vehicles.



PM peak hour inflow is 2274 vehicles. PM peak hour outflow is 2274 vehicles.

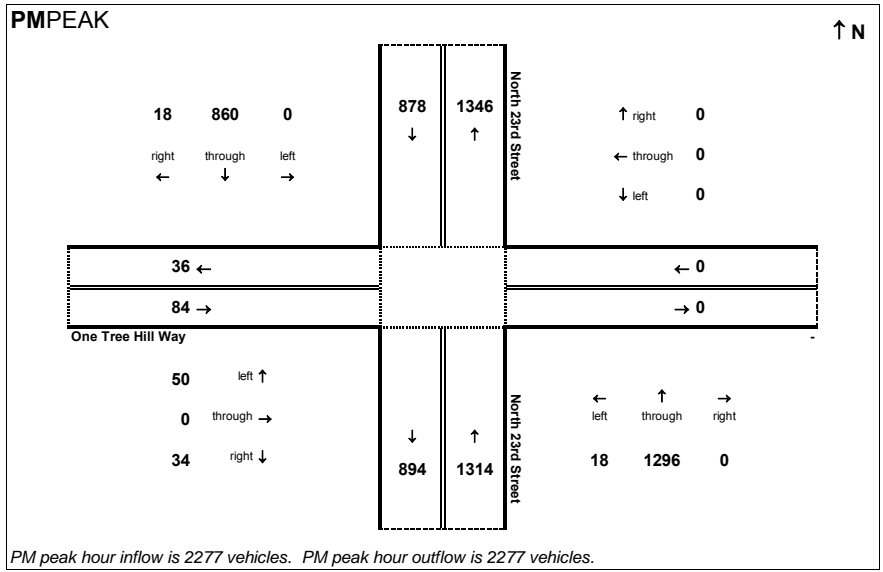
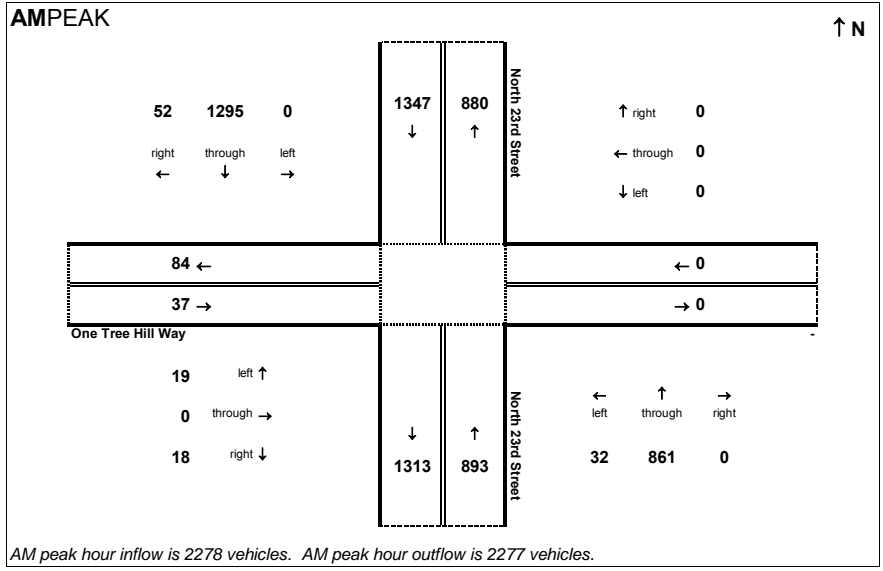


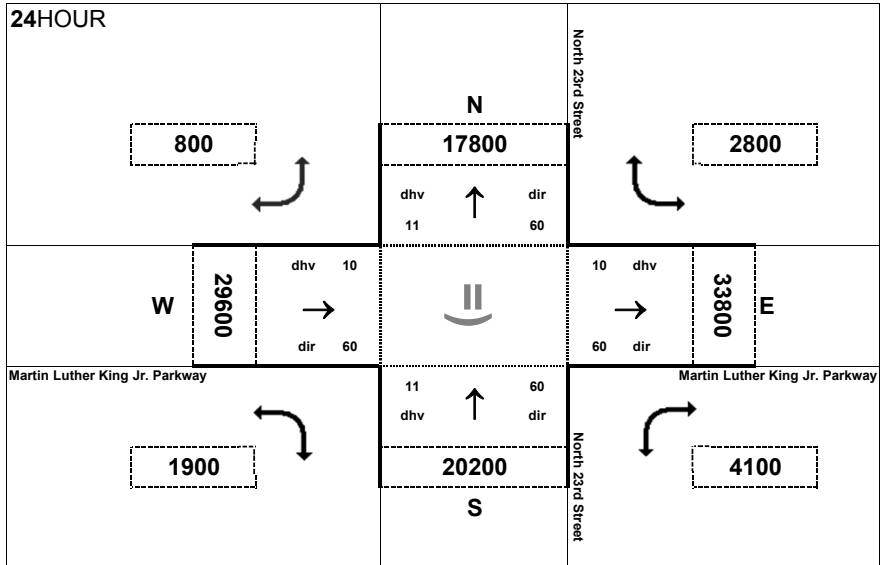
**Peak Hour Volume Breakouts Report:**  
 (26) North 23rd Street @ One Tree Hill Way

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



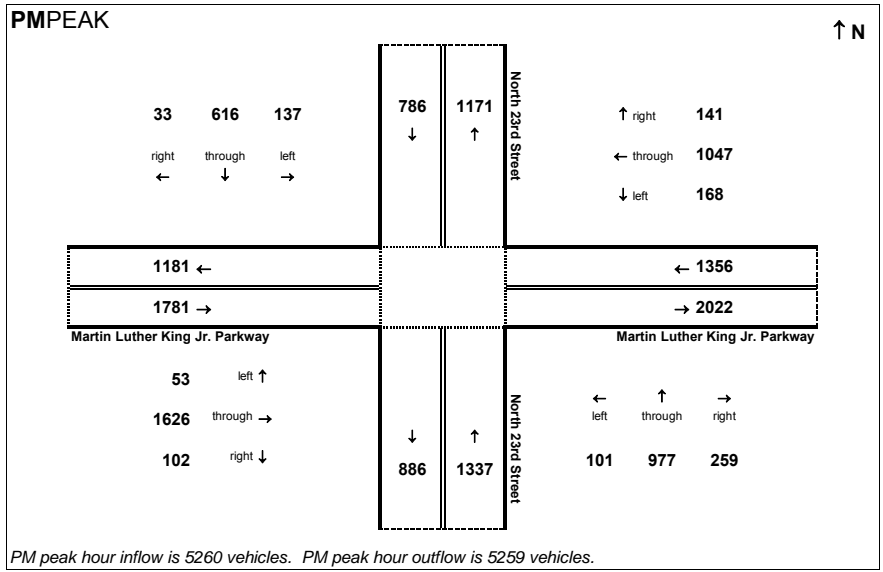
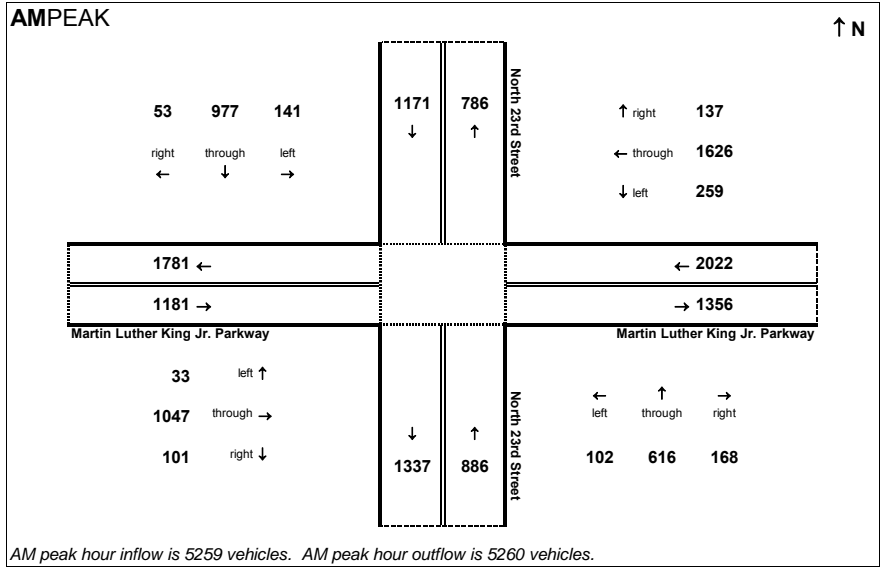


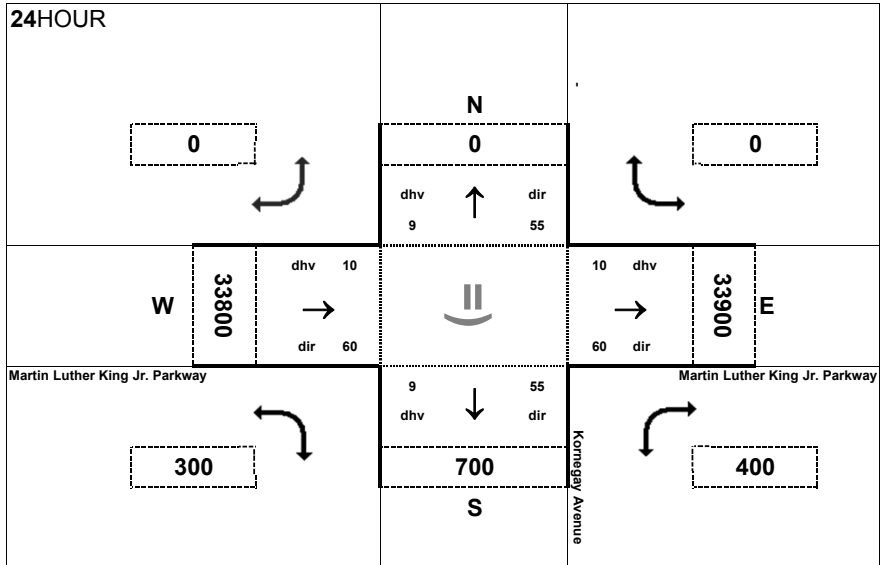
**Peak Hour Volume Breakouts Report:**  
 (27) Martin Luther King Jr. Parkway @ North 23rd Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



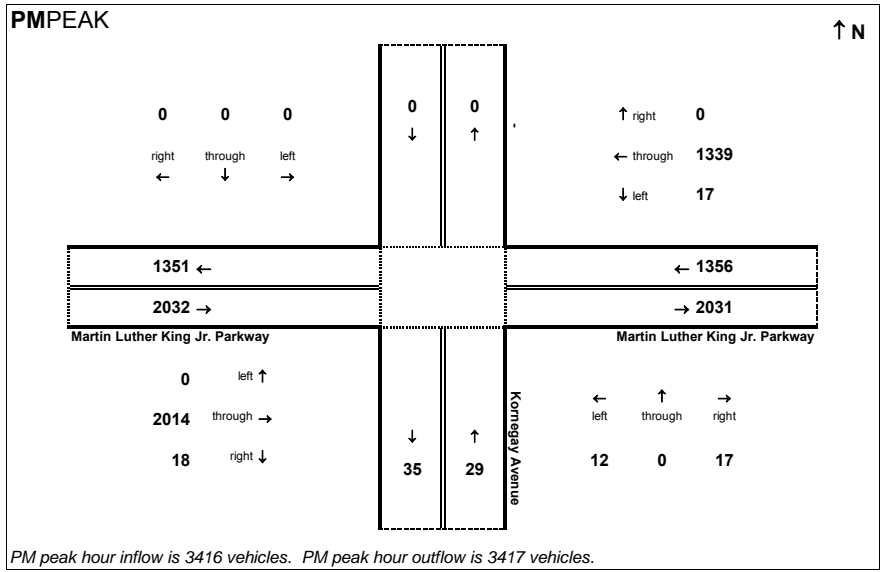
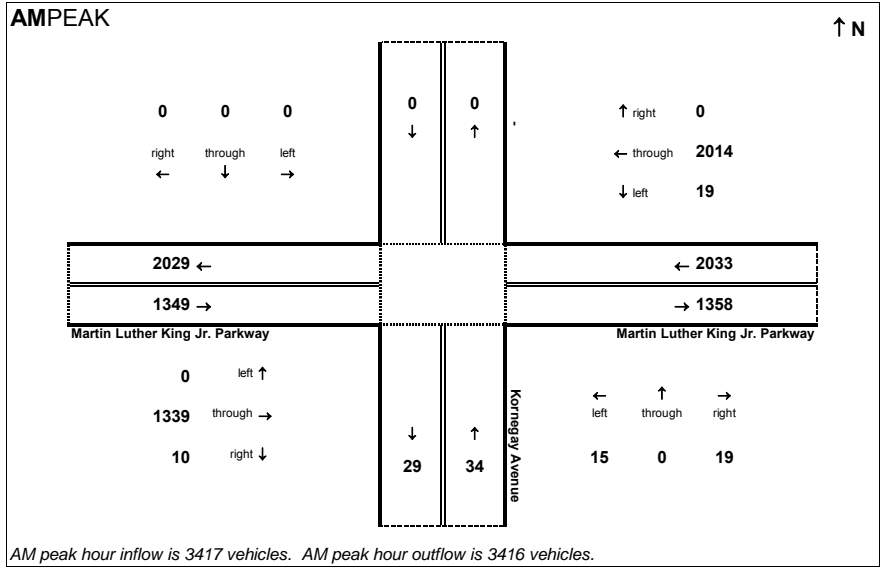


**Peak Hour Volume Breakouts Report:**  
 (28) Martin Luther King Jr. Parkway @ Kornegay Avenue

**Traffic Forecast Release Date:**  
 August-12

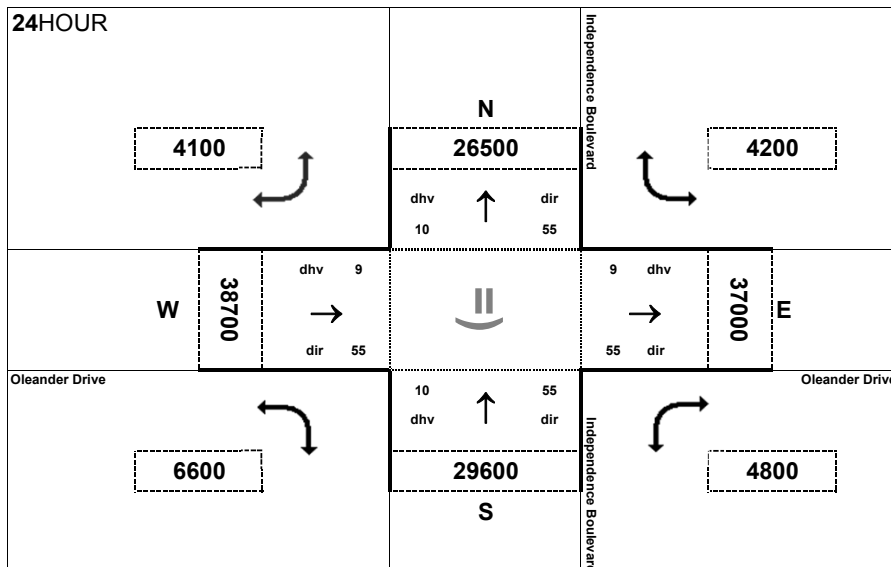
**Traffic Data Year:**  
 2012 - Base Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



## 2040 No Build Conditions

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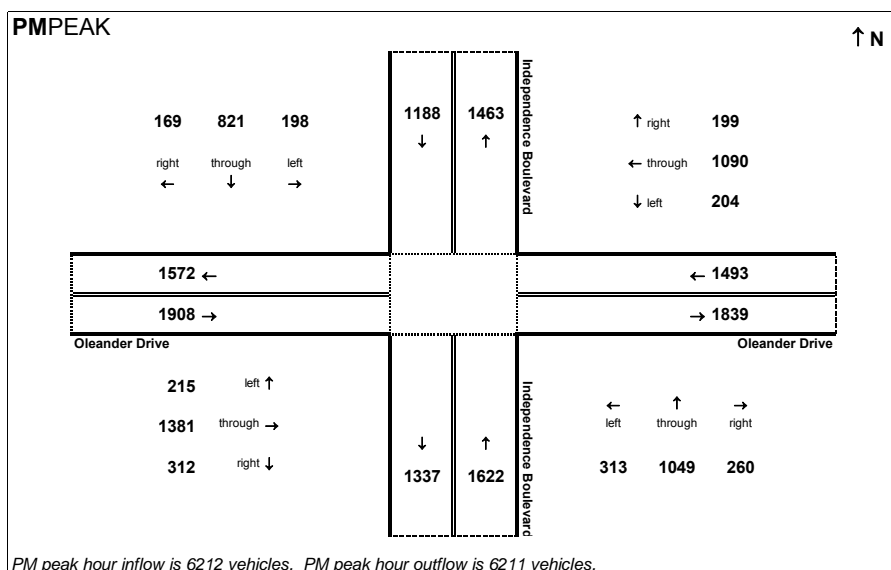
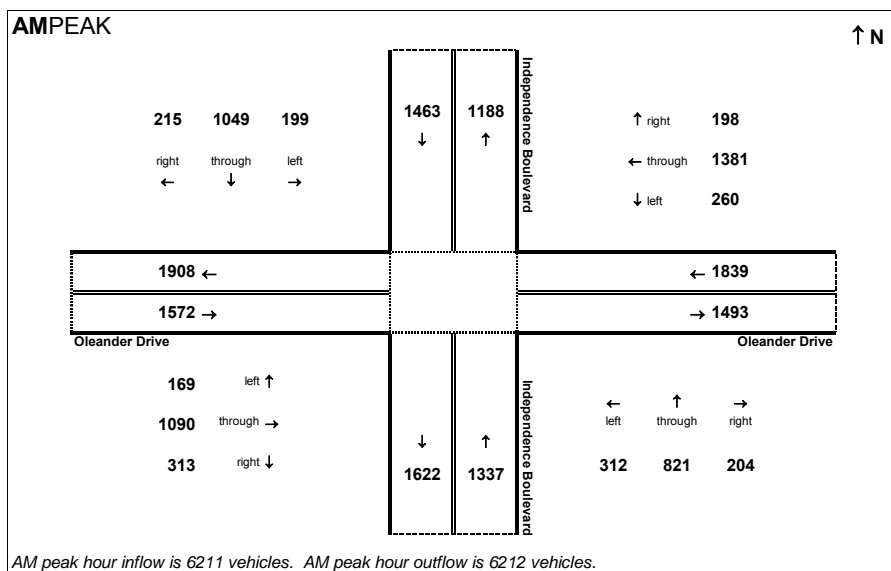


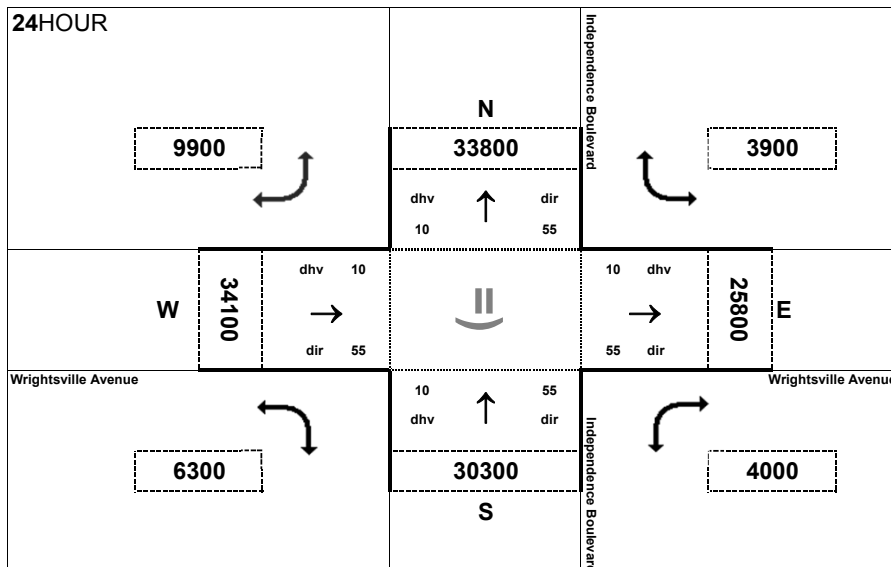
**Peak Hour Volume Breakouts Report:**  
 (1) Oleander Drive @ Independence Boulevard

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



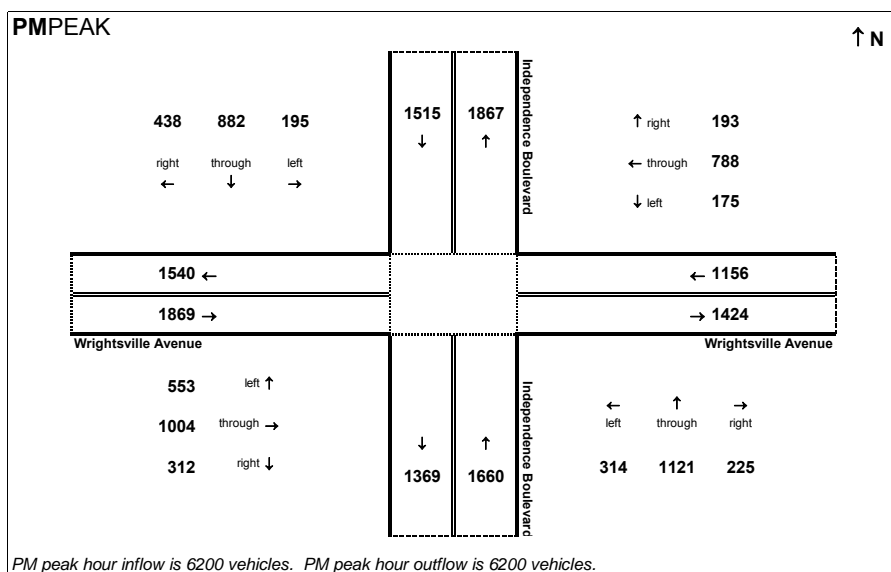
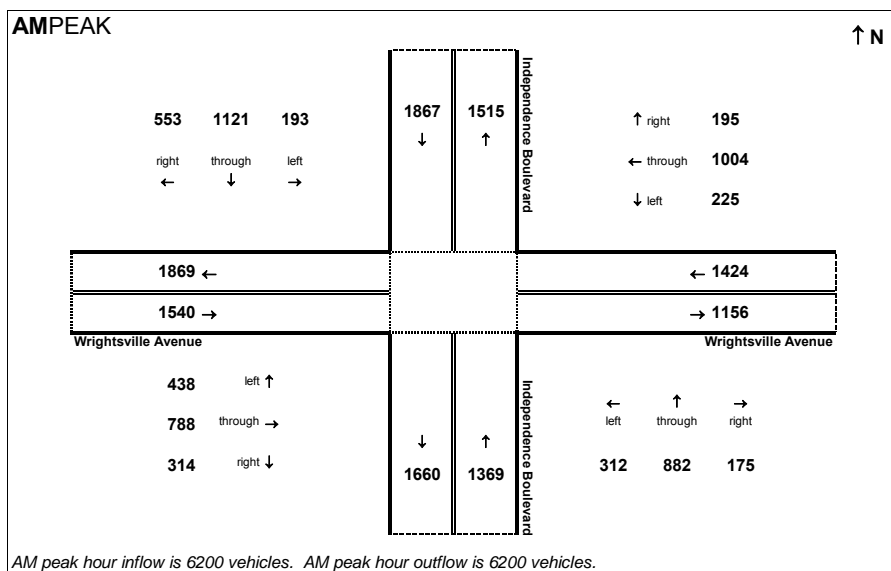


**Peak Hour Volume Breakouts Report:**  
 (2) Independence Boulevard @ Wrightsville Avenue

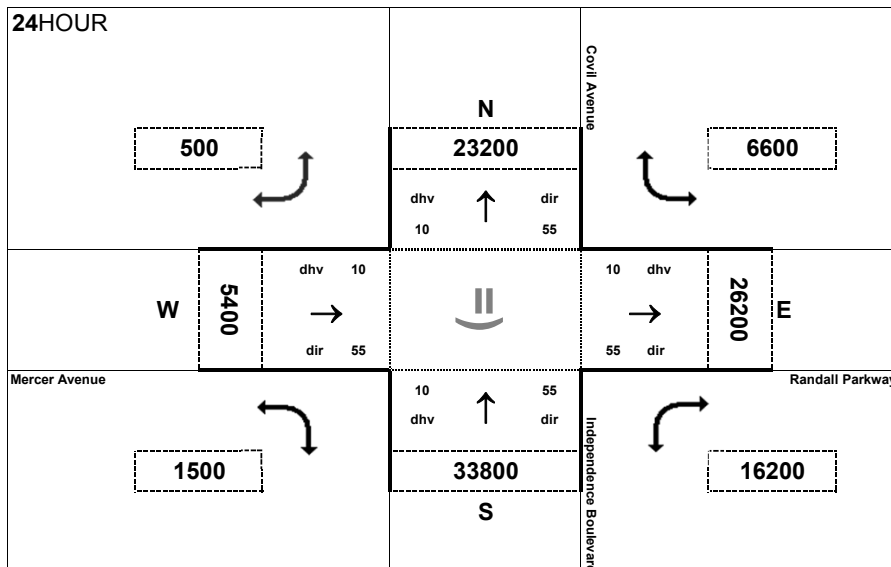
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434





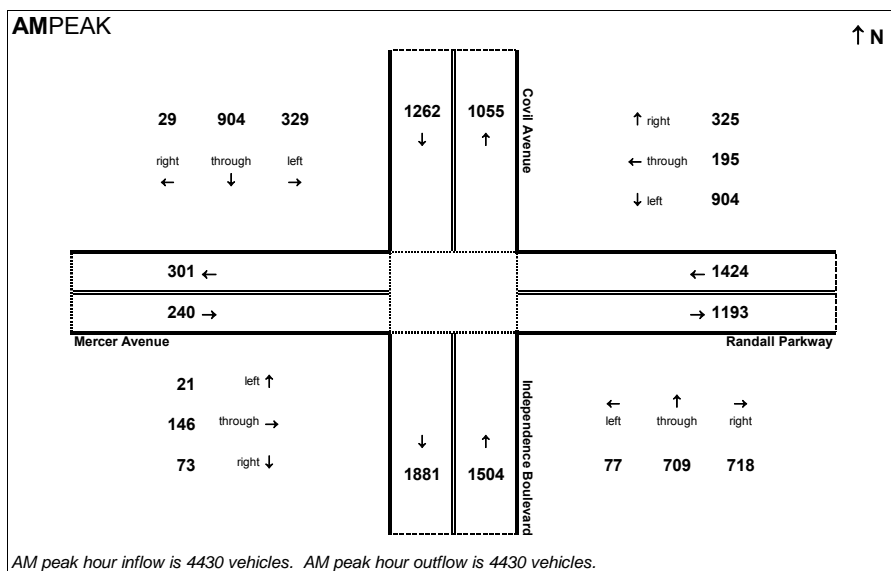


**Peak Hour Volume Breakouts Report:**  
 (3) Independence Boulevard @ Randall Parkway

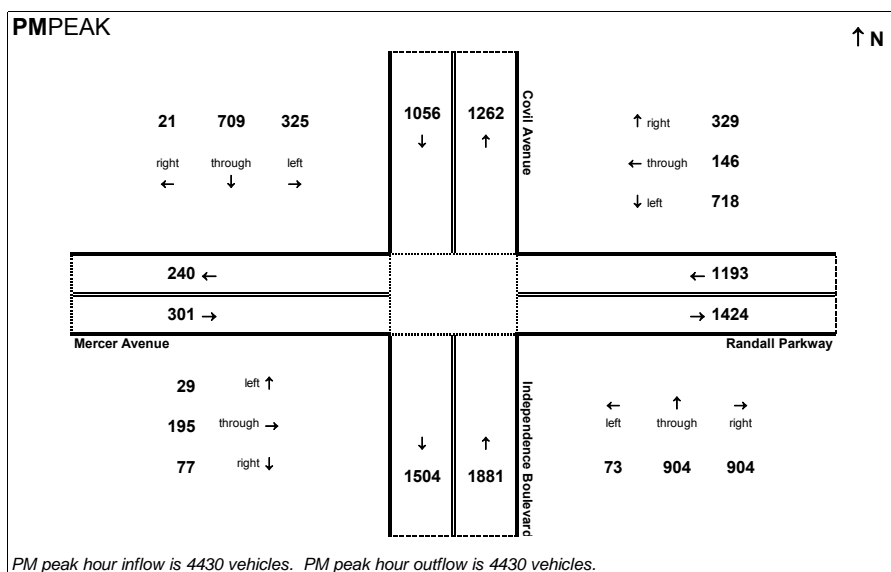
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

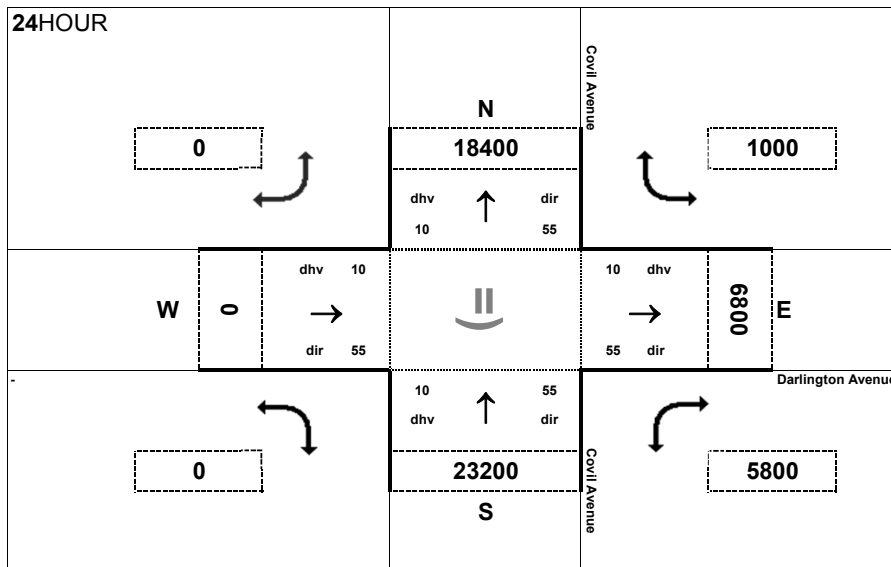
**Project:**  
 TIP: U-4434



AM peak hour inflow is 4430 vehicles. AM peak hour outflow is 4430 vehicles.



PM peak hour inflow is 4430 vehicles. PM peak hour outflow is 4430 vehicles.

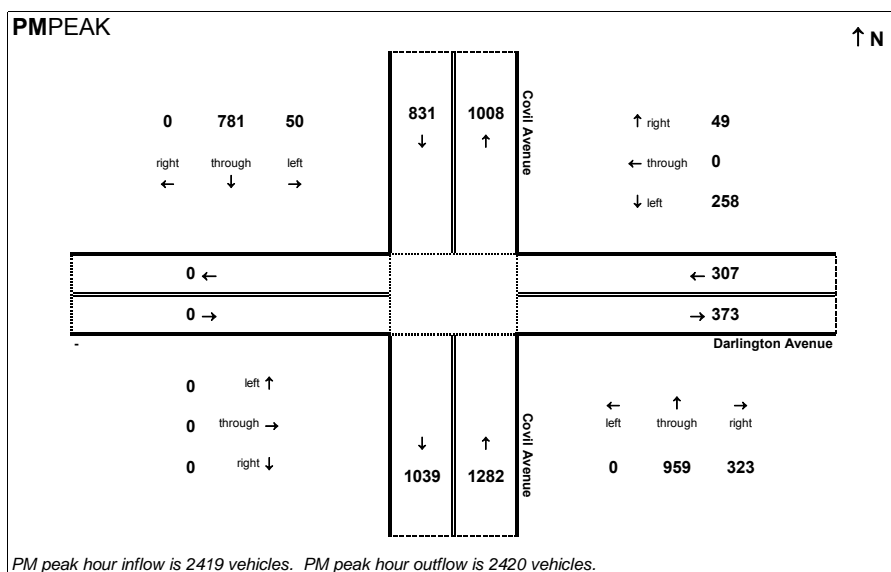
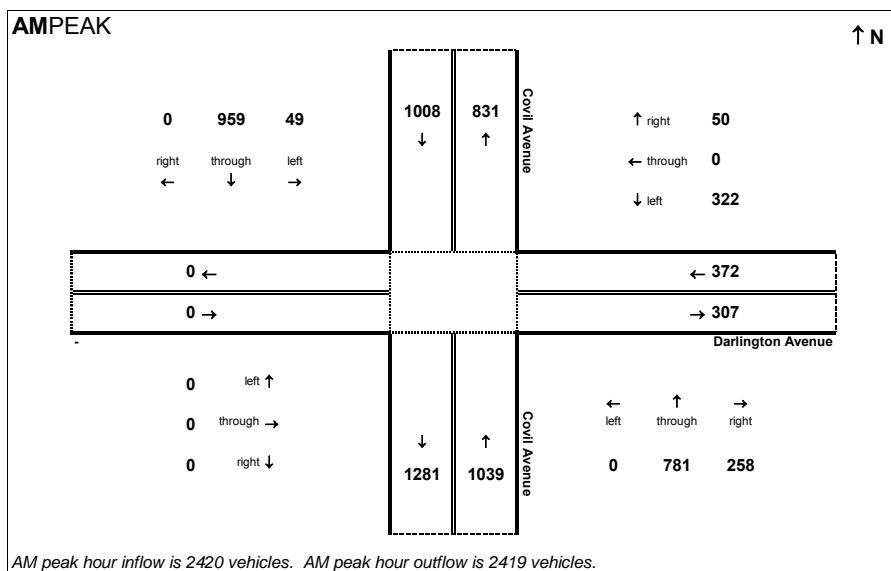


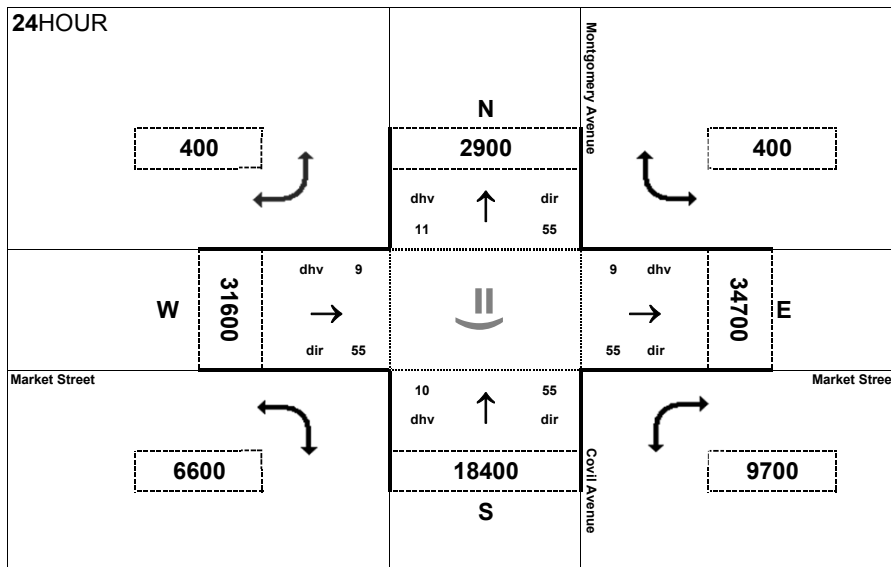
**Peak Hour Volume Breakouts Report:**  
(4) Covil Avenue @ Darlington Avenue

**Traffic Forecast Release Date:**  
August-12

**Traffic Data Year:**  
2040 - Future Year No-Build - Without Skyway

**Project:**  
TIP: U-4434



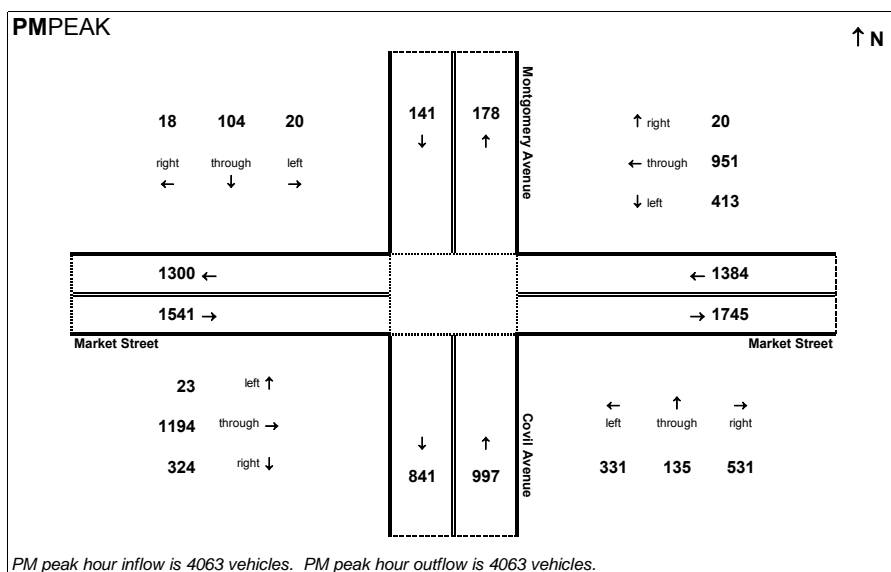
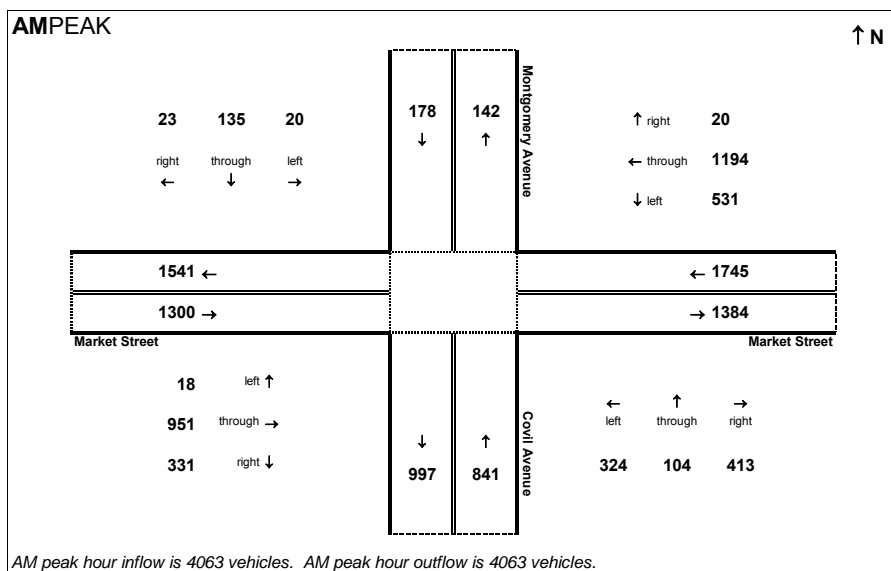


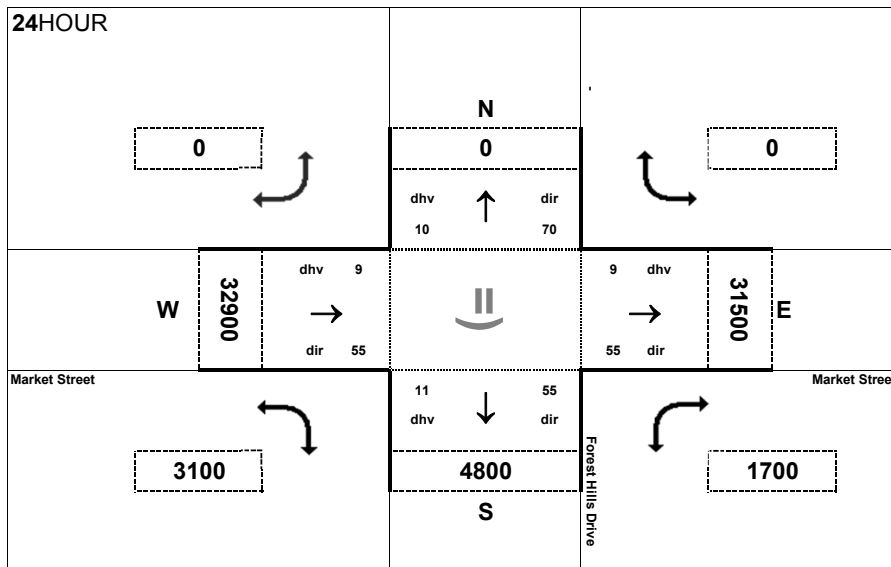
**Peak Hour Volume Breakouts Report:**  
 (5) Market Street @ Covil Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



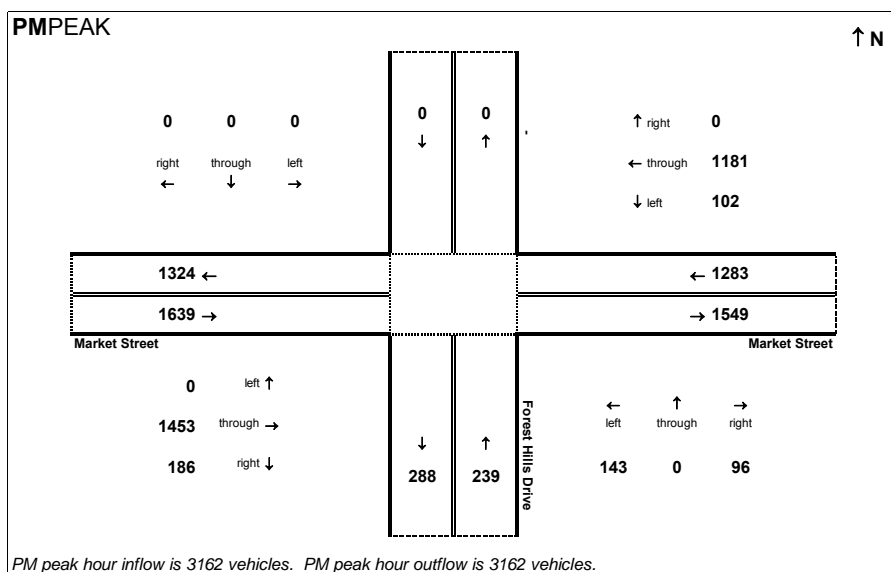
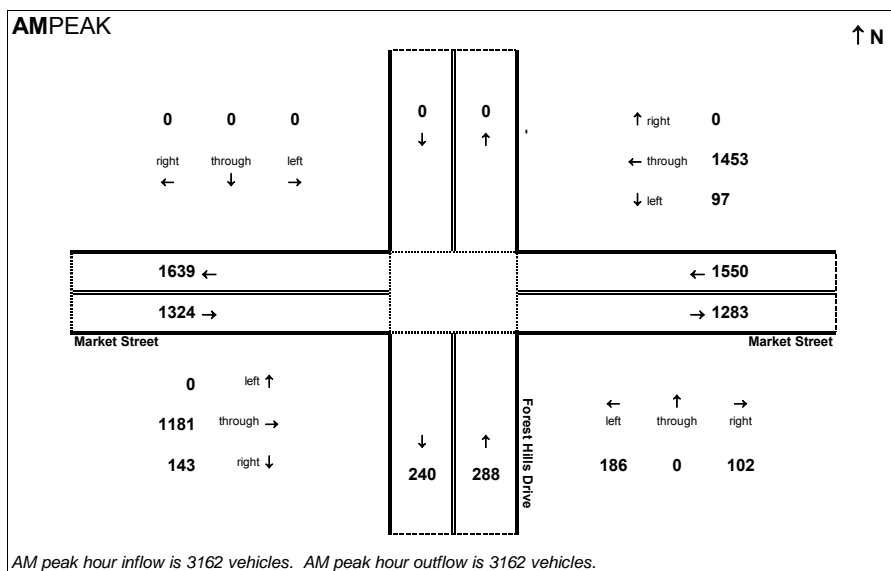


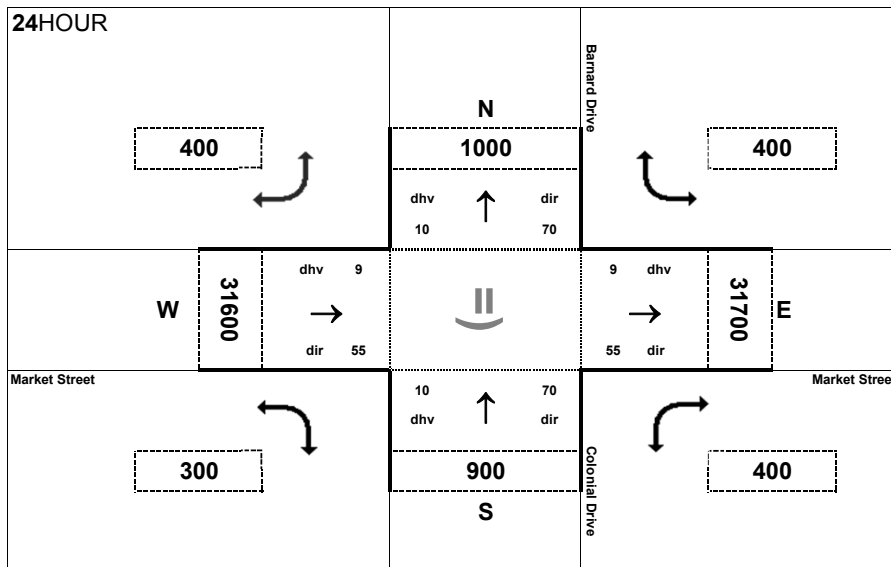
**Peak Hour Volume Breakouts Report:**  
 (6) Market Street @ Forest Hills Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



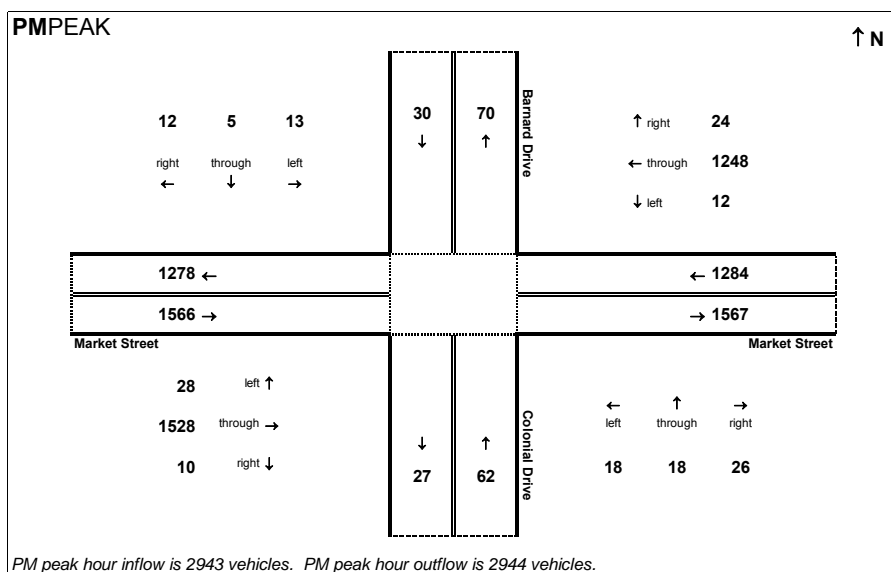
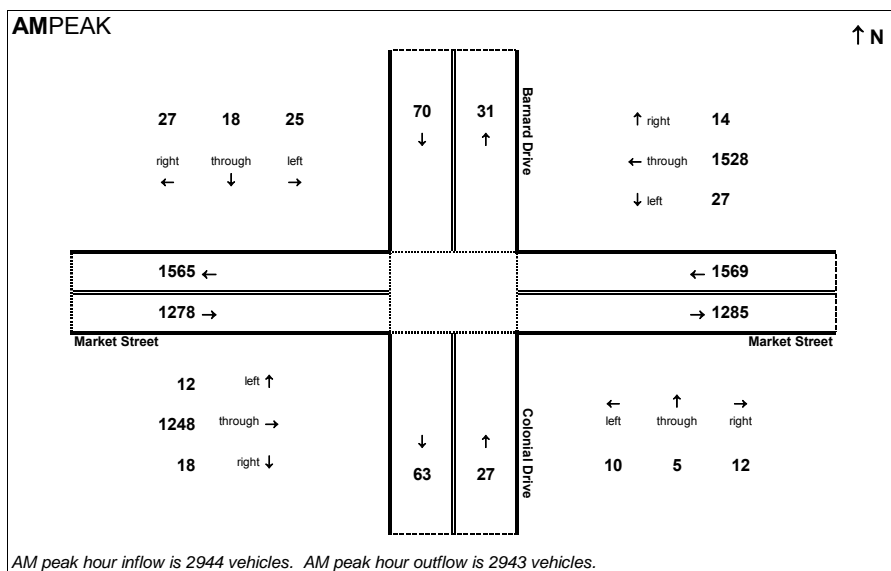


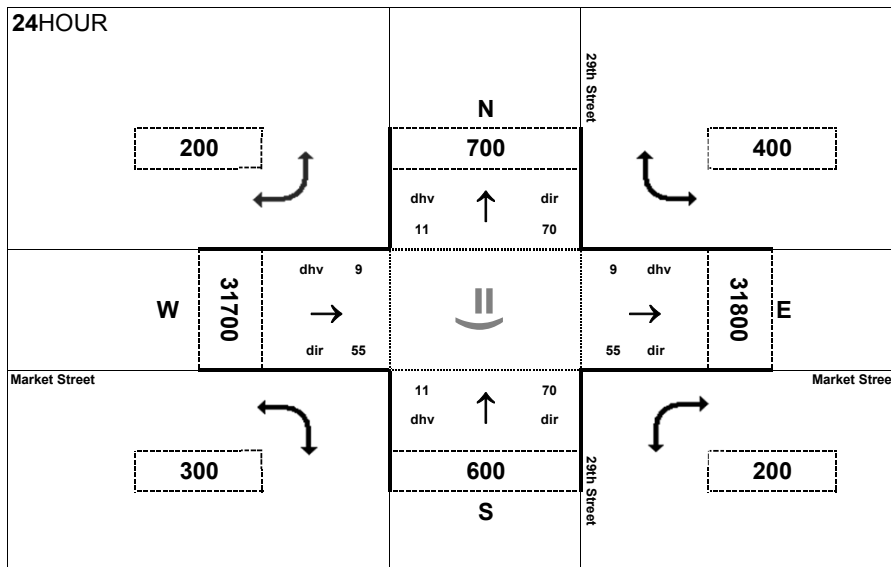
**Peak Hour Volume Breakouts Report:**  
 (7) Market Street @ Colonial Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



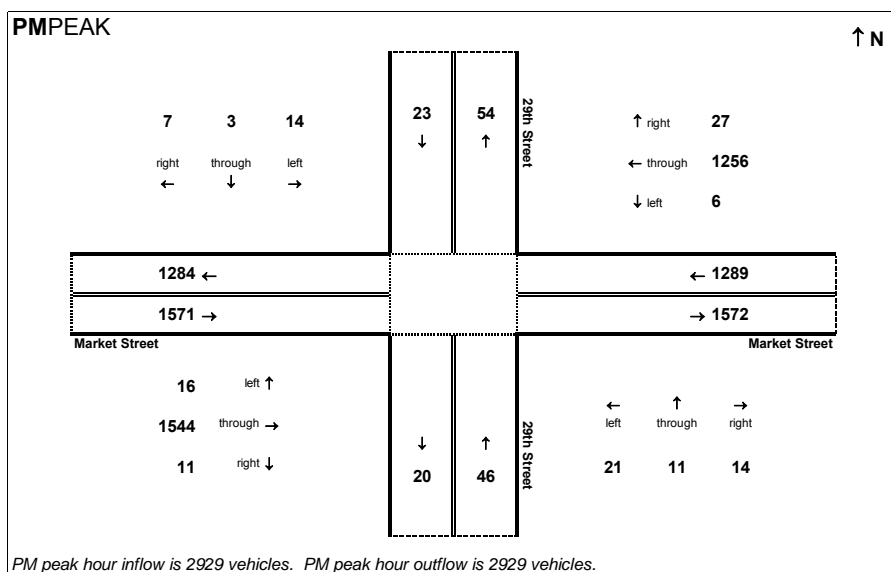
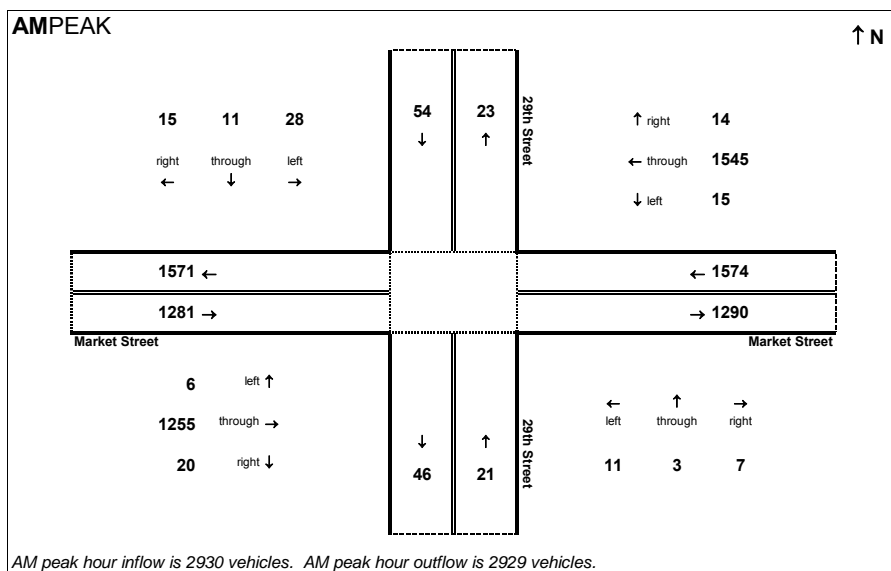


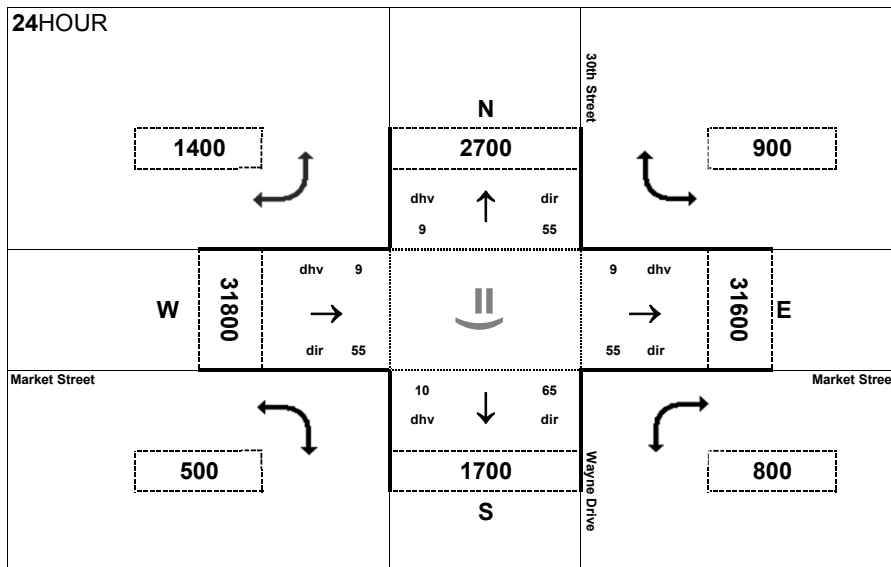
**Peak Hour Volume Breakouts Report:**  
 (8) Market Street @ 29th Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



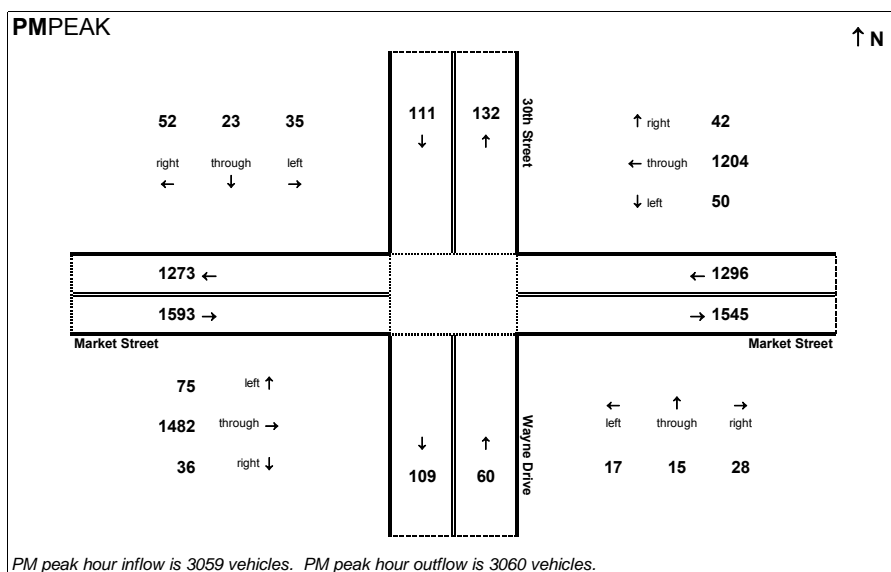
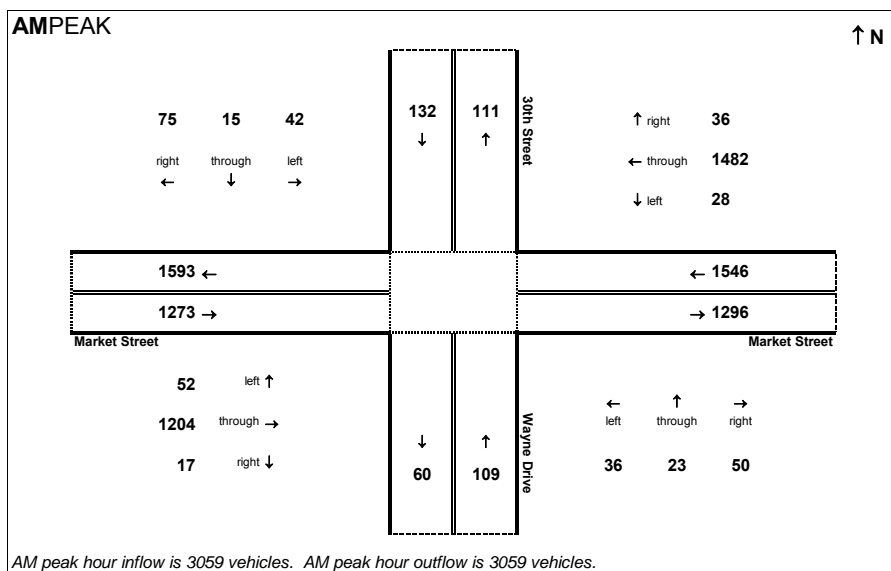


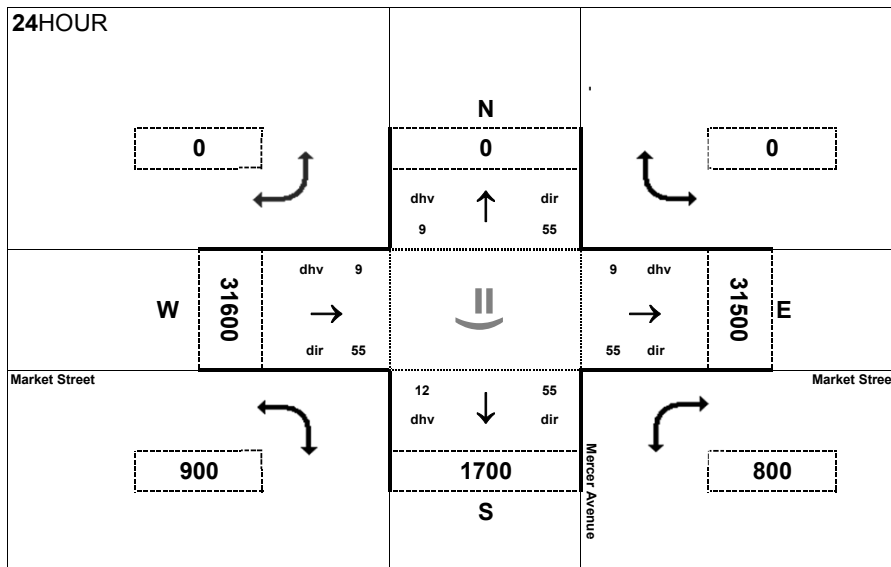
**Peak Hour Volume Breakouts Report:**  
 (9) Market Street @ Wayne Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



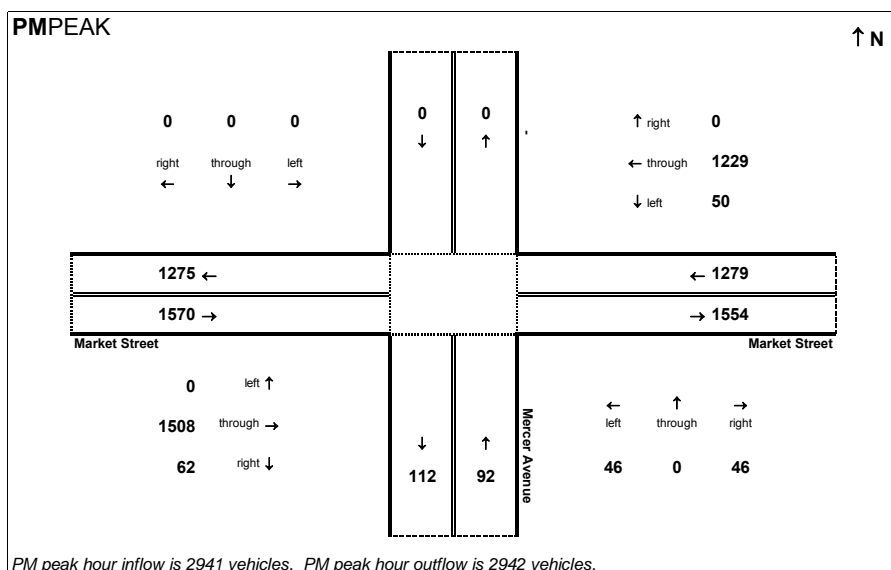
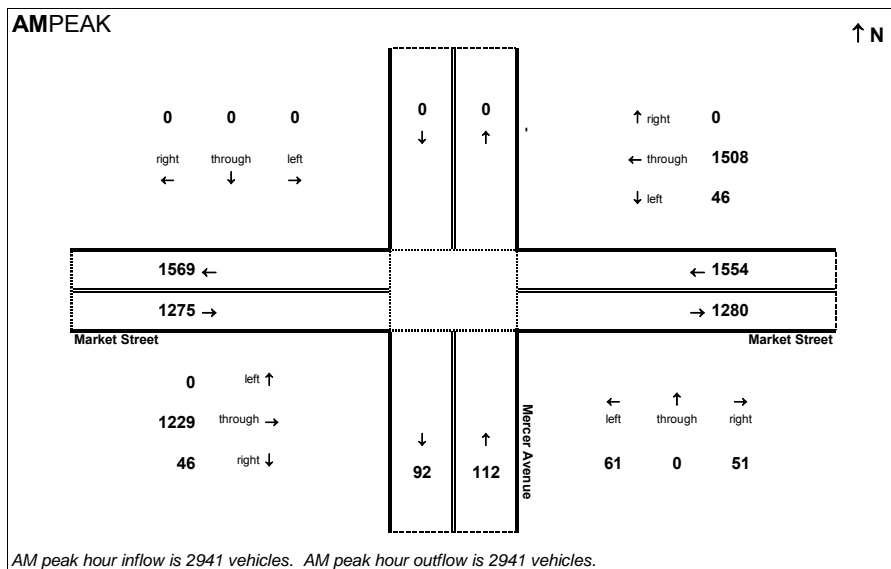


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 (10) Market Street @ Mercer Avenue

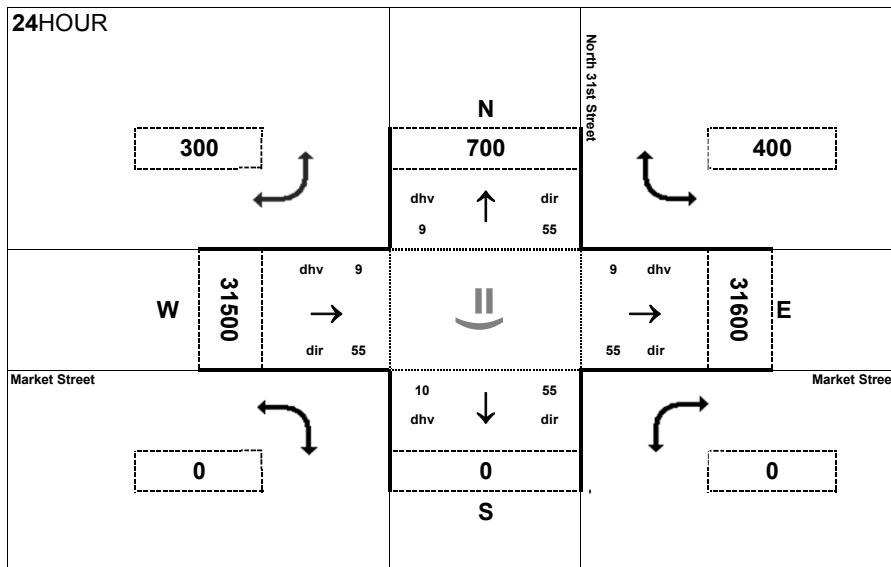
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434





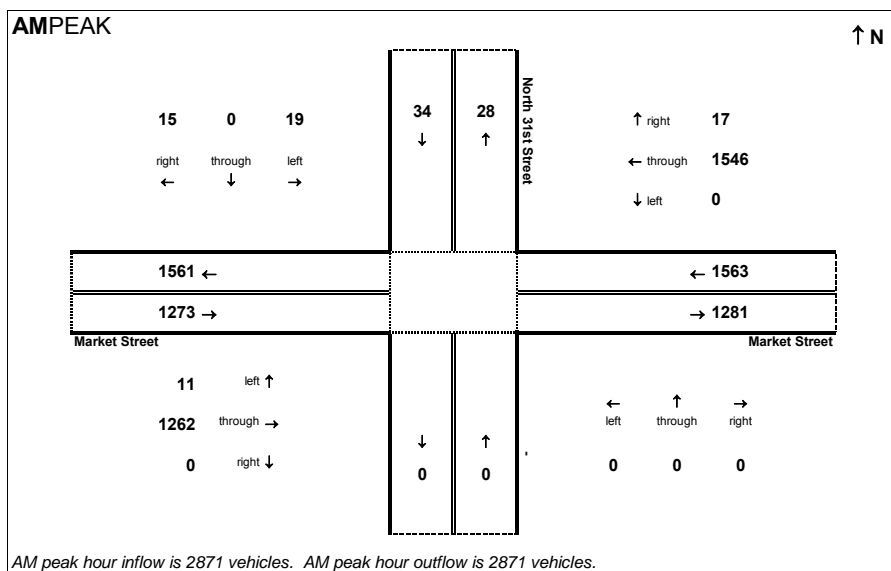


**Peak Hour Volume Breakouts Report:**  
 (11) Market Street @ North 31st Street

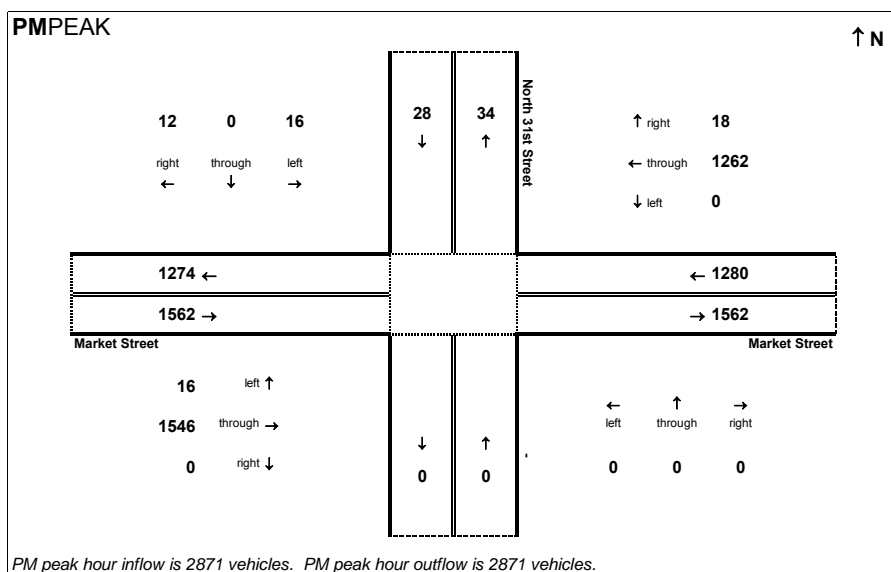
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

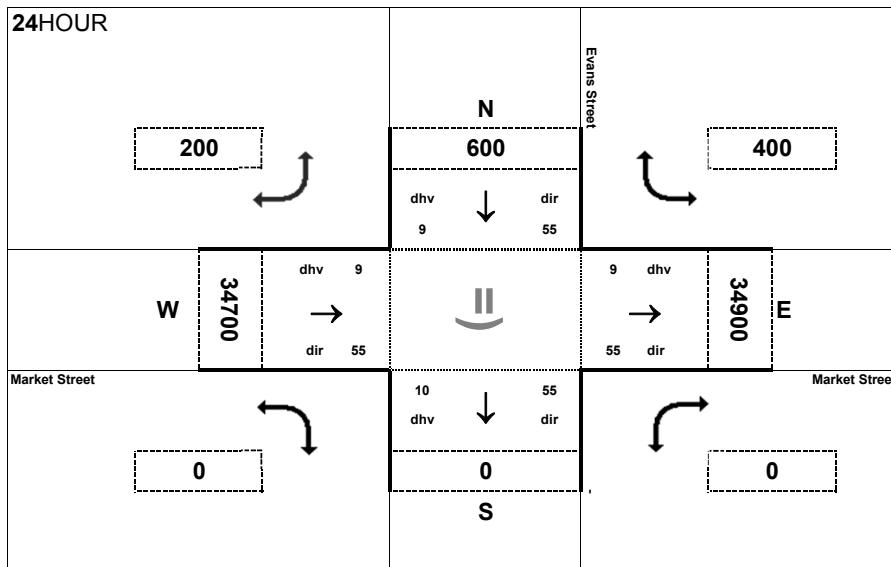
**Project:**  
 TIP: U-4434



AM peak hour inflow is 2871 vehicles. AM peak hour outflow is 2871 vehicles.



PM peak hour inflow is 2871 vehicles. PM peak hour outflow is 2871 vehicles.

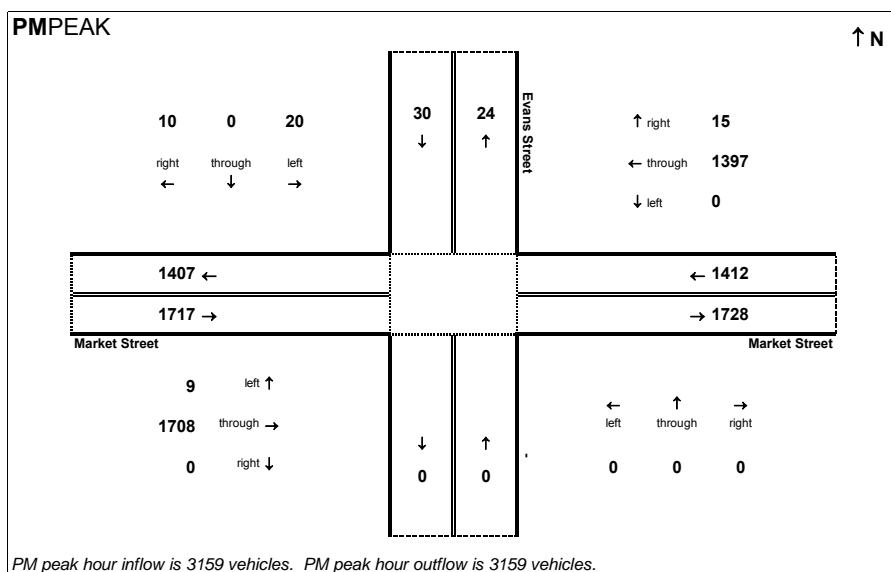
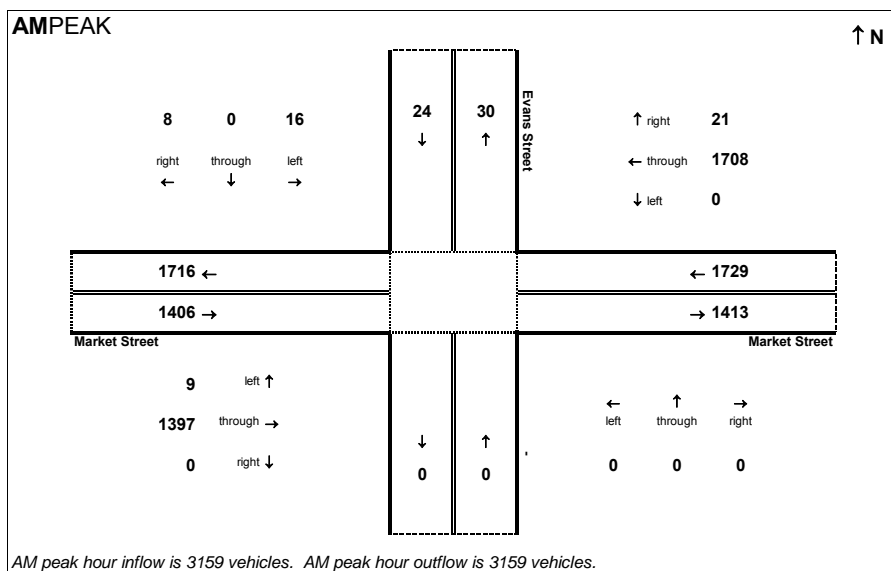


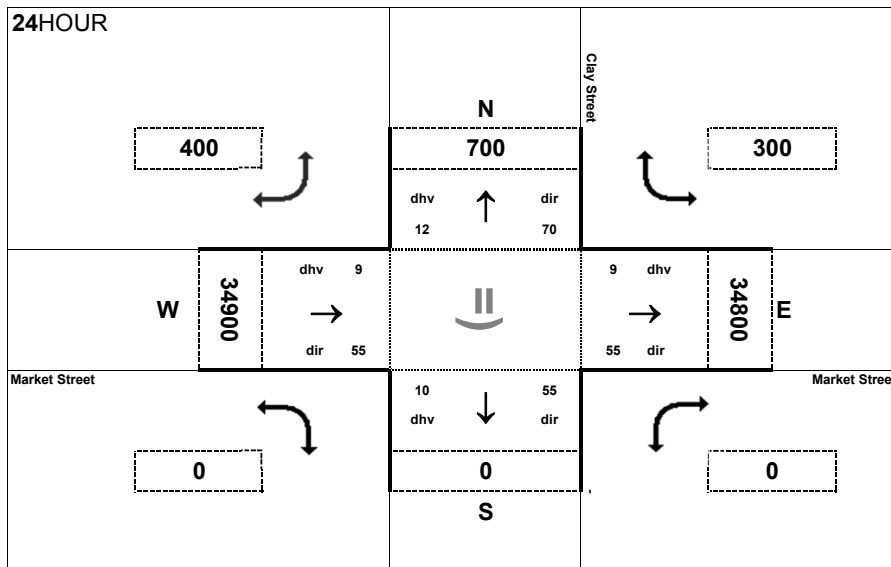
**Peak Hour Volume Breakouts Report:**  
 (12) Market Street @ Evans Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



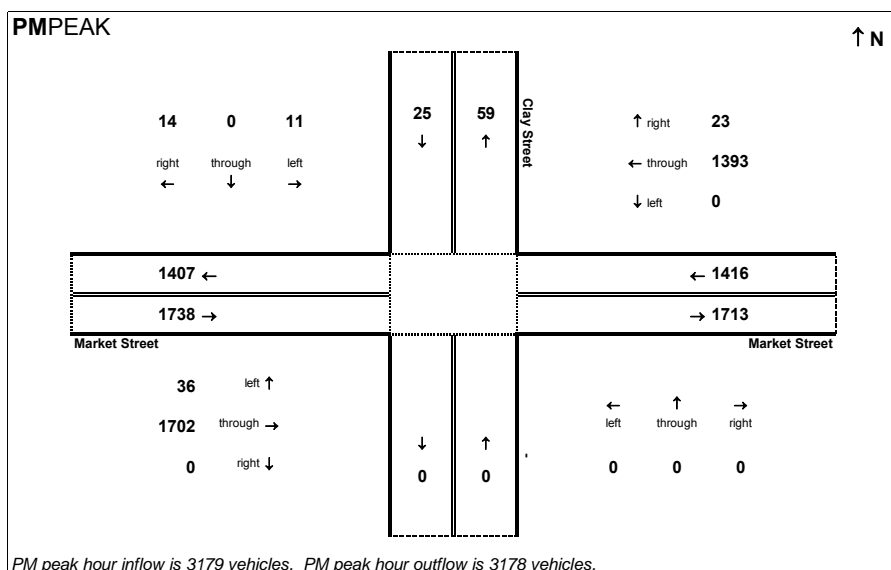
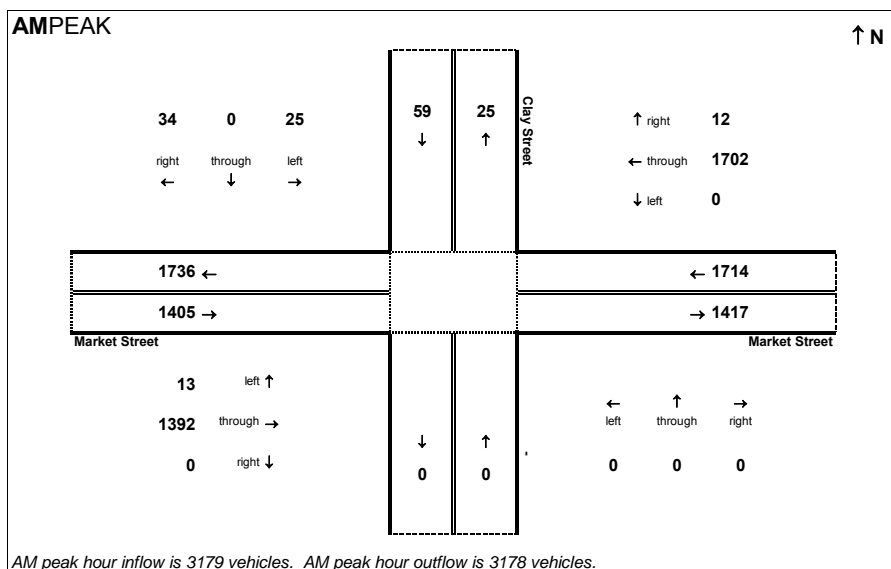


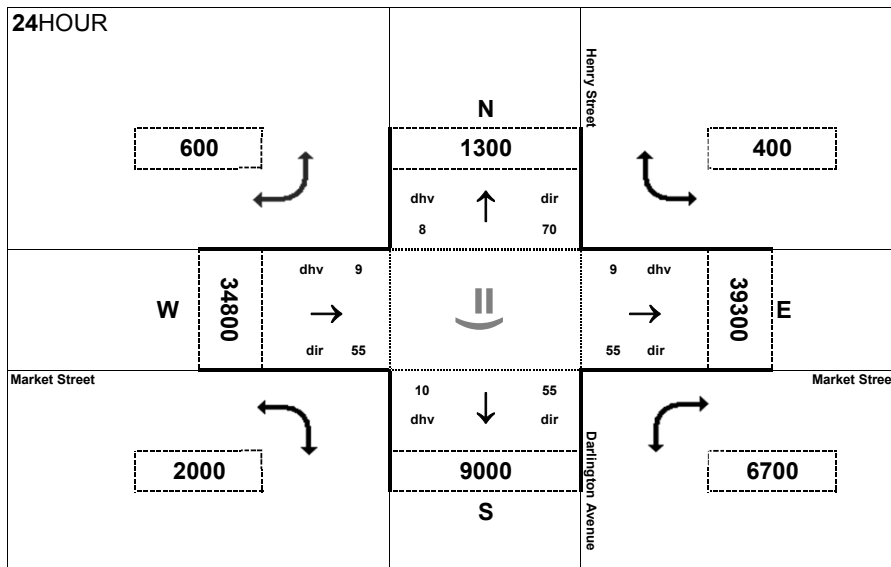
**Peak Hour Volume Breakouts Report:**  
 (13) Market Street @ Clay Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



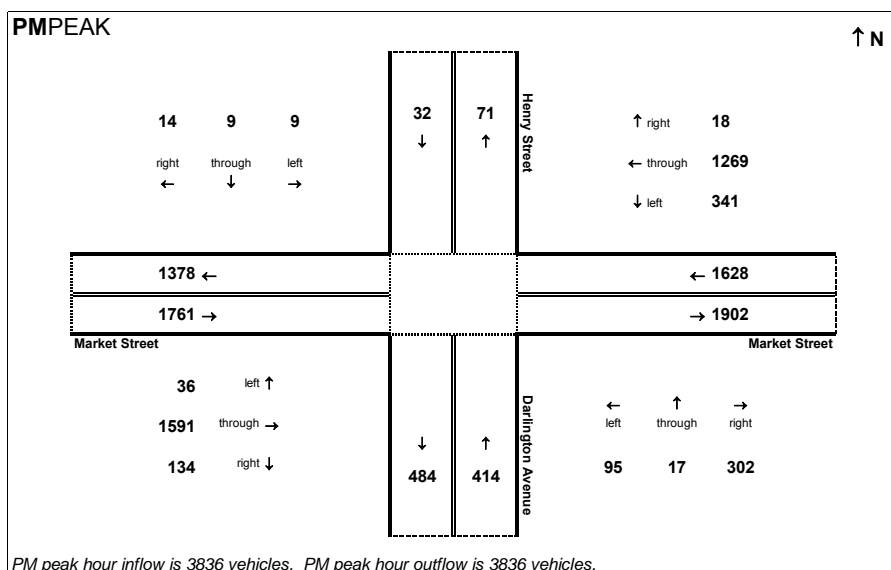
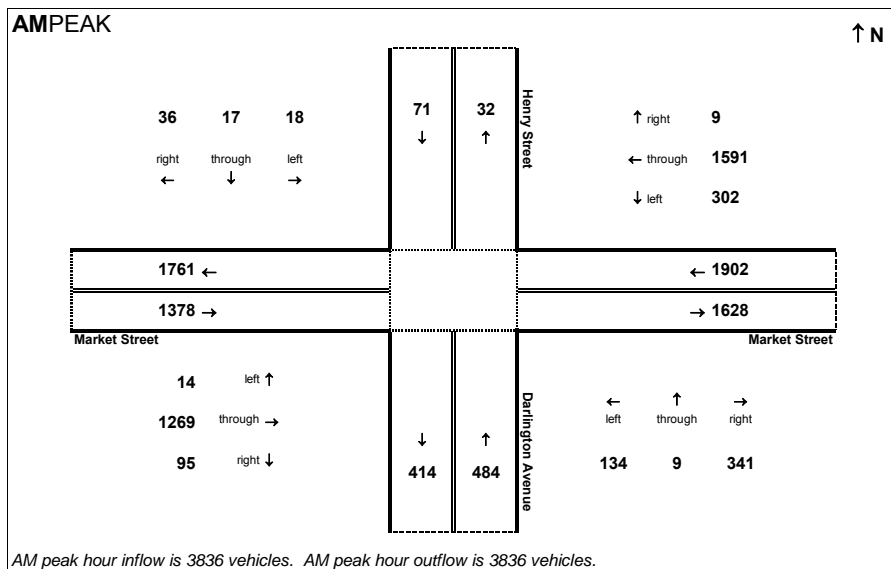


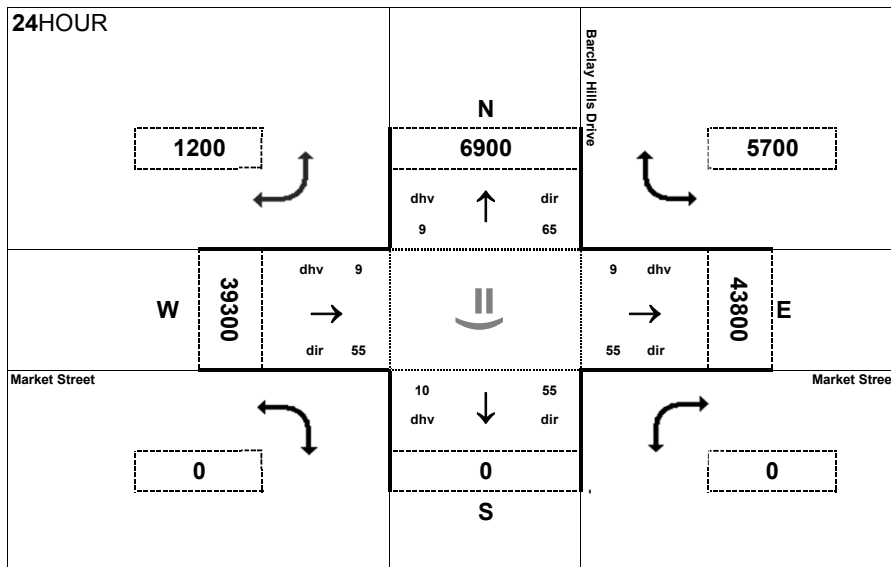
**Peak Hour Volume Breakouts Report:**  
 (14) Market Street @ Darlington Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



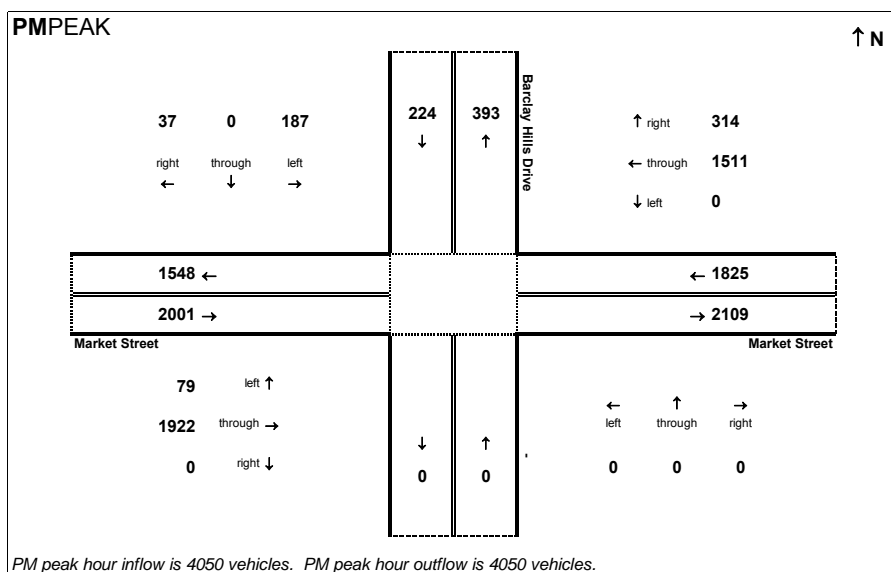
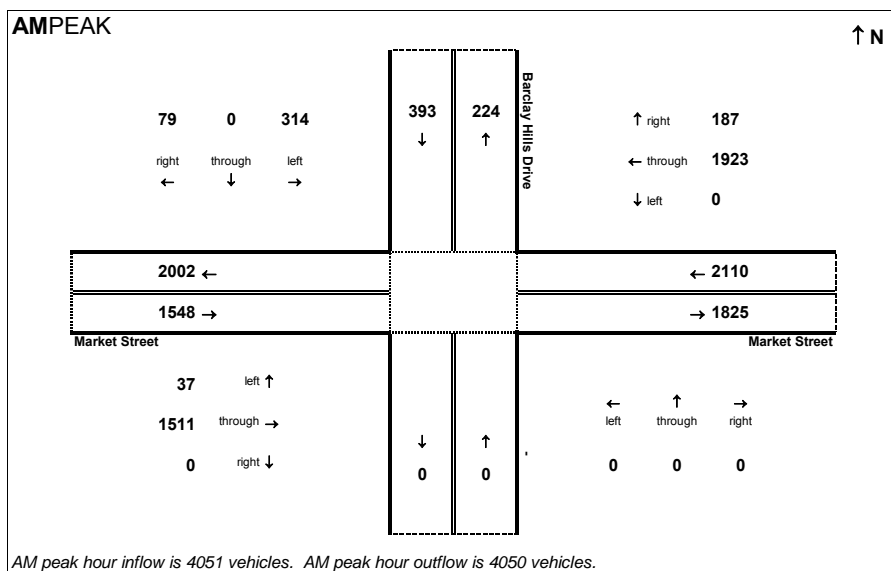


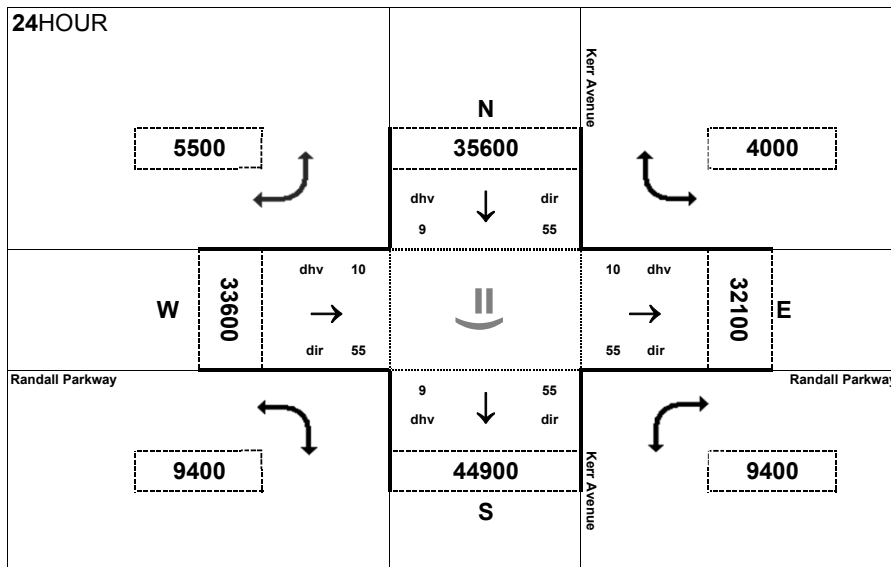
**Peak Hour Volume Breakouts Report:**  
 (15) Market Street @ Barclay Hills Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



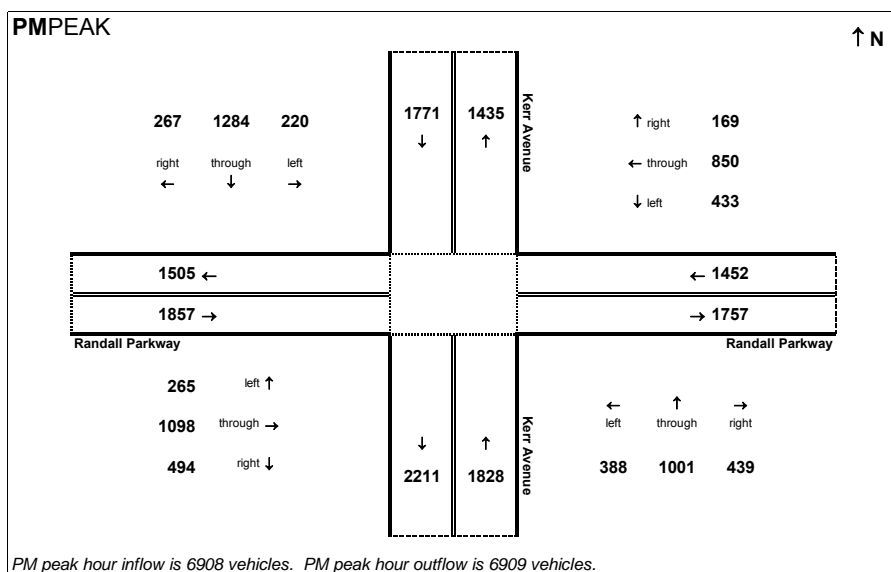
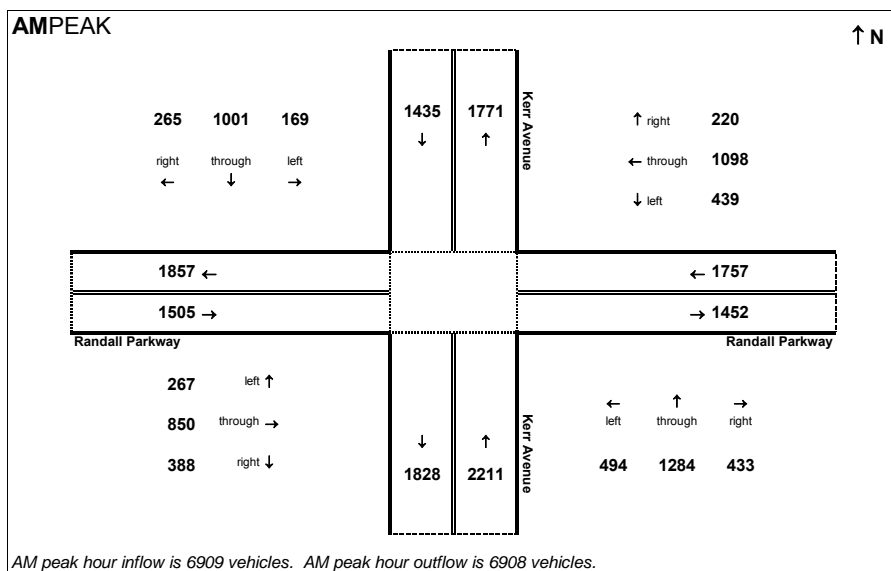


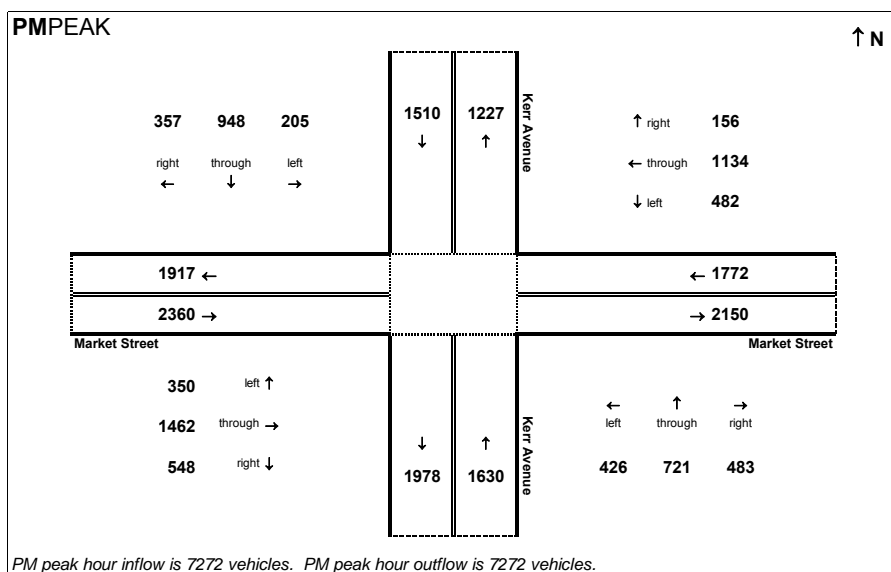
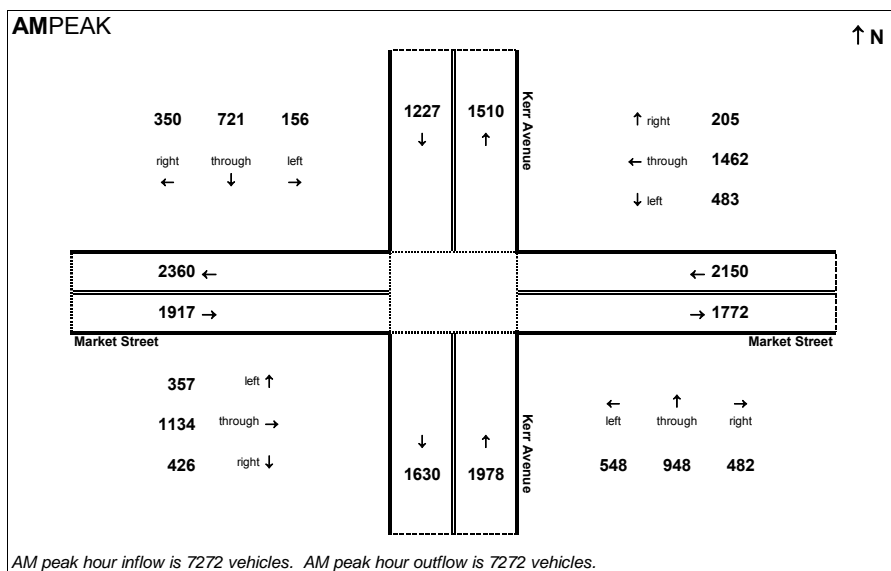
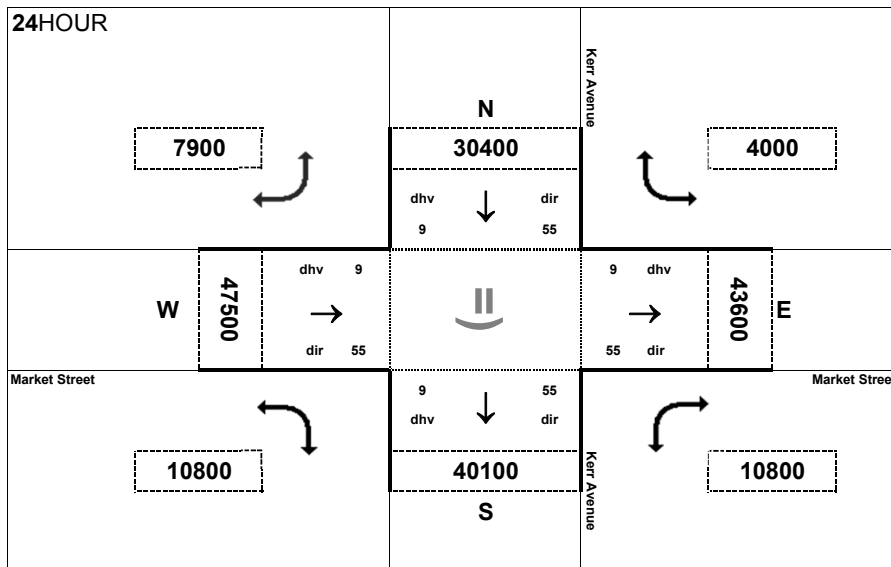
**Peak Hour Volume Breakouts Report:**  
 (16) Kerr Avenue @ Randall Parkway

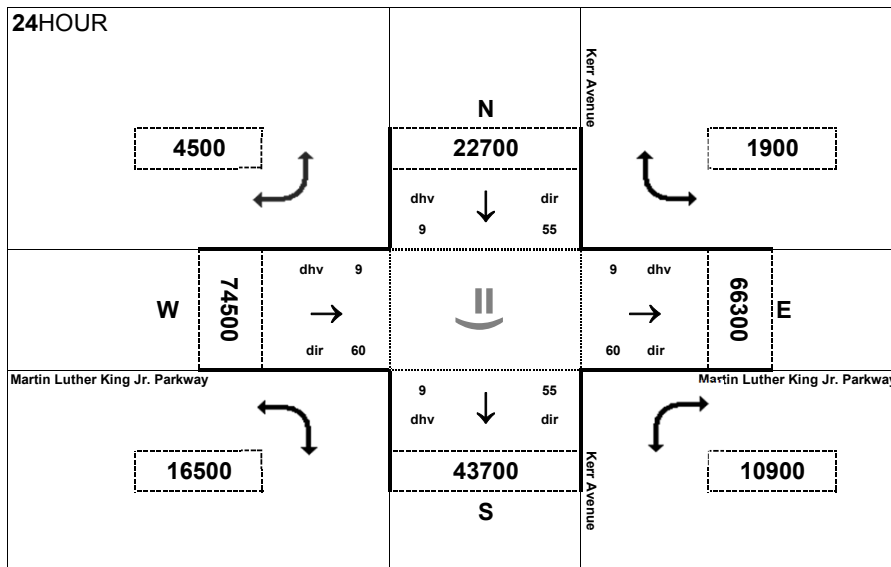
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434





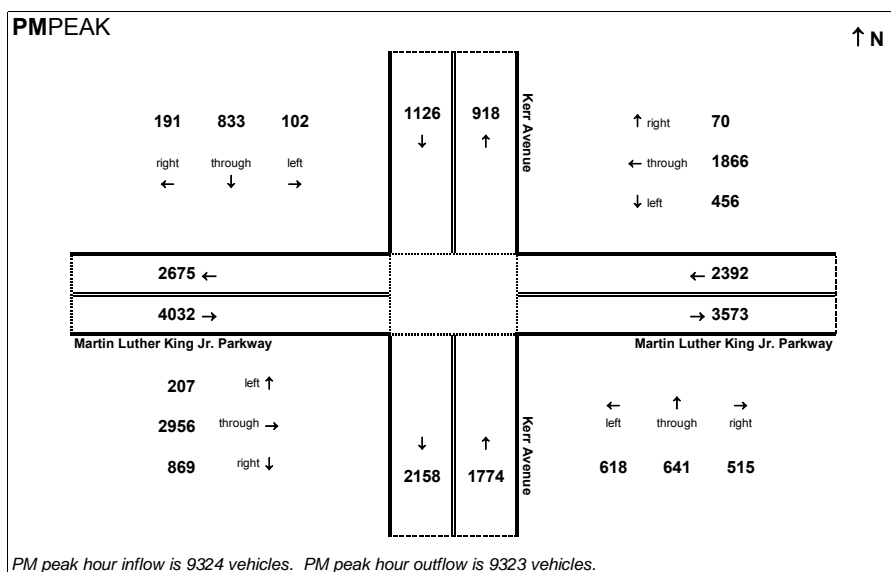
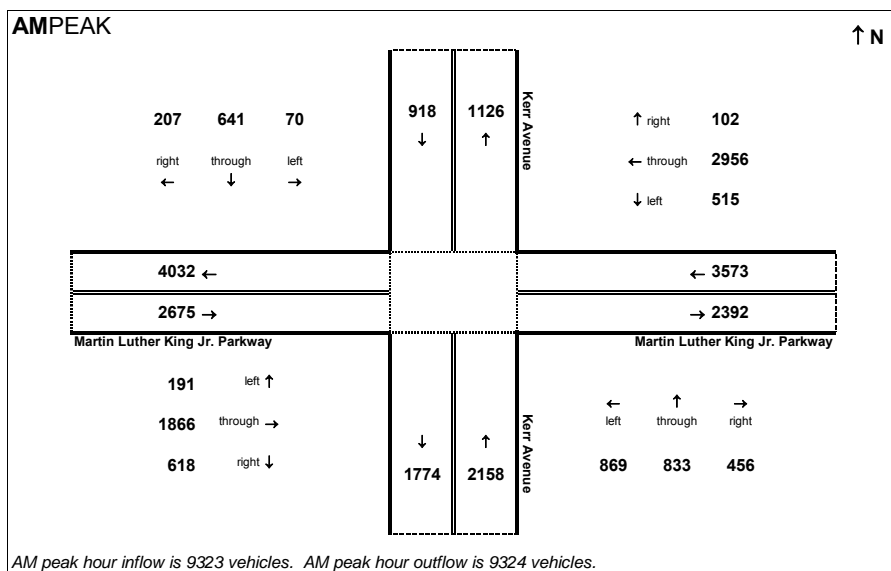


**Peak Hour Volume Breakouts Report:**  
 (18) Kerr Avenue @ Martin Luther King Jr. Parkway

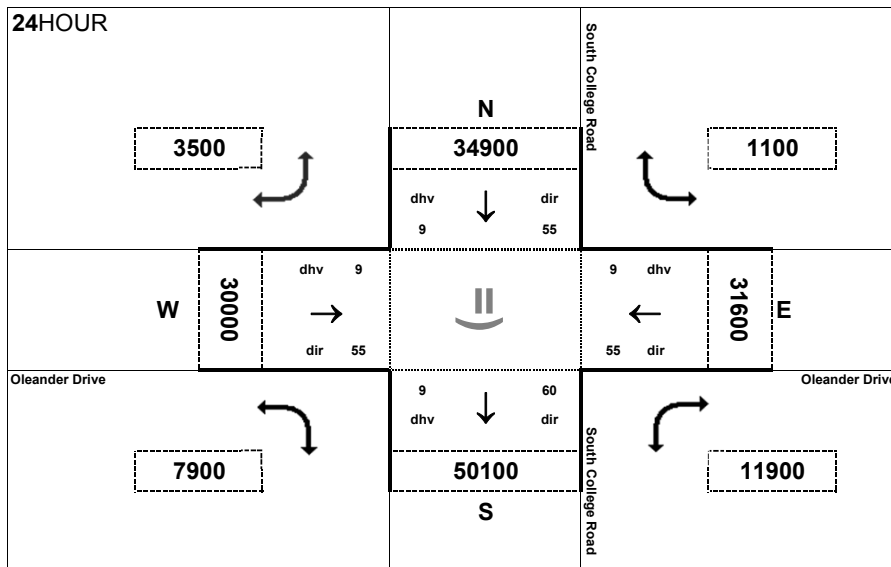
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434





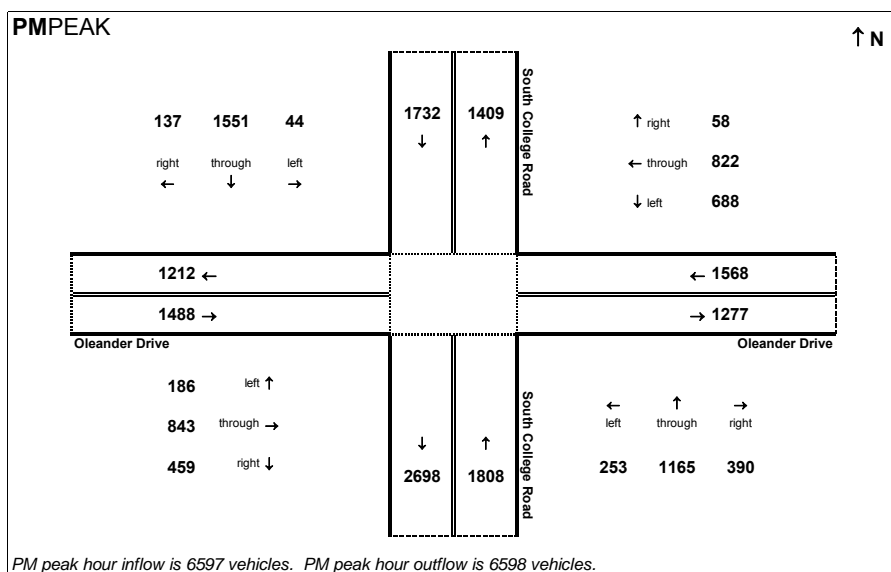
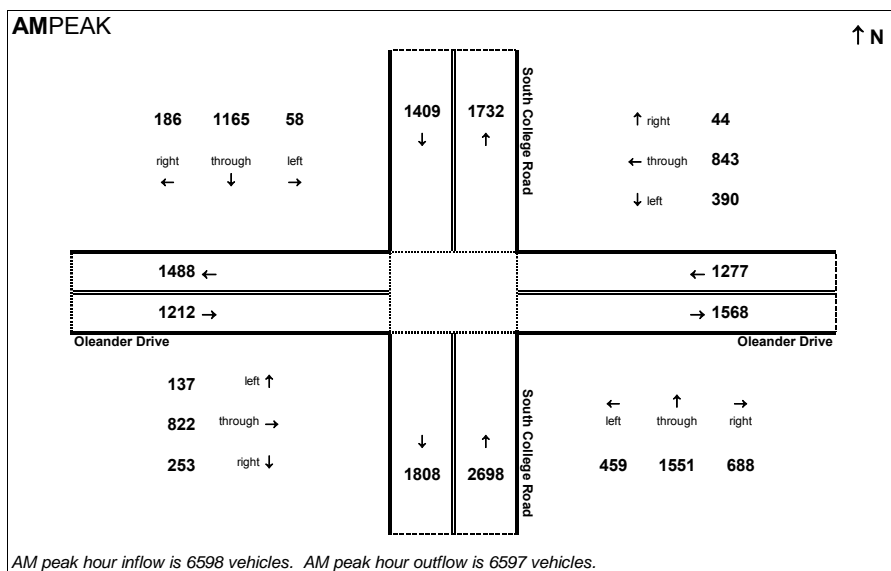


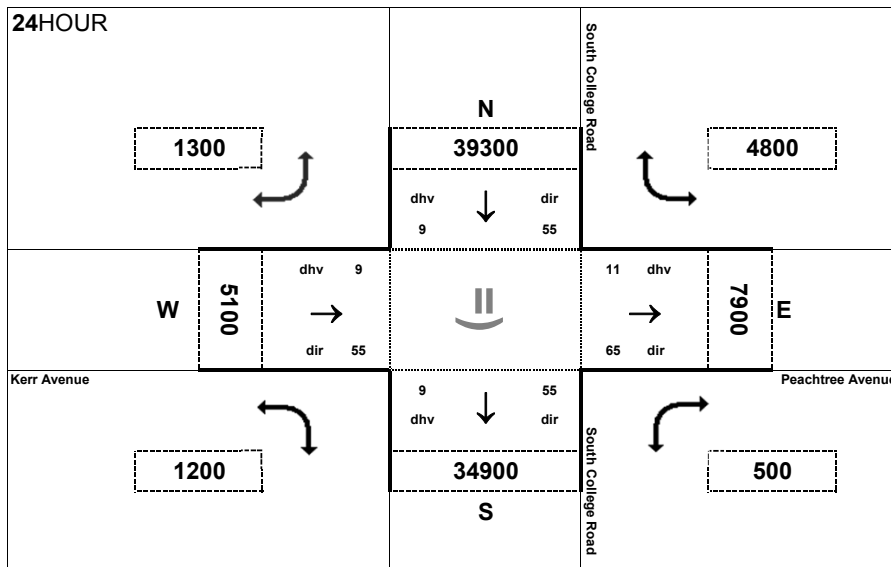
**Peak Hour Volume Breakouts Report:**  
 (19) South College Road @ Oleander Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



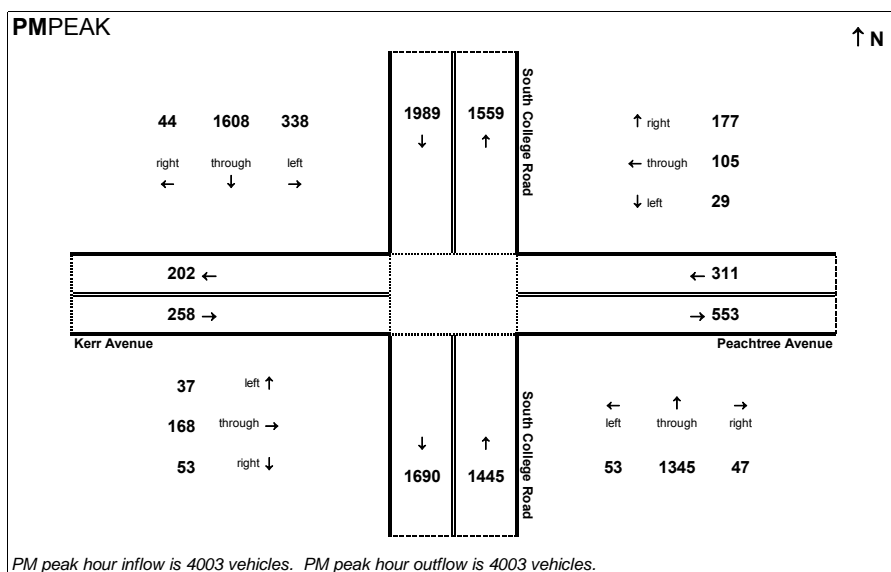
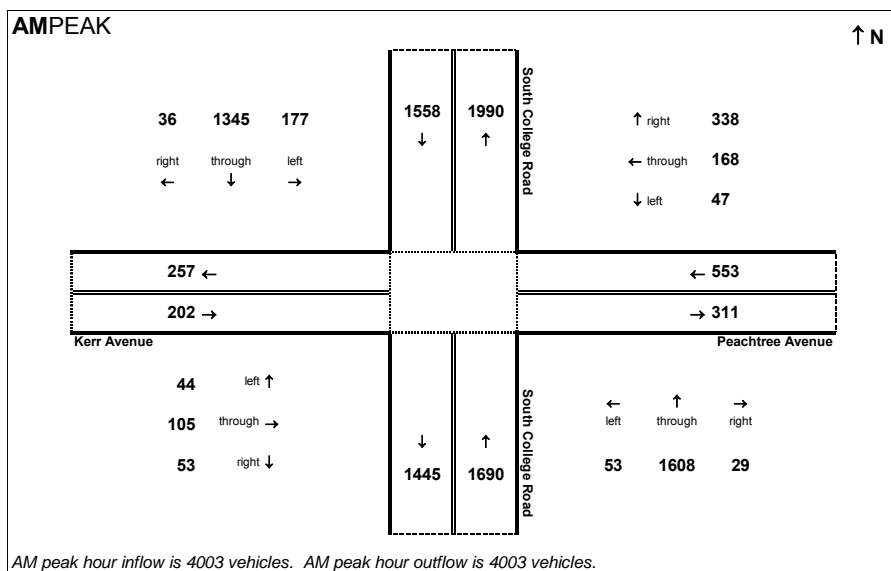


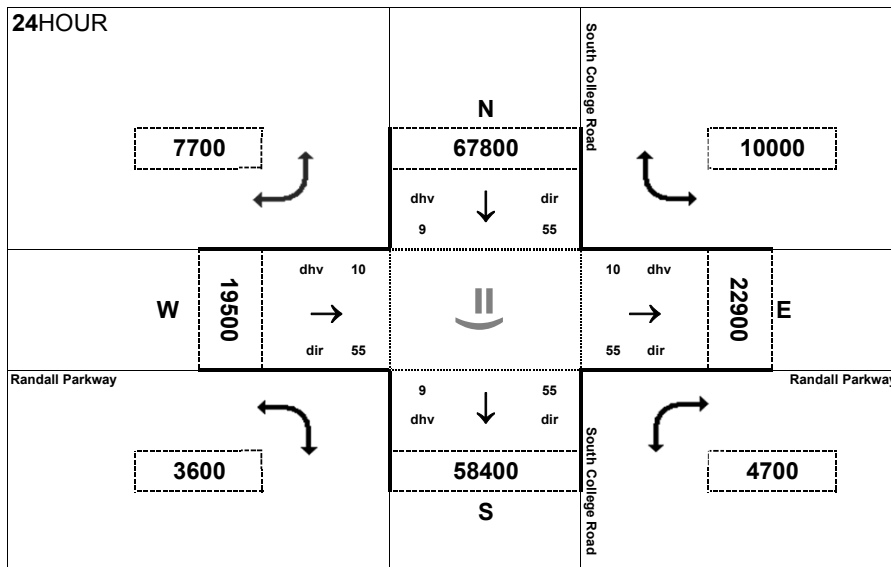
**Peak Hour Volume Breakouts Report:**  
 (20) South College Road @ Kerr Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



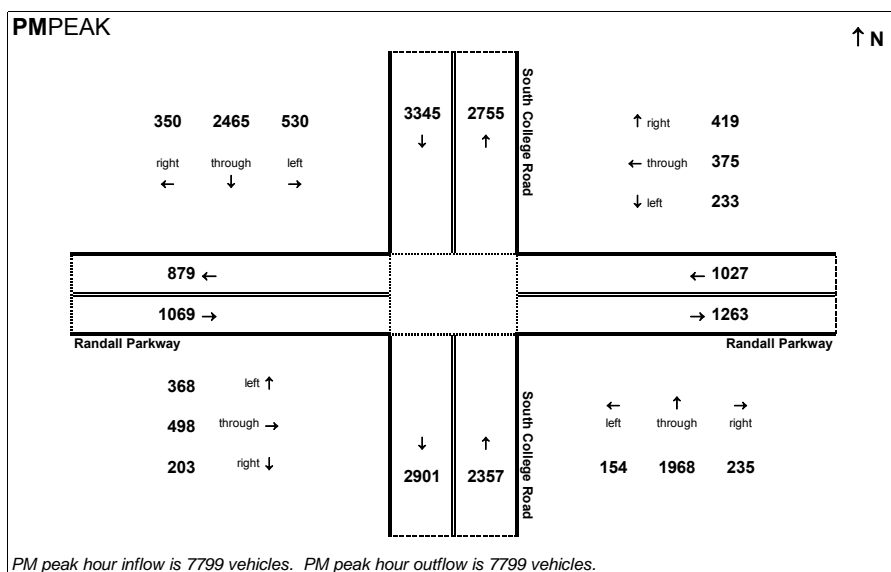
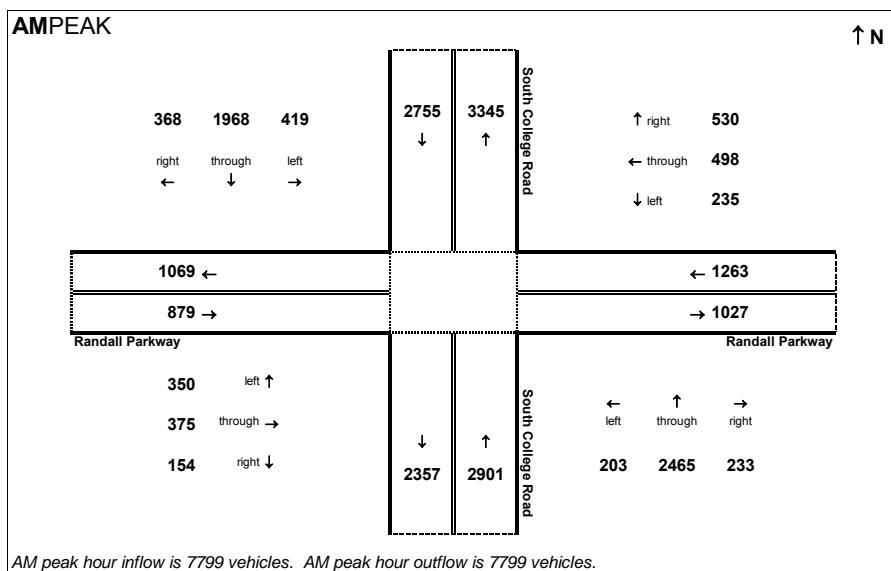


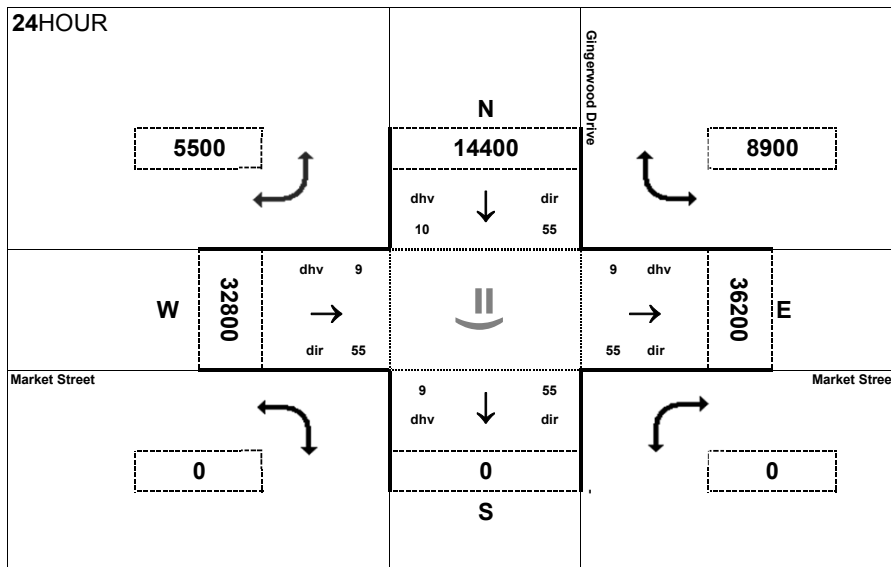
**Peak Hour Volume Breakouts Report:**  
 (21) South College Road @ Randall Parkway

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



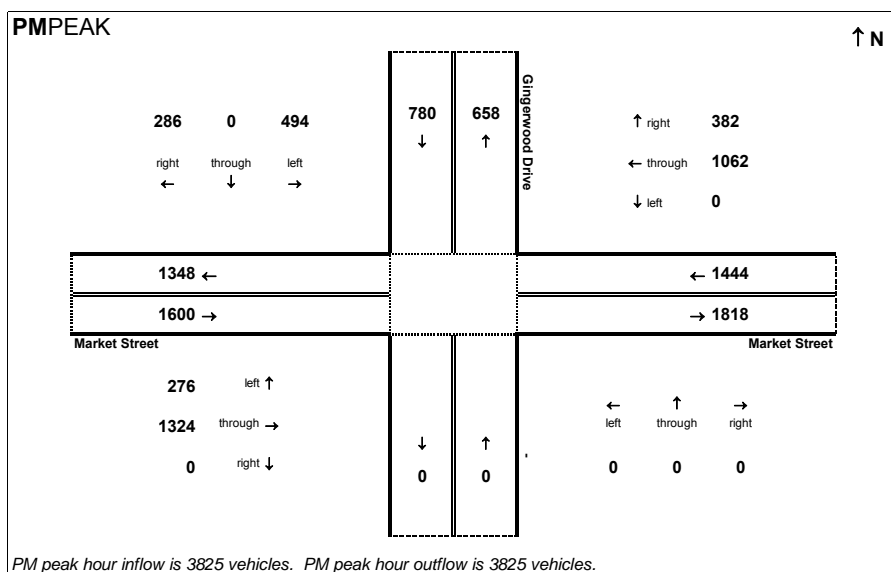
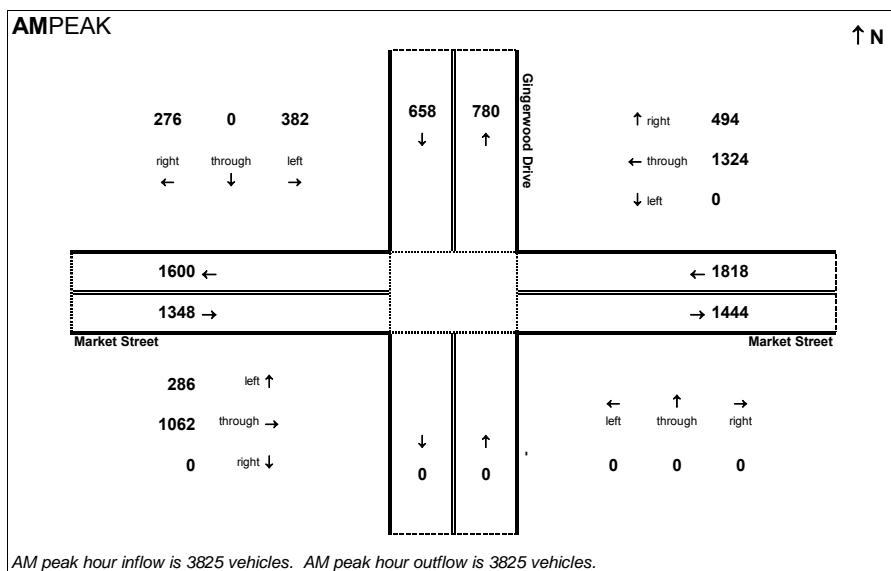


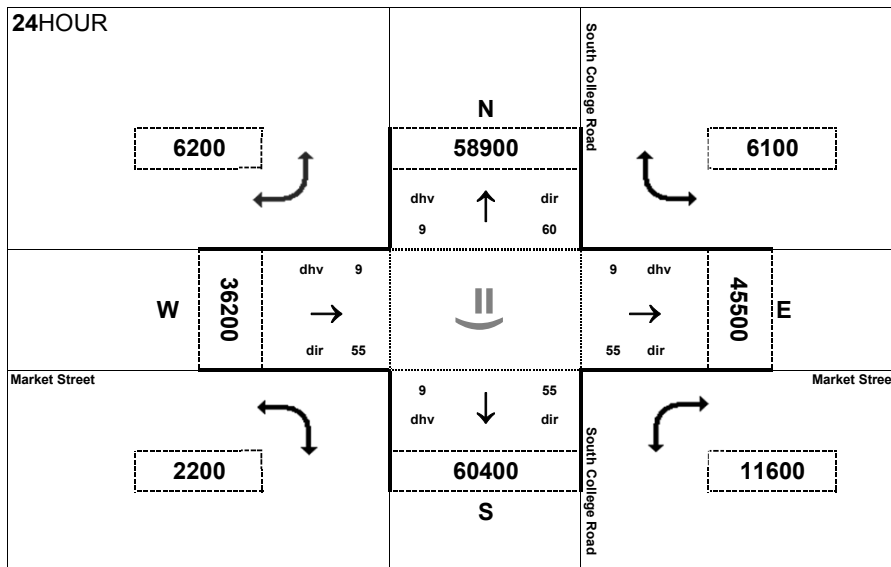
**Peak Hour Volume Breakouts Report:**  
 (22) Market Street @ Gingerwood Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



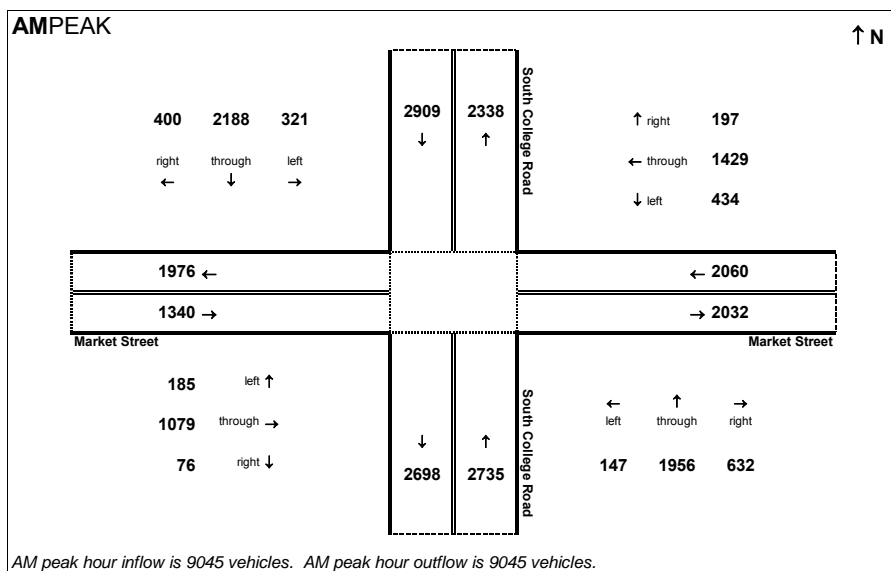


**Peak Hour Volume Breakouts Report:**  
 (23) South College Road @ Market Street

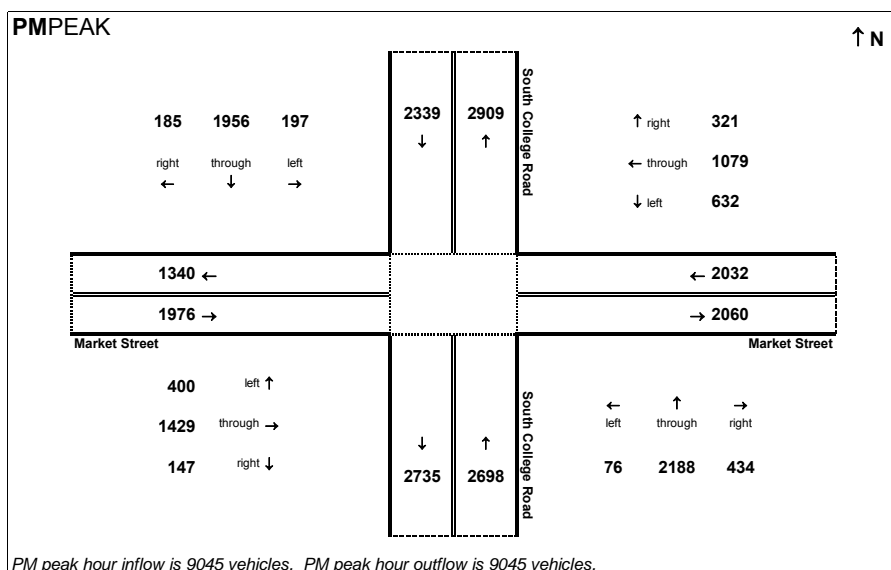
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

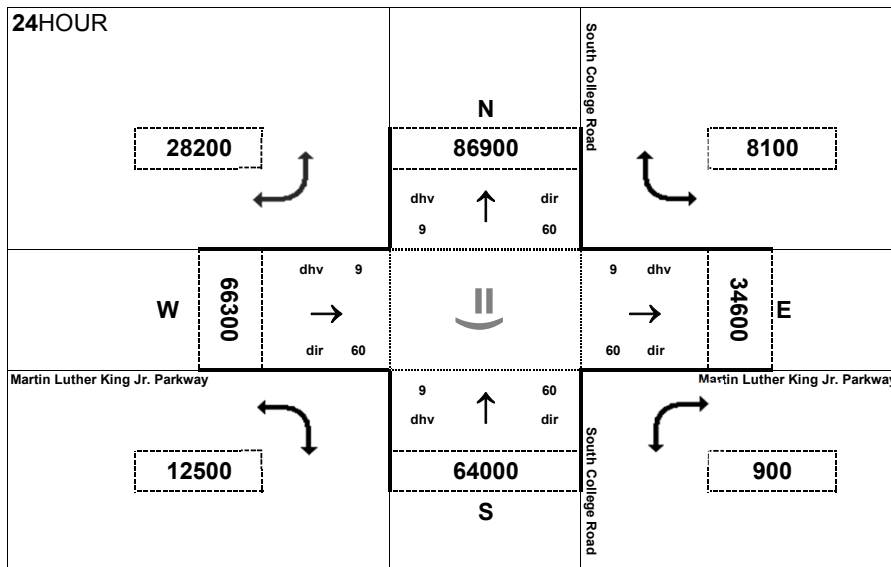
**Project:**  
 TIP: U-4434



AM peak hour inflow is 9045 vehicles. AM peak hour outflow is 9045 vehicles.



PM peak hour inflow is 9045 vehicles. PM peak hour outflow is 9045 vehicles.

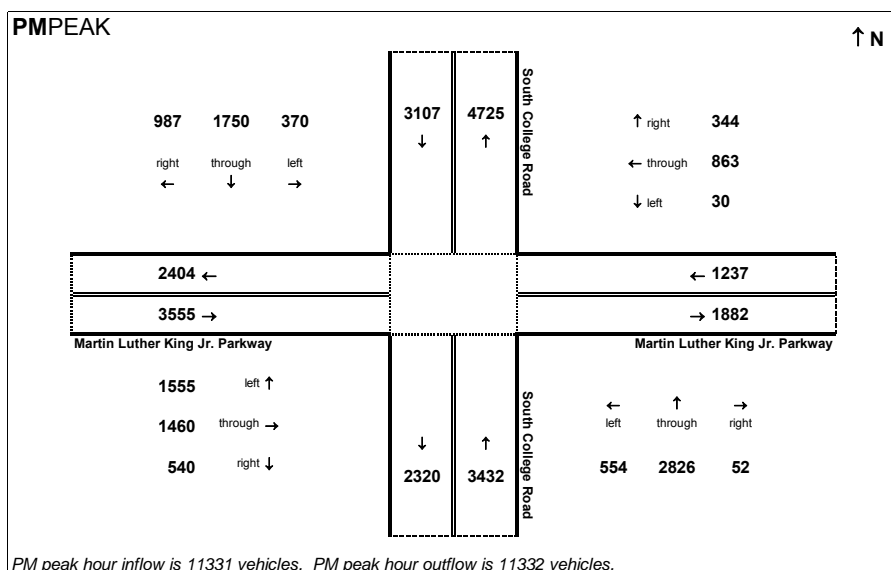
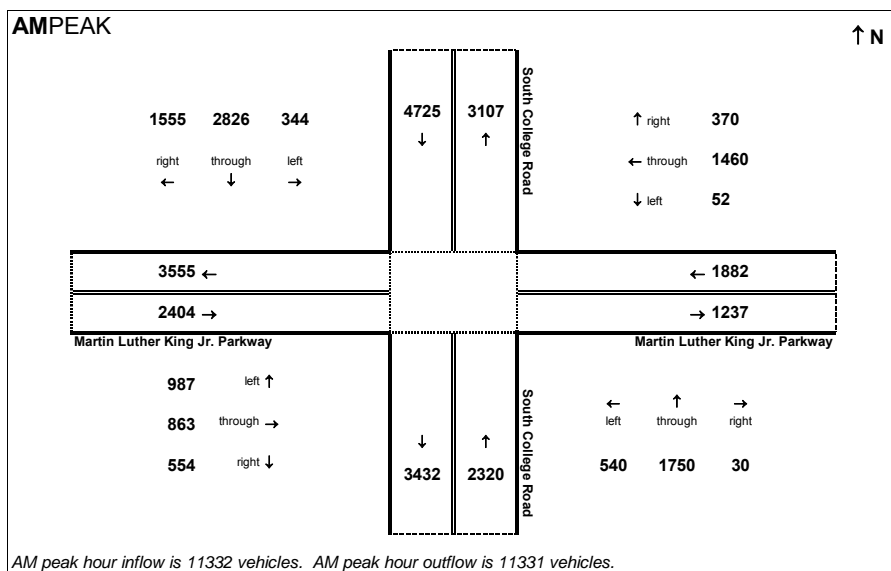


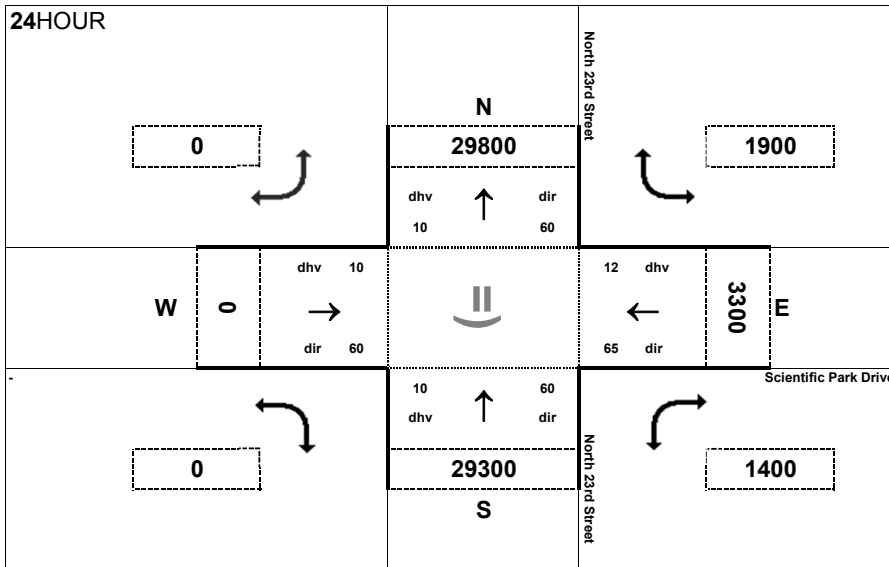
**Peak Hour Volume Breakouts Report:**  
 (24) South College Road @ Martin Luther King Jr. Parkway

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434



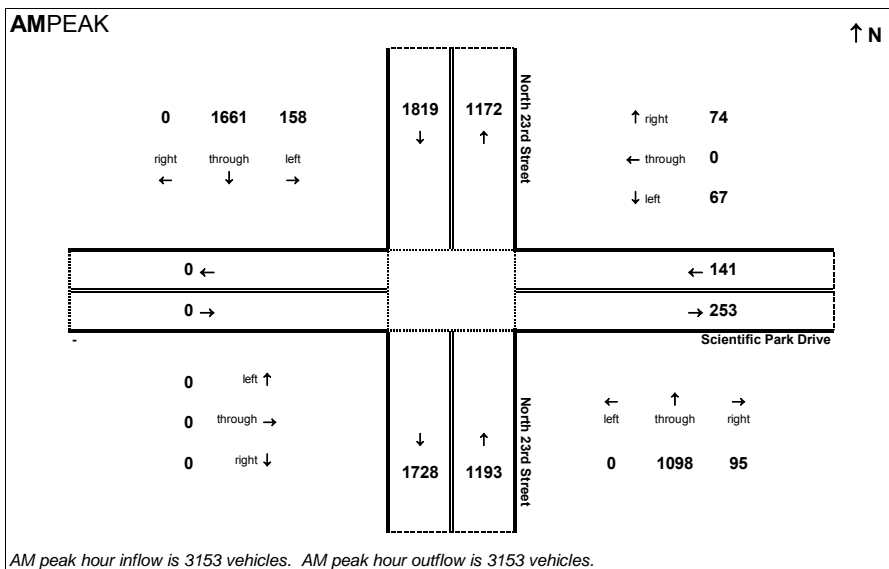


**Peak Hour Volume Breakouts Report:**  
 (25) North 23rd Street @ Scientific Park Drive

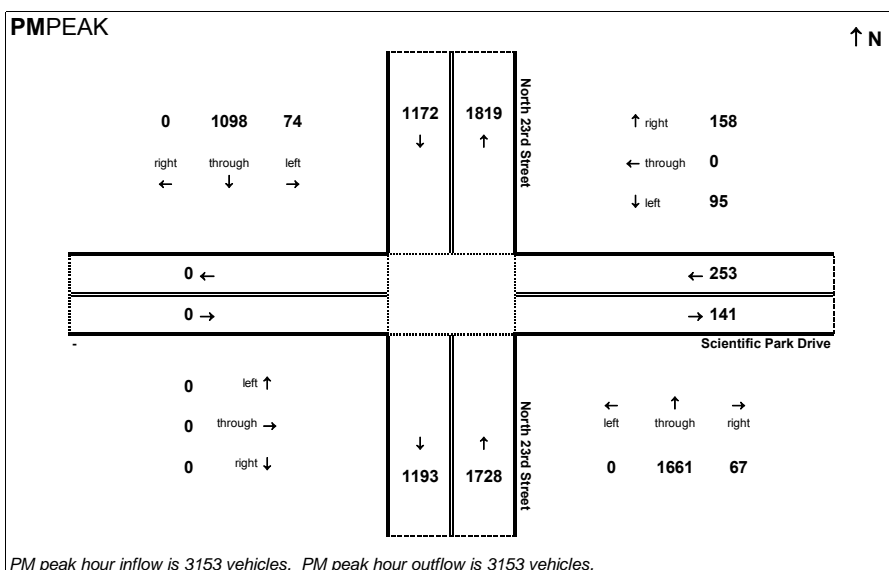
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

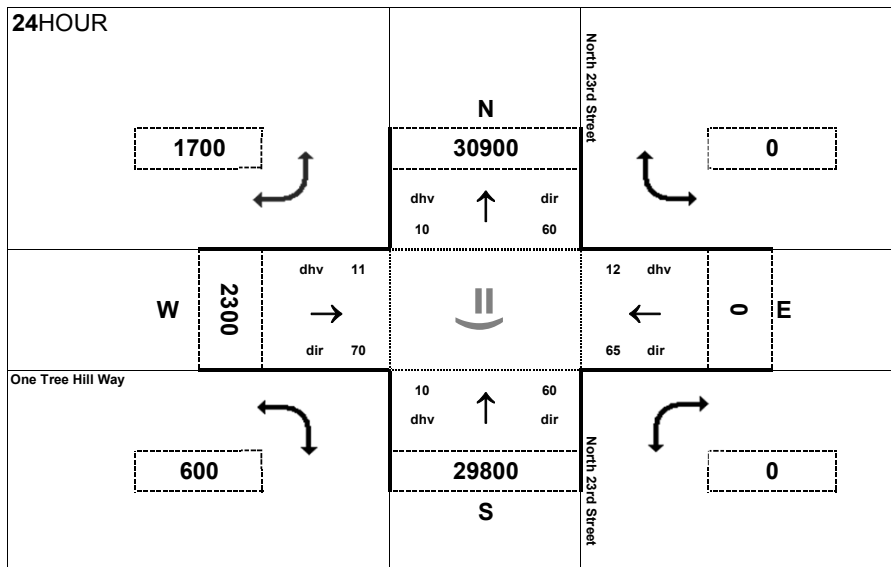
**Project:**  
 TIP: U-4434



AM peak hour inflow is 3153 vehicles. AM peak hour outflow is 3153 vehicles.



PM peak hour inflow is 3153 vehicles. PM peak hour outflow is 3153 vehicles.

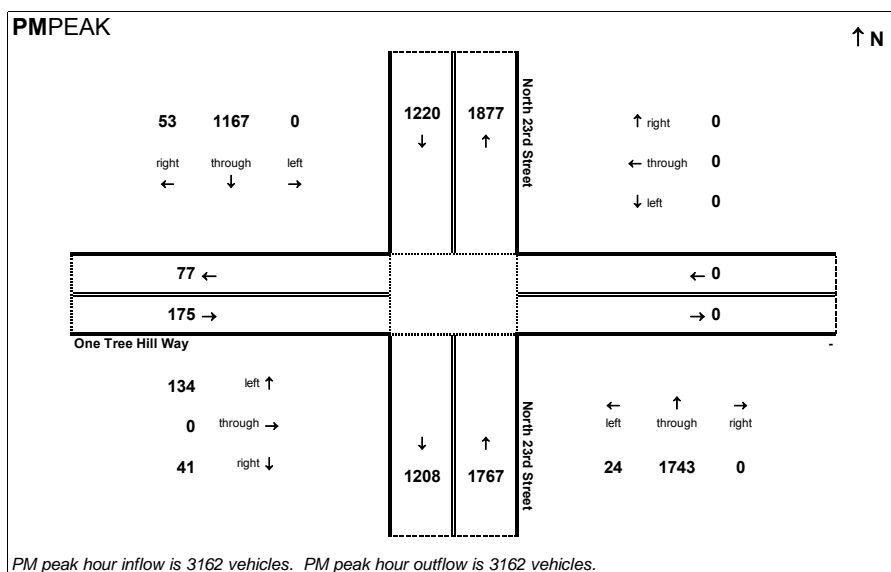
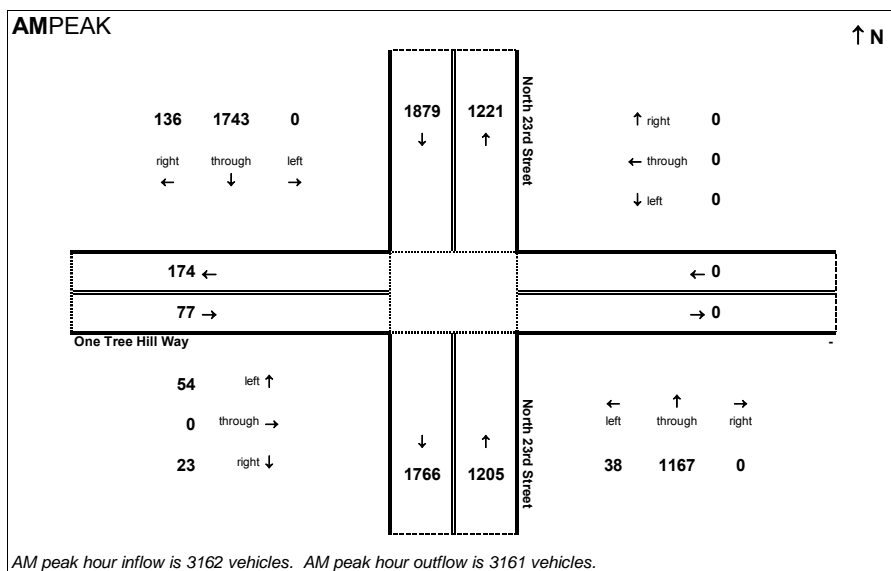


**Peak Hour Volume Breakouts Report:**  
 (26) North 23rd Street @ One Tree Hill Way

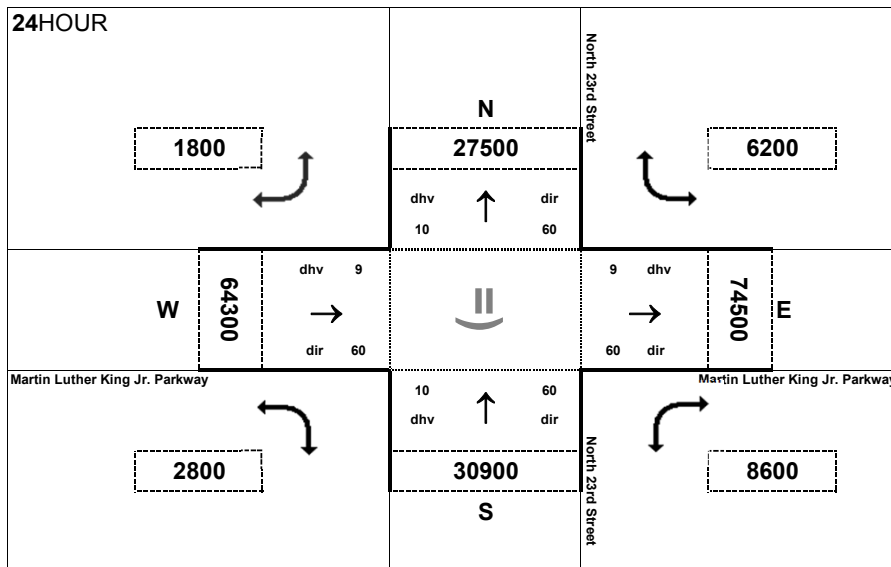
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

**Project:**  
 TIP: U-4434





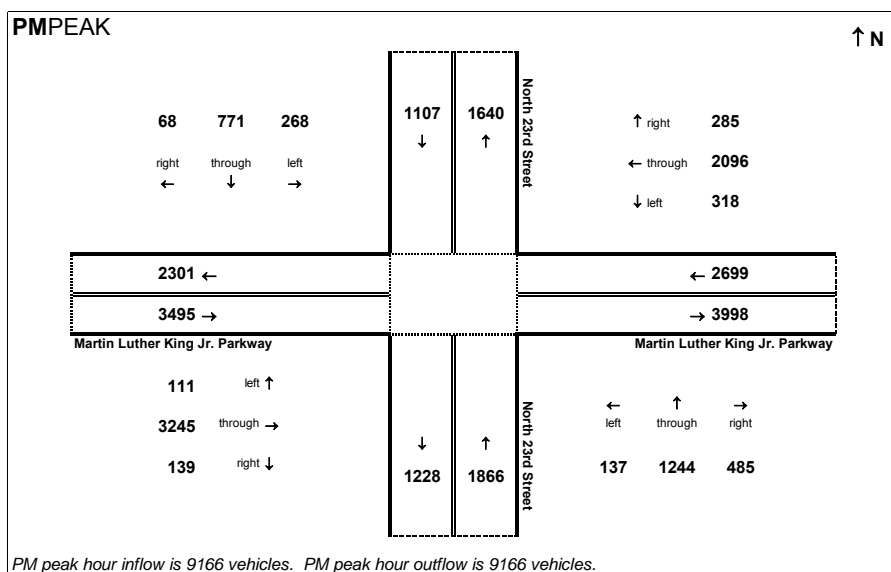
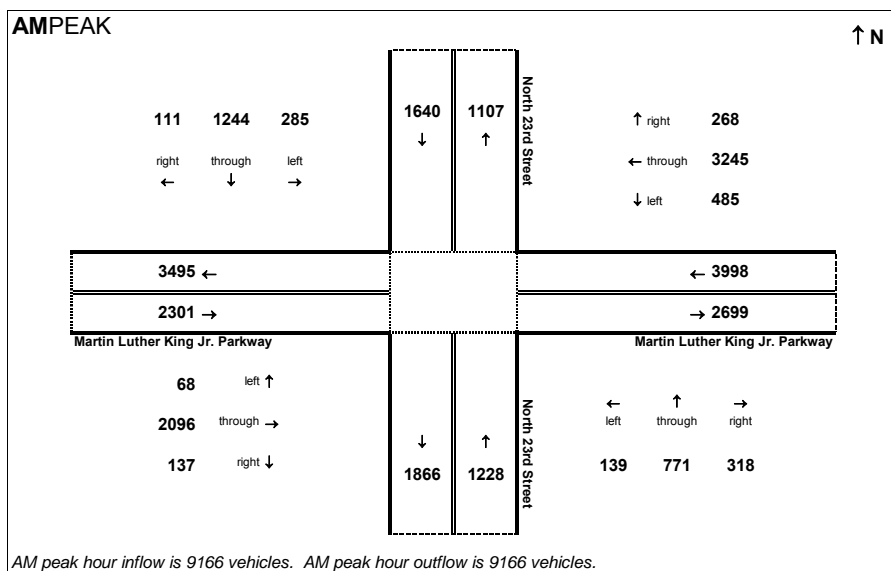


**Peak Hour Volume Breakouts Report:**  
 (27) Martin Luther King Jr. Parkway @ North 23rd Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year No-Build - Without Skyway

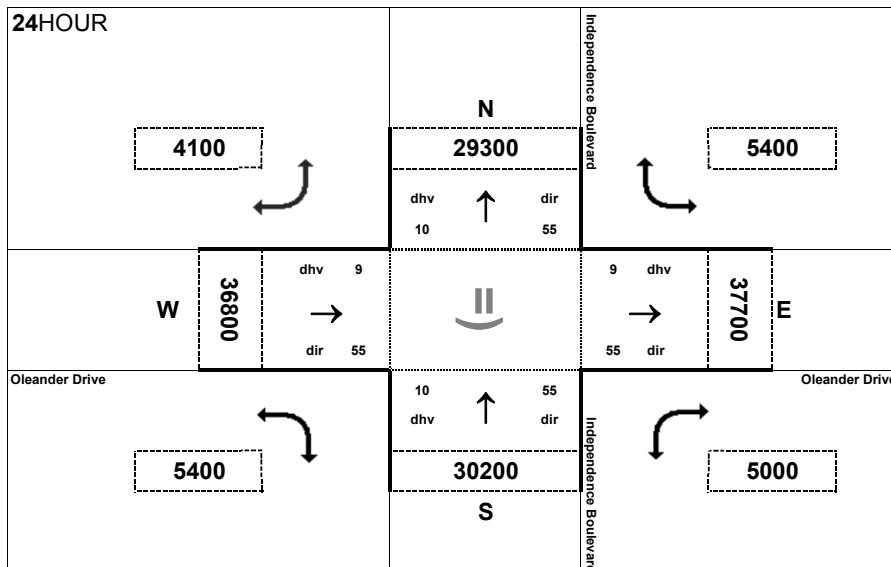
**Project:**  
 TIP: U-4434



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## 2040 Build Conditions

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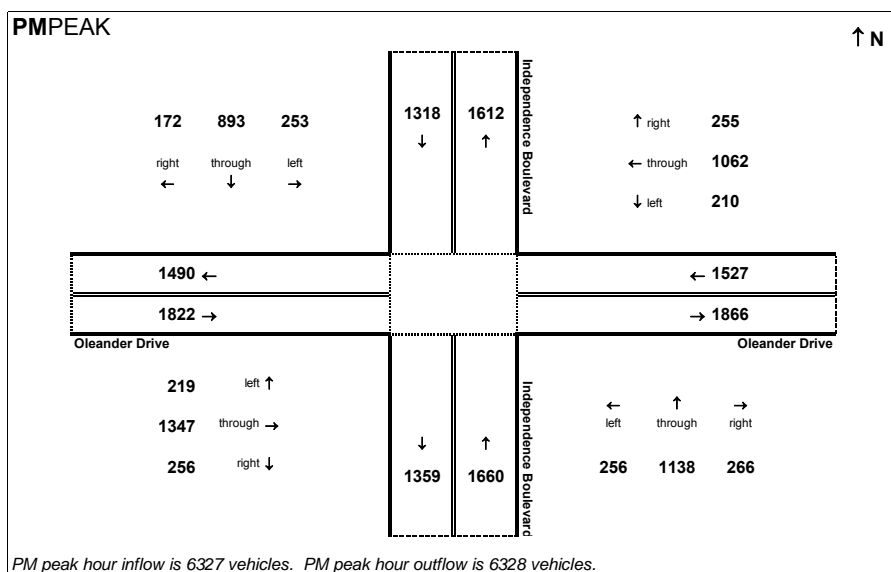
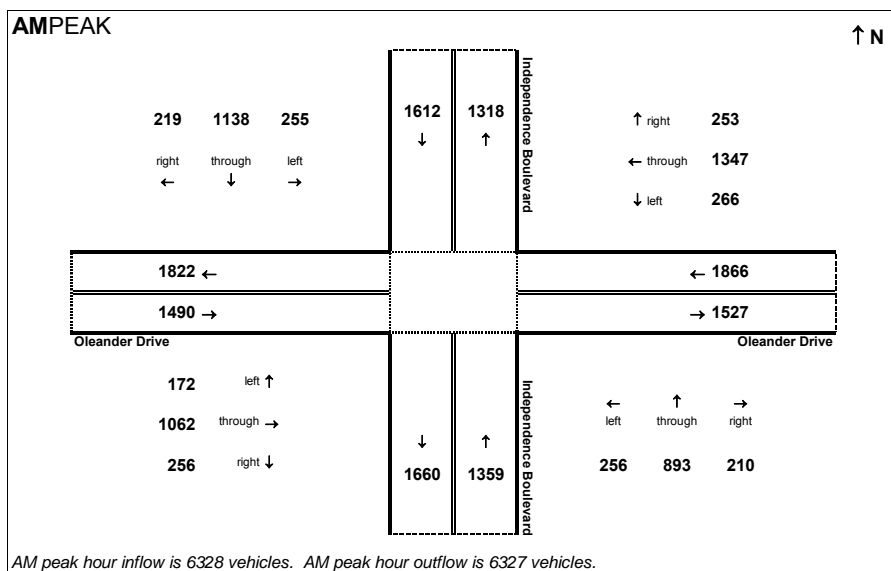


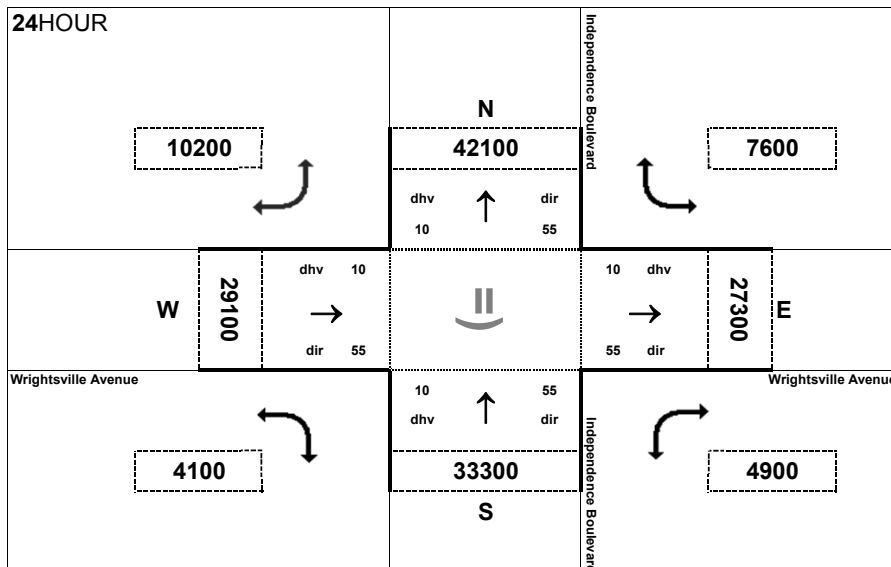
**Peak Hour Volume Breakouts Report:**  
 (1) Oleander Drive @ Independence Boulevard

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



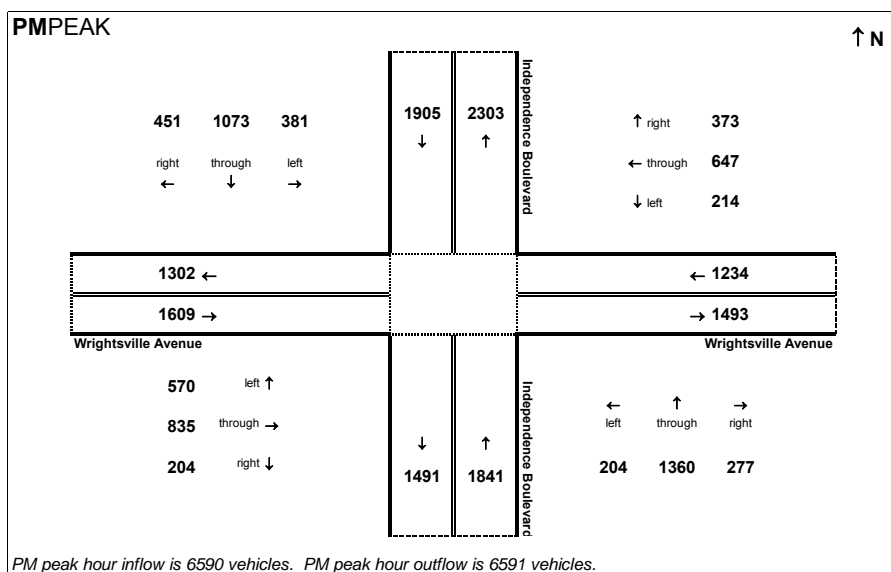
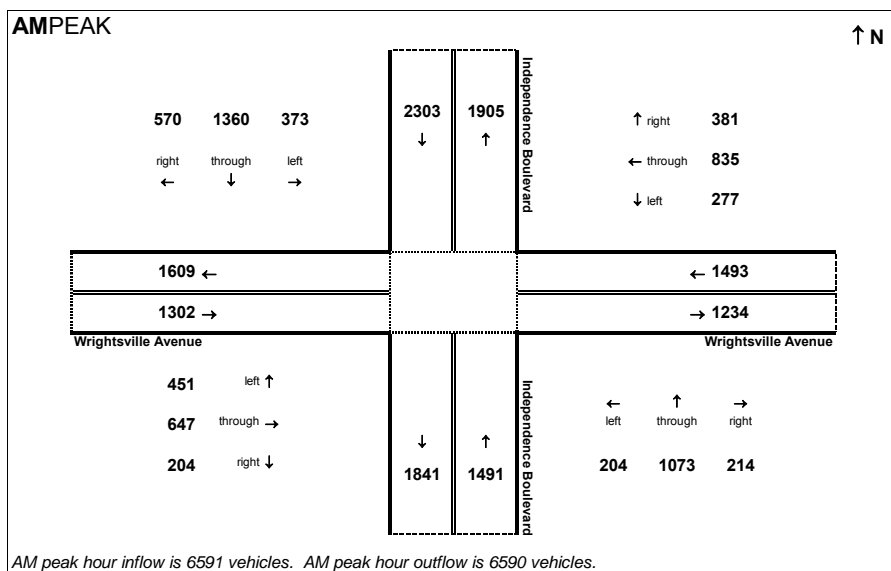


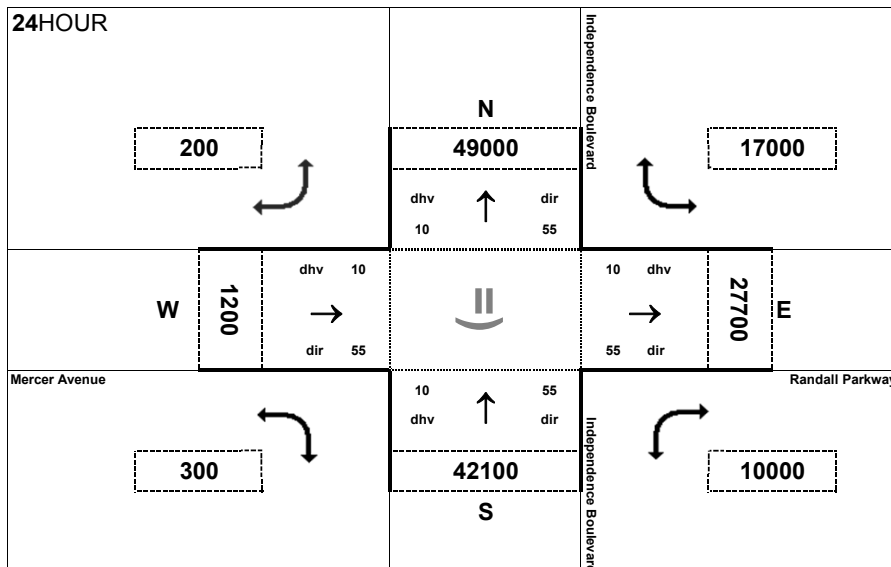
**Peak Hour Volume Breakouts Report:**  
 (2) Independence Boulevard @ Wrightsville Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



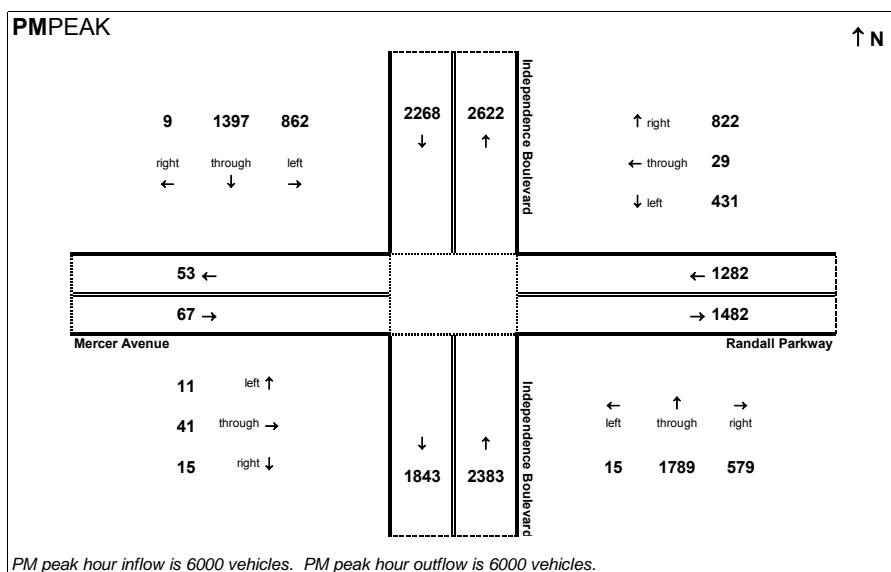
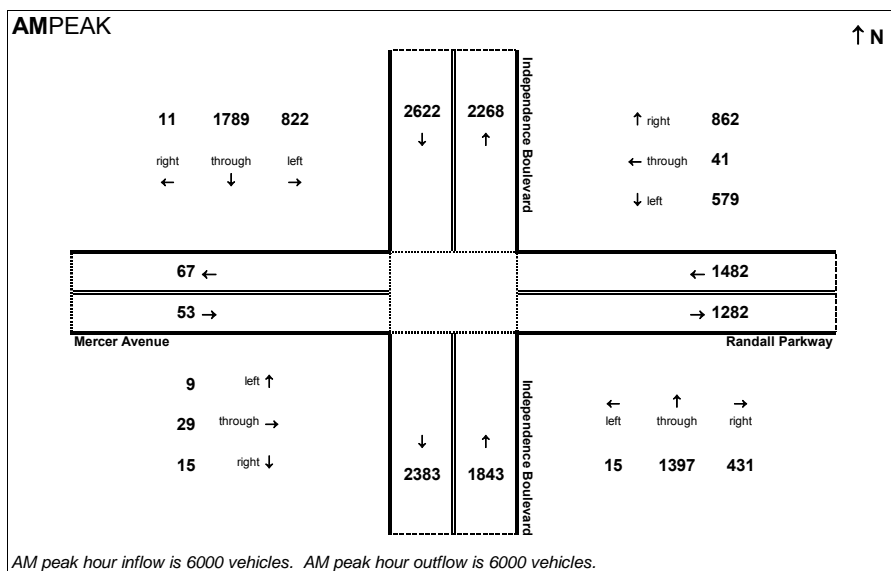


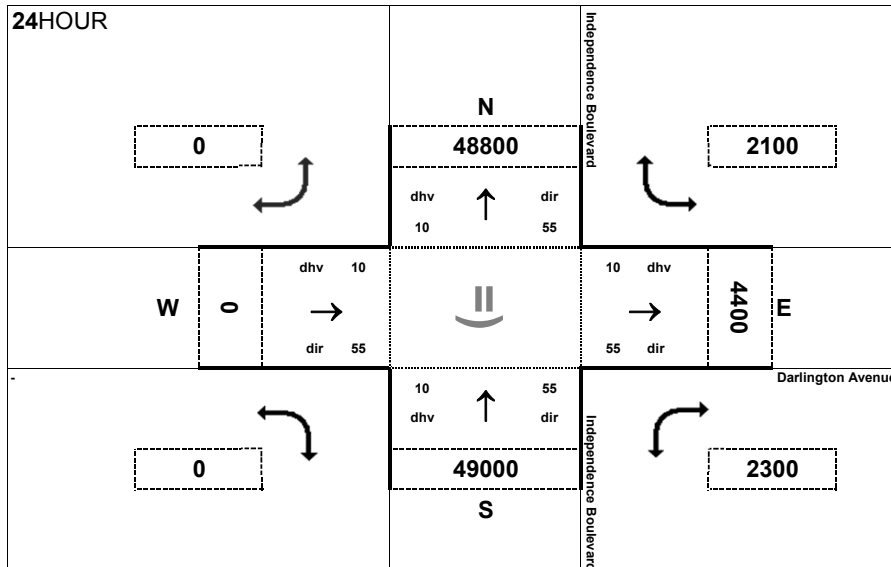
**Peak Hour Volume Breakouts Report:**  
 (3) Independence Boulevard @ Randall Parkway

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



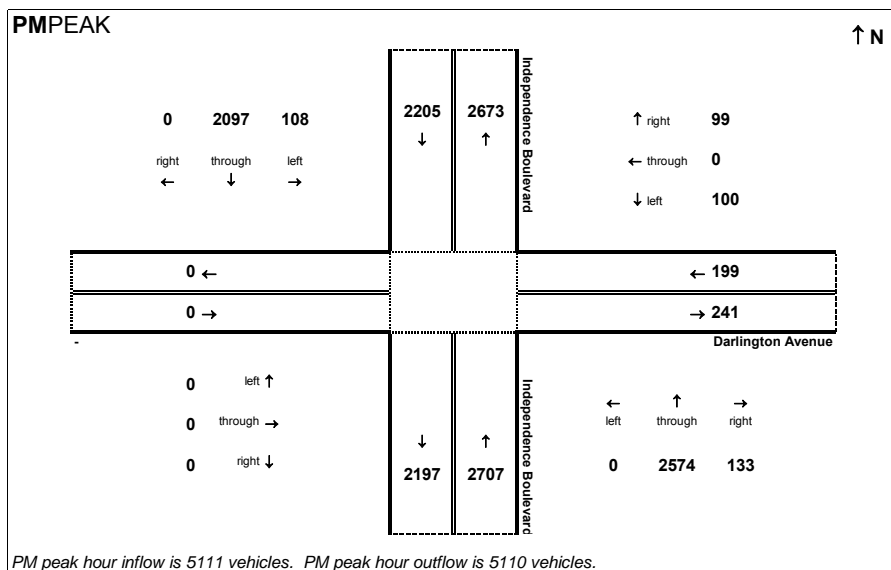
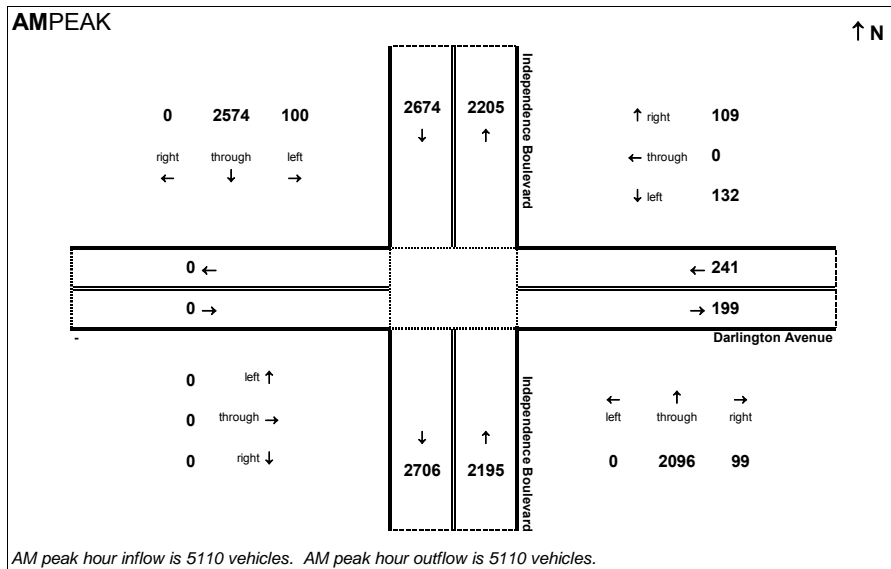


**Peak Hour Volume Breakouts Report:**  
 (4) Covil Avenue @ Darlington Avenue

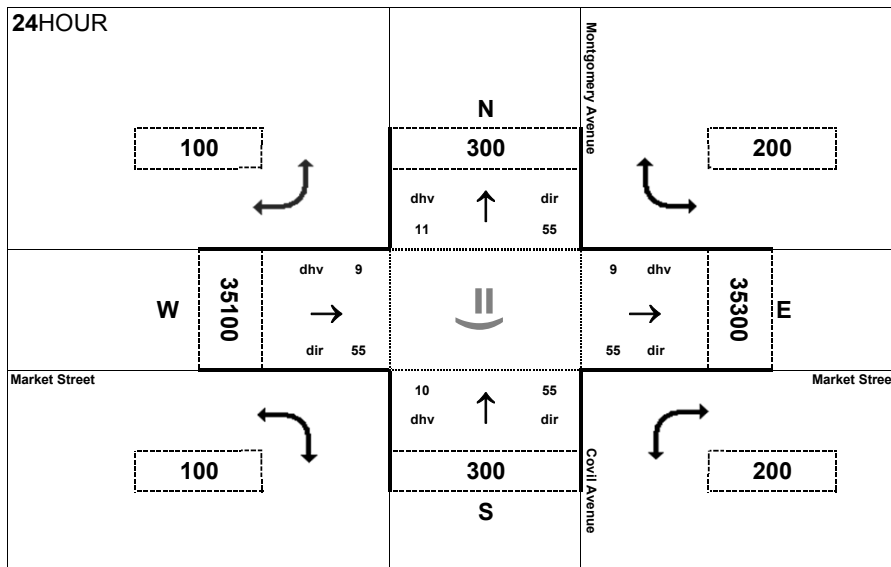
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434





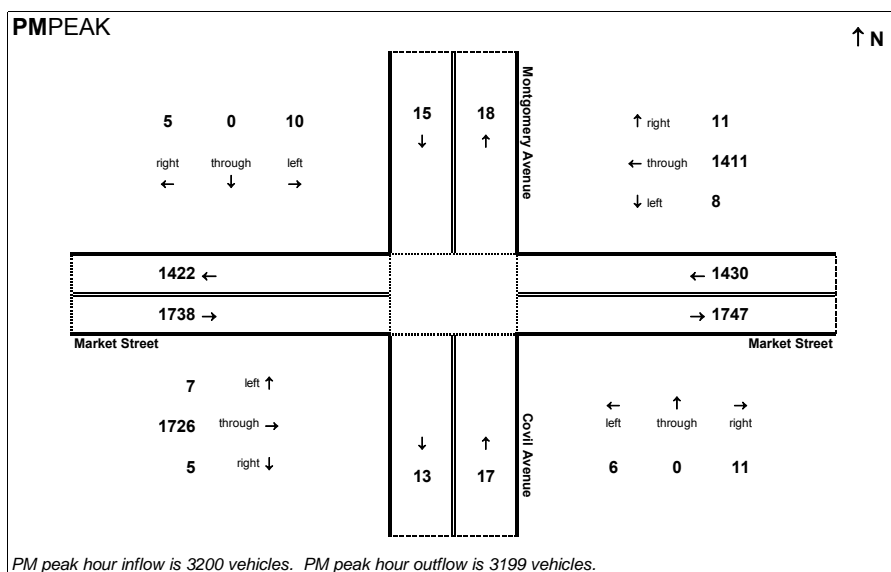
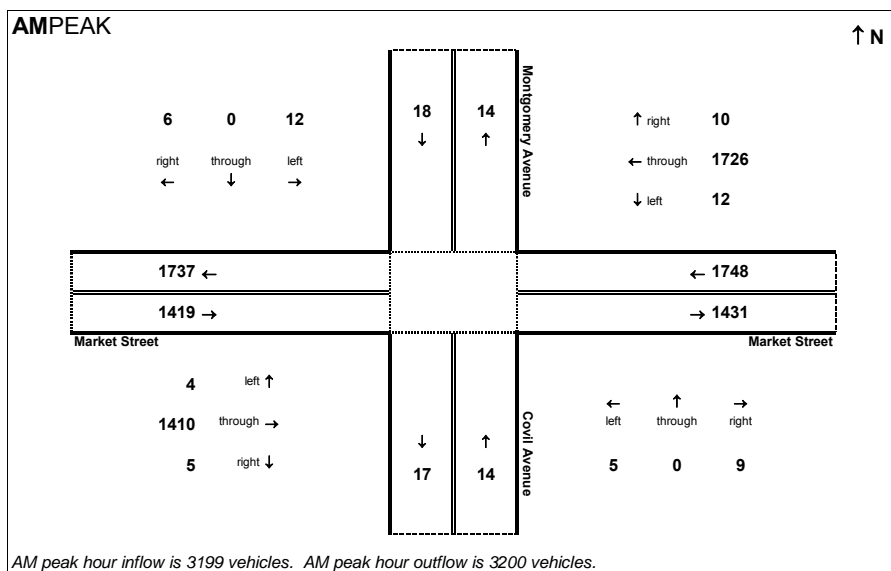


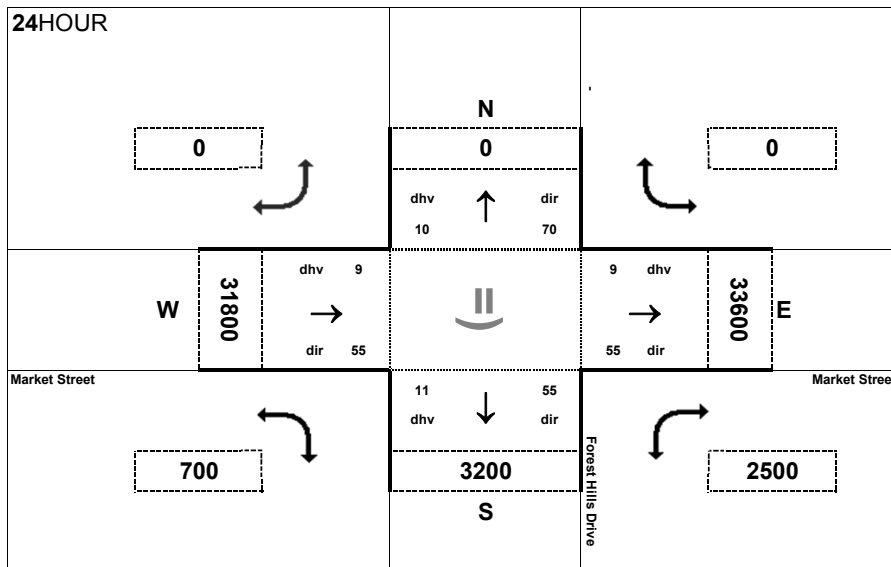
**Peak Hour Volume Breakouts Report:**  
 (5) Market Street @ Covil Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



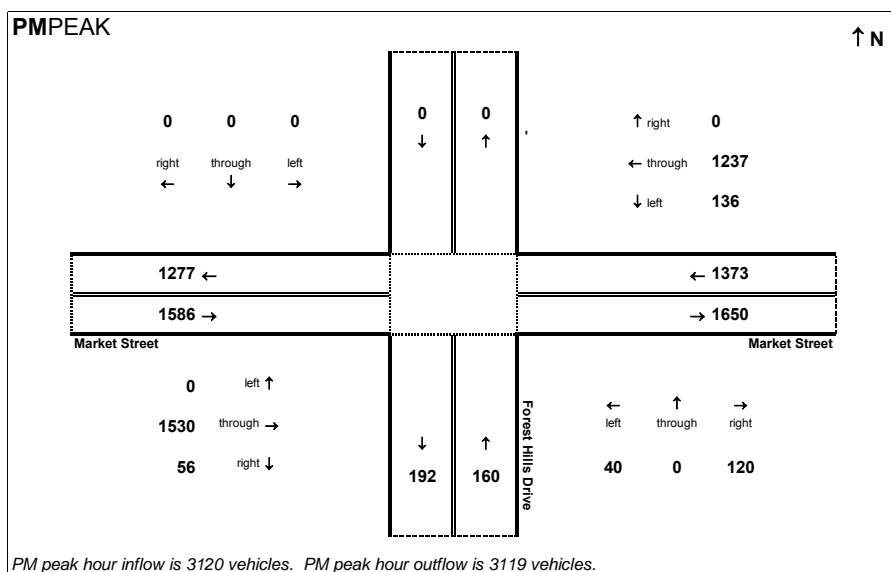
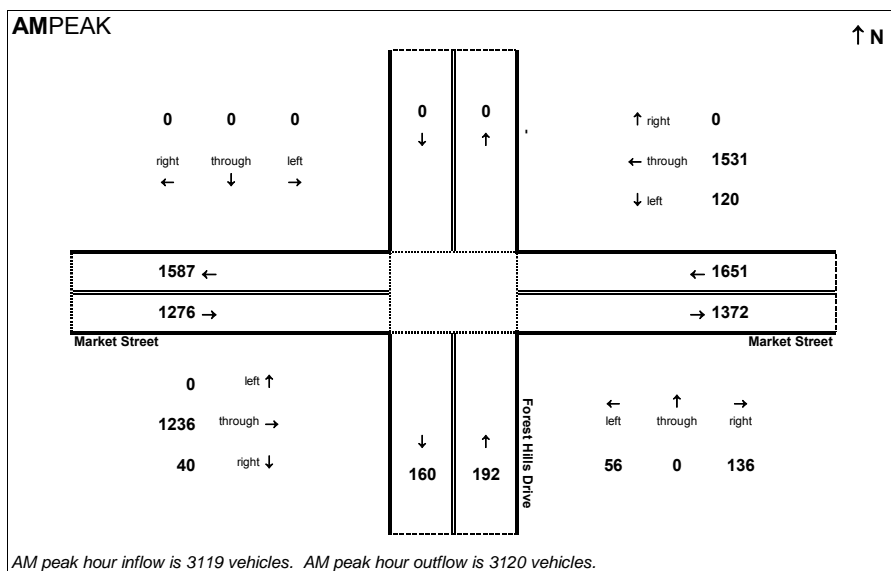


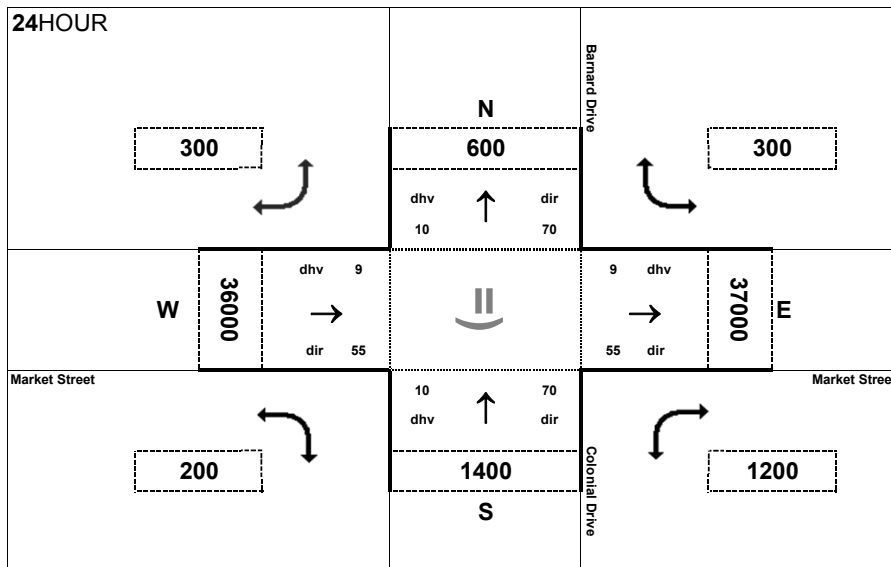
**Peak Hour Volume Breakouts Report:**  
 (6) Market Street @ Forest Hills Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



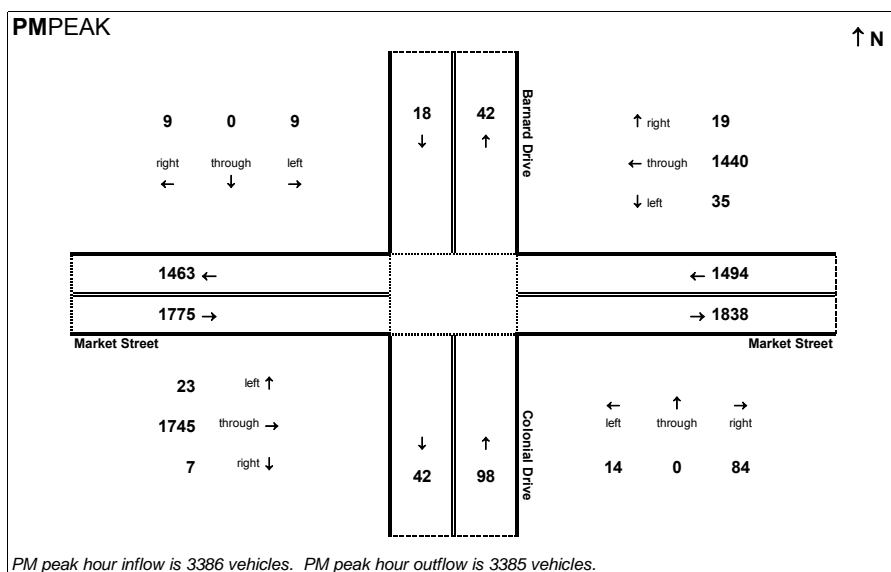
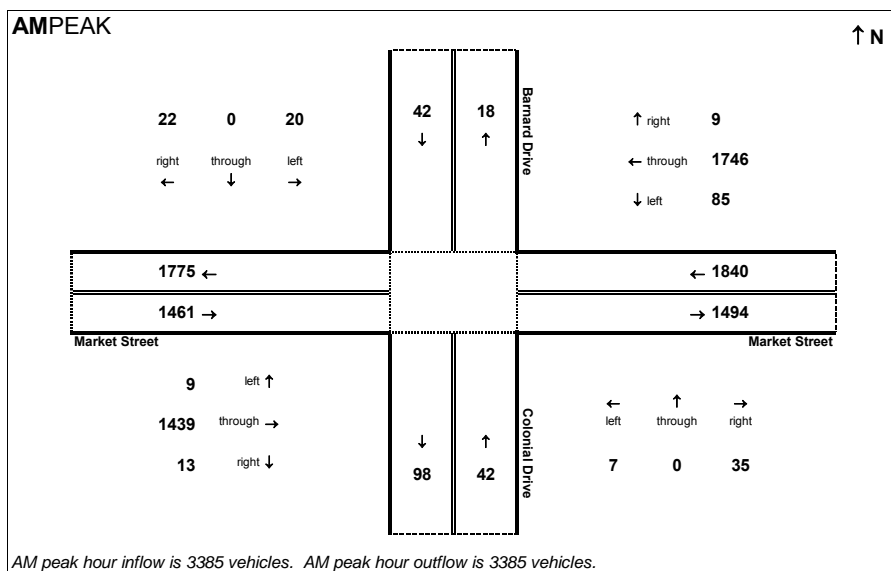


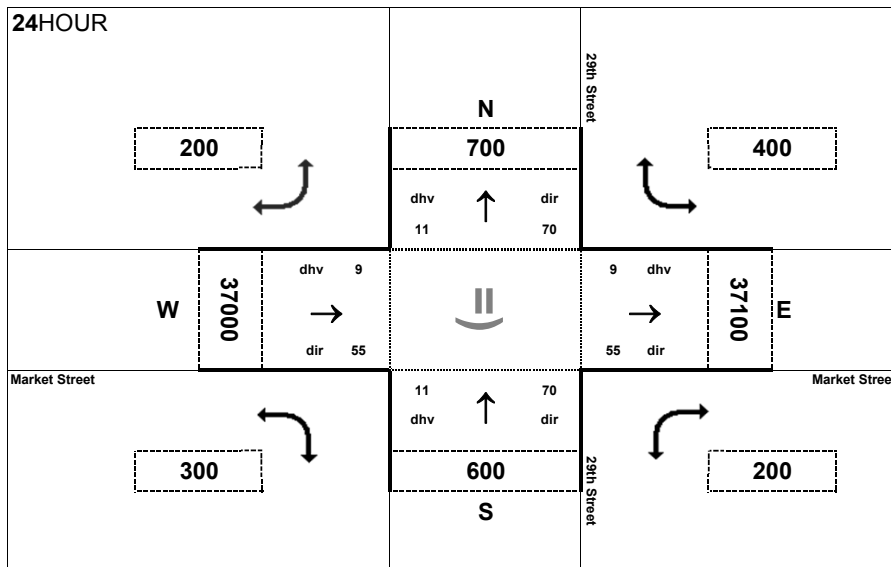
**Peak Hour Volume Breakouts Report:**  
 (7) Market Street @ Colonial Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



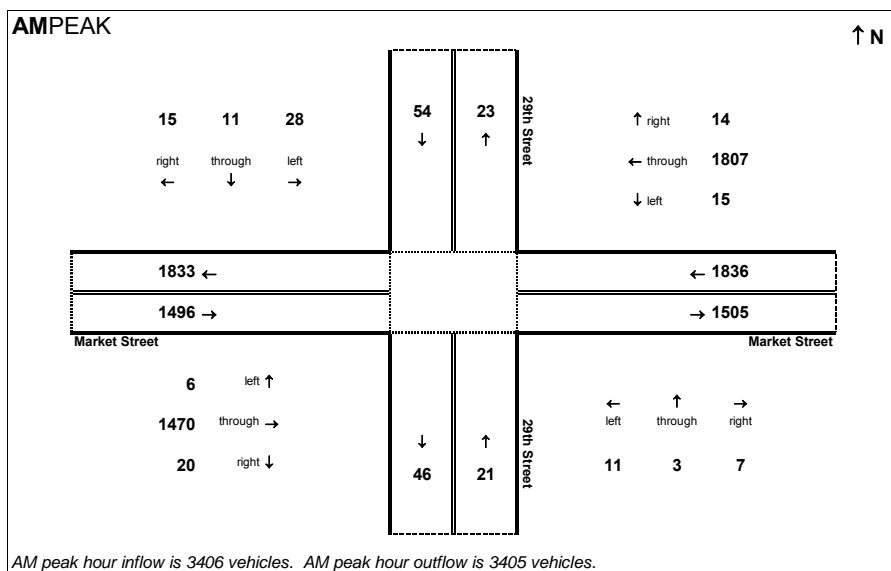


**Peak Hour Volume Breakouts Report:**  
 (8) Market Street @ 29th Street

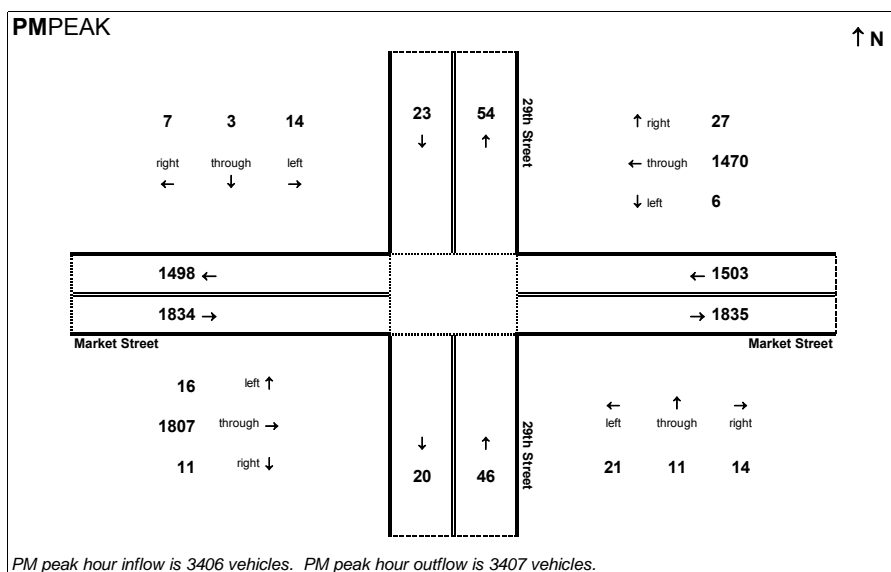
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

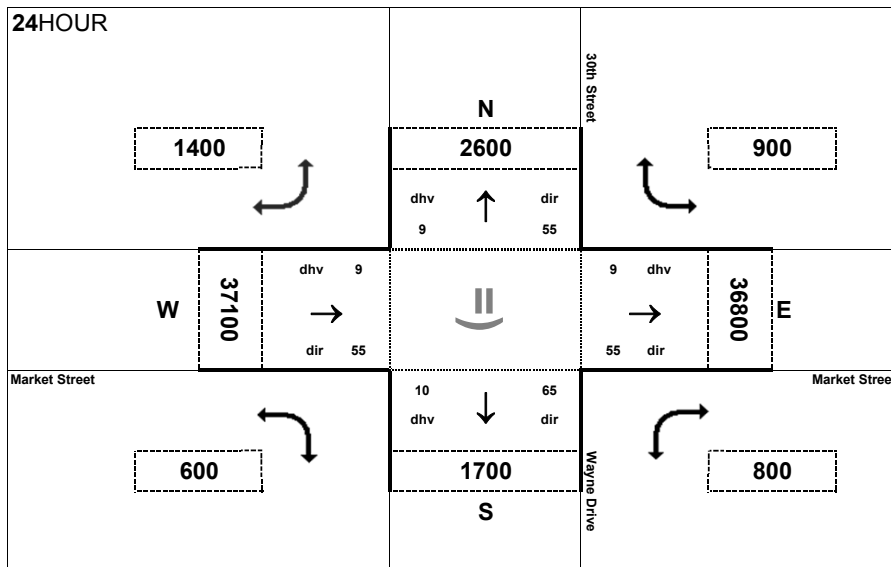
**Project:**  
 TIP: U-4434



AM peak hour inflow is 3406 vehicles. AM peak hour outflow is 3405 vehicles.



PM peak hour inflow is 3406 vehicles. PM peak hour outflow is 3407 vehicles.

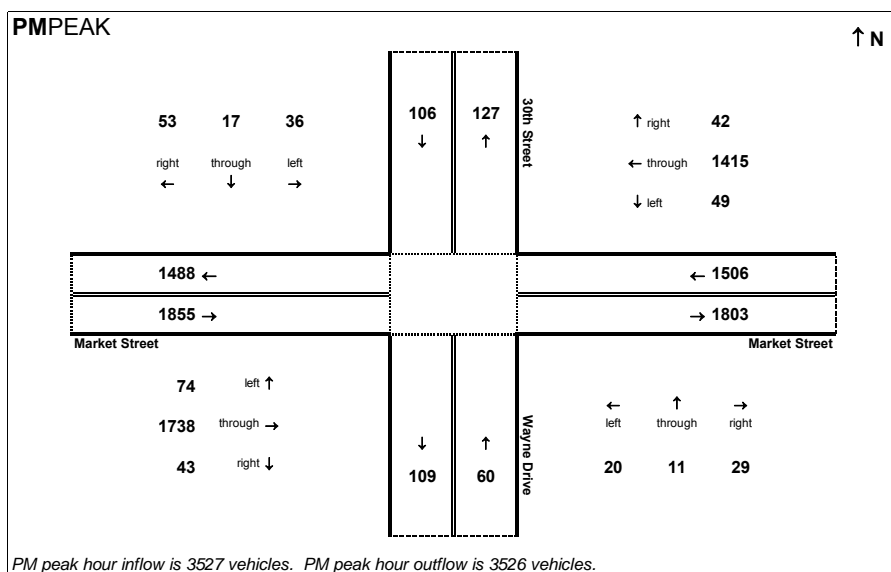
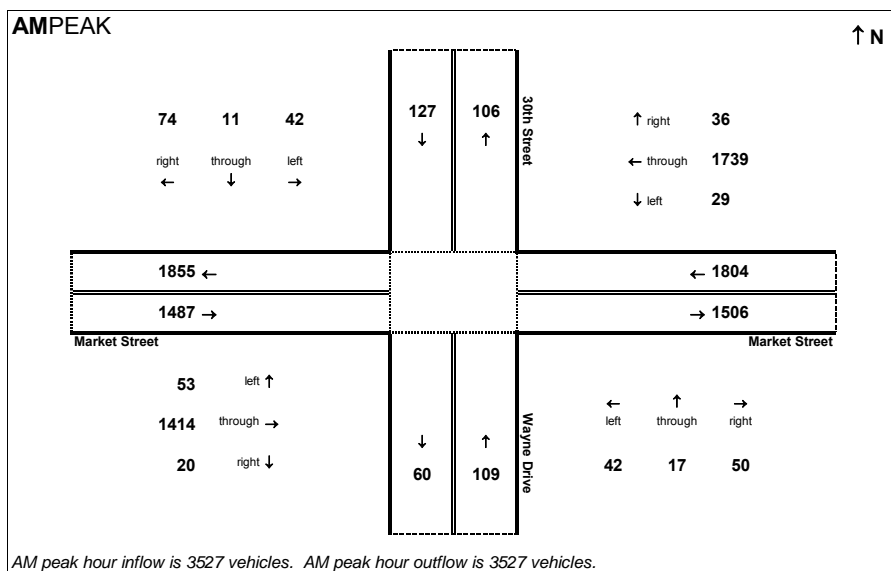


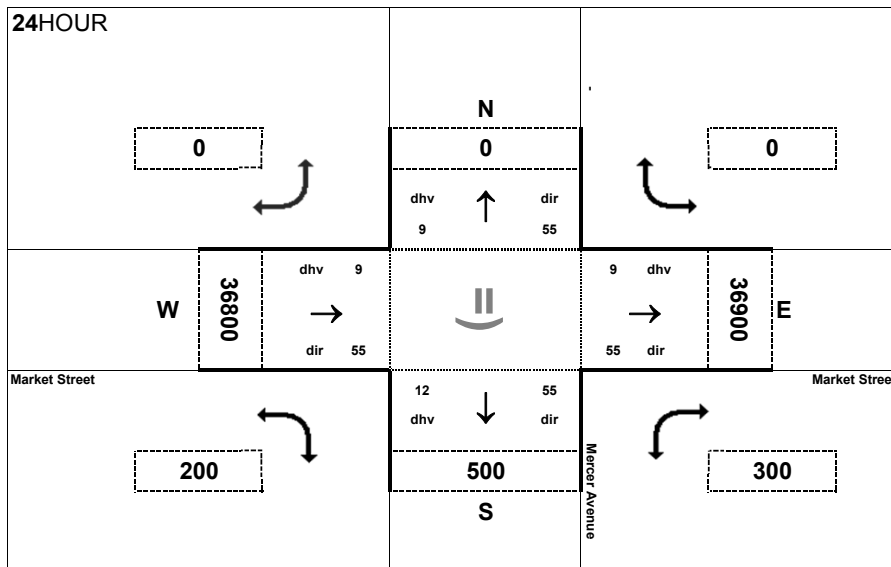
**Peak Hour Volume Breakouts Report:**  
 (9) Market Street @ Wayne Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



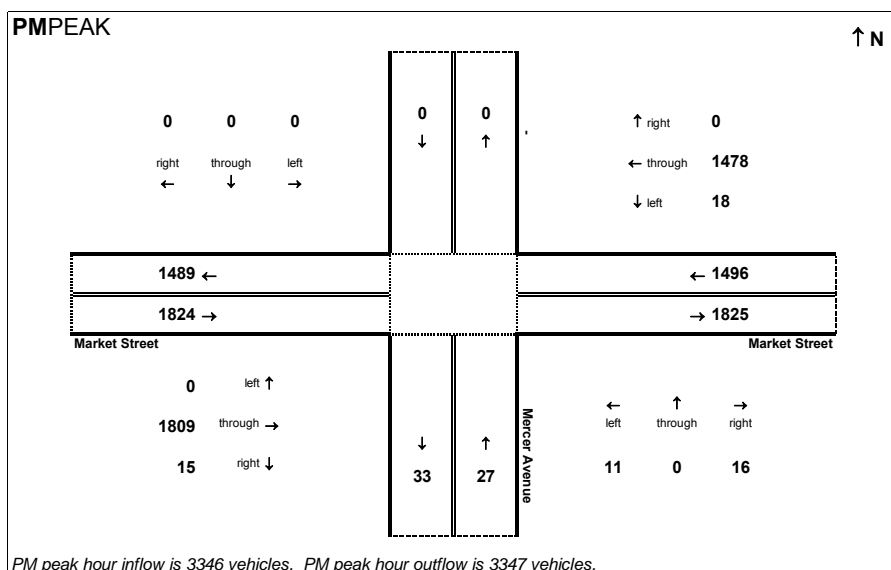
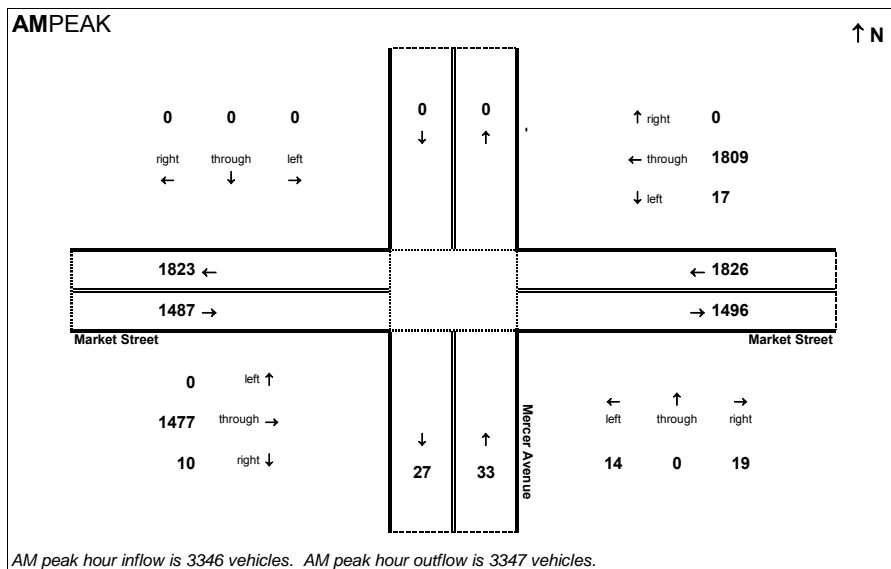


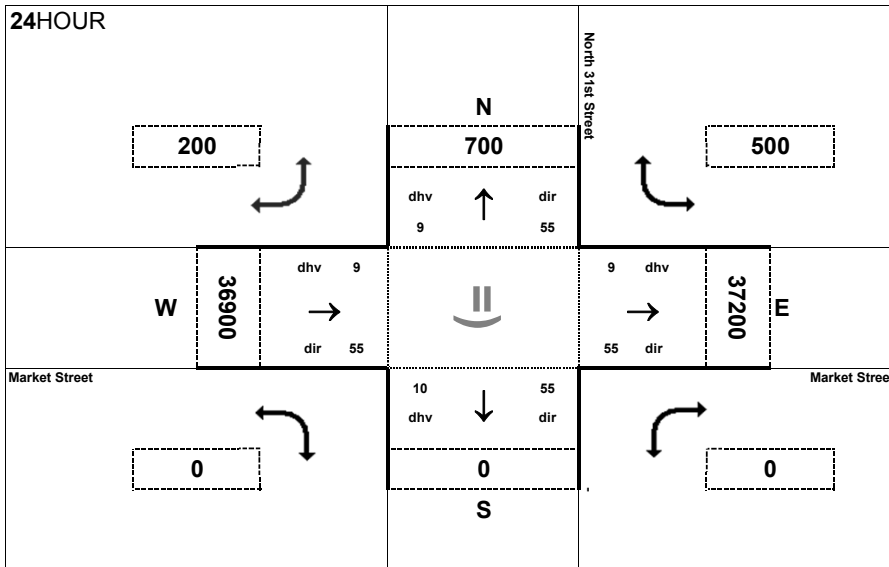
**Peak Hour Volume Breakouts Report:**  
 (10) Market Street @ Mercer Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



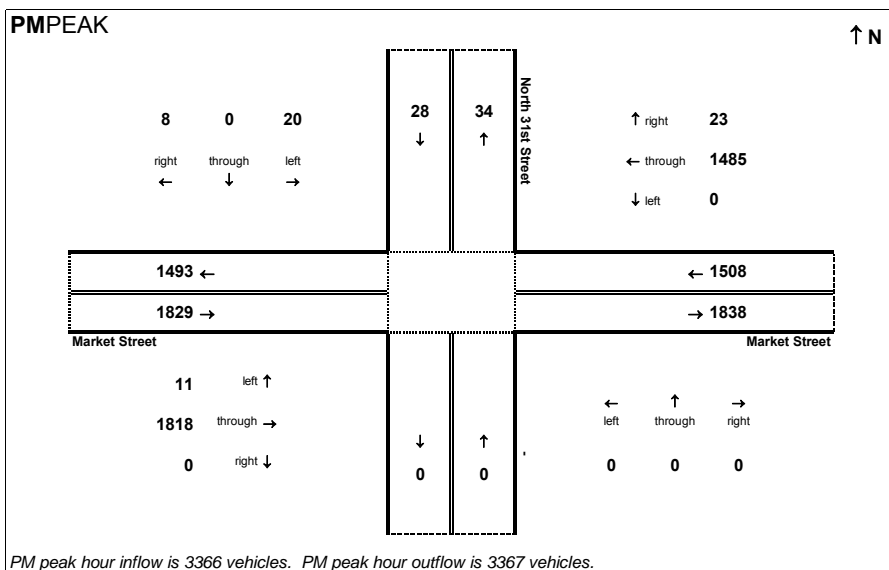
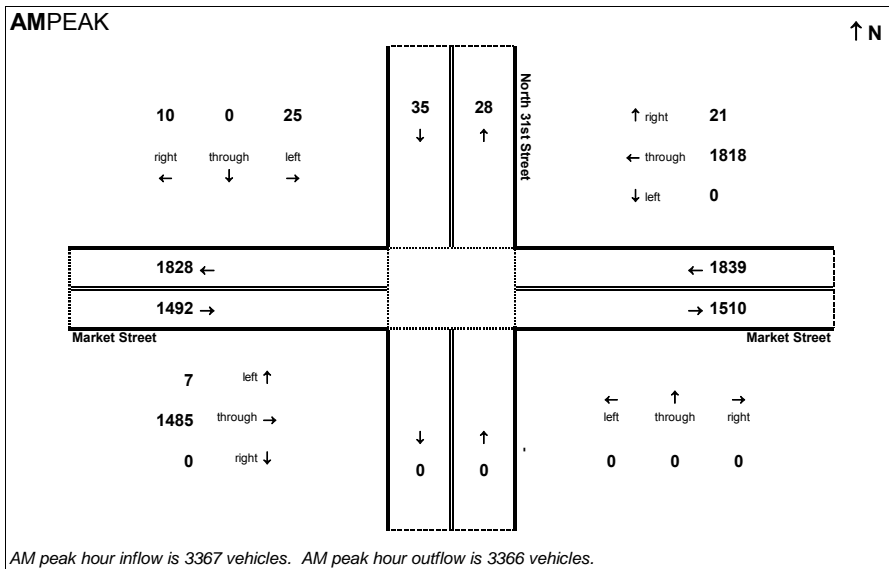


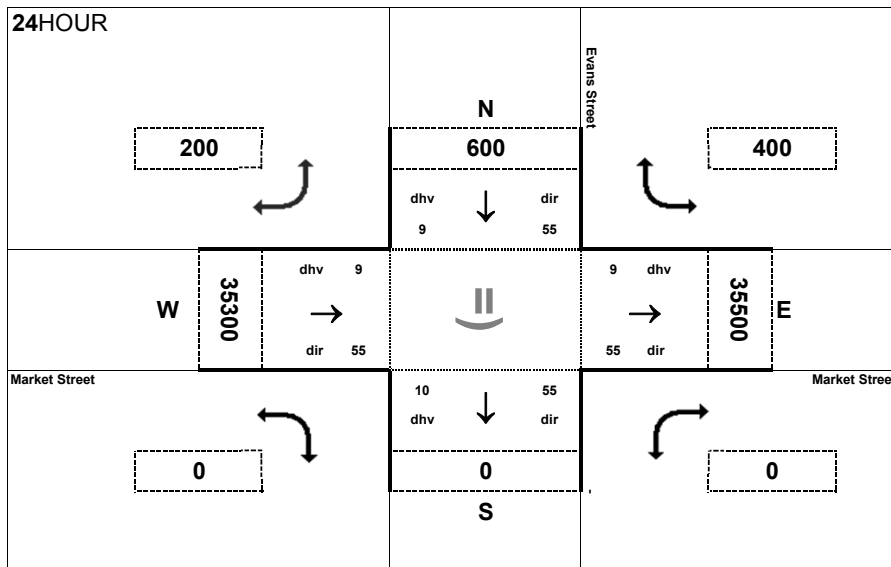
**Peak Hour Volume Breakouts Report:**  
 (11) Market Street @ North 31st Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



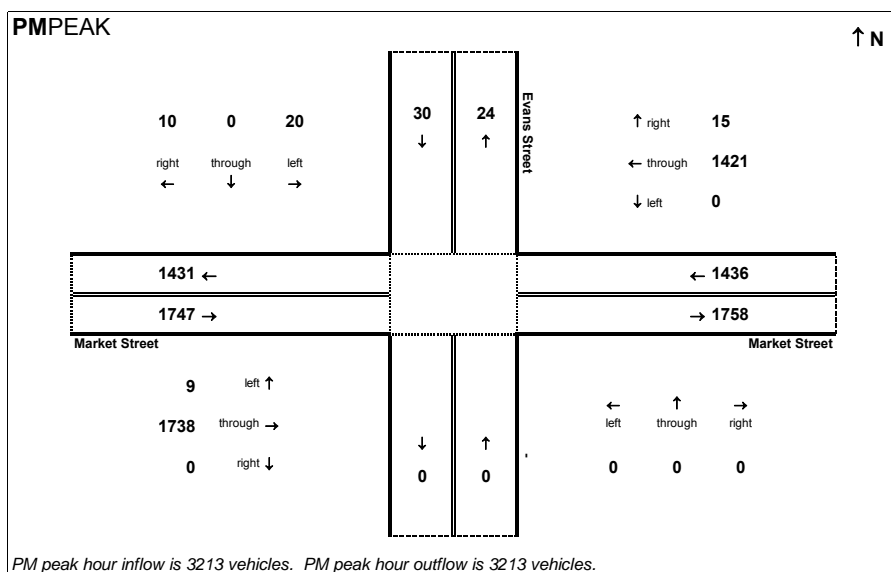
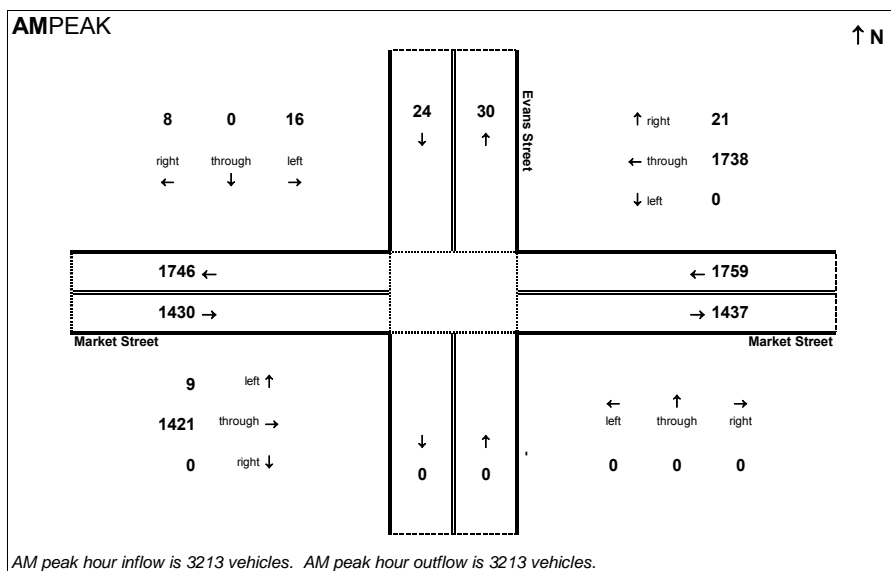


**Peak Hour Volume Breakouts Report:**  
 (12) Market Street @ Evans Street

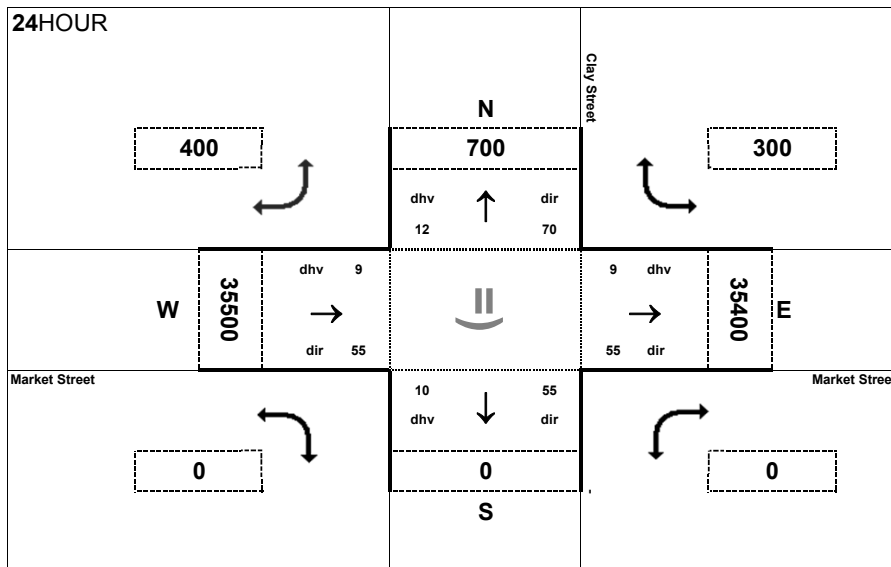
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434





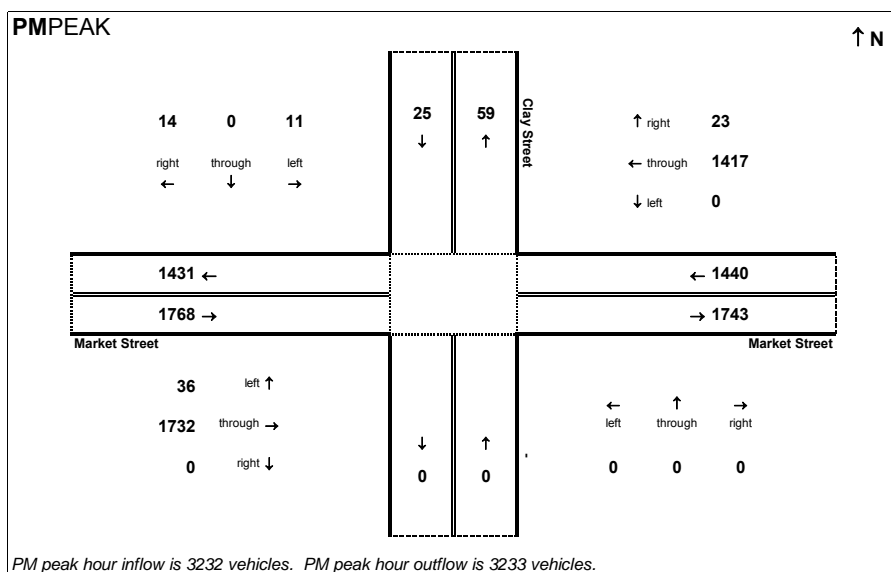
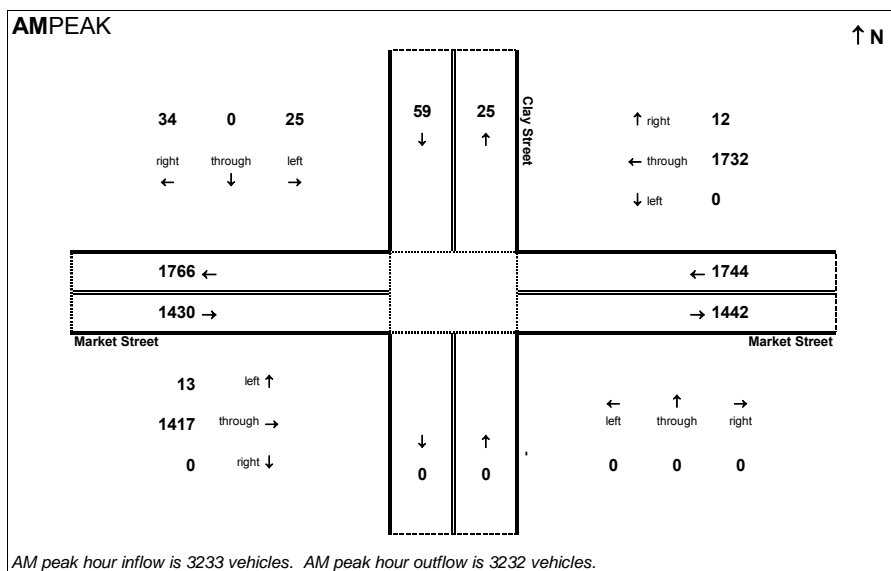


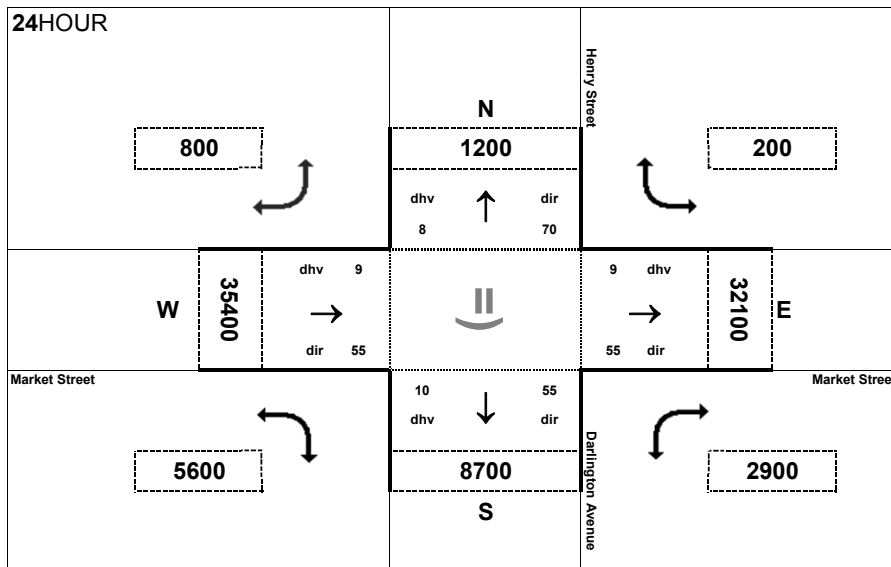
**Peak Hour Volume Breakouts Report:**  
 (13) Market Street @ Clay Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



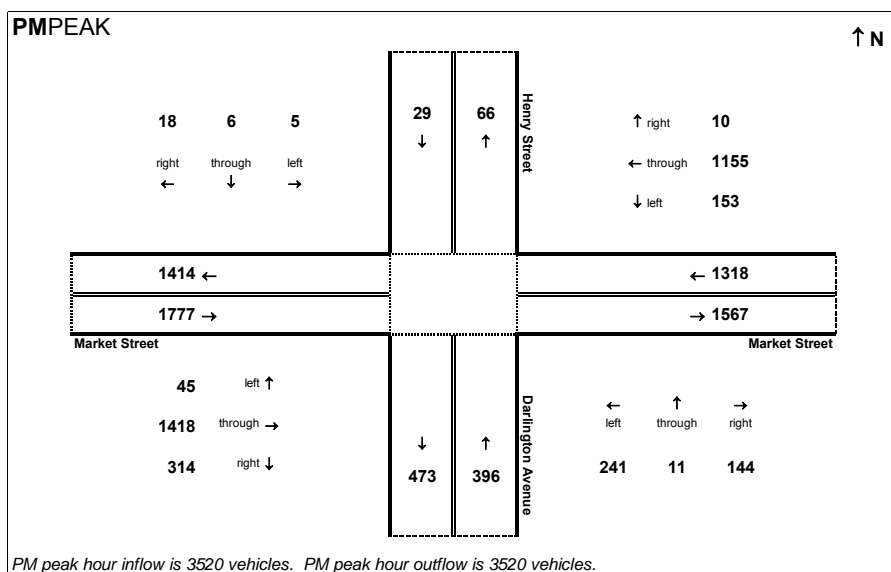
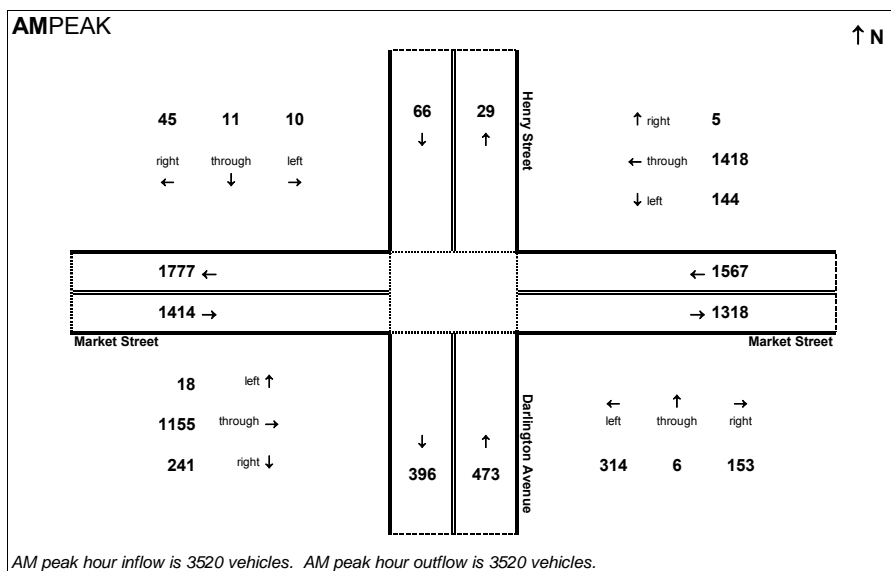


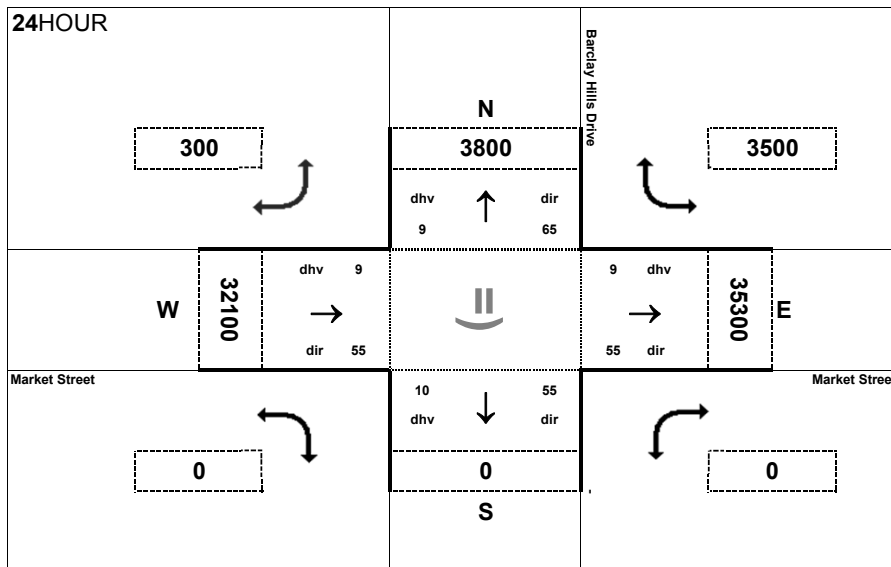
**Peak Hour Volume Breakouts Report:**  
 (14) Market Street @ Darlington Avenue

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



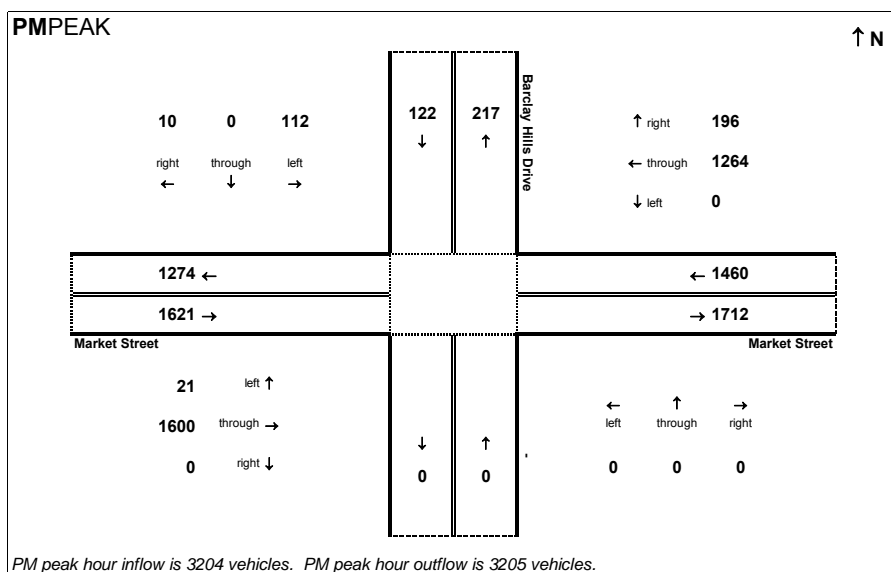
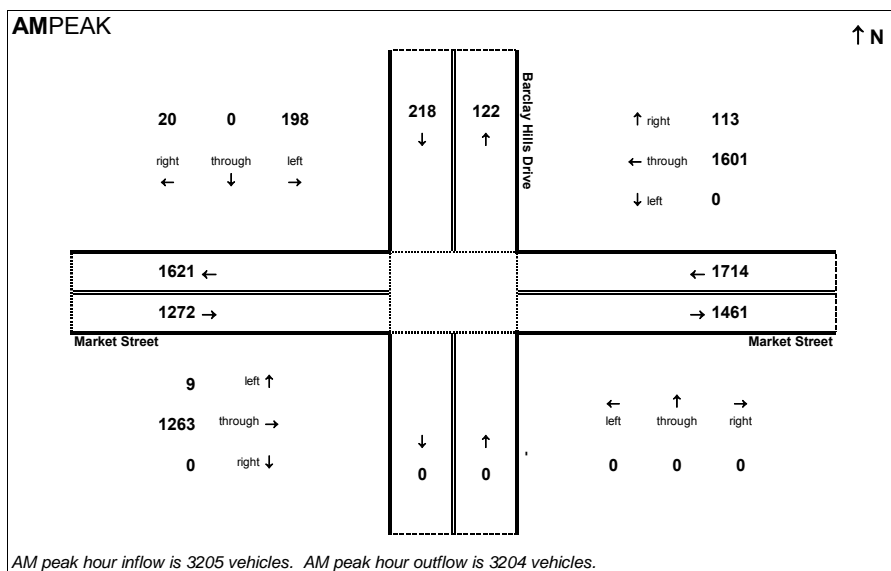


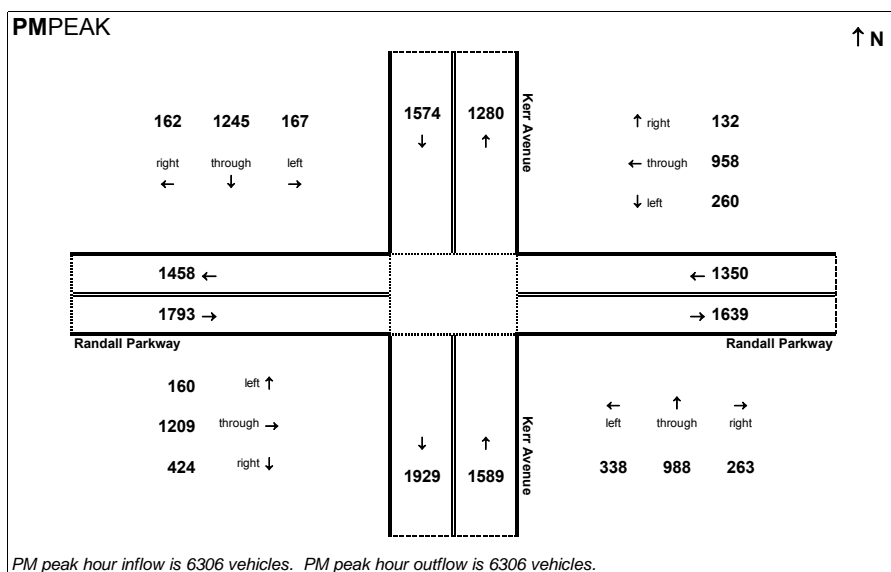
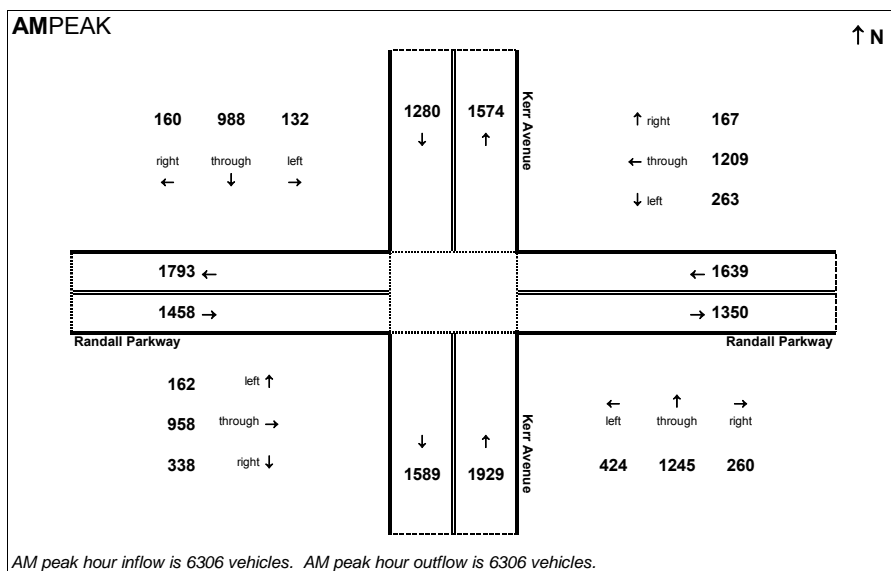
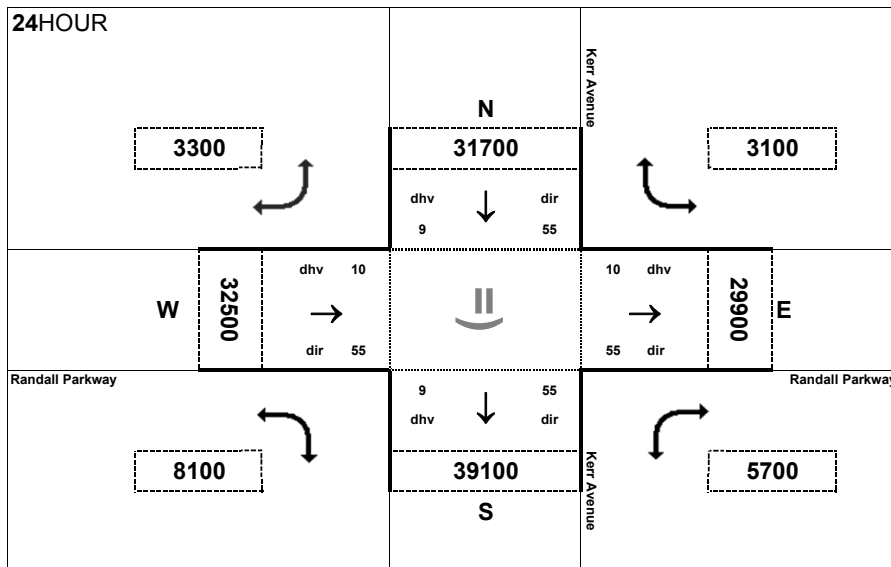
**Peak Hour Volume Breakouts Report:**  
 (15) Market Street @ Barclay Hills Drive

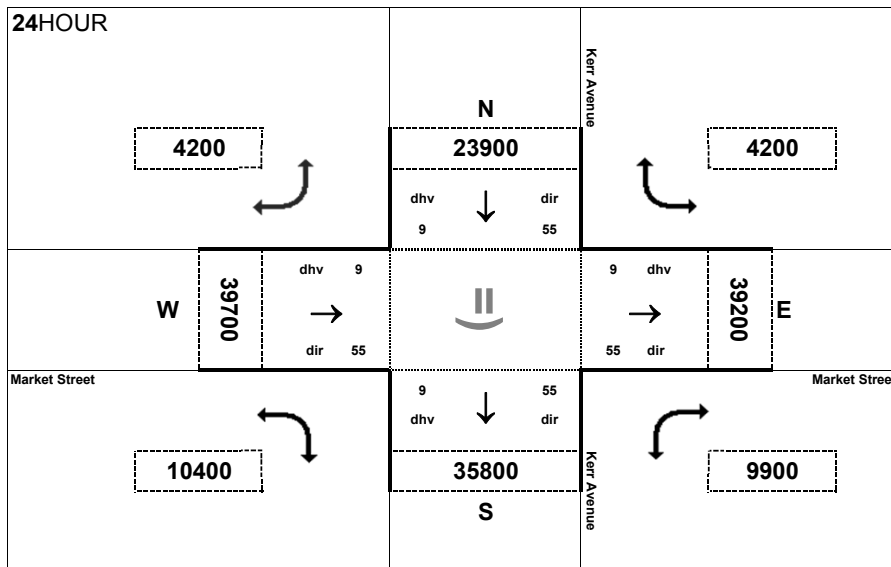
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434





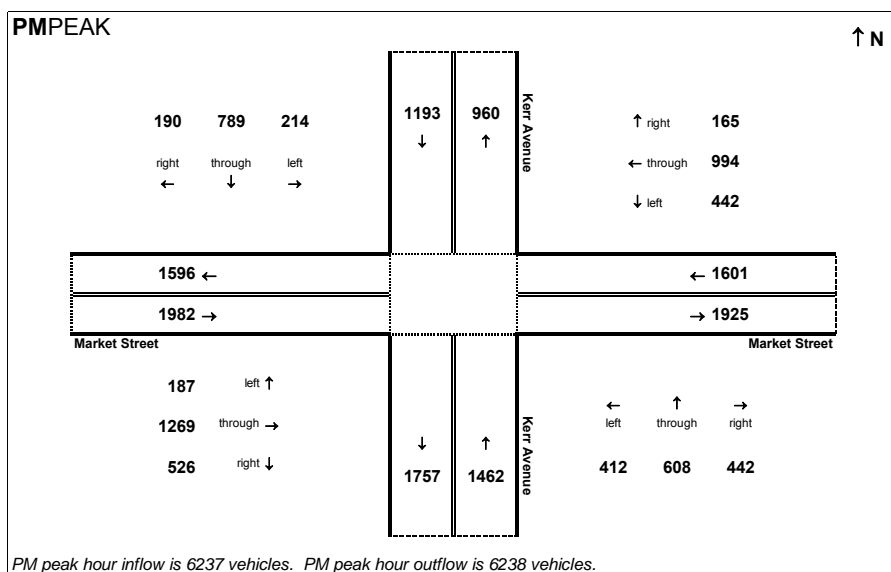
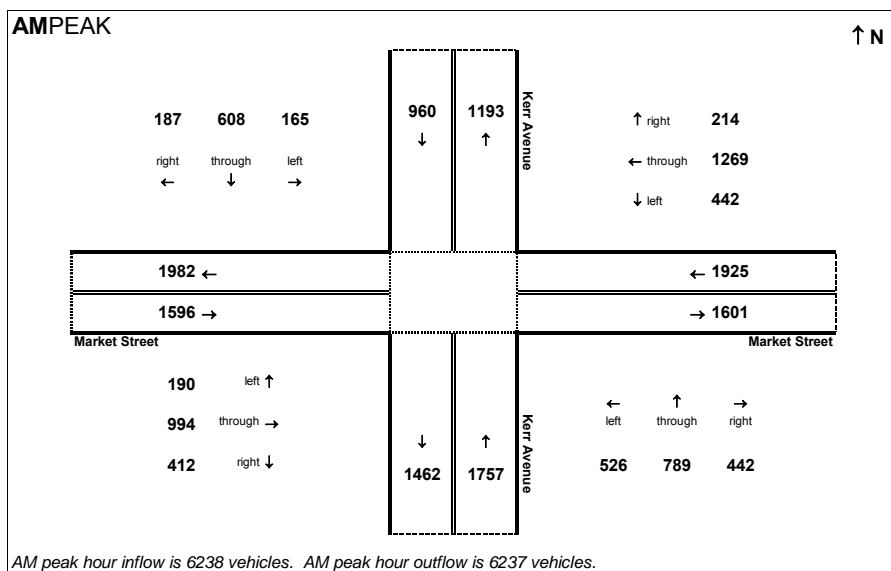


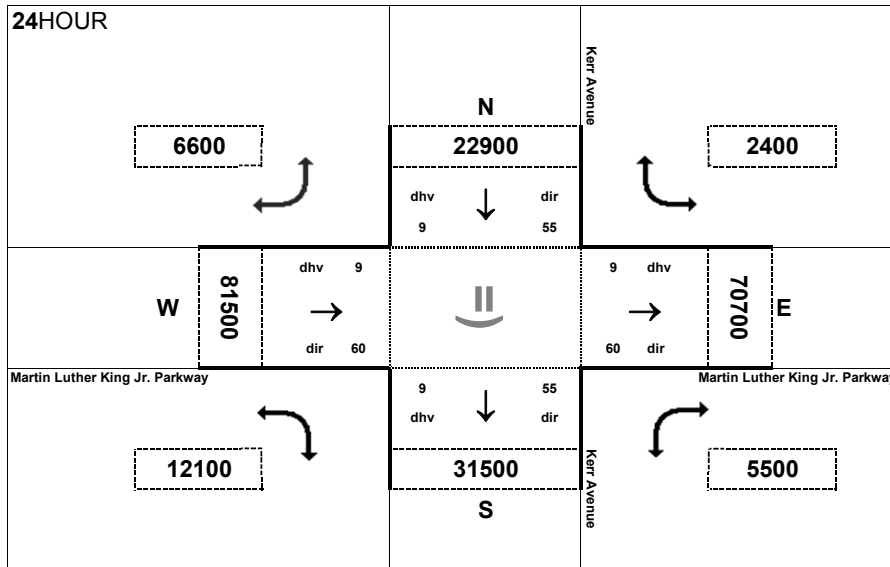
**Peak Hour Volume Breakouts Report:**  
 (17) Kerr Avenue @ Market Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



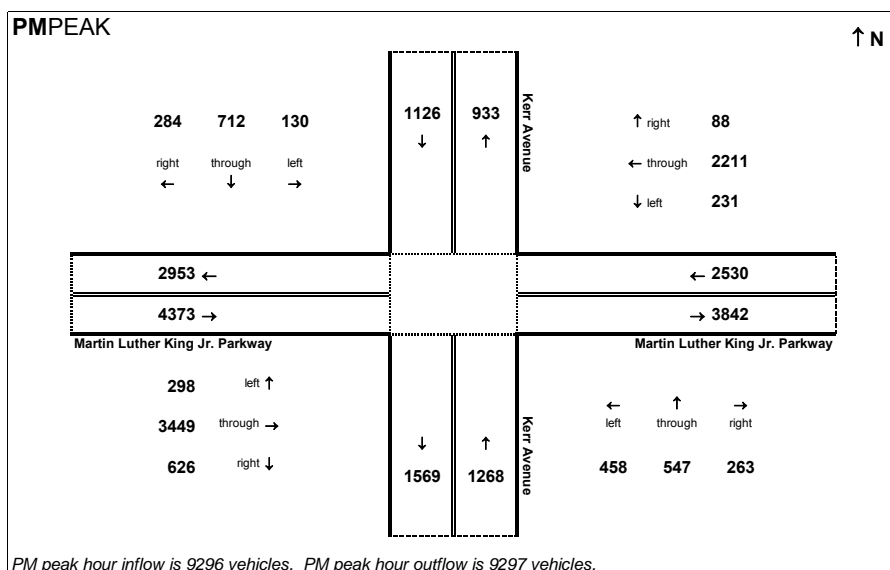
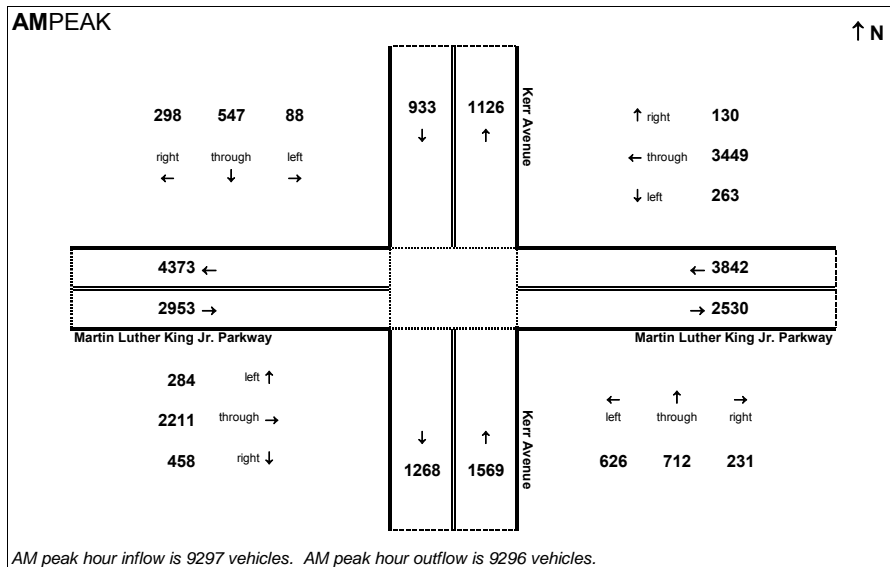


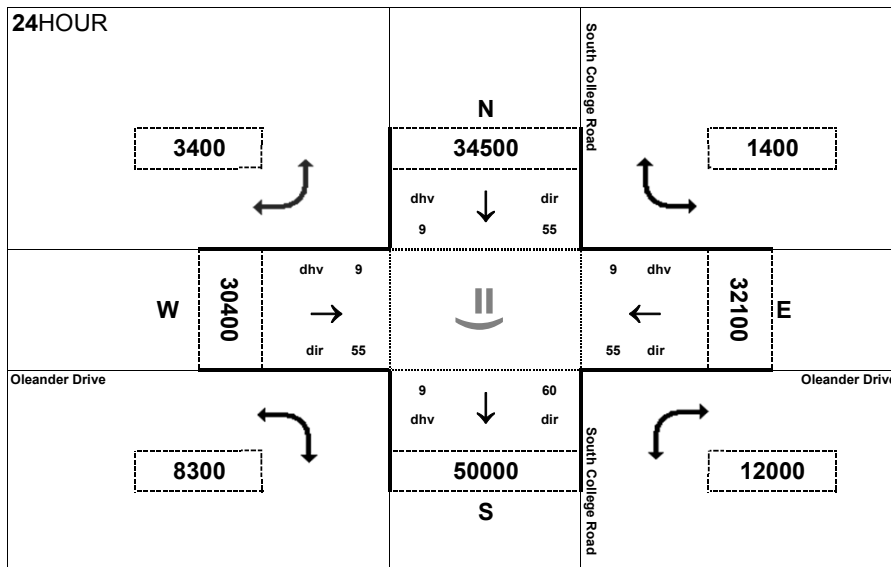
**Peak Hour Volume Breakouts Report:**  
 (18) Kerr Avenue @ Martin Luther King Jr. Parkway

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



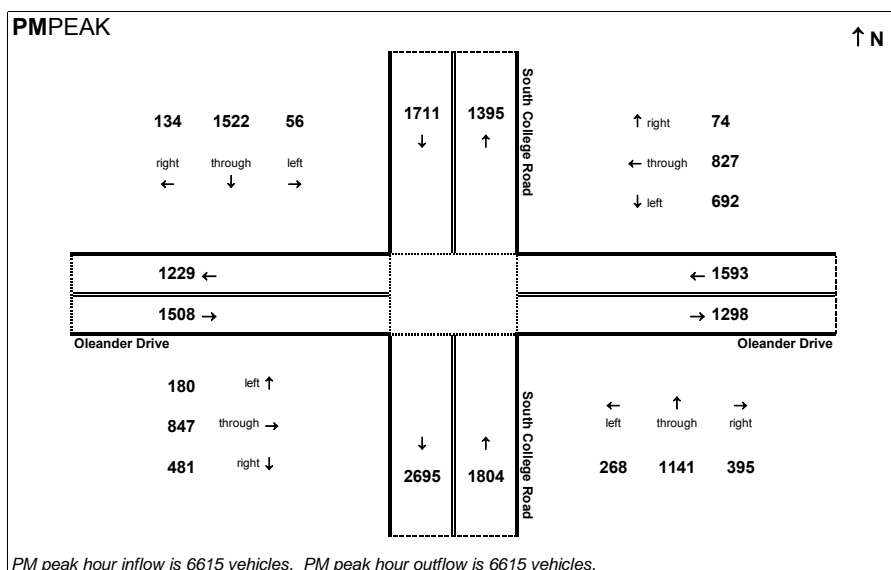
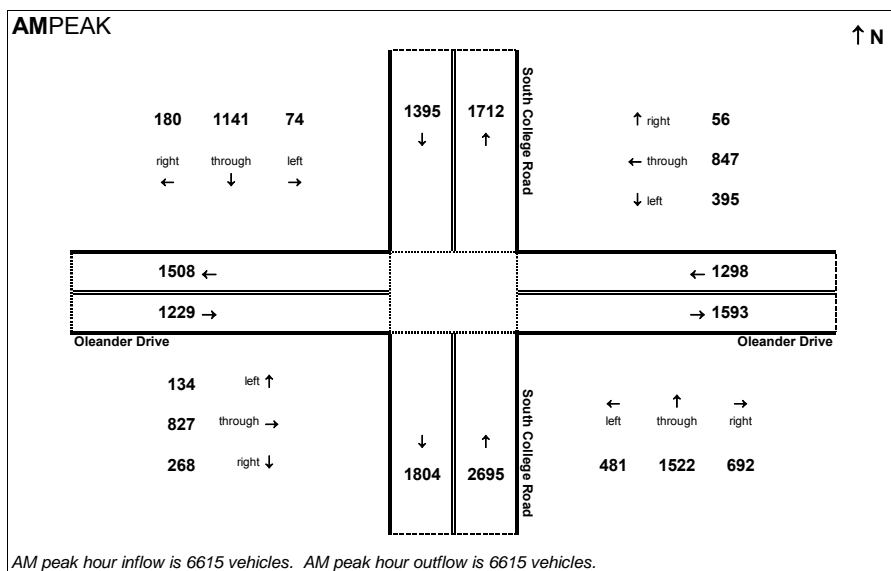


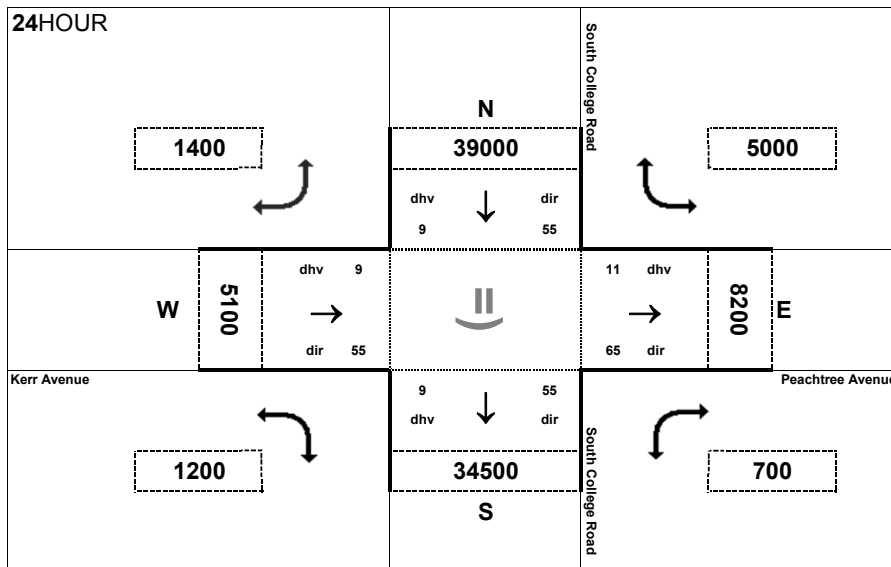
**Peak Hour Volume Breakouts Report:**  
 (19) South College Road @ Oleander Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



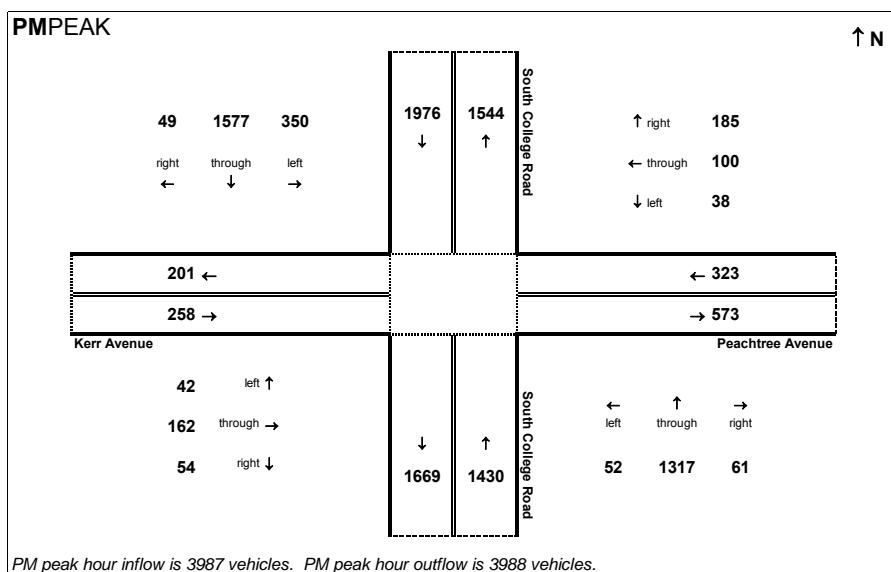
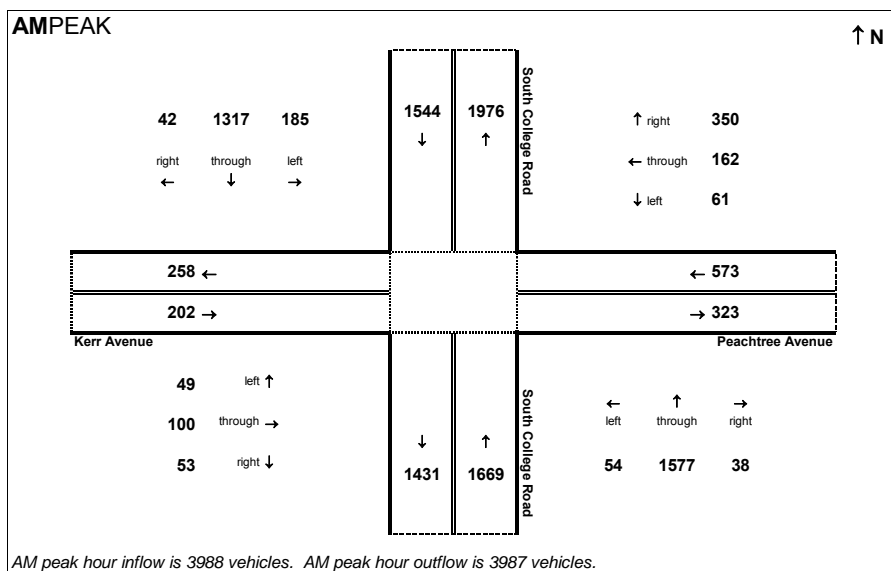


**Peak Hour Volume Breakouts Report:**  
 (20) South College Road @ Kerr Avenue

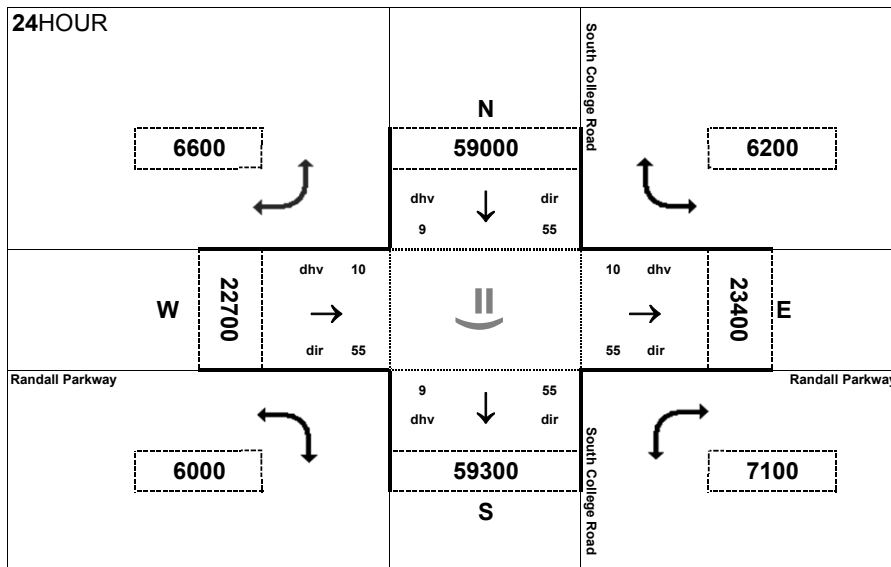
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434





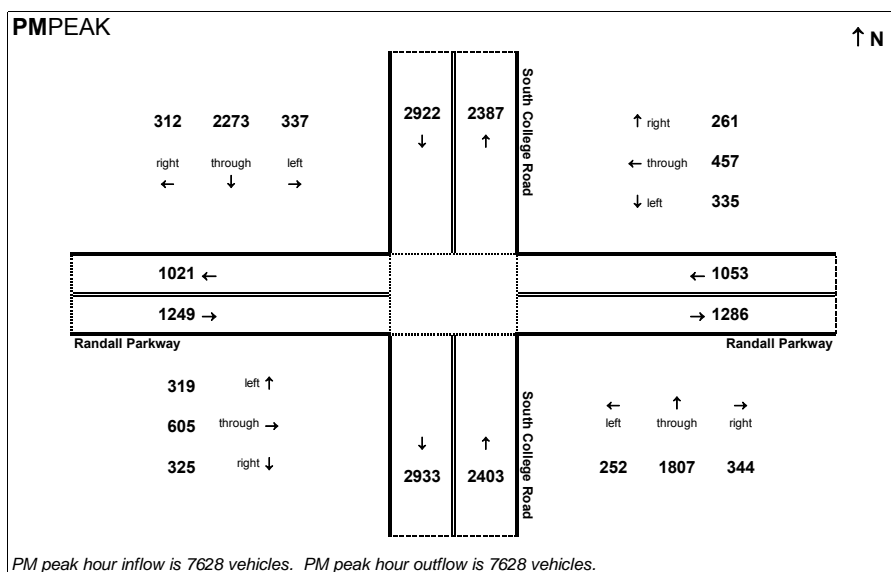
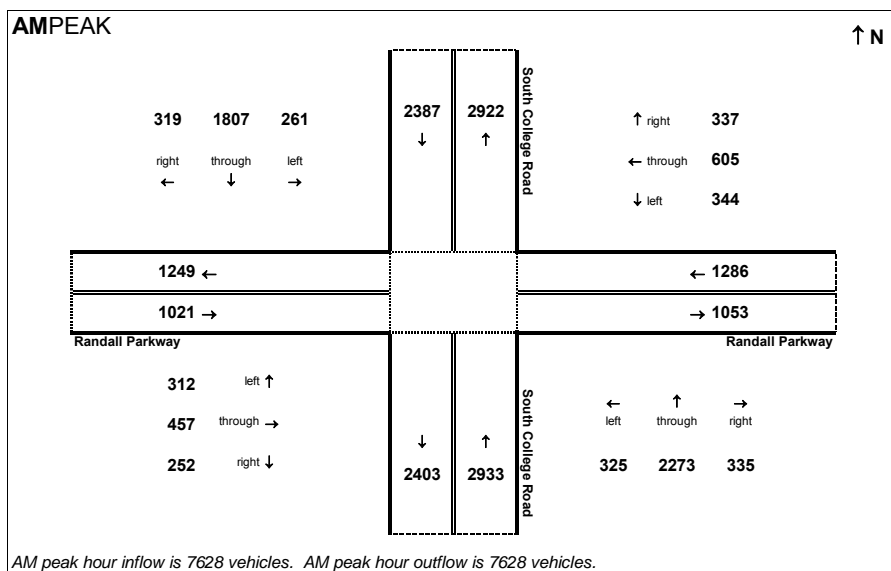


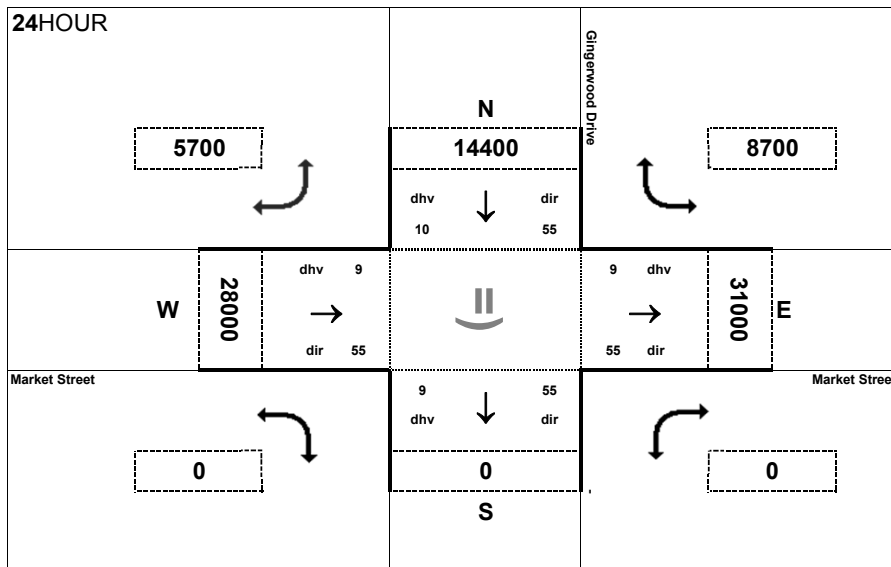
**Peak Hour Volume Breakouts Report:**  
 (21) South College Road @ Randall Parkway

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



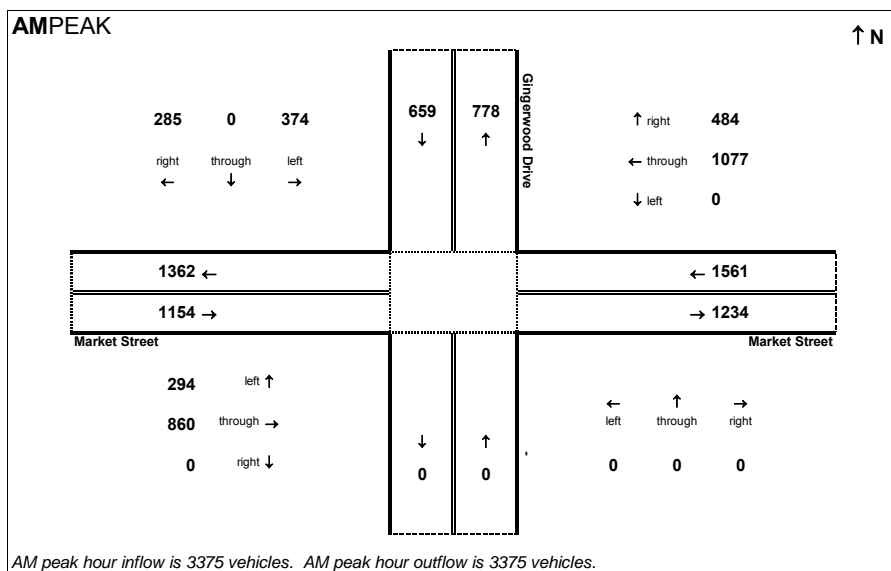


**Peak Hour Volume Breakouts Report:**  
 (22) Market Street @ Gingerwood Drive

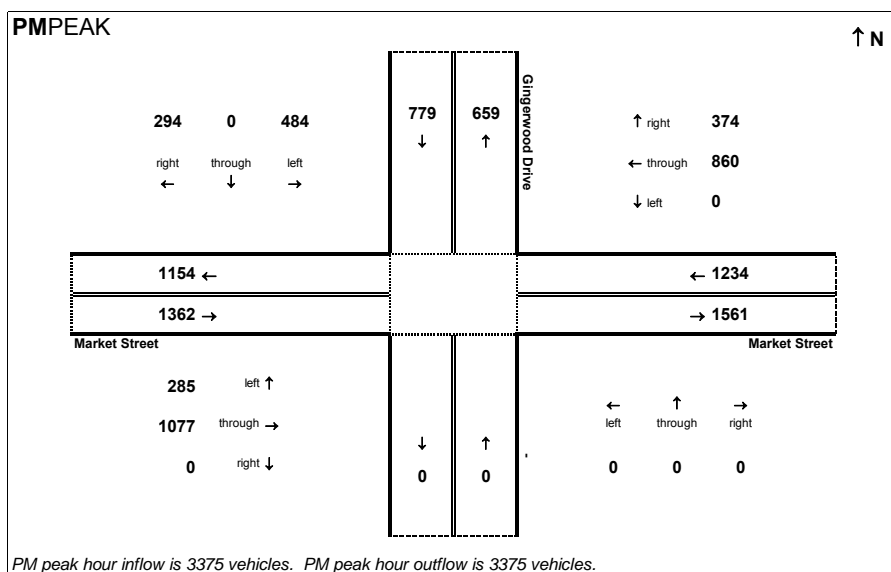
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

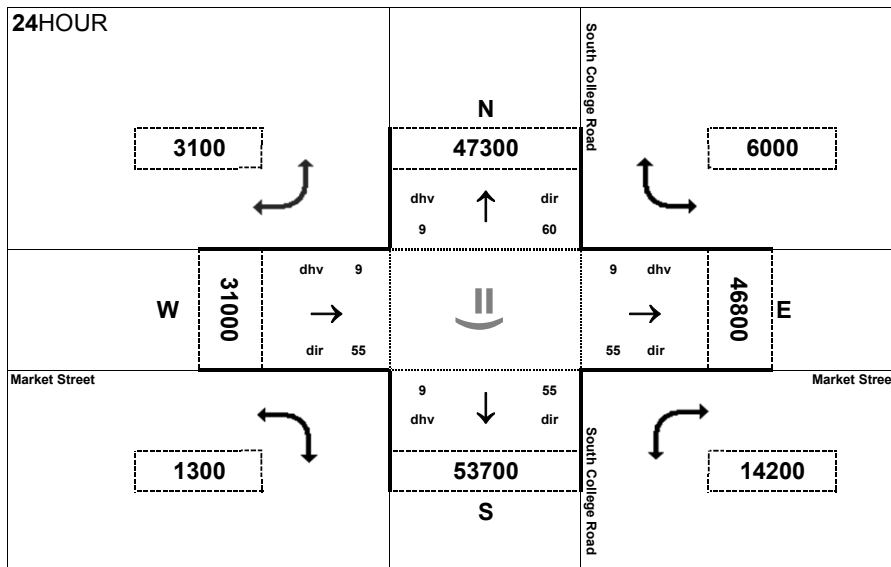
**Project:**  
 TIP: U-4434



AM peak hour inflow is 3375 vehicles. AM peak hour outflow is 3375 vehicles.



PM peak hour inflow is 3375 vehicles. PM peak hour outflow is 3375 vehicles.

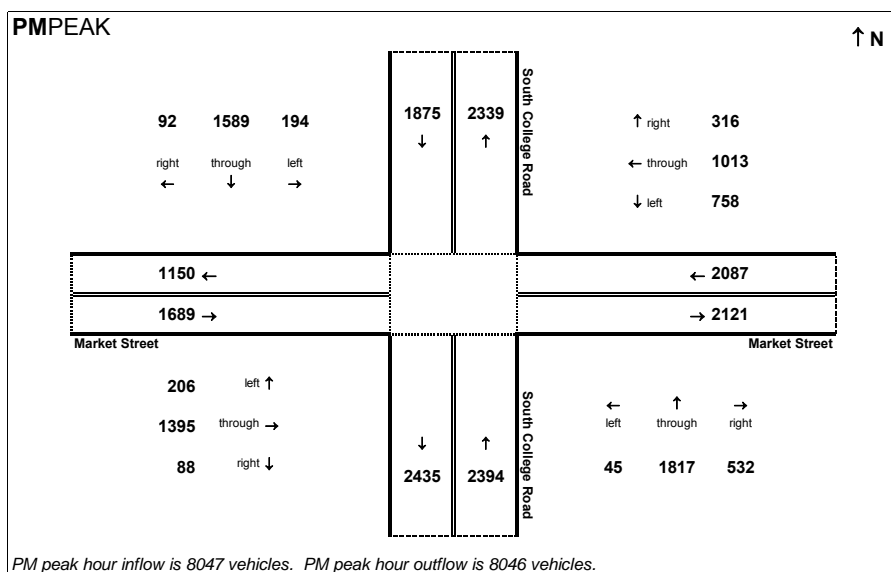
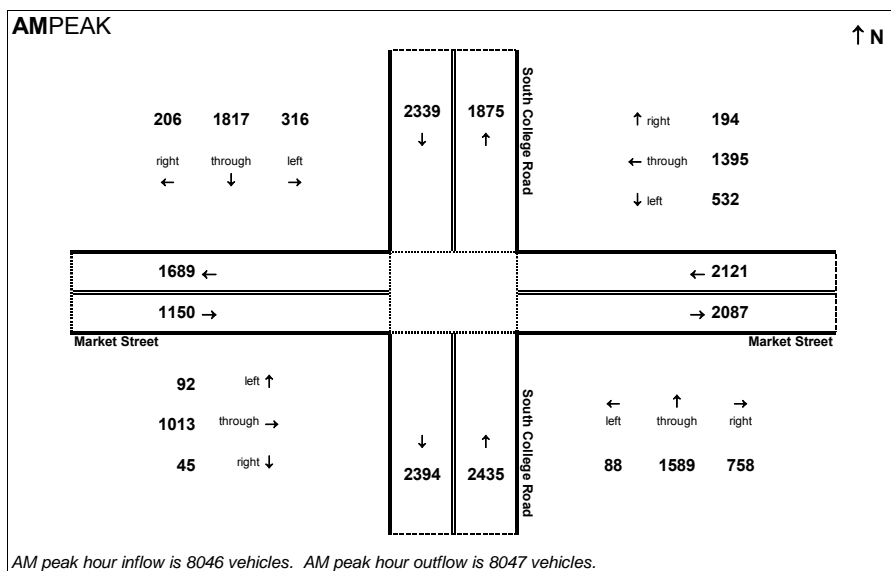


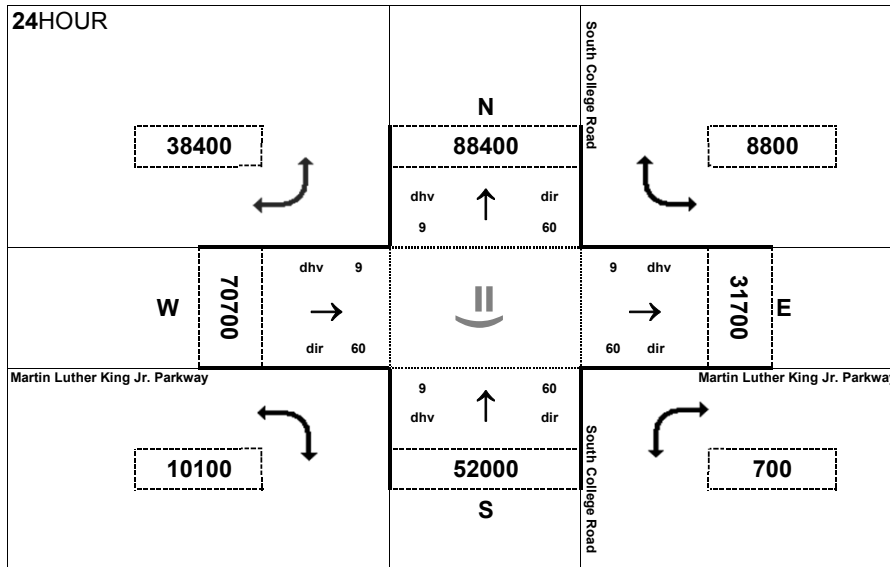
**Peak Hour Volume Breakouts Report:**  
 (23) South College Road @ Market Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



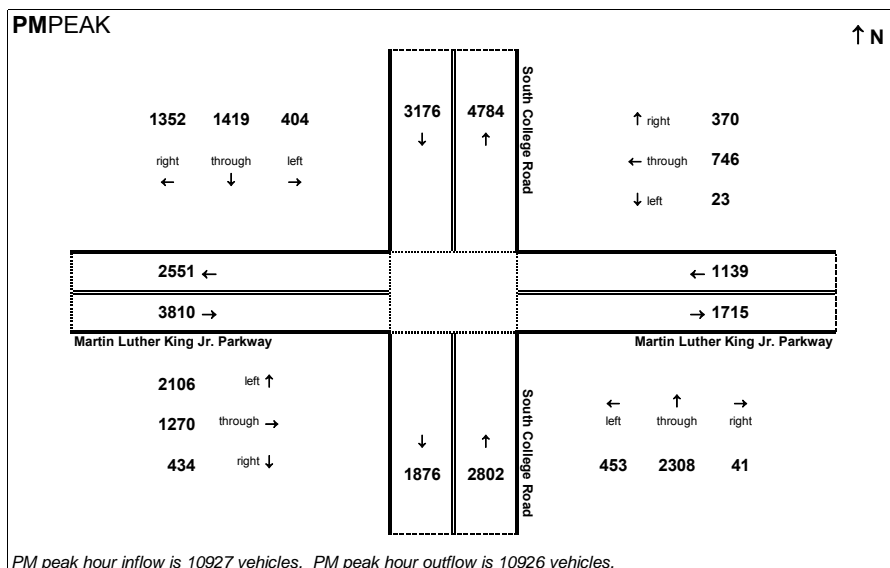
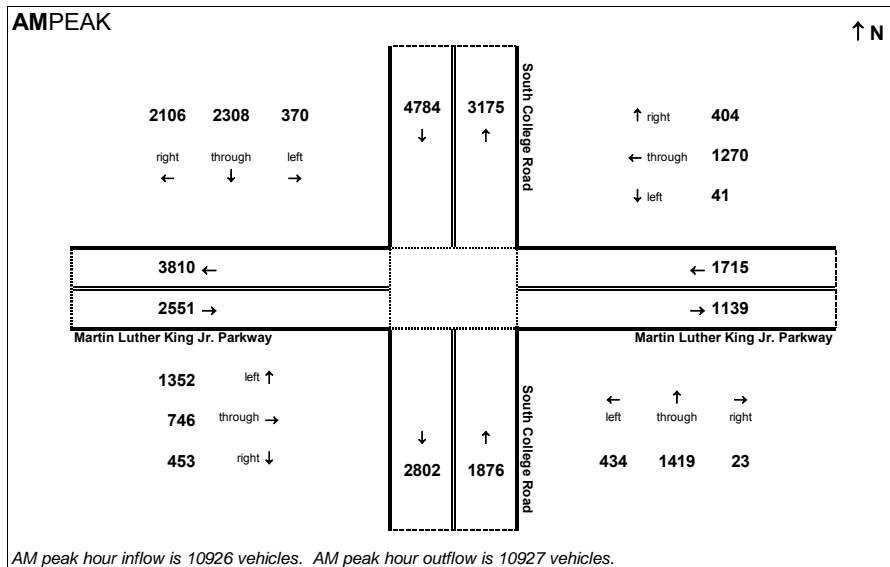


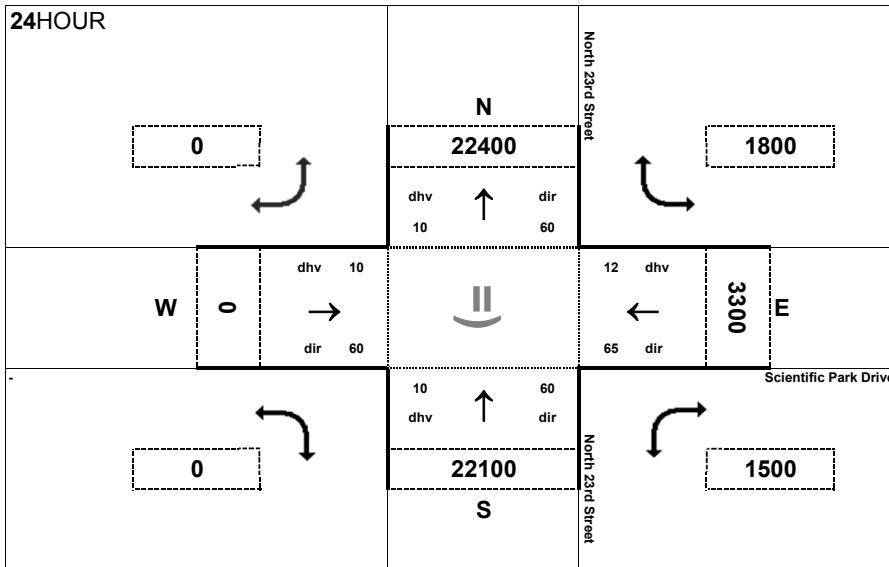
**Peak Hour Volume Breakouts Report:**  
 (24) South College Road @ Martin Luther King Jr. Parkway

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



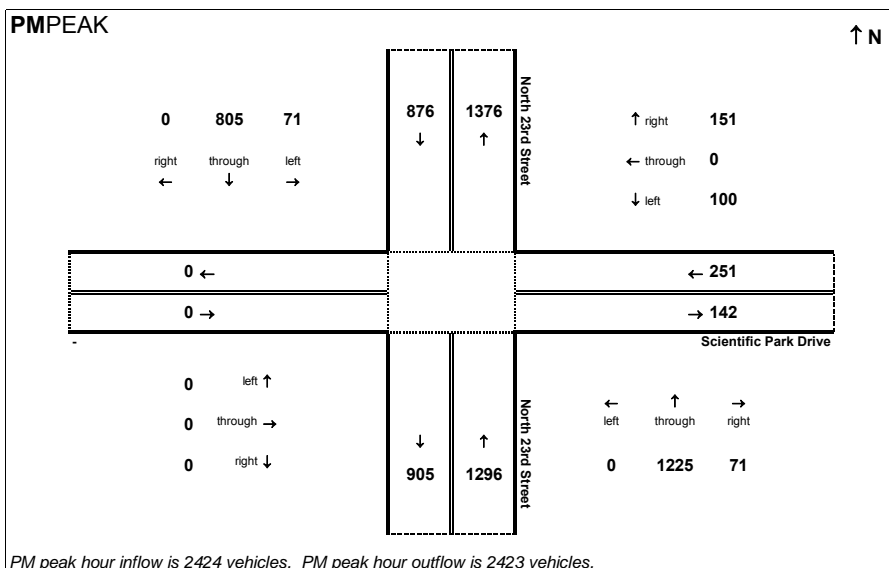
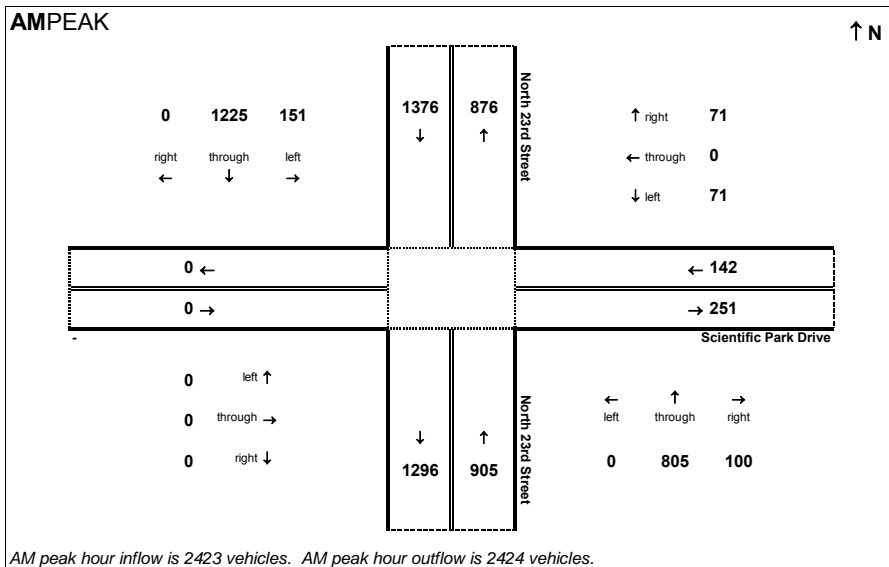


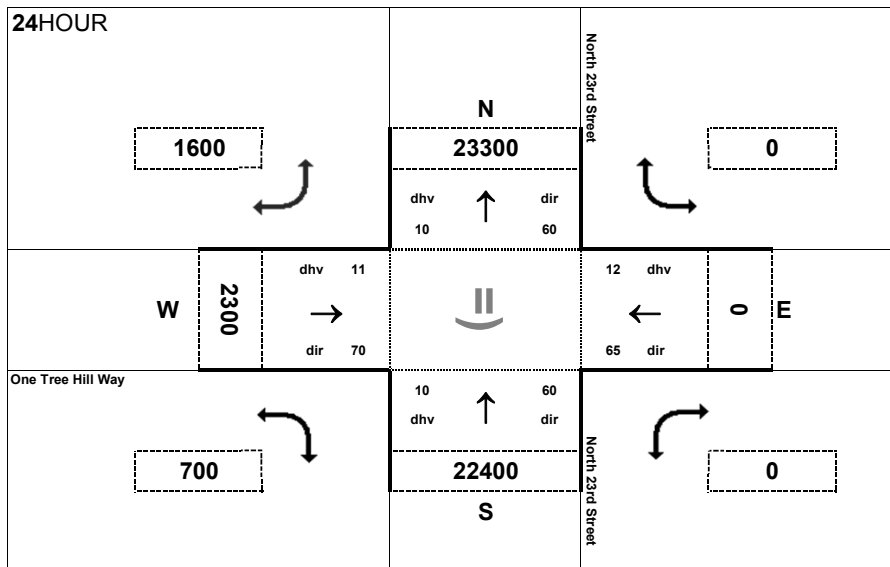
**Peak Hour Volume Breakouts Report:**  
 (25) North 23rd Street @ Scientific Park Drive

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



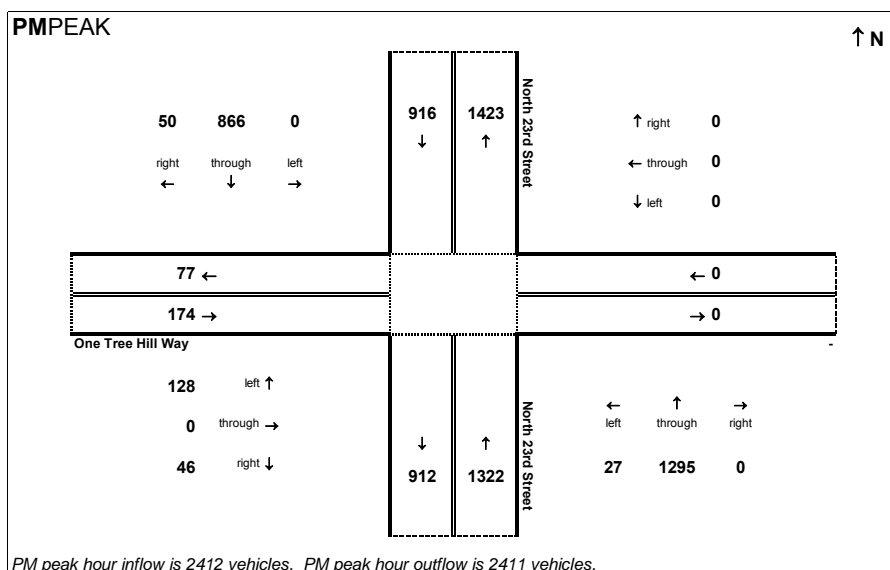
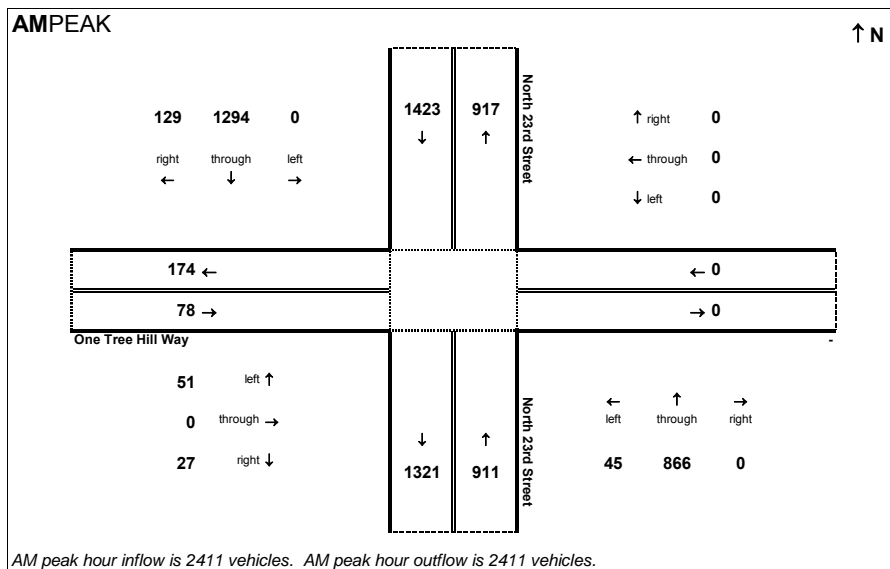


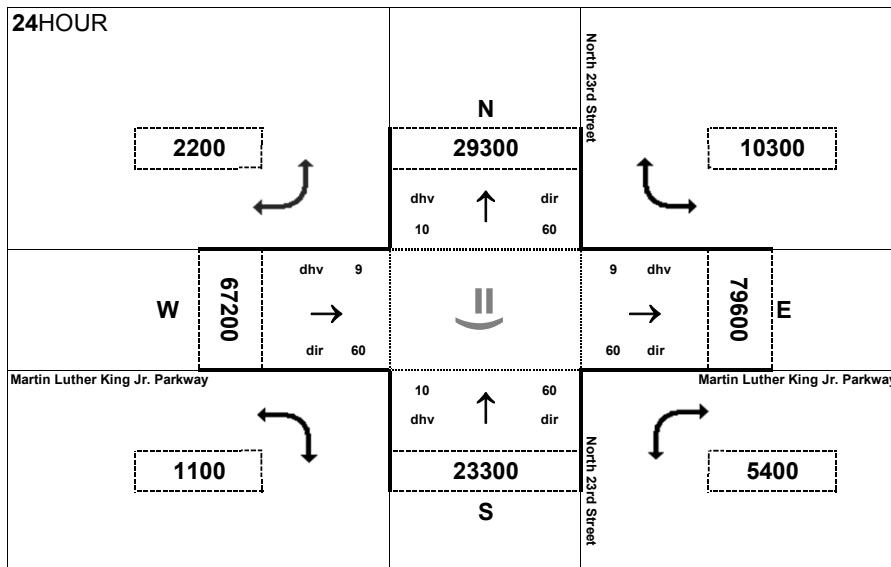
**Peak Hour Volume Breakouts Report:**  
 (26) North 23rd Street @ One Tree Hill Way

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



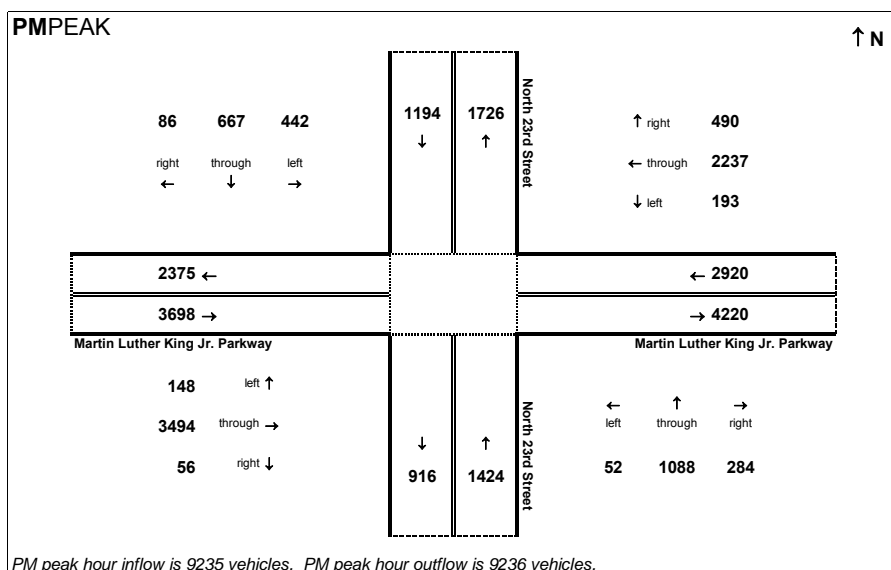
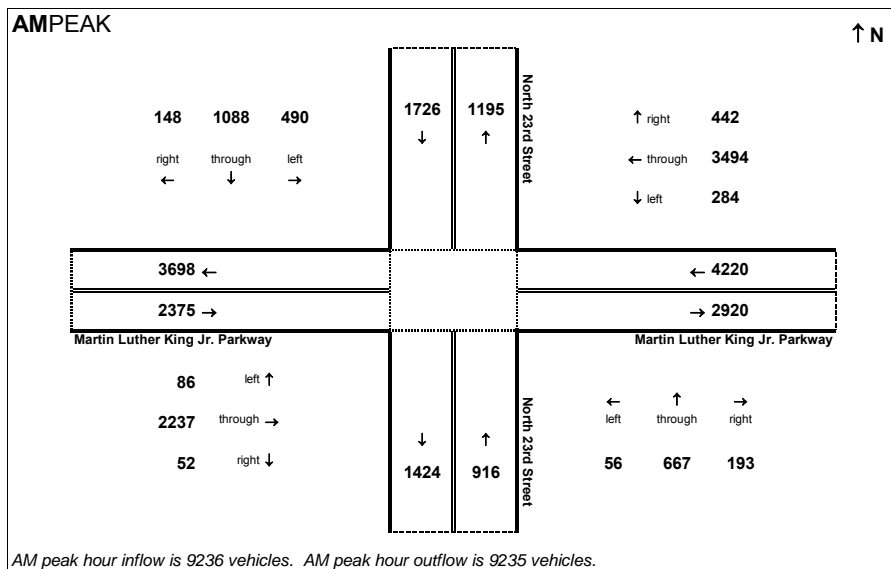


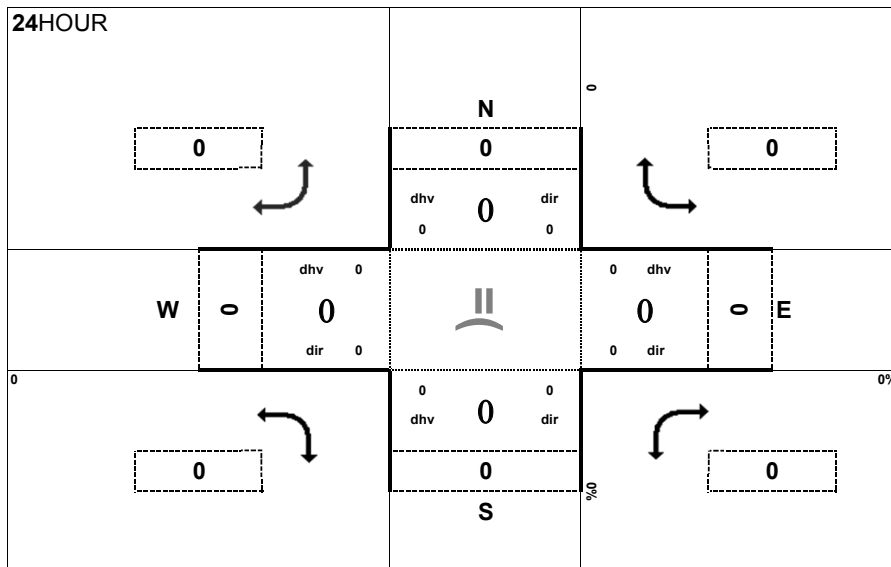
**Peak Hour Volume Breakouts Report:**  
 (27) Martin Luther King Jr. Parkway @ North 23rd Street

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



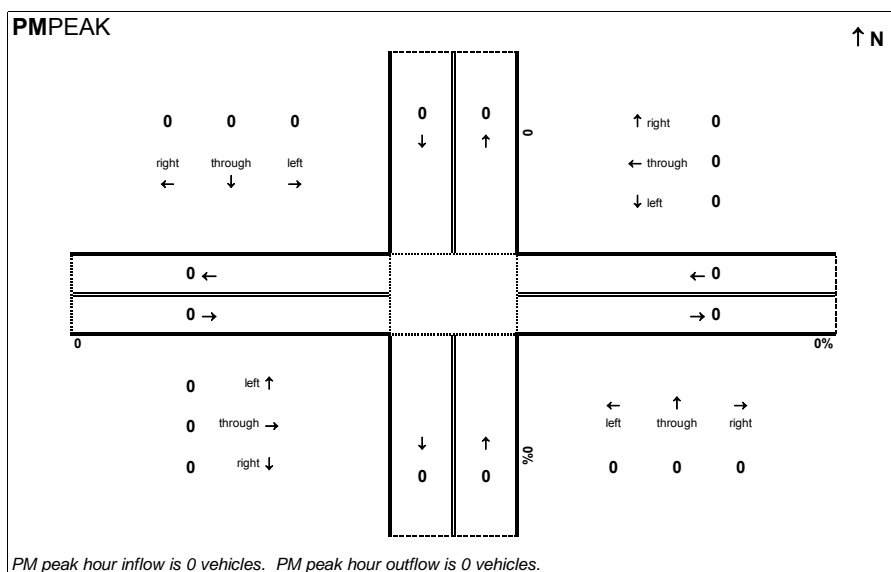
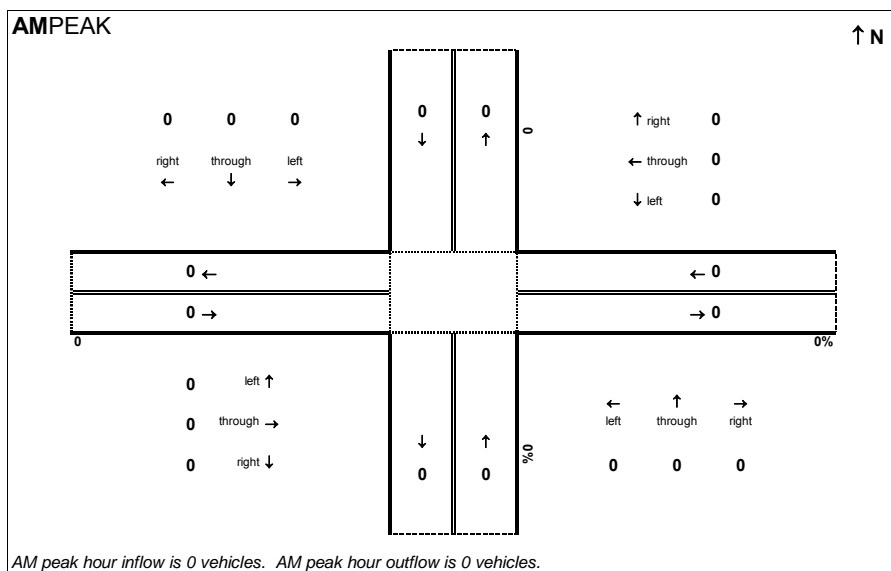


**Peak Hour Volume Breakouts Report:**  
 (28) Martin Luther King Jr. Parkway @ Komegay Avenue

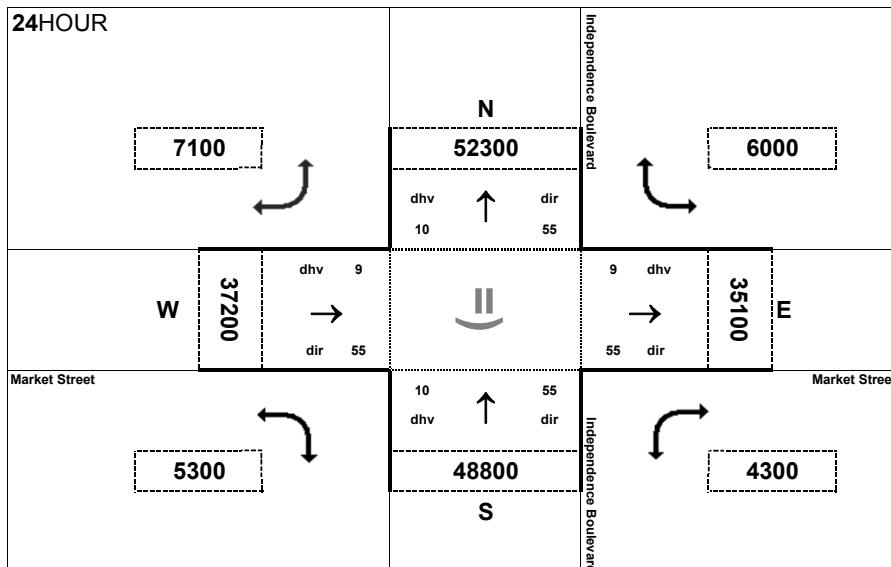
**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434





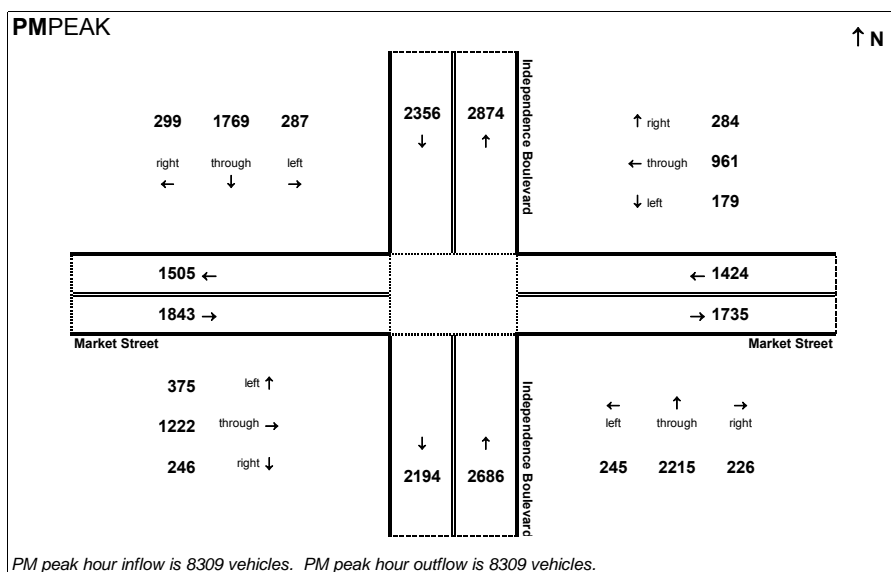
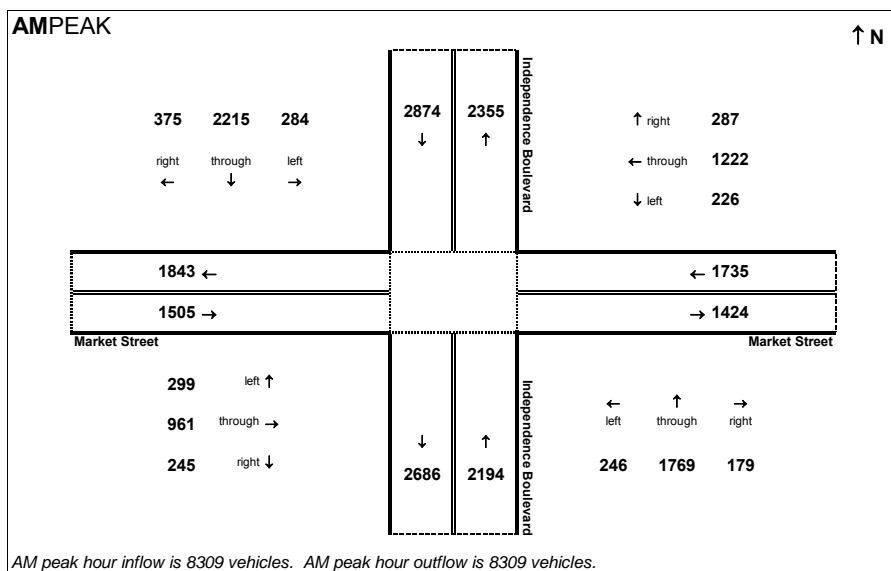


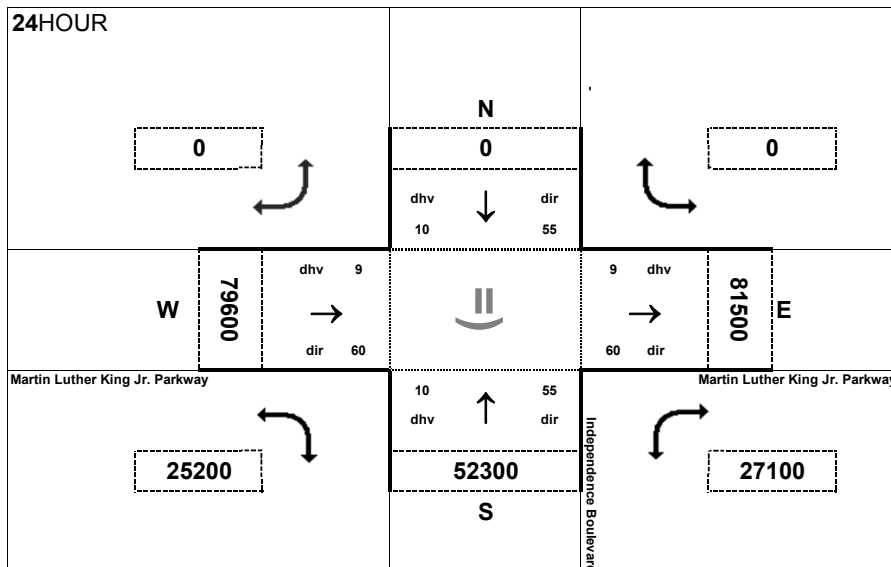
**Peak Hour Volume Breakouts Report:**  
 (29) Market Street @ Independence Boulevard

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



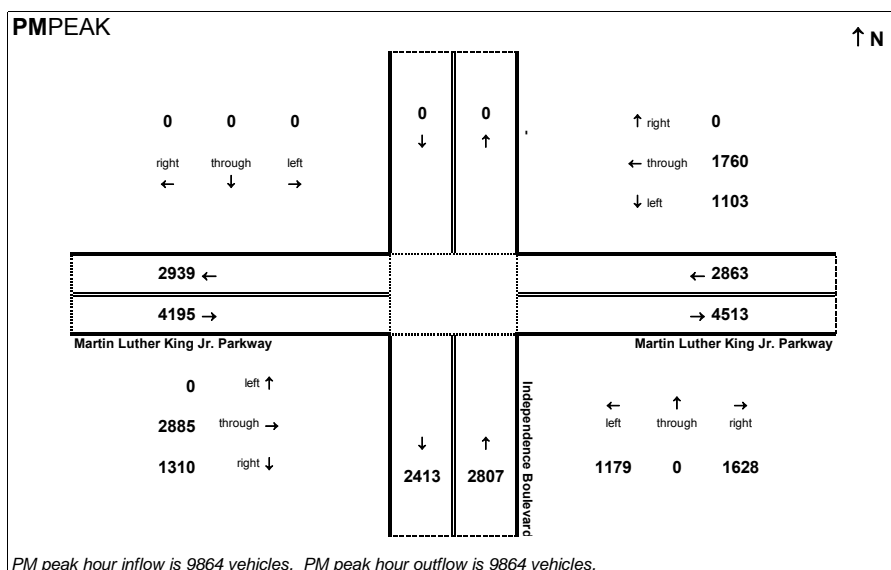
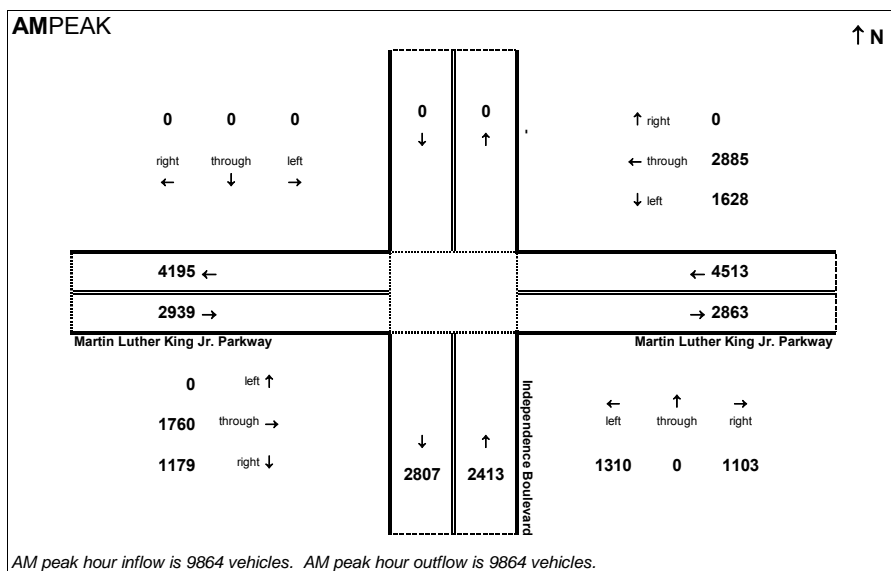


**Peak Hour Volume Breakouts Report:**  
 (30) Independence Boulevard @ Martin Luther King Jr. Parkway

**Traffic Forecast Release Date:**  
 August-12

**Traffic Data Year:**  
 2040 - Future Year Build - Without Skyway

**Project:**  
 TIP: U-4434



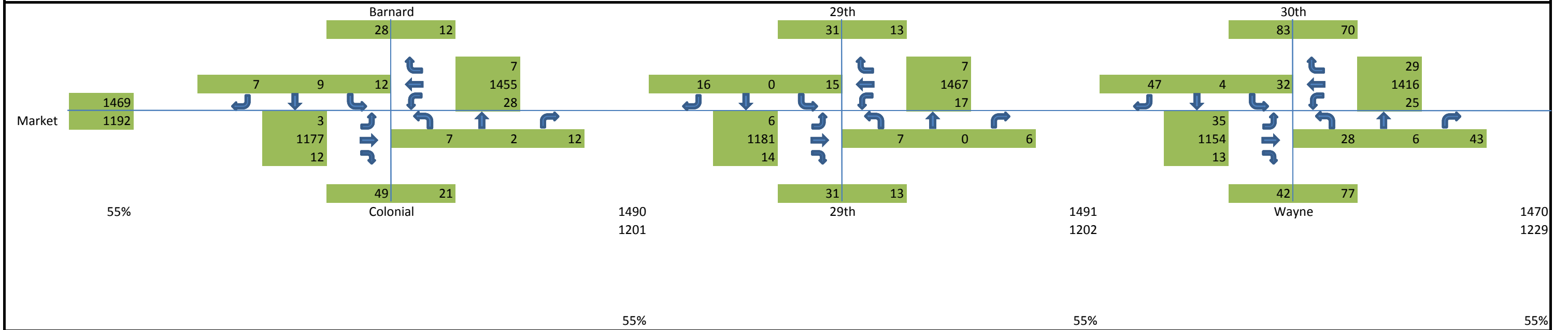
# Appendix C: Traffic Volume Adjustments and Balancing

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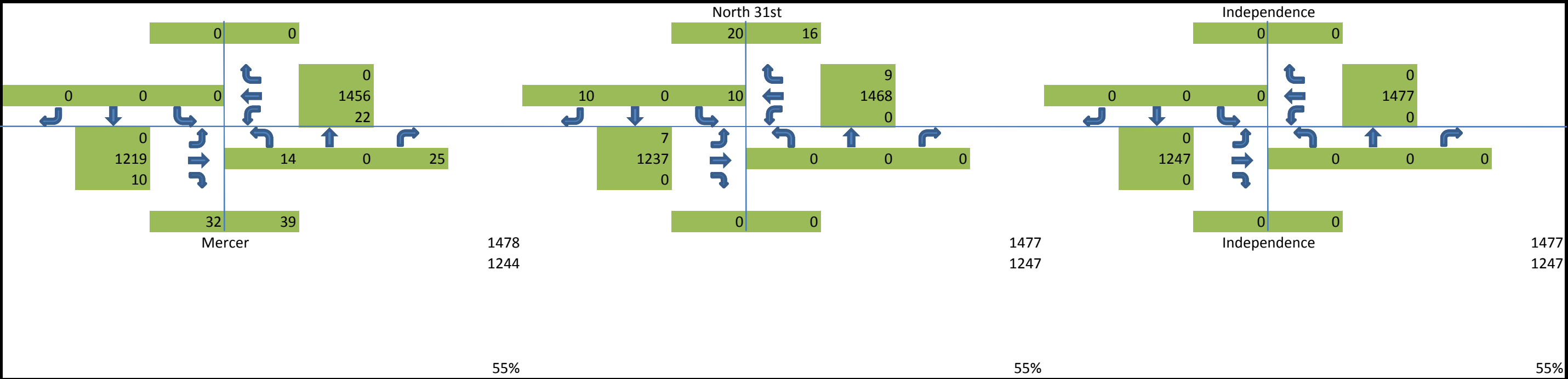
## US 17 Business (Market Street) Corridor

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## 2012 BASE YEAR AM PEAK

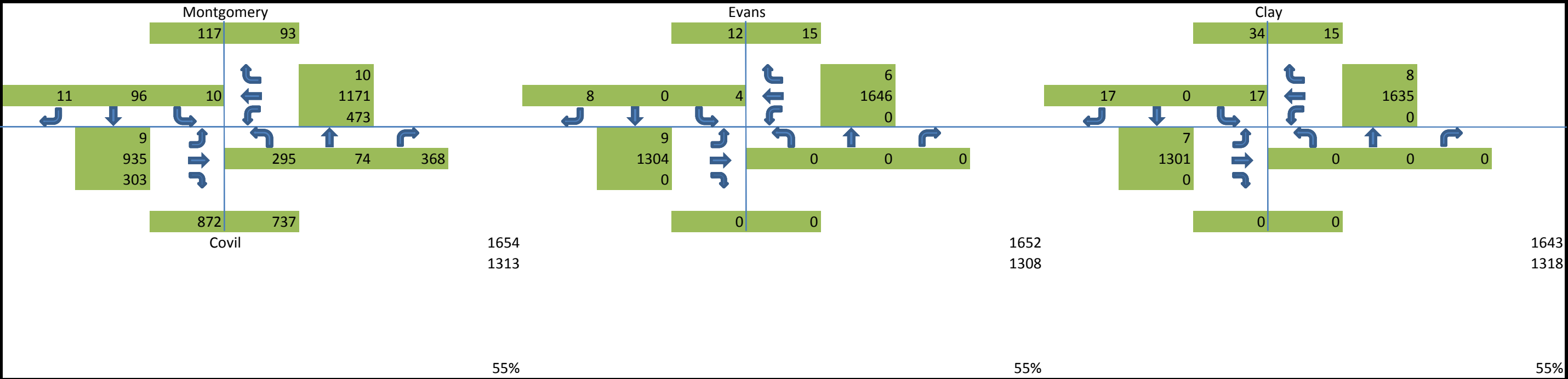


# 2012 BASE YEAR AM PEAK

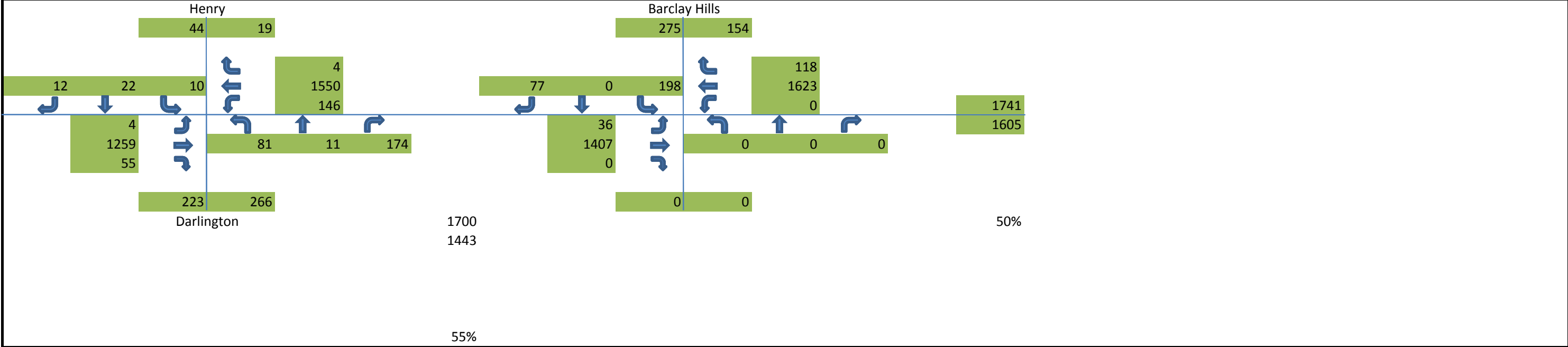




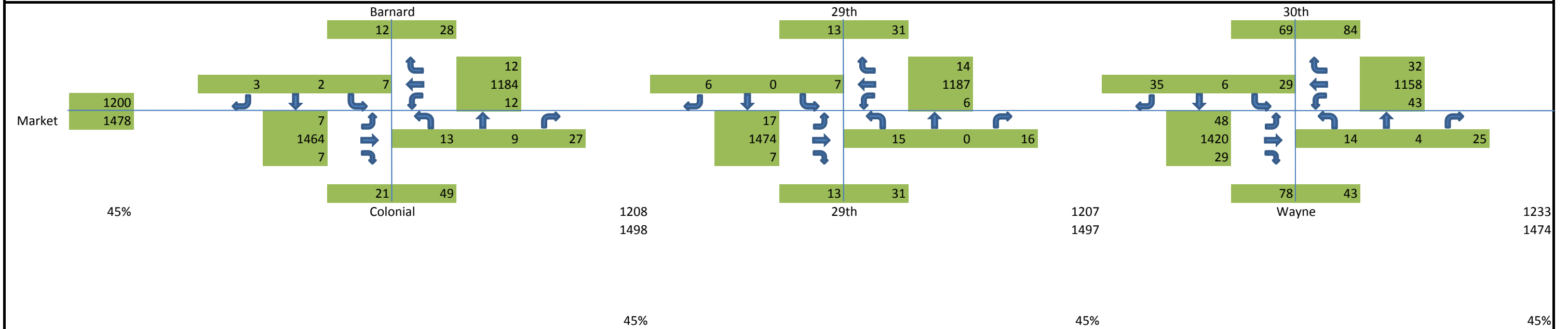
# 2012 BASE YEAR AM PEAK



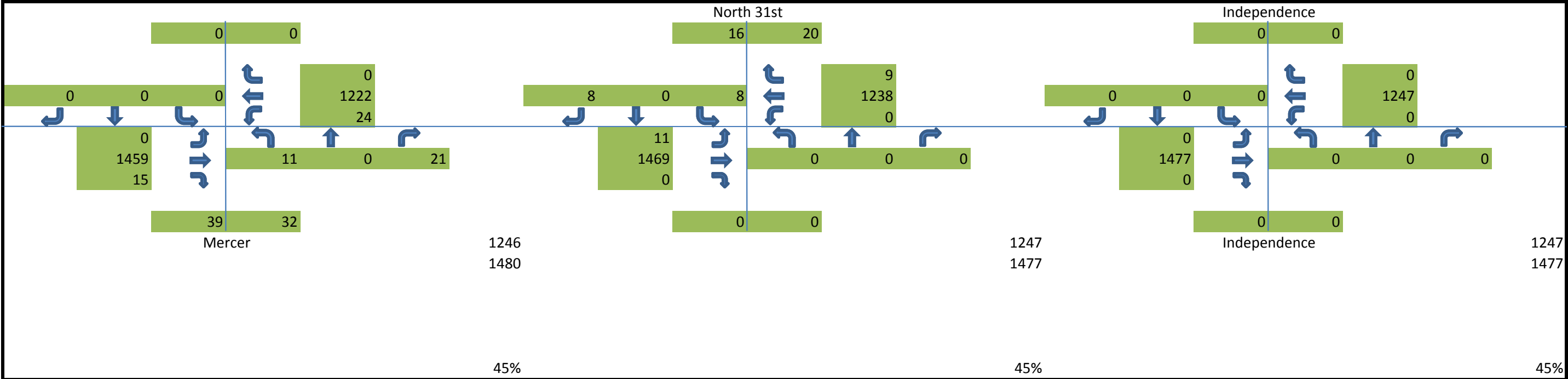
### 2012 BASE YEAR AM PEAK



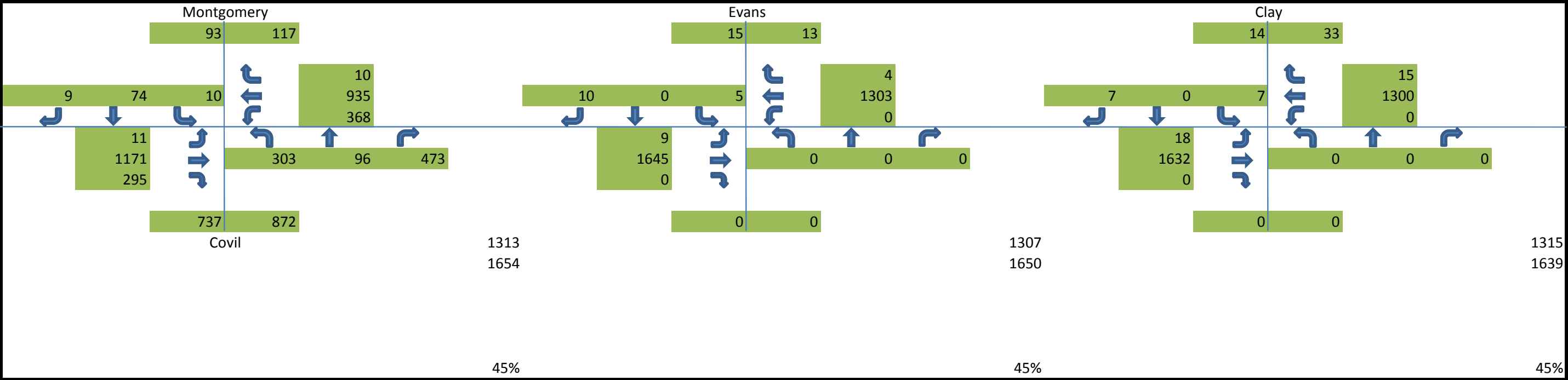
## 2012 BASE YEAR PM PEAK



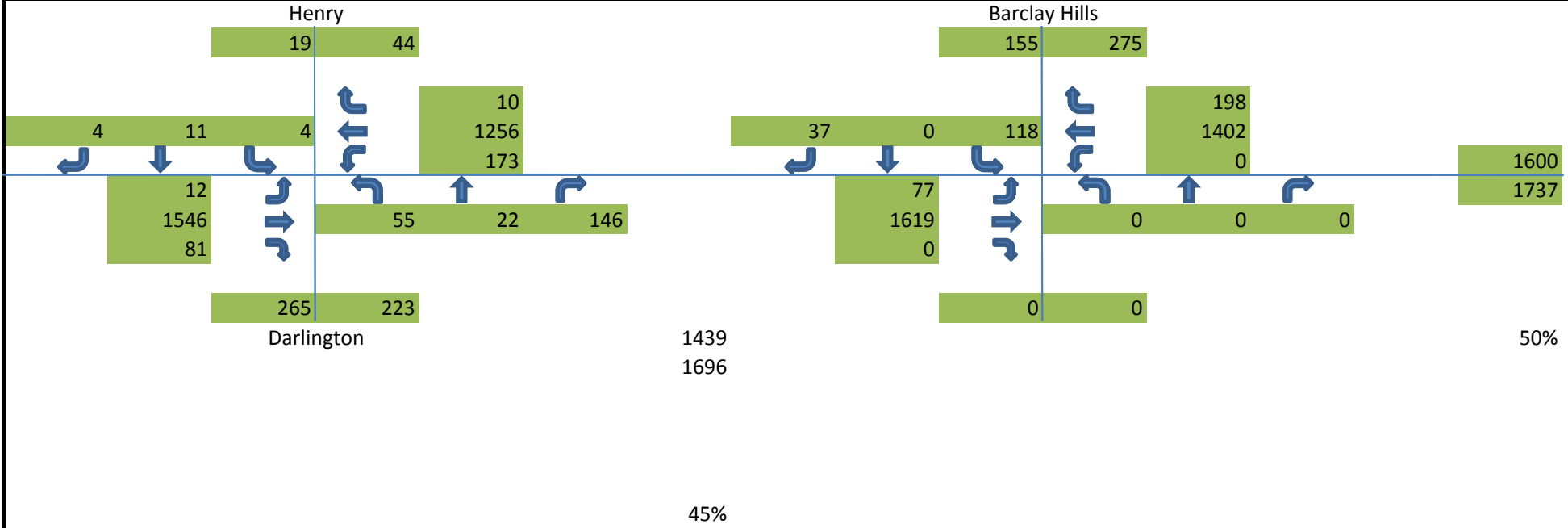
# 2012 BASE YEAR PM PEAK



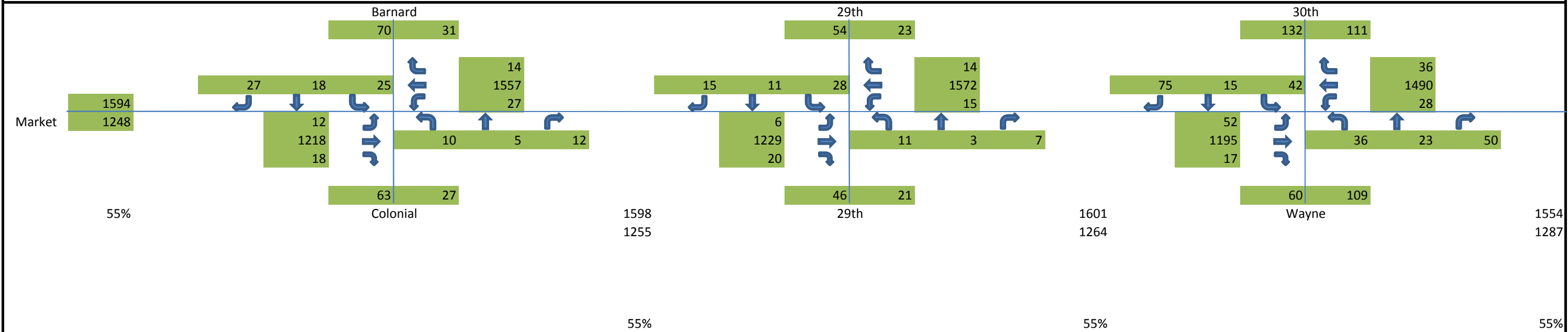
# 2012 BASE YEAR PM PEAK



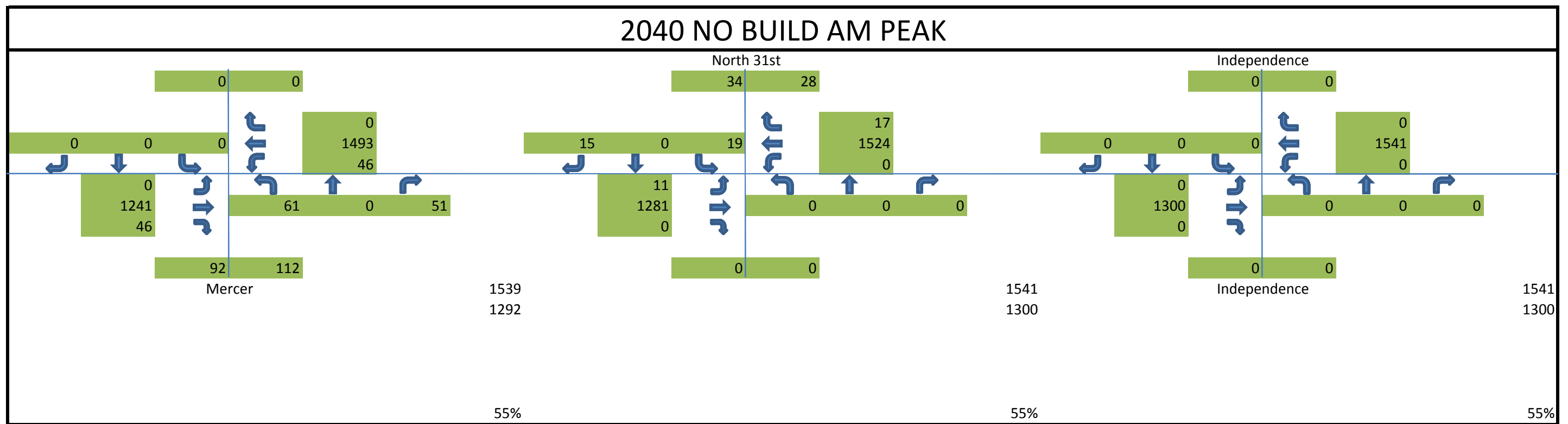
### 2012 BASE YEAR PM PEAK



### 2040 NO BUILD AM PEAK

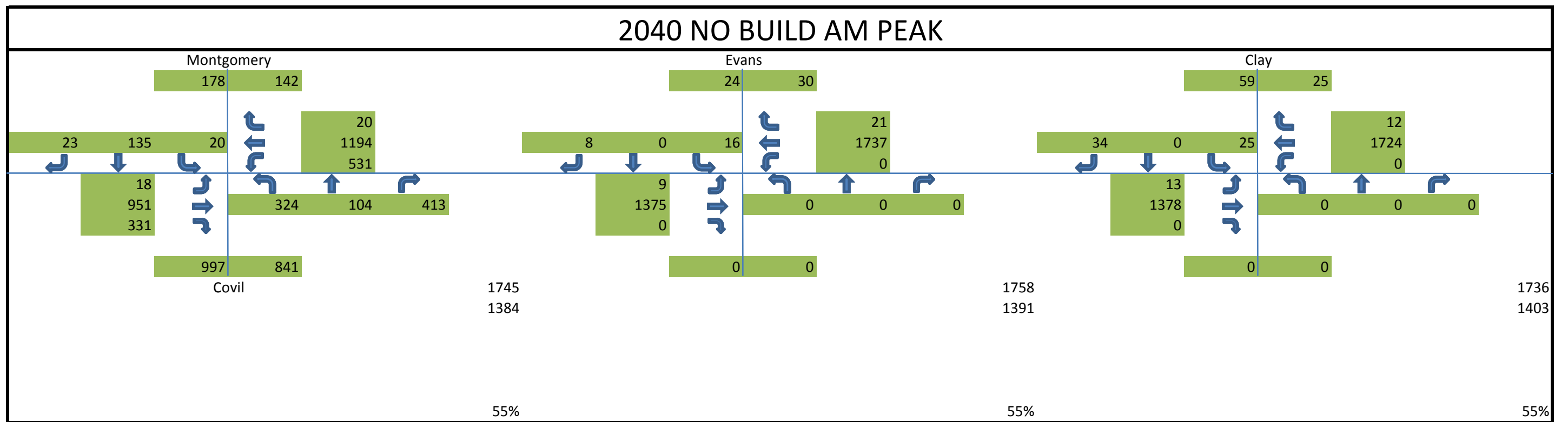


# 2040 NO BUILD AM PEAK

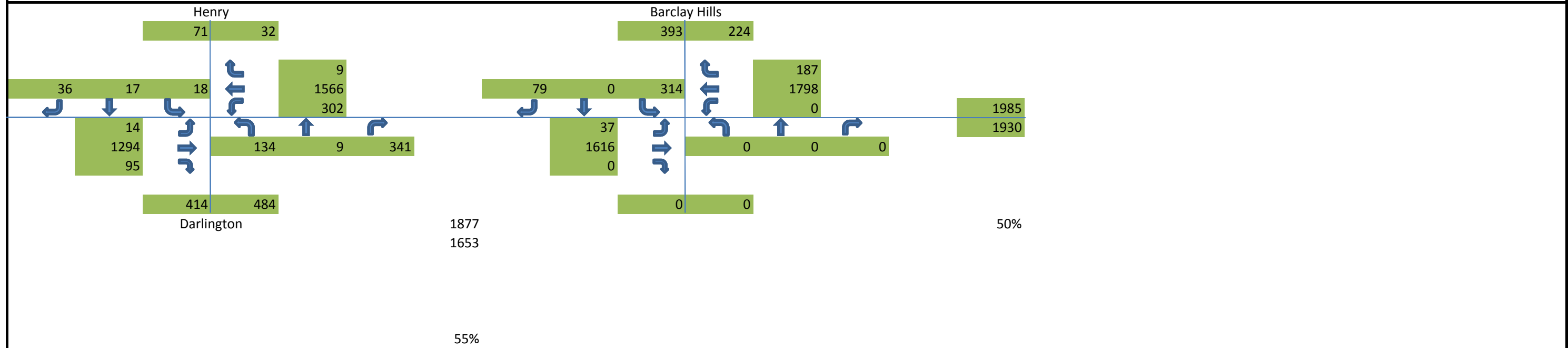




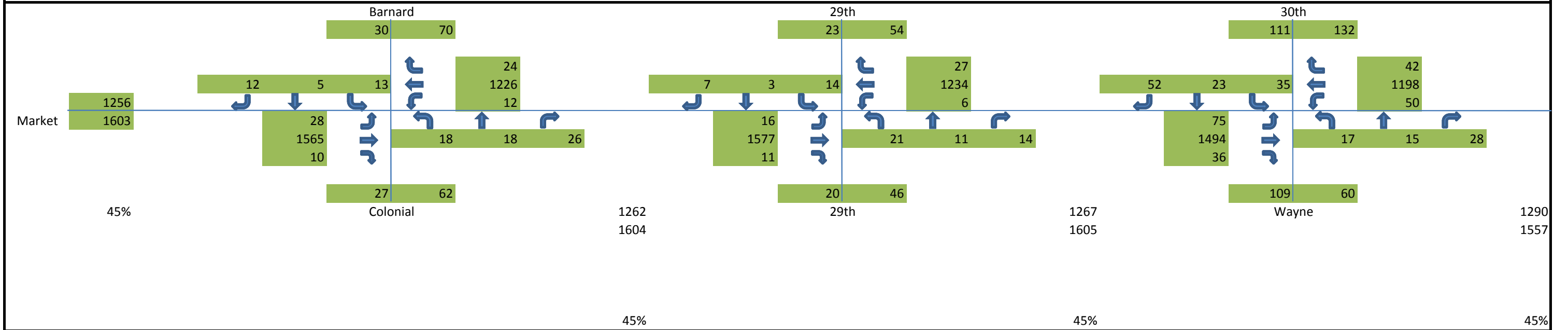
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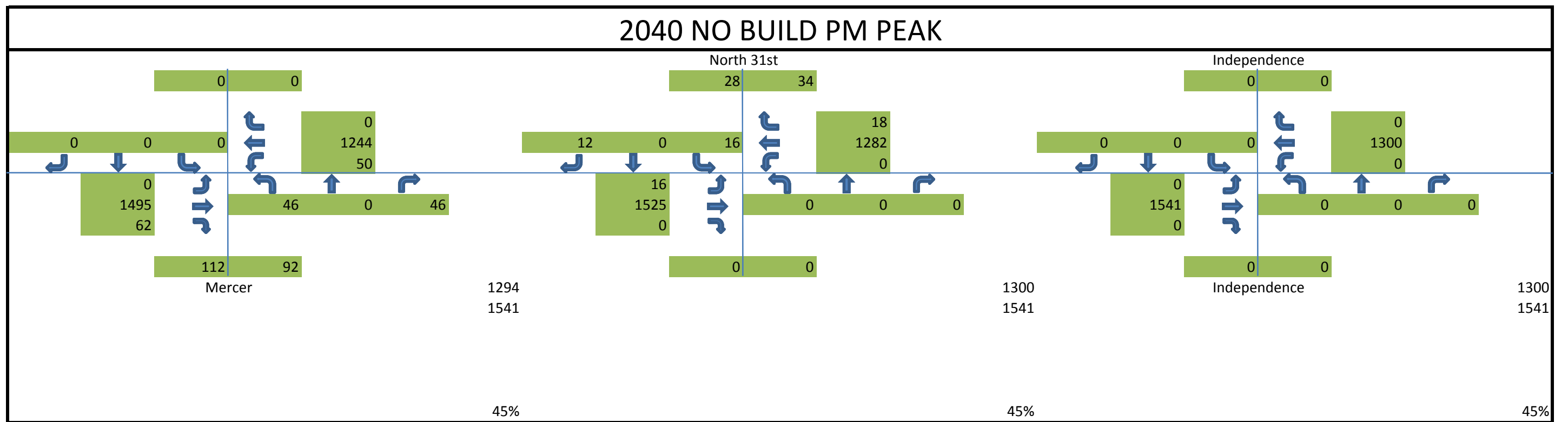
## 2040 NO BUILD AM PEAK



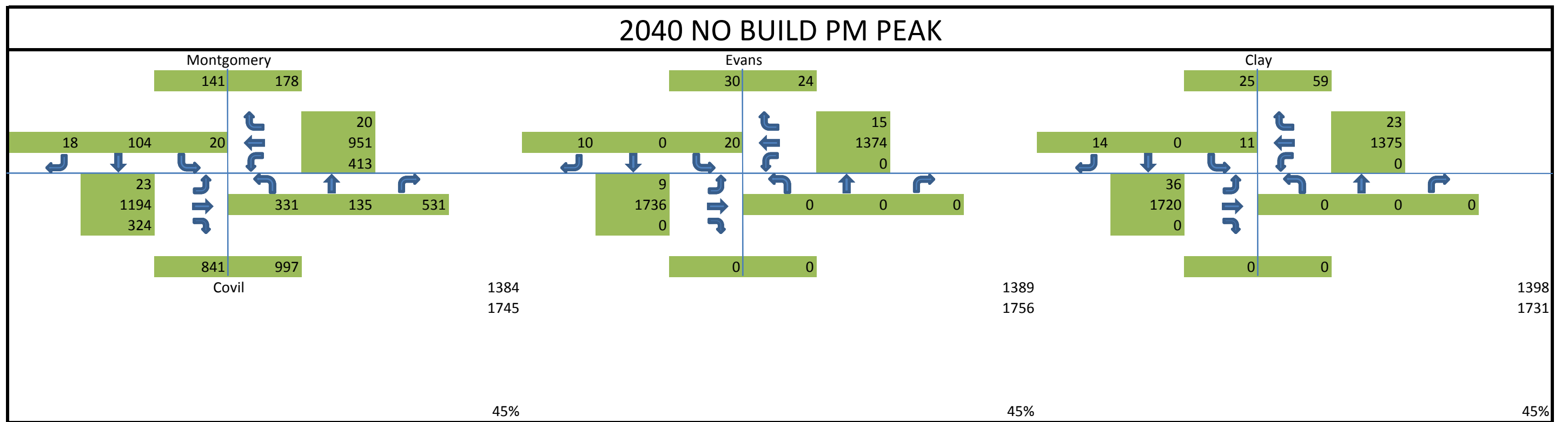
## 2040 NO BUILD PM PEAK



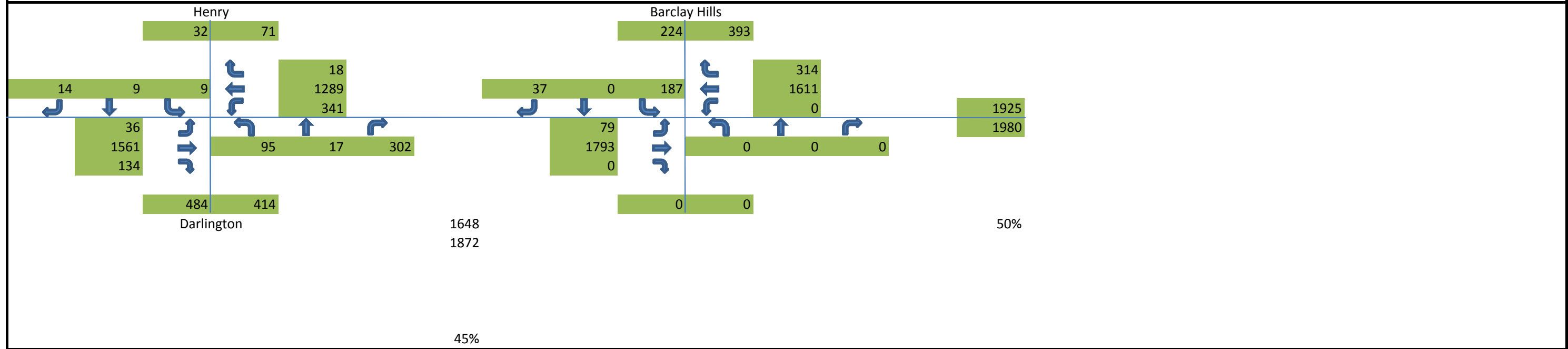
# 2040 NO BUILD PM PEAK



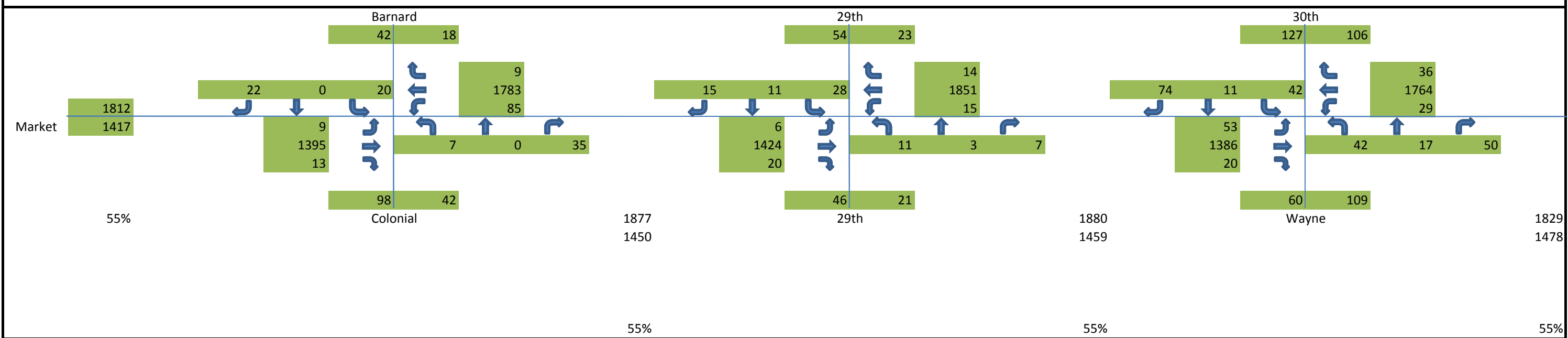
## 2040 NO BUILD PM PEAK



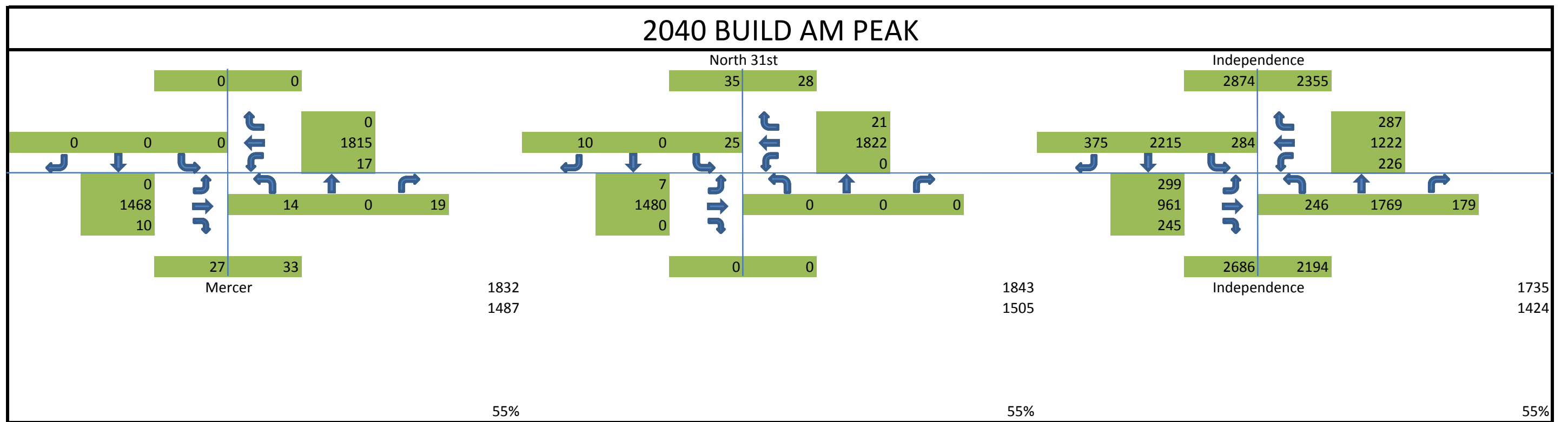
### 2040 NO BUILD PM PEAK



### 2040 BUILD AM PEAK

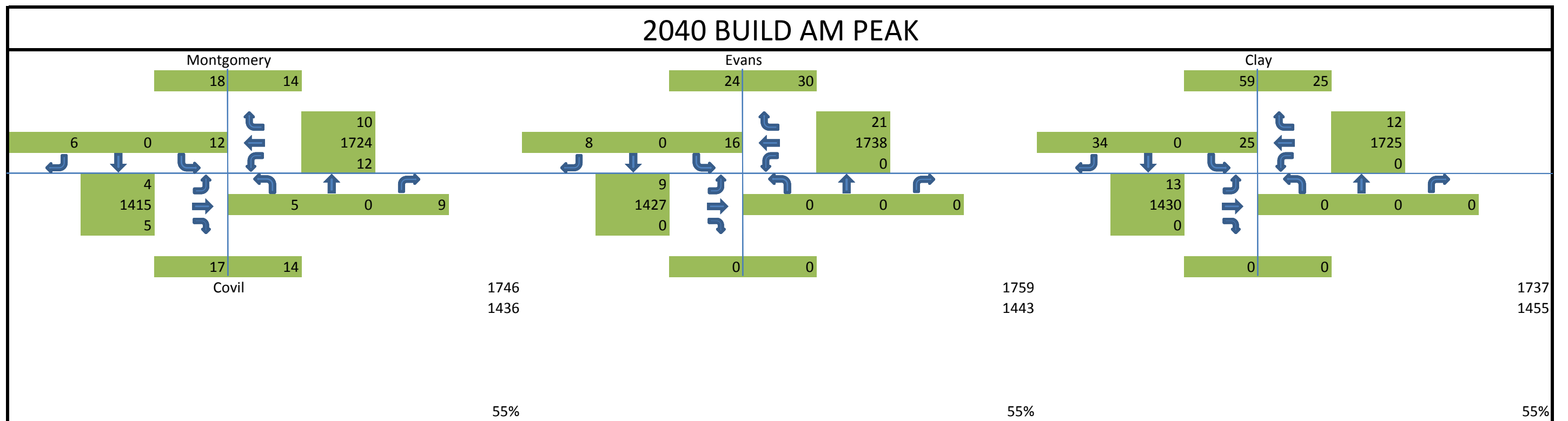


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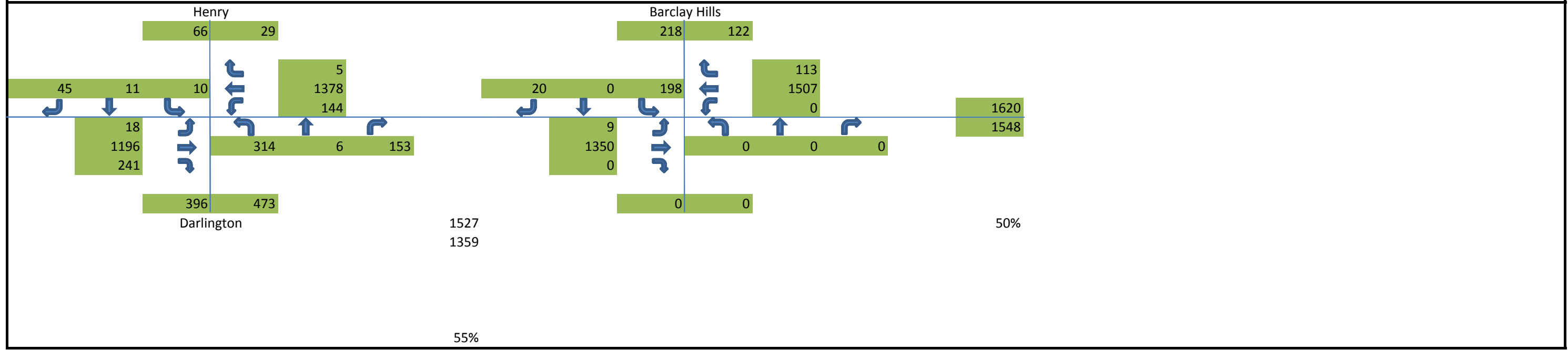




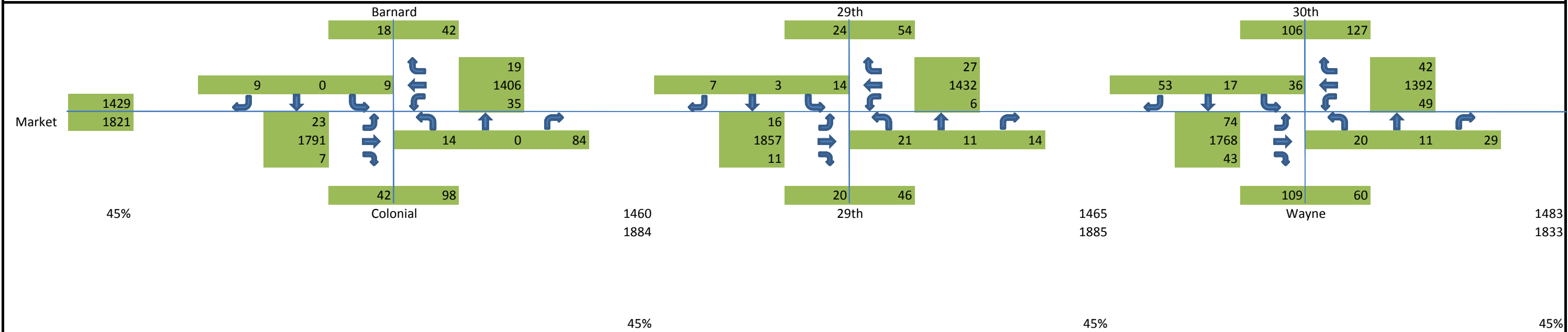
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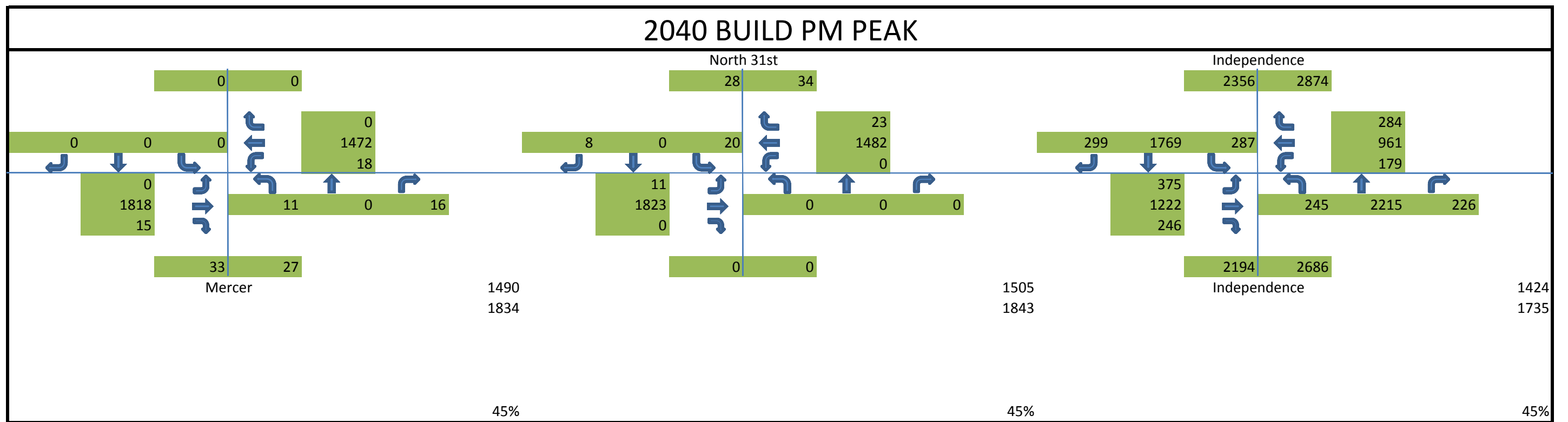
## 2040 BUILD AM PEAK



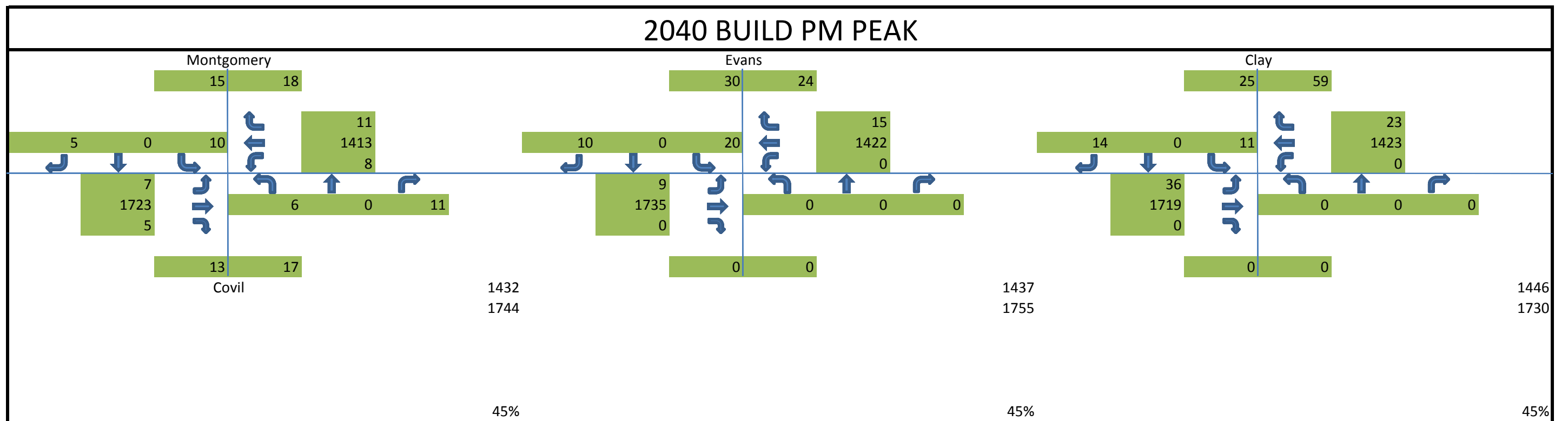
### 2040 BUILD PM PEAK



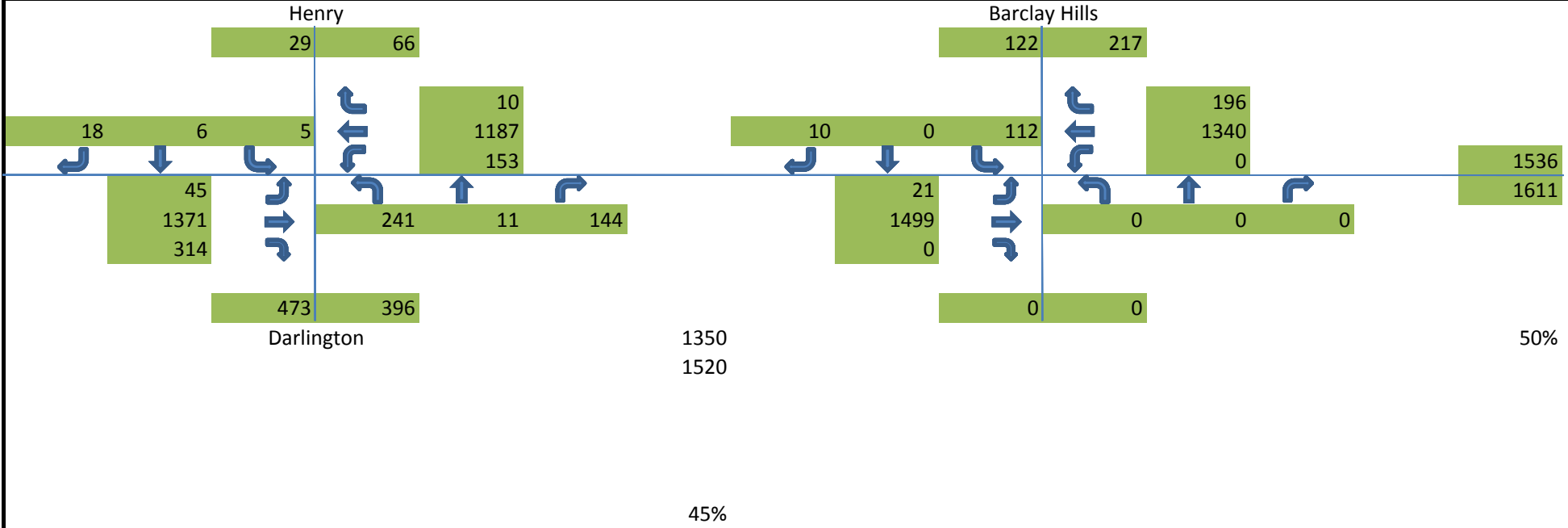
# 2040 BUILD PM PEAK



## 2040 BUILD PM PEAK



### 2040 BUILD PM PEAK

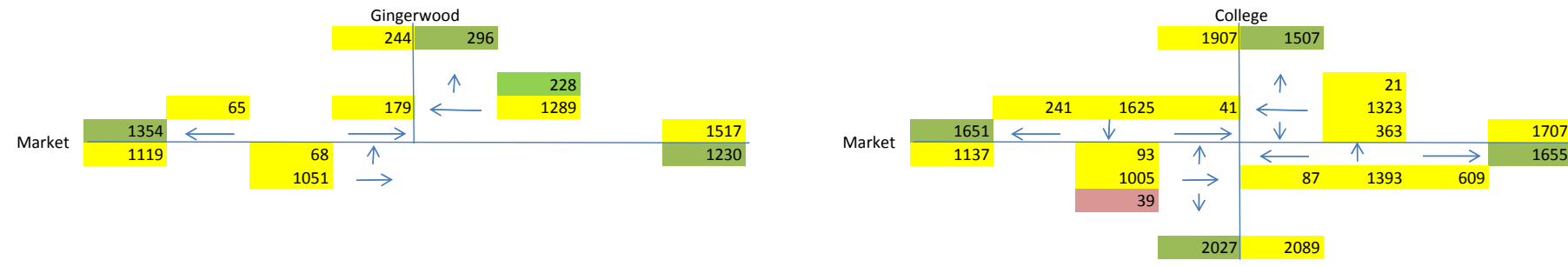


**US 117 (College Road) at US 17 Business (Market Street) and Gingerwood Drive**

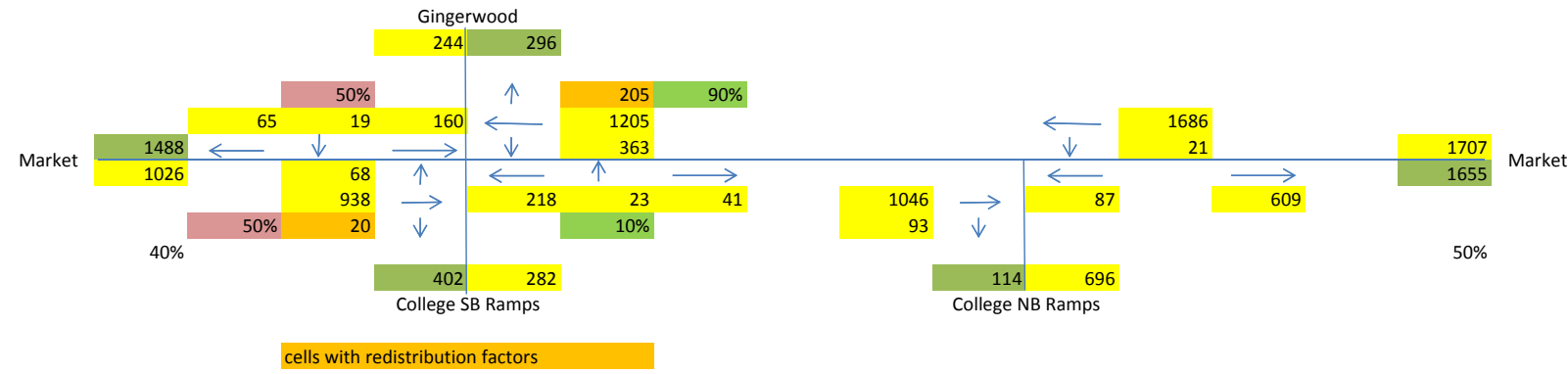
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2012 BASE YEAR AM  
PEAK IAU VOLUMES



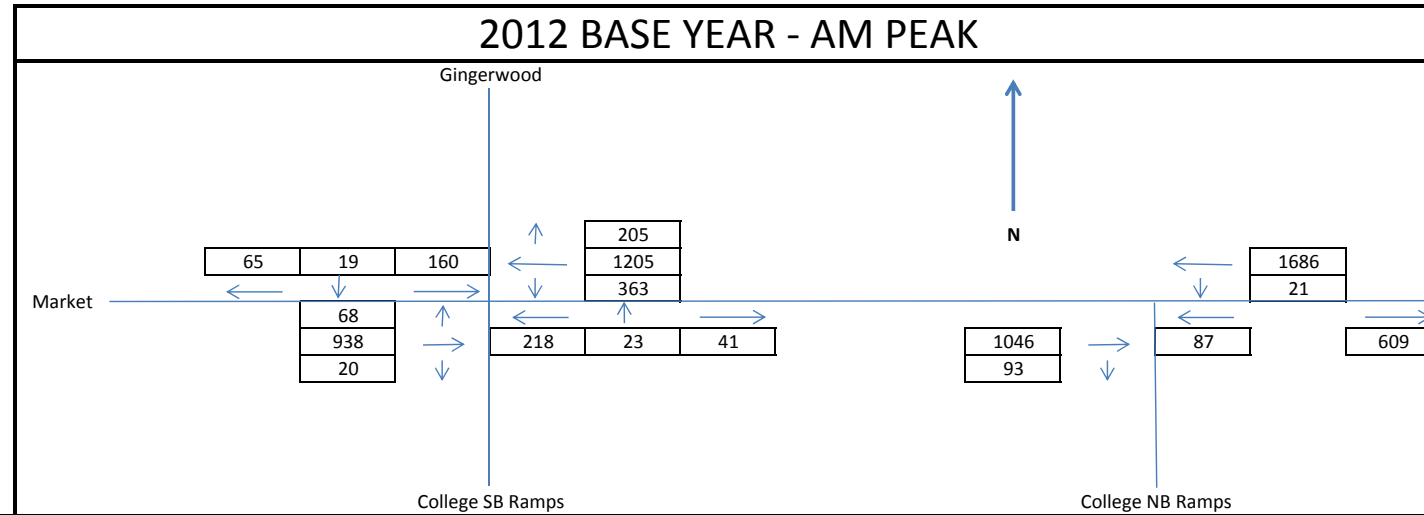
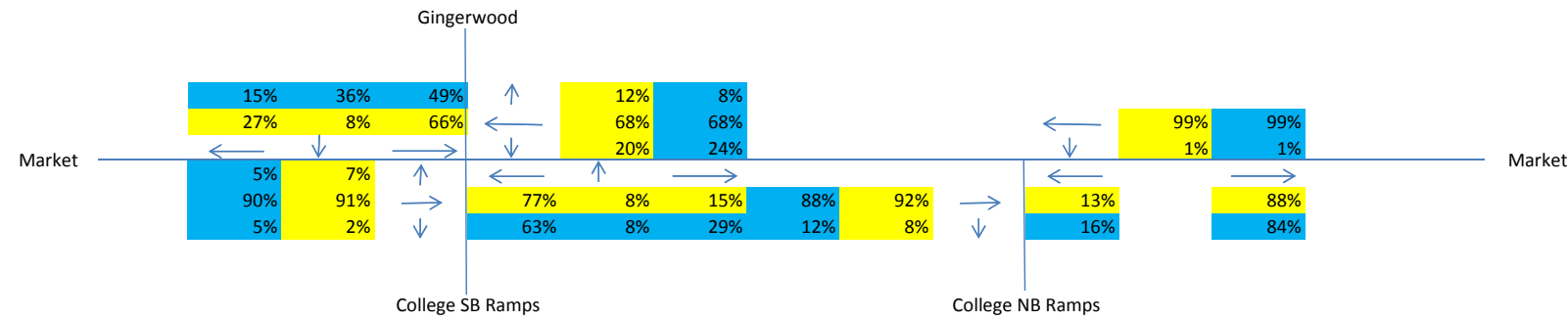
REDISTRIBUTION  
PERCENTAGES



**CALCULATION EQUALITY CHECK**

E25	+	E21	=	O10	
20		19		39	TRUE
G24	+	H24	=	N6	
218		23		241	TRUE
E21	+	F21	=	F6	
19		160		179	TRUE
H20	+	H24	=	H5	
205		23		228	TRUE

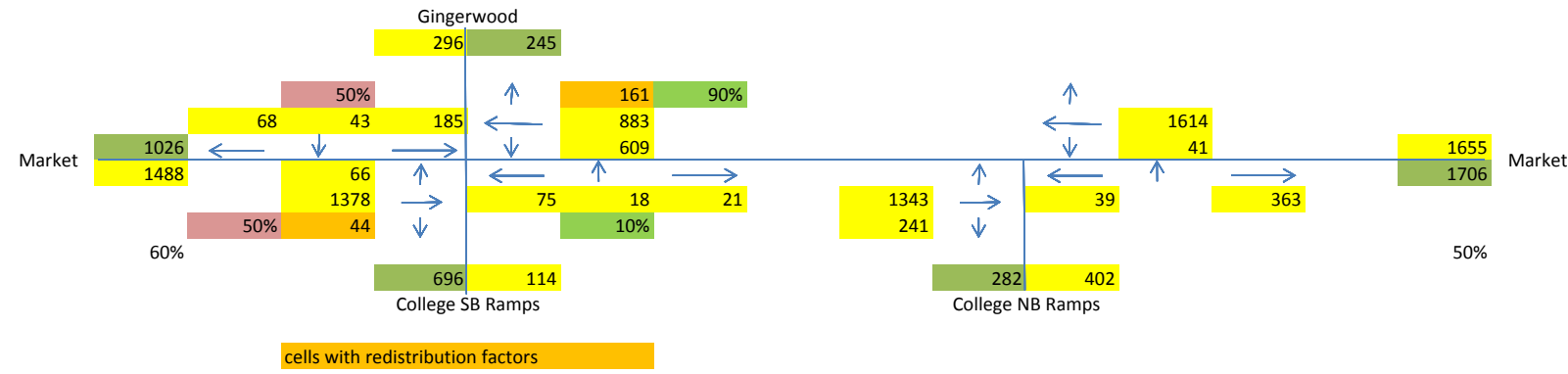
MOVEMENT  
PERCENTAGE  
COMPARISON



2012 BASE YEAR AM  
PEAK IAU VOLUMES



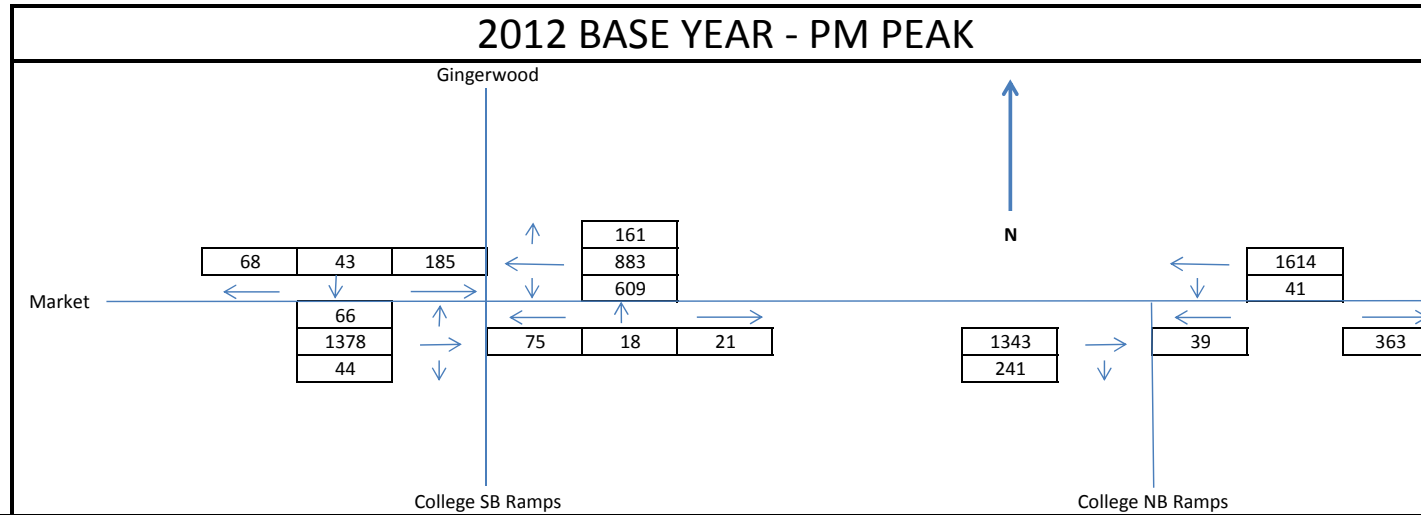
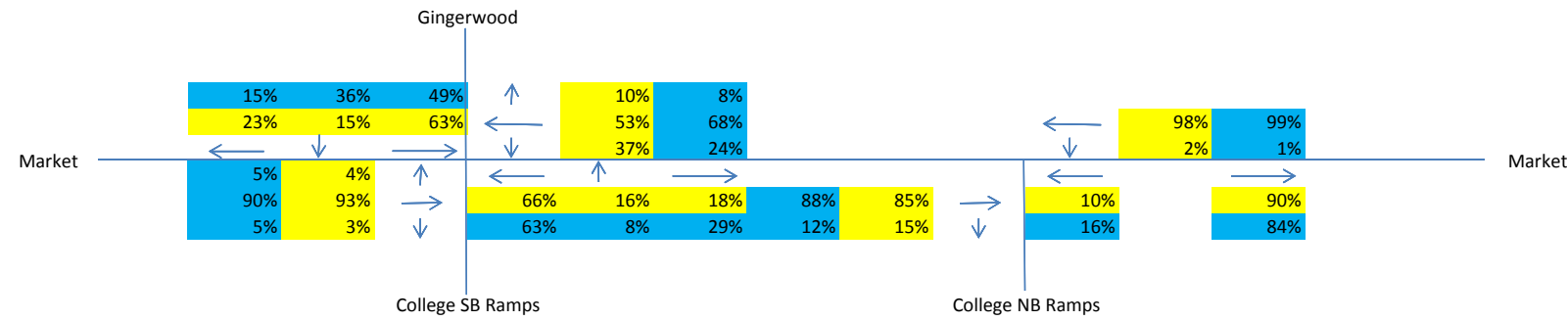
REDISTRIBUTION  
PERCENTAGES



**CALCULATION EQUALITY CHECK**

E25	+	E21	=	O10	
44		43		87	TRUE
G24	+	H24	=	N6	
75		18		93	TRUE
E21	+	F21	=	F6	
43		185		228	TRUE
H20	+	H24	=	H5	
161		18		179	TRUE

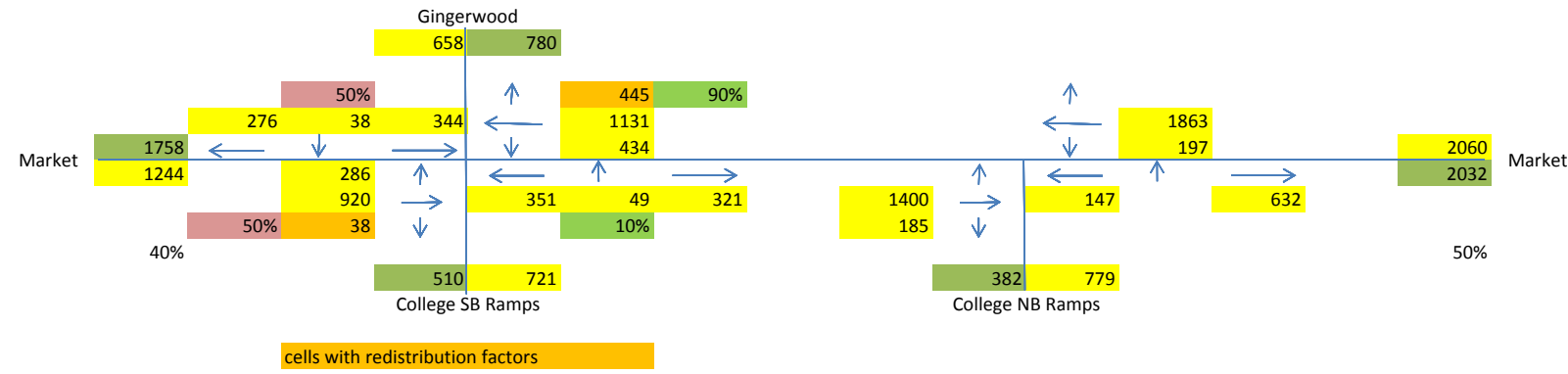
MOVEMENT  
PERCENTAGE  
COMPARISON



2012 BASE YEAR AM  
PEAK IAU VOLUMES



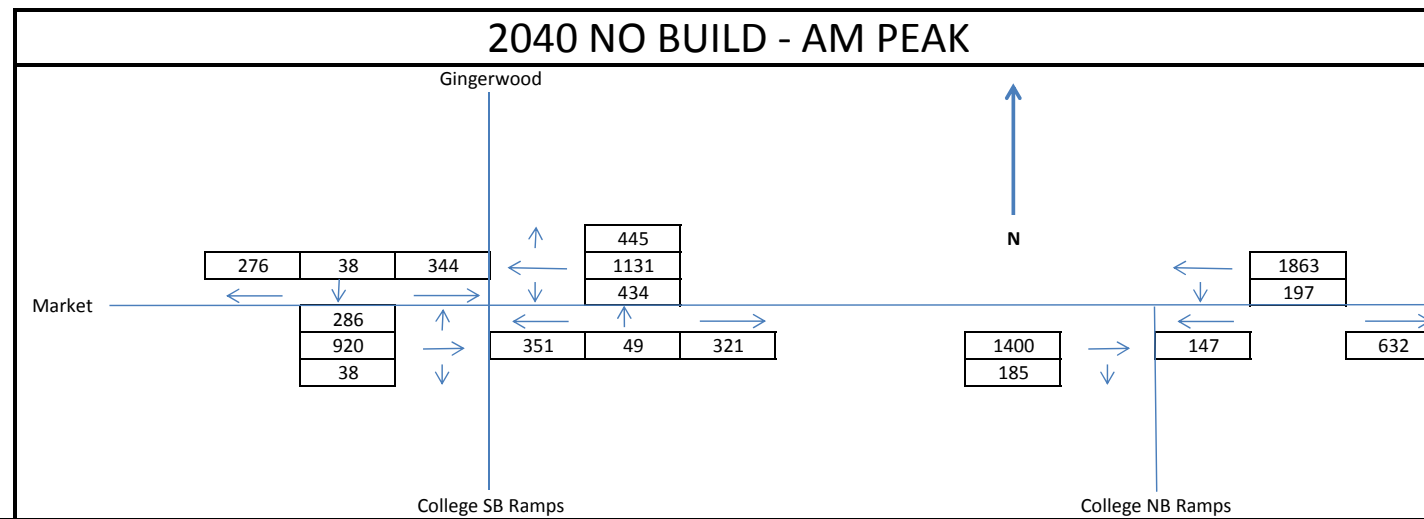
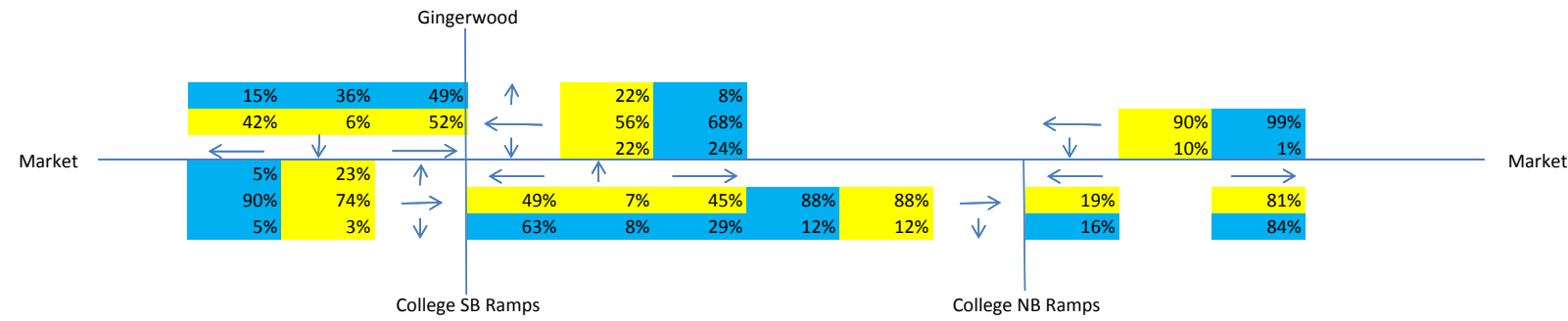
REDISTRIBUTION  
PERCENTAGES



**CALCULATION EQUALITY CHECK**

E25	+	E21	=	O10	
38		38		76	TRUE
G24	+	H24	=	N6	
351		49		400	TRUE
E21	+	F21	=	F6	
38		344		382	TRUE
H20	+	H24	=	H5	
445		49		494	TRUE

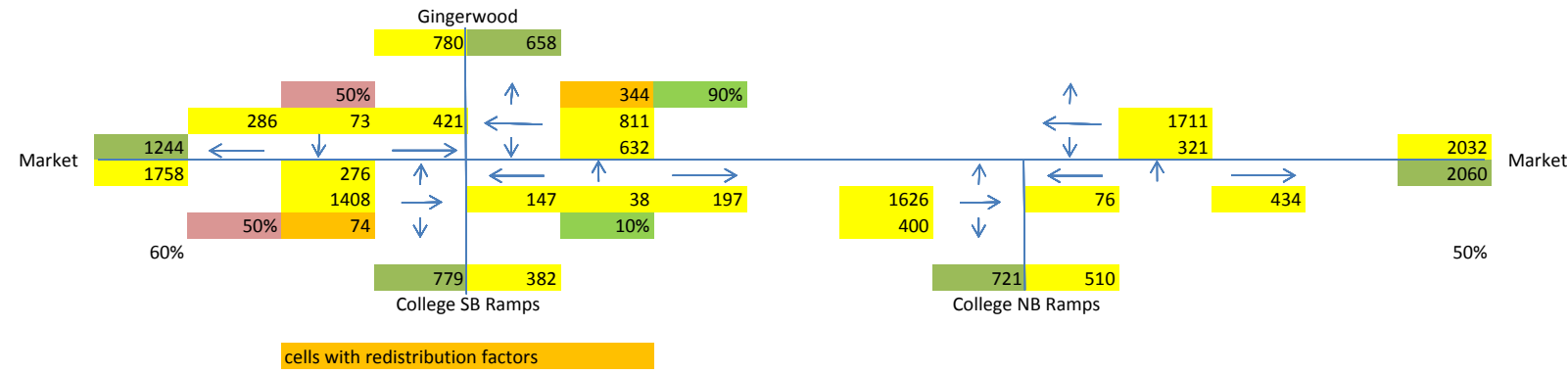
MOVEMENT  
PERCENTAGE  
COMPARISON



2012 BASE YEAR AM  
PEAK IAU VOLUMES



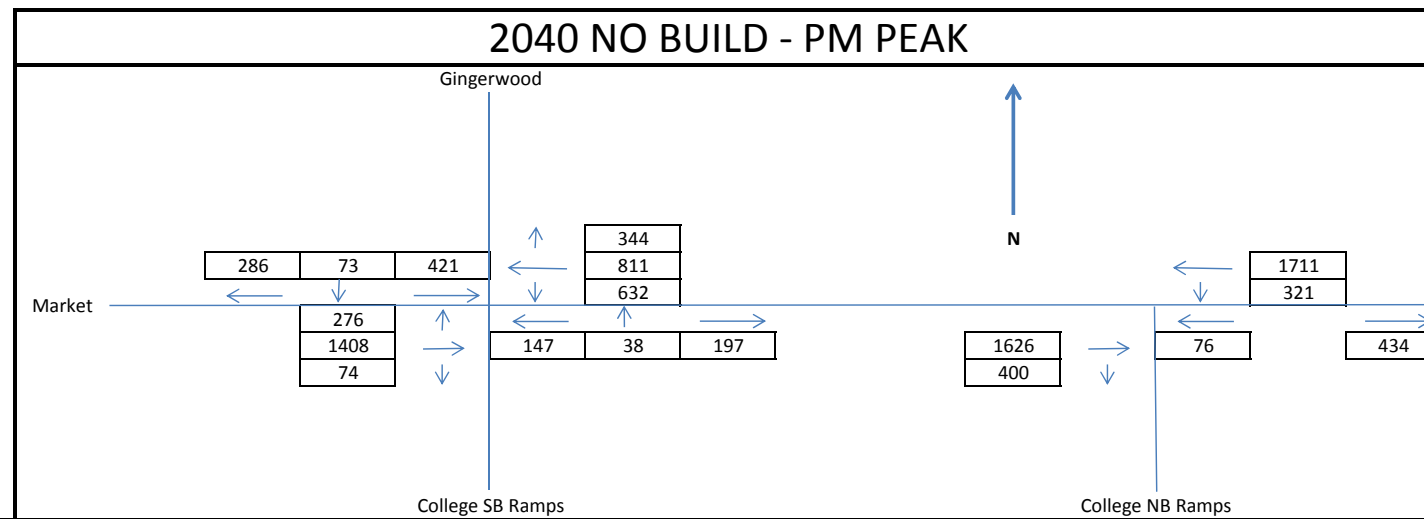
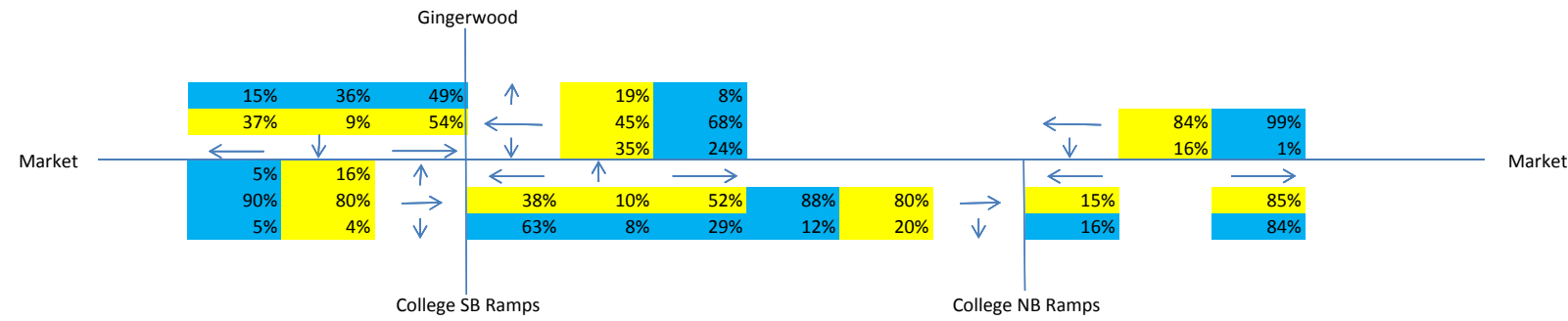
REDISTRIBUTION  
PERCENTAGES



**CALCULATION EQUALITY CHECK**

E25	+	E21	=	O10	
74		73		147	TRUE
G24	+	H24	=	N6	
147		38		185	TRUE
E21	+	F21	=	F6	
73		421		494	TRUE
H20	+	H24	=	H5	
344		38		382	TRUE

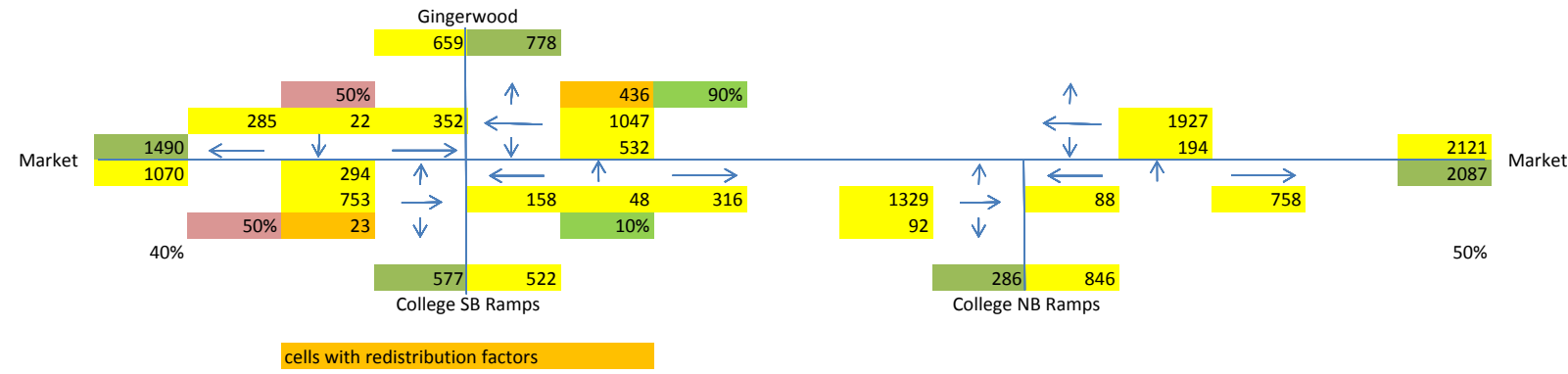
MOVEMENT  
PERCENTAGE  
COMPARISON



2012 BASE YEAR AM  
PEAK IAU VOLUMES



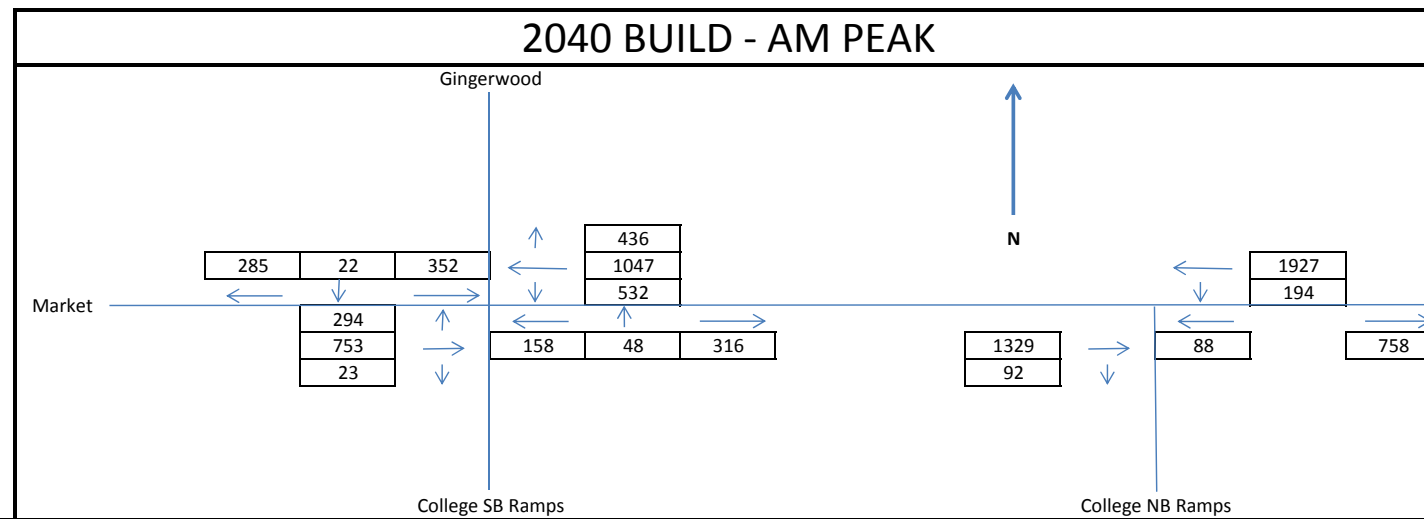
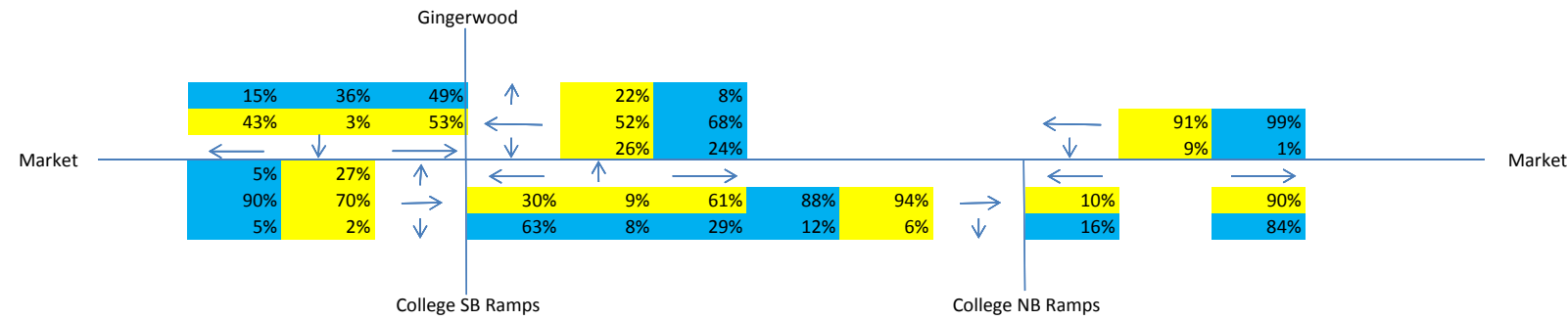
REDISTRIBUTION  
PERCENTAGES



**CALCULATION EQUALITY CHECK**

E25	+	E21	=	O10	
23		22		45	TRUE
G24	+	H24	=	N6	
158		48		206	TRUE
E21	+	F21	=	F6	
22		352		374	TRUE
H20	+	H24	=	H5	
436		48		484	TRUE

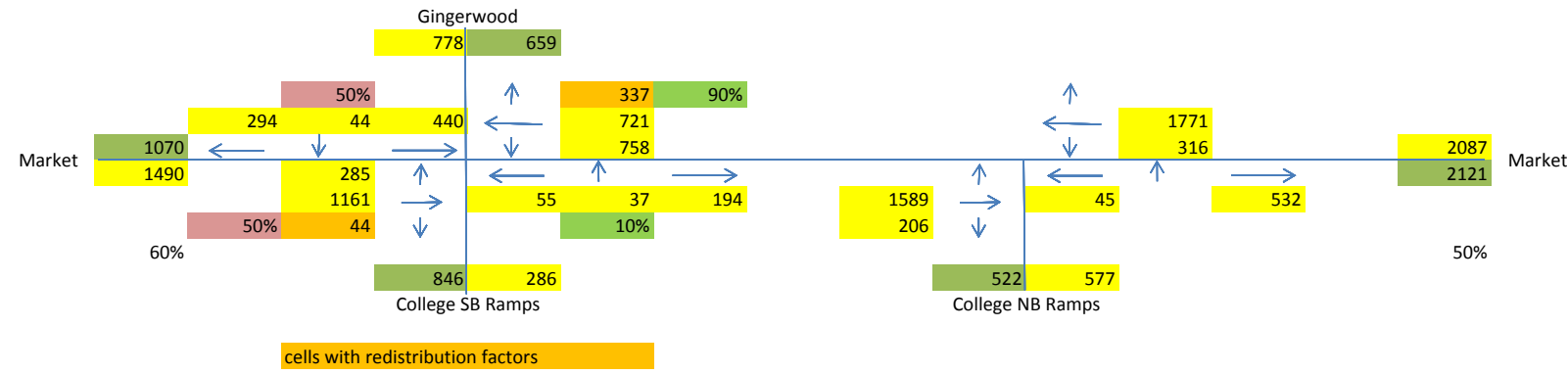
MOVEMENT  
PERCENTAGE  
COMPARISON



2012 BASE YEAR AM  
PEAK IAU VOLUMES



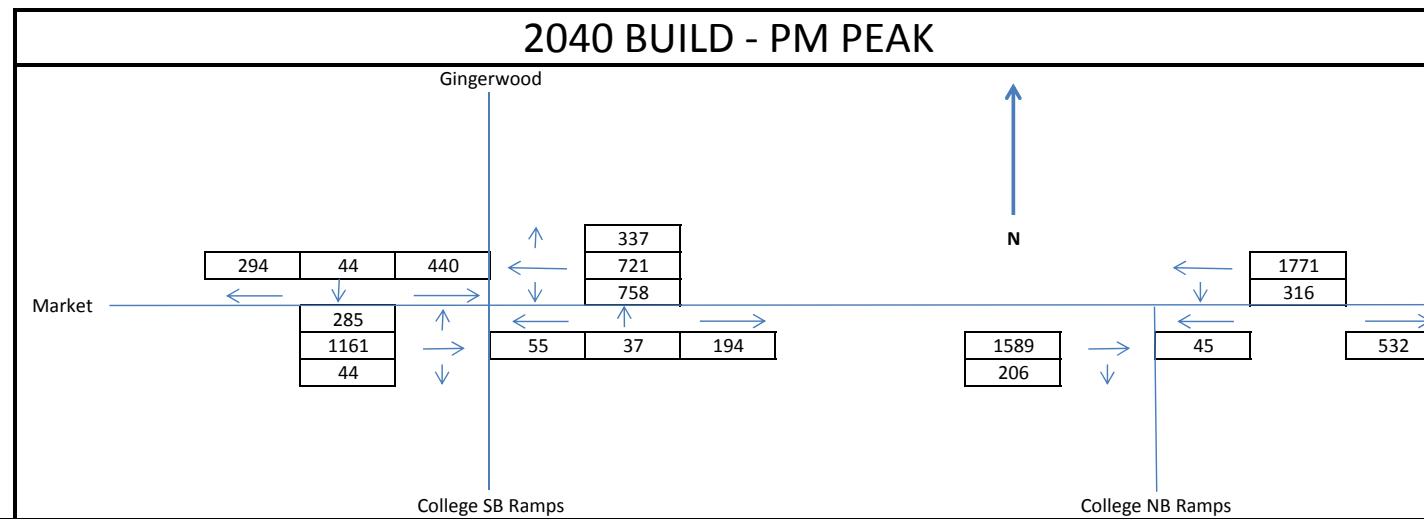
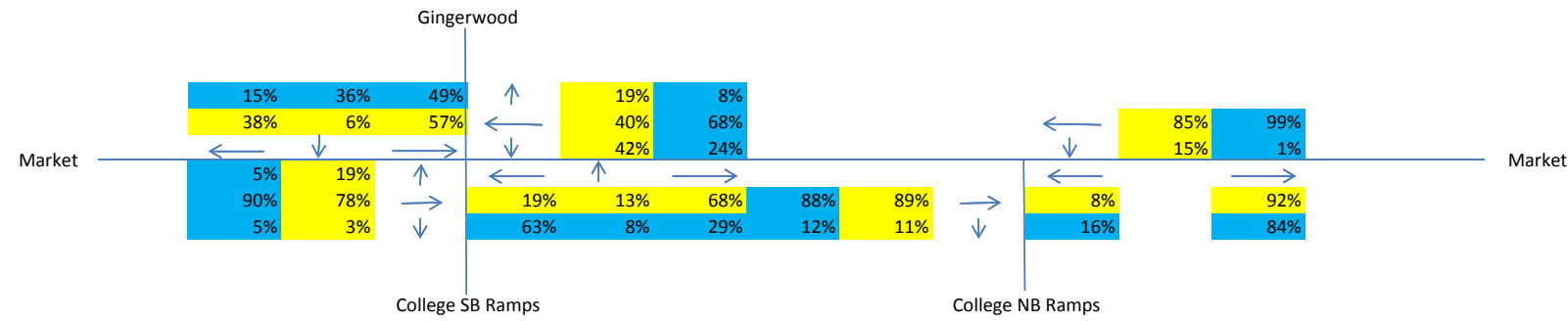
REDISTRIBUTION  
PERCENTAGES



**CALCULATION EQUALITY CHECK**

E25	+	E21	=	O10	
44		44		88	TRUE
G24	+	H24	=	N6	
55		37		92	TRUE
E21	+	F21	=	F6	
44		440		484	TRUE
H20	+	H24	=	H5	
337		37		374	TRUE

MOVEMENT  
PERCENTAGE  
COMPARISON

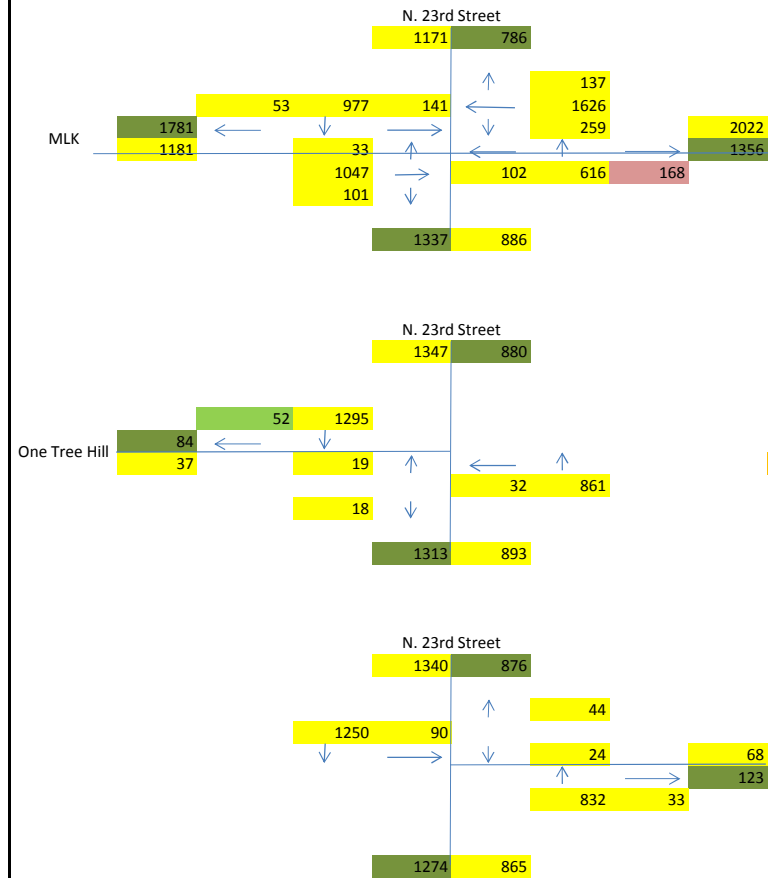


**US 74 (Martin Luther King Jr. Boulevard) at 23<sup>rd</sup> Street and One Tree Hill**

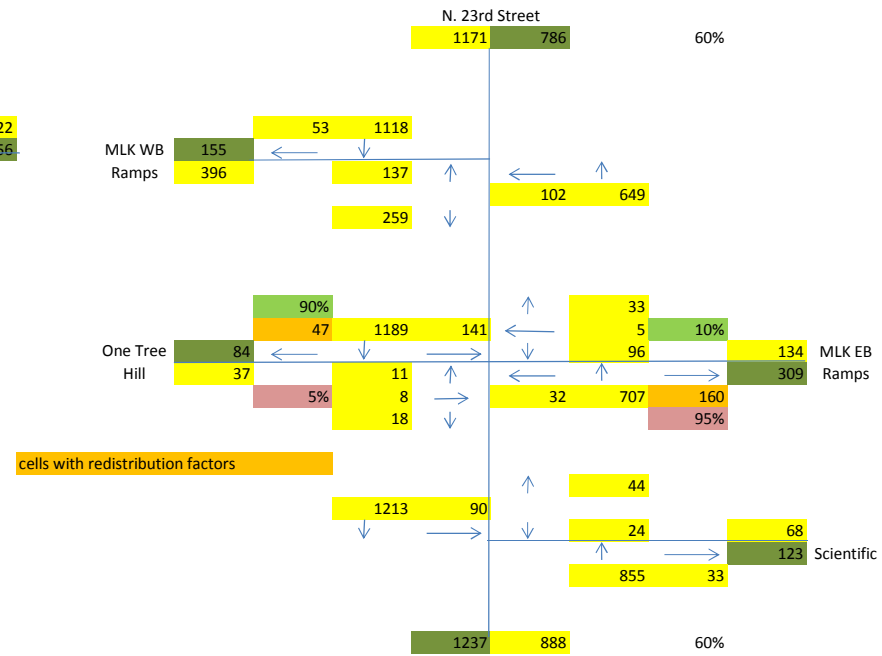
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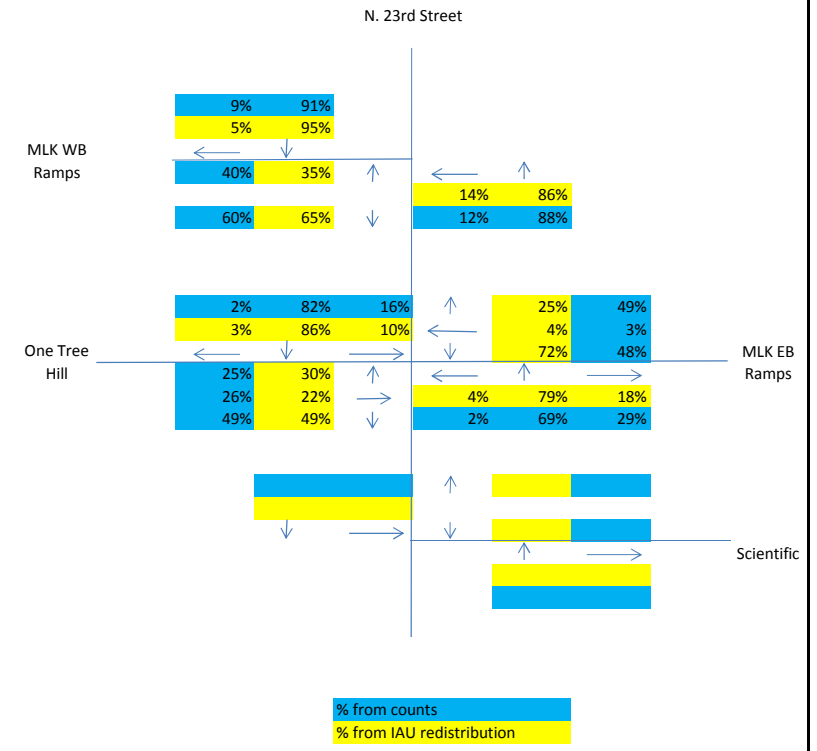
### 2012 BASE YEAR AM PEAK IAU VOLUMES



### REDISTRIBUTION PERCENTAGES

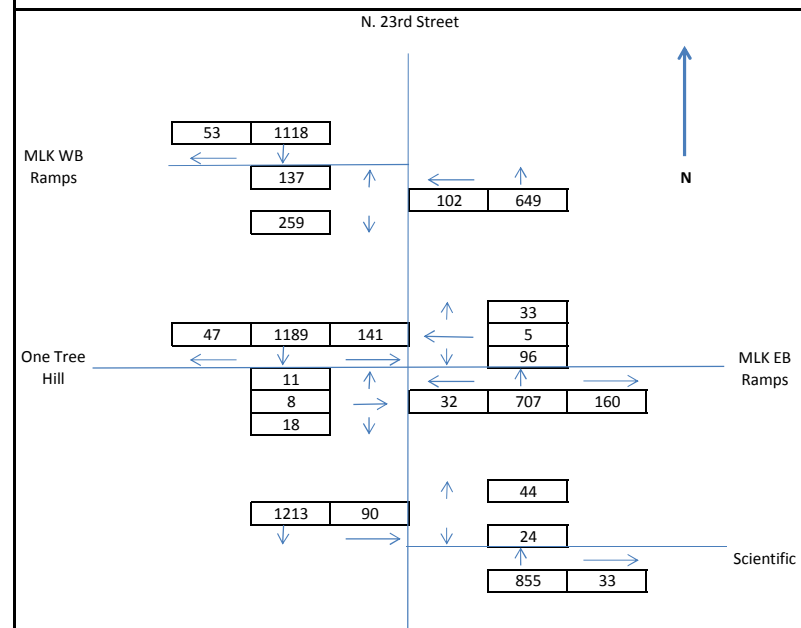


### MOVEMENT PERCENTAGE COMPARISON

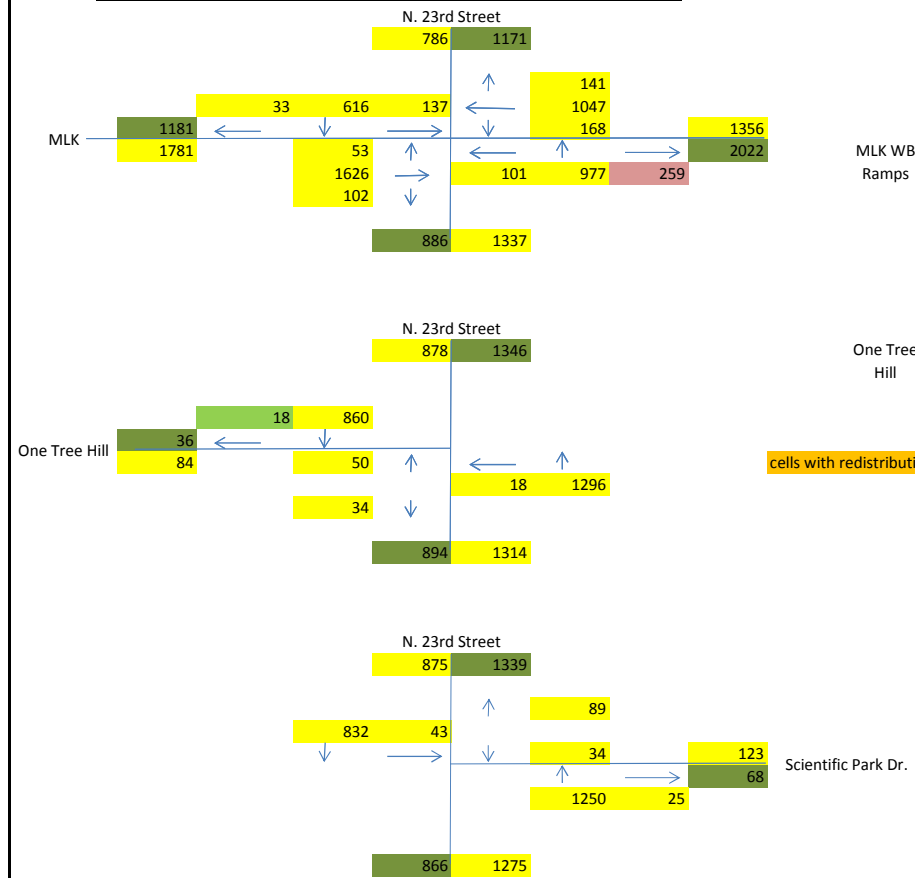


CALCULATION EQUALITY CHECK					
N19	+	R19	=	H9	
8		160		168	TRUE
Q16	+	Q17	=	D10	
5		96		101	TRUE
N18	+	N19	=	D22	
11		8		19	TRUE
M16	+	Q16	=	C20	
47		5		52	TRUE

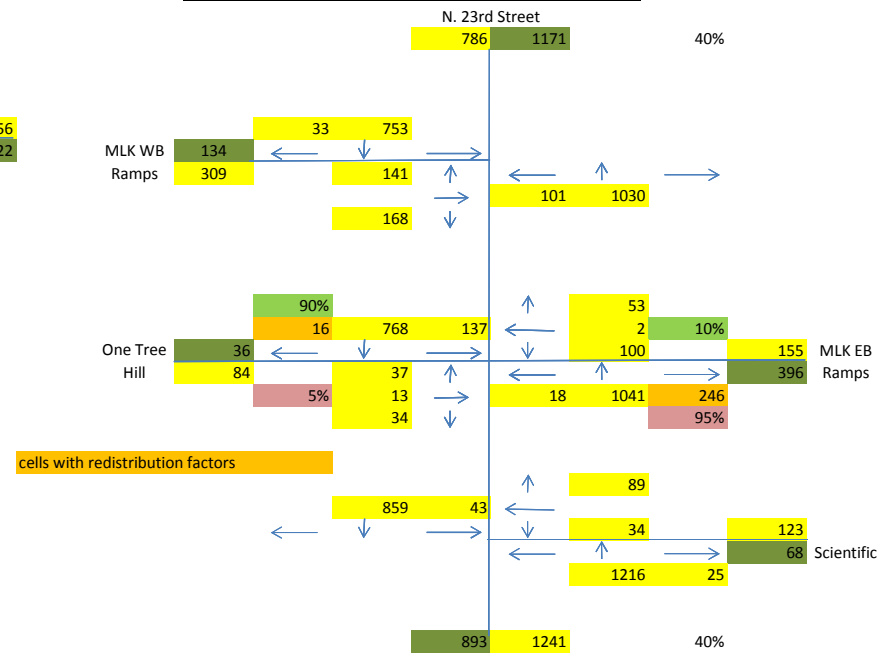
### 2012 BASE YEAR - AM PEAK



### 2012 BASE YEAR PM PEAK IAU VOLUMES

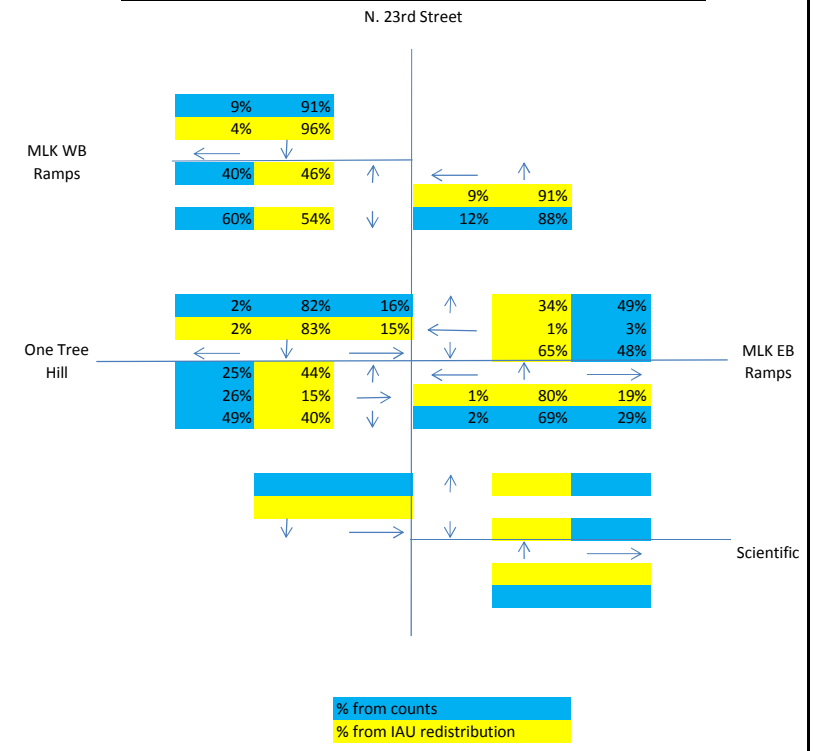


### REDISTRIBUTION PERCENTAGES

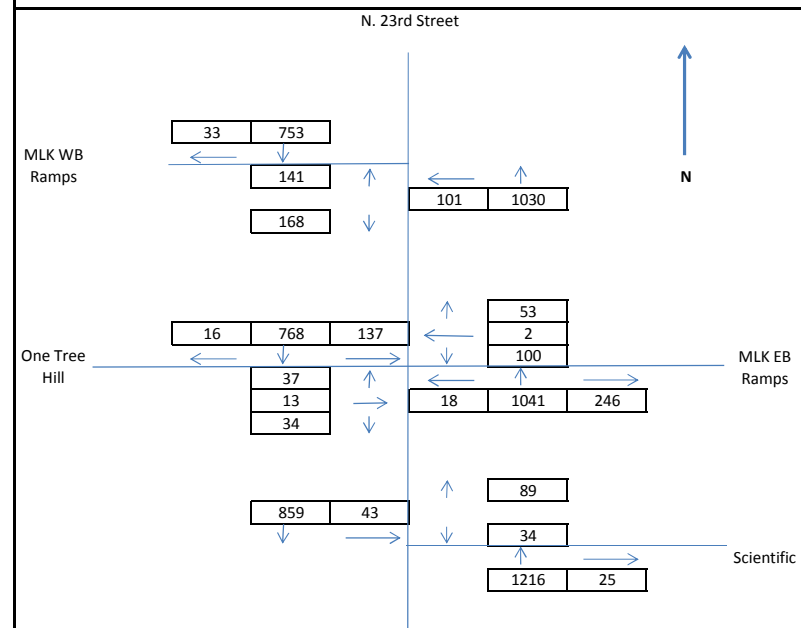


CALCULATION EQUALITY CHECK				
N19	+	R19	=	H9
13		246		259
				TRUE
Q16	+	Q17	=	D10
2		100		102
				TRUE
N18	+	N19	=	D22
37		13		50
				TRUE
M16	+	Q16	=	C20
16		2		18
				TRUE

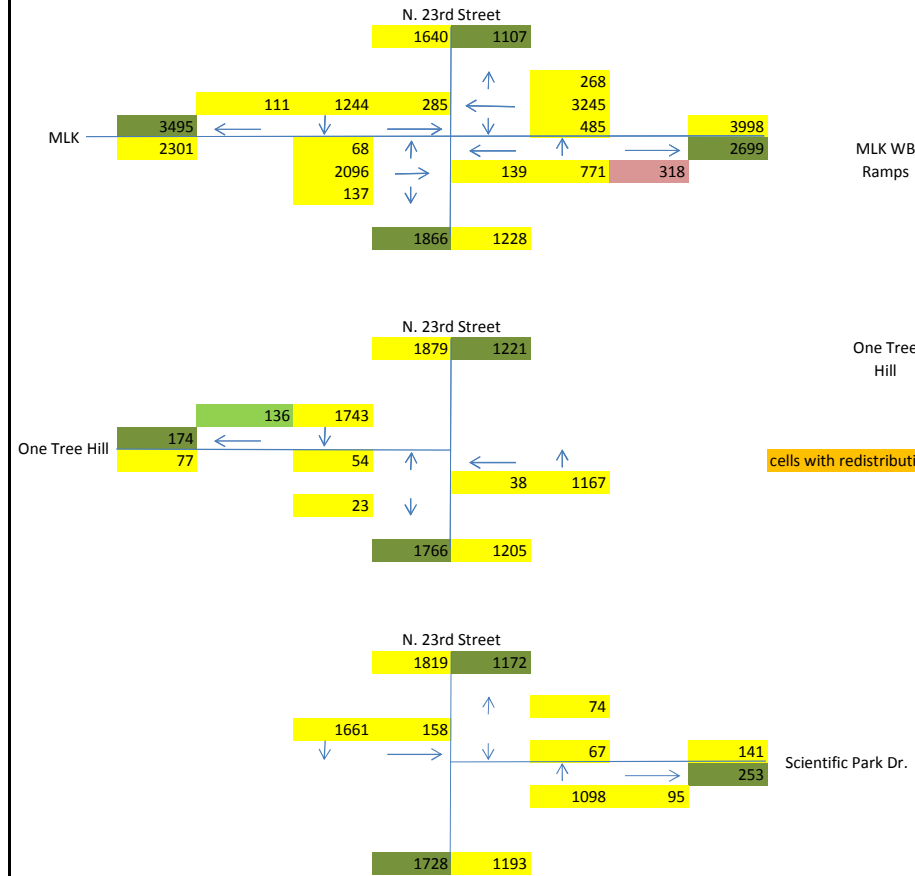
### MOVEMENT PERCENTAGE COMPARISON



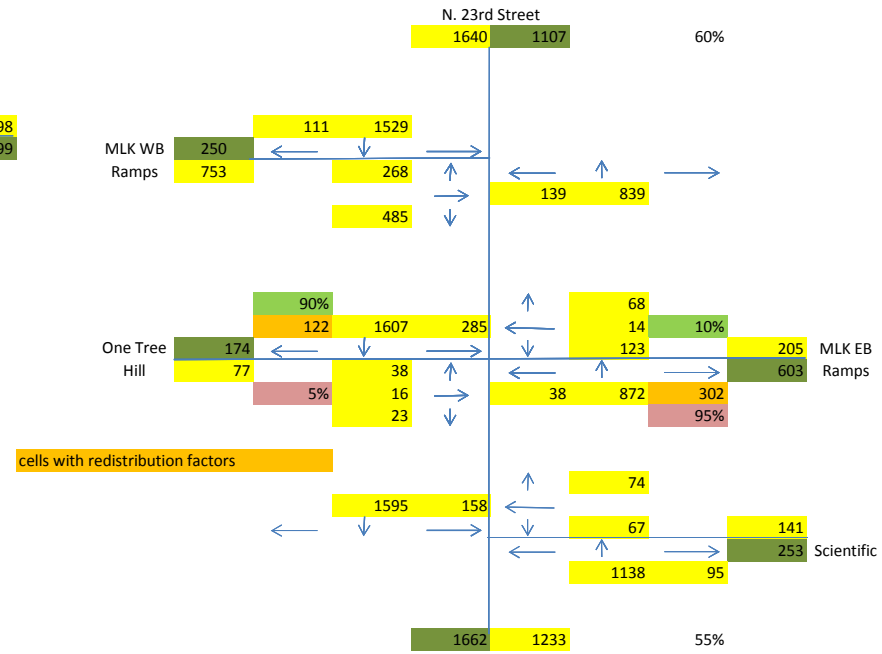
### 2012 BASE YEAR - PM PEAK



### 2040 NO BUILD AM PEAK IAU VOLUMES

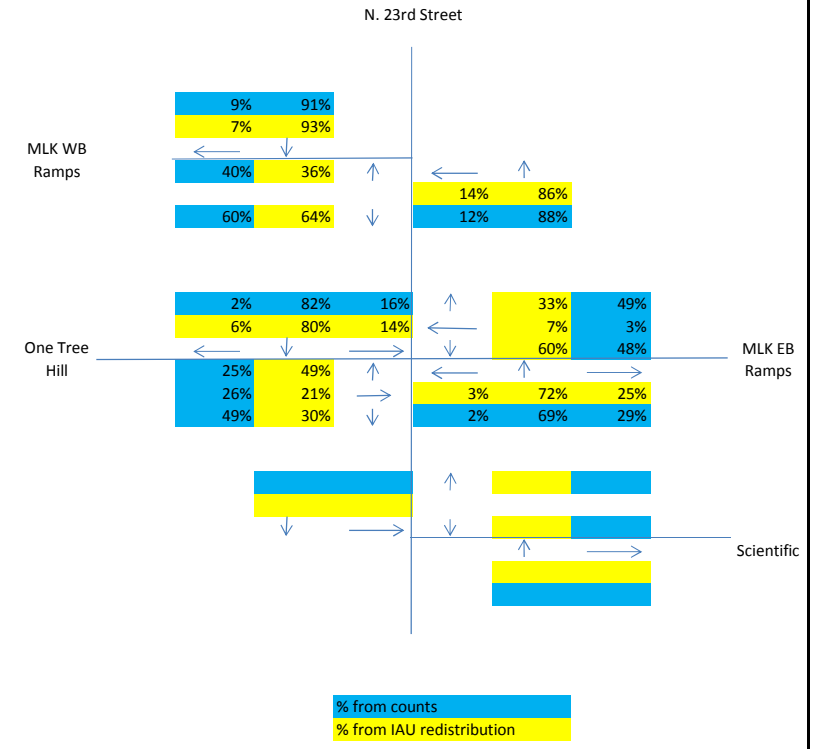


### REDISTRIBUTION PERCENTAGES

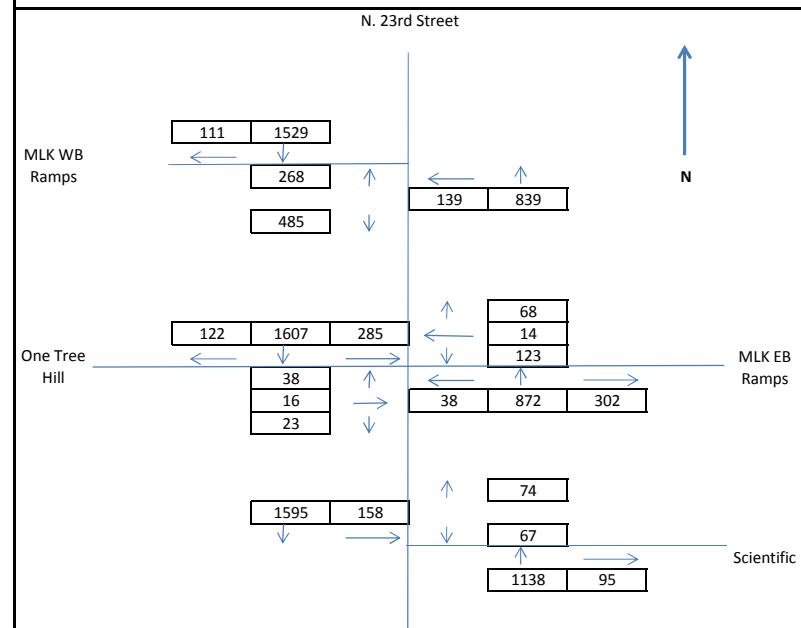


CALCULATION EQUALITY CHECK					
N19	+	R19	=	H9	TRUE
16		302		318	
Q16	+	Q17	=	D10	TRUE
14		123		137	
N18	+	N19	=	D22	TRUE
38		16		54	
M16	+	Q16	=	C20	TRUE
122		14		136	

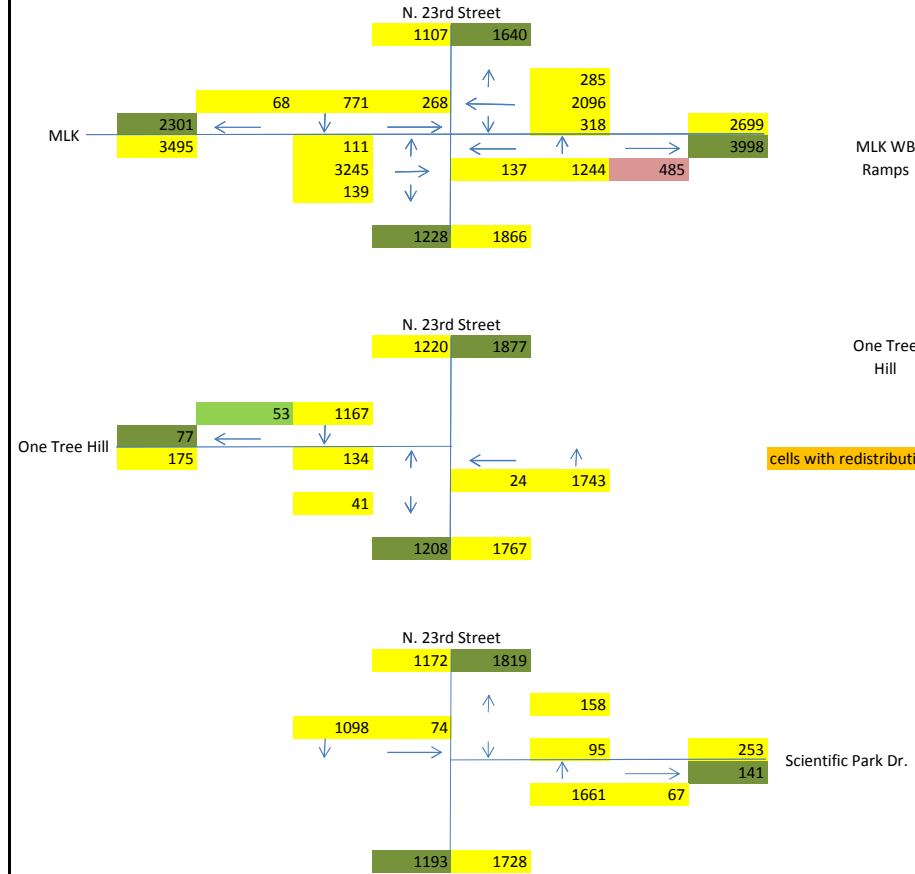
### MOVEMENT PERCENTAGE COMPARISON



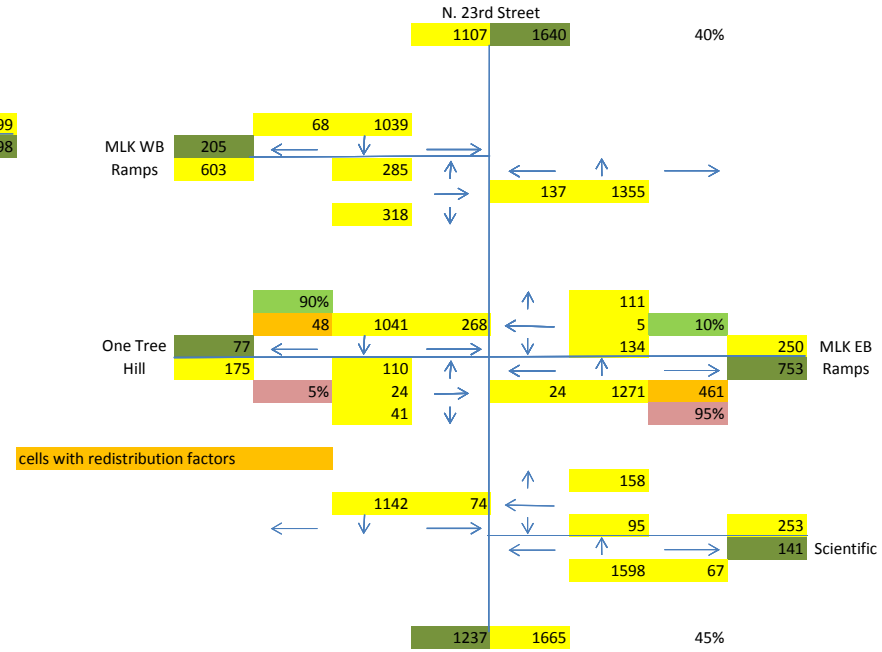
### 2040 NO BUILD - AM PEAK



### 2040 NO BUILD PM PEAK IAU VOLUMES

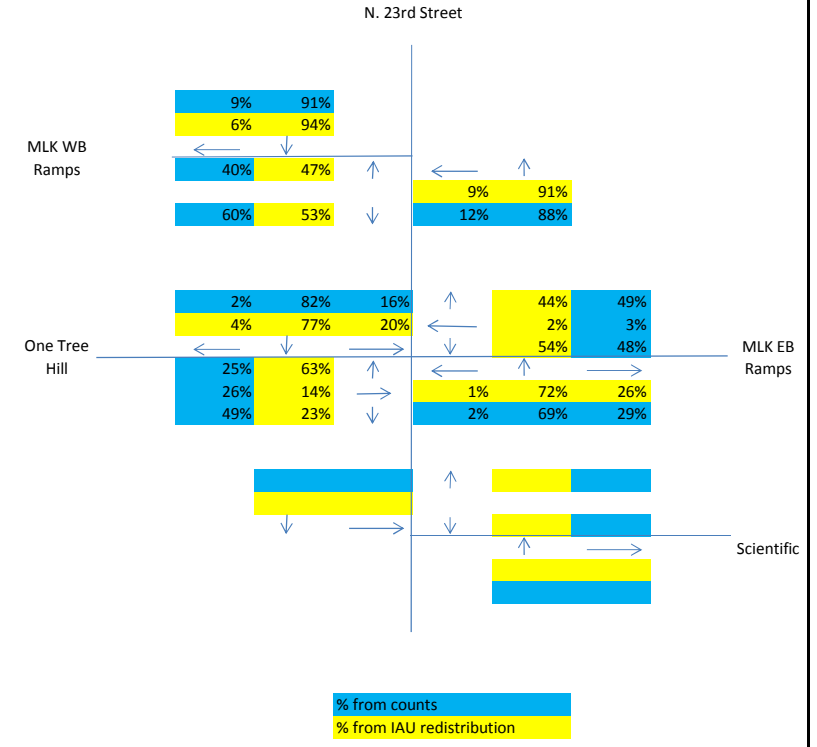


### REDISTRIBUTION PERCENTAGES

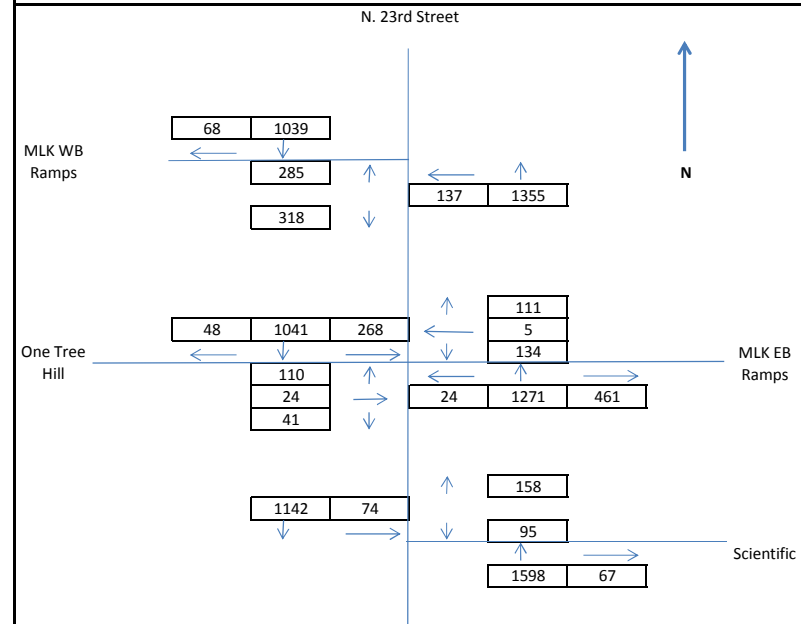


CALCULATION EQUALITY CHECK					
N19	+	R19	=	H9	TRUE
24		461		485	
Q16	+	Q17	=	D10	
5		134		139	TRUE
N18	+	N19	=	D22	
110		24		134	TRUE
M16	+	Q16	=	C20	
48		5		53	TRUE

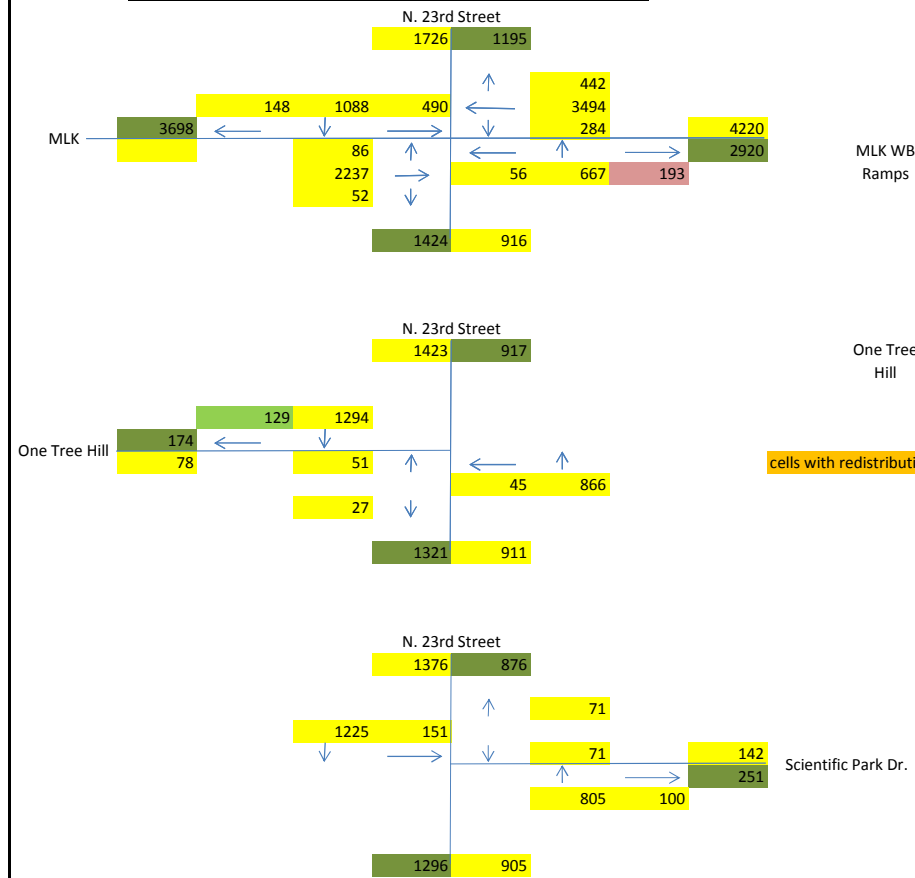
### MOVEMENT PERCENTAGE COMPARISON



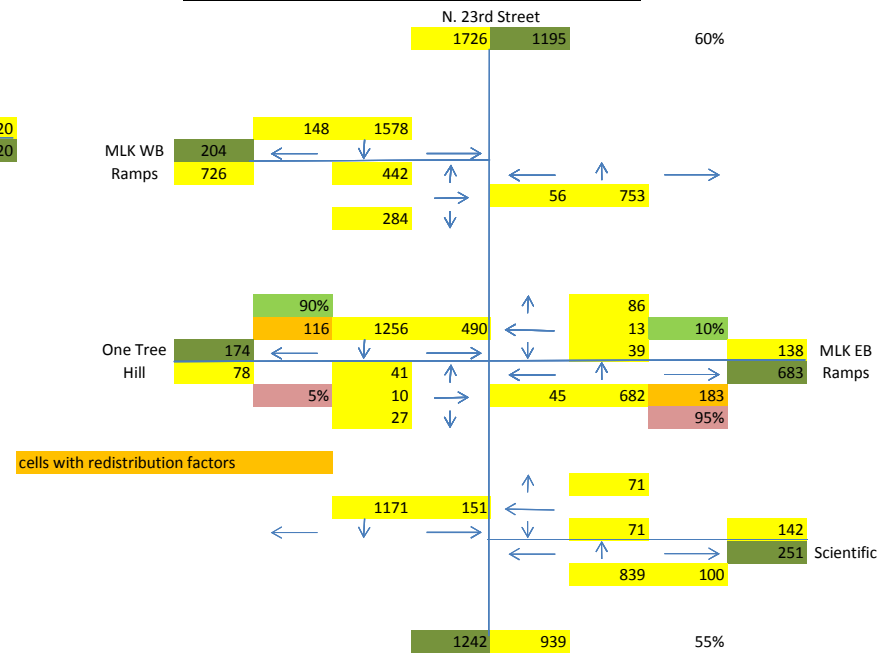
### 2040 NO BUILD - PM PEAK



### 2040 BUILD AM PEAK IAU VOLUMES



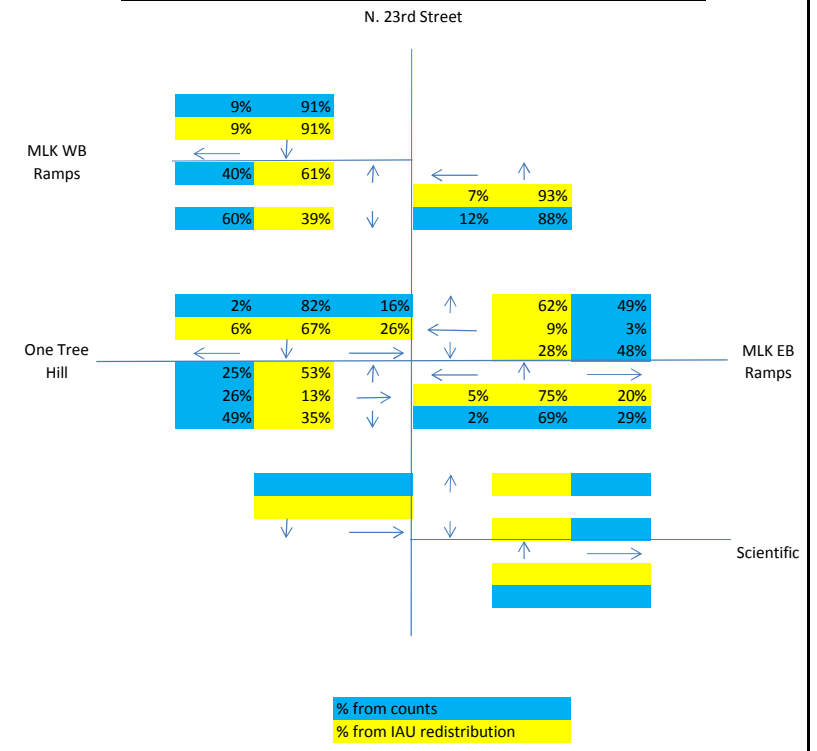
### REDISTRIBUTION PERCENTAGES



cells with redistribution factors

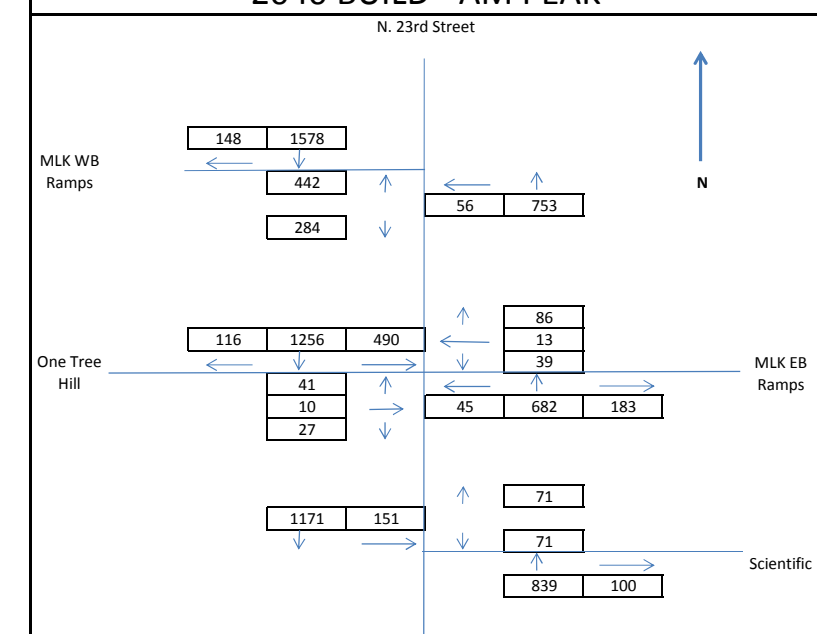
CALCULATION EQUALITY CHECK					
N19	+	R19	=	H9	TRUE
10		183		193	
Q16	+	Q17	=	D10	TRUE
13		39		52	
N18	+	N19	=	D22	TRUE
41		10		51	
M16	+	Q16	=	C20	TRUE
116		13		129	

### MOVEMENT PERCENTAGE COMPARISON

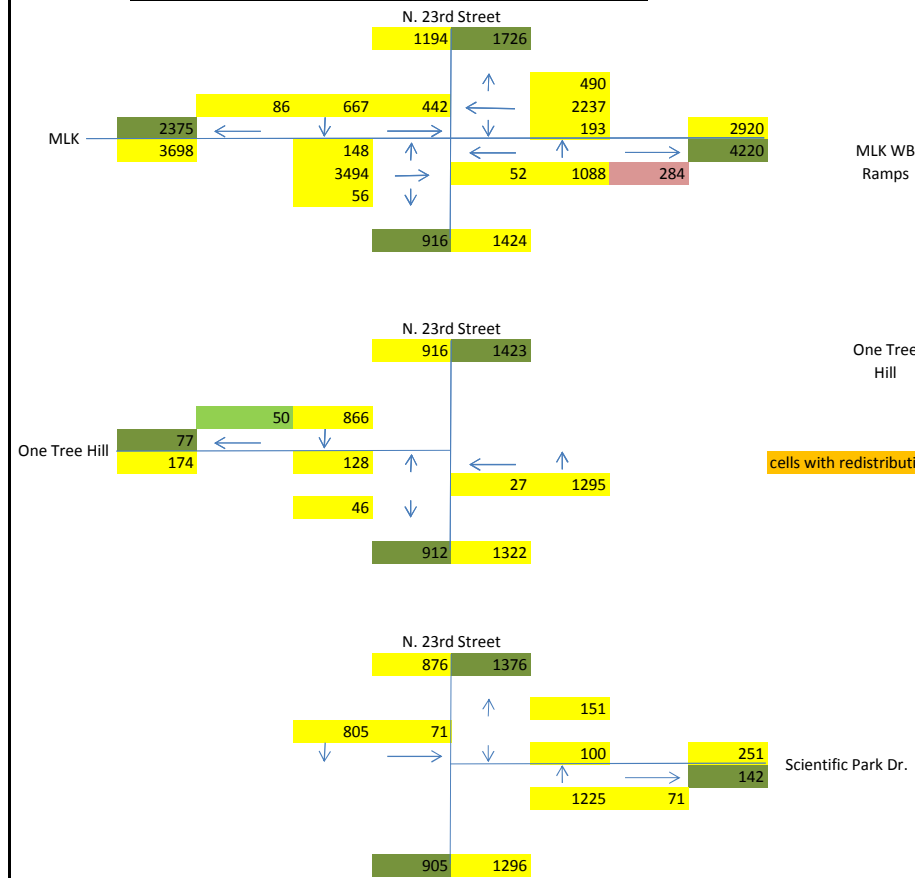


% from counts  
% from IAU redistribution

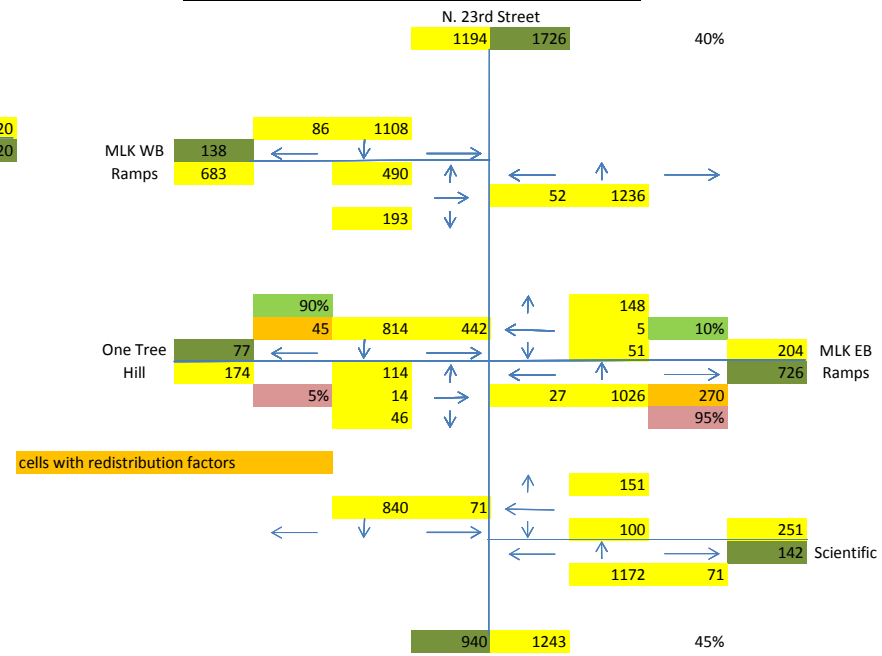
### 2040 BUILD - AM PEAK



### 2040 BUILD PM PEAK IAU VOLUMES

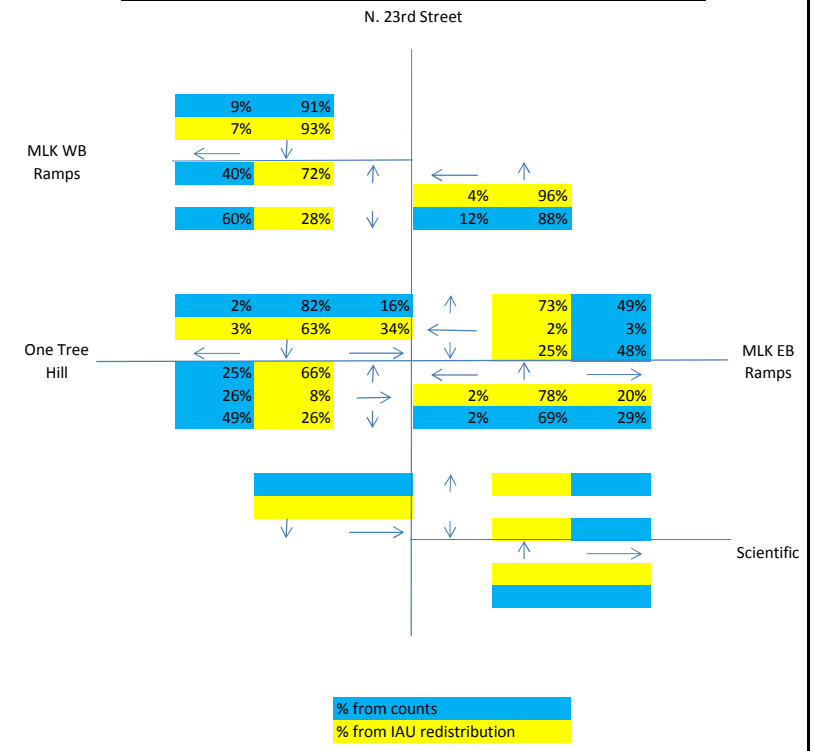


### REDISTRIBUTION PERCENTAGES

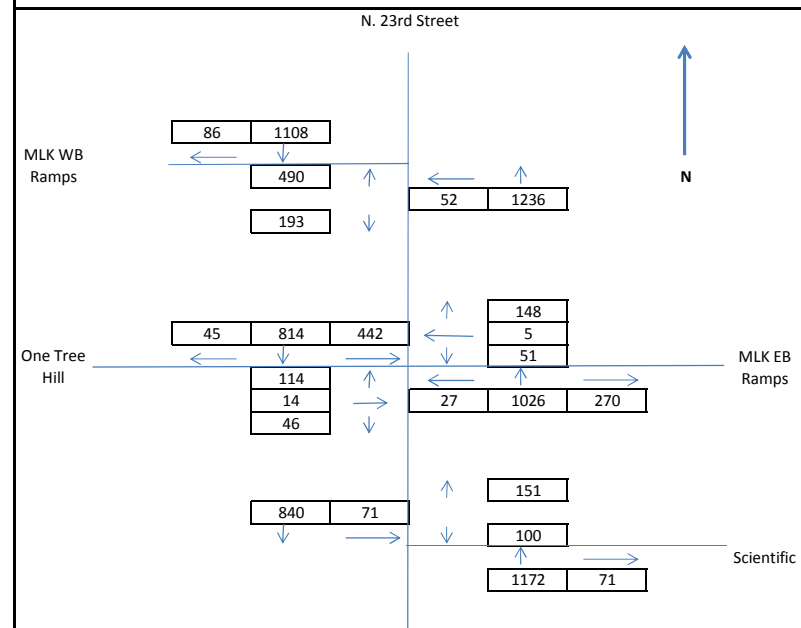


CALCULATION EQUALITY CHECK					
N19	+	R19	=	H9	TRUE
14		270		284	
Q16	+	Q17	=	D10	
5		51		56	TRUE
N18	+	N19	=	D22	
114		14		128	TRUE
M16	+	Q16	=	C20	
45		5		50	TRUE

### MOVEMENT PERCENTAGE COMPARISON



### 2040 BUILD - PM PEAK



**Appendix D: 2040 Build Storage Length Recommendations**

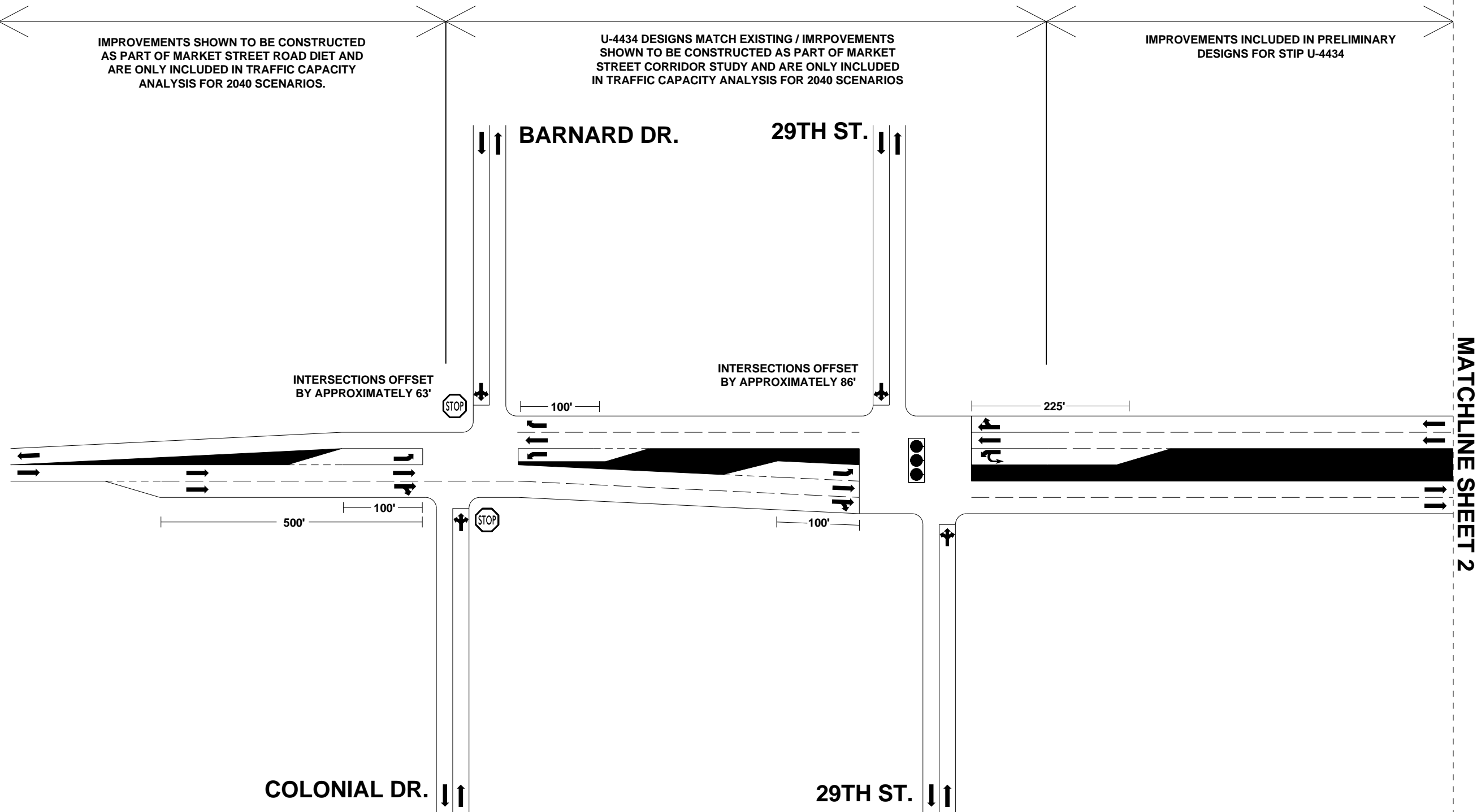
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IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET ROAD DIET AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS.

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET CORRIDOR STUDY AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS

IMPROVEMENTS INCLUDED IN PRELIMINARY DESIGNS FOR STIP U-4434



# SHEET 1

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

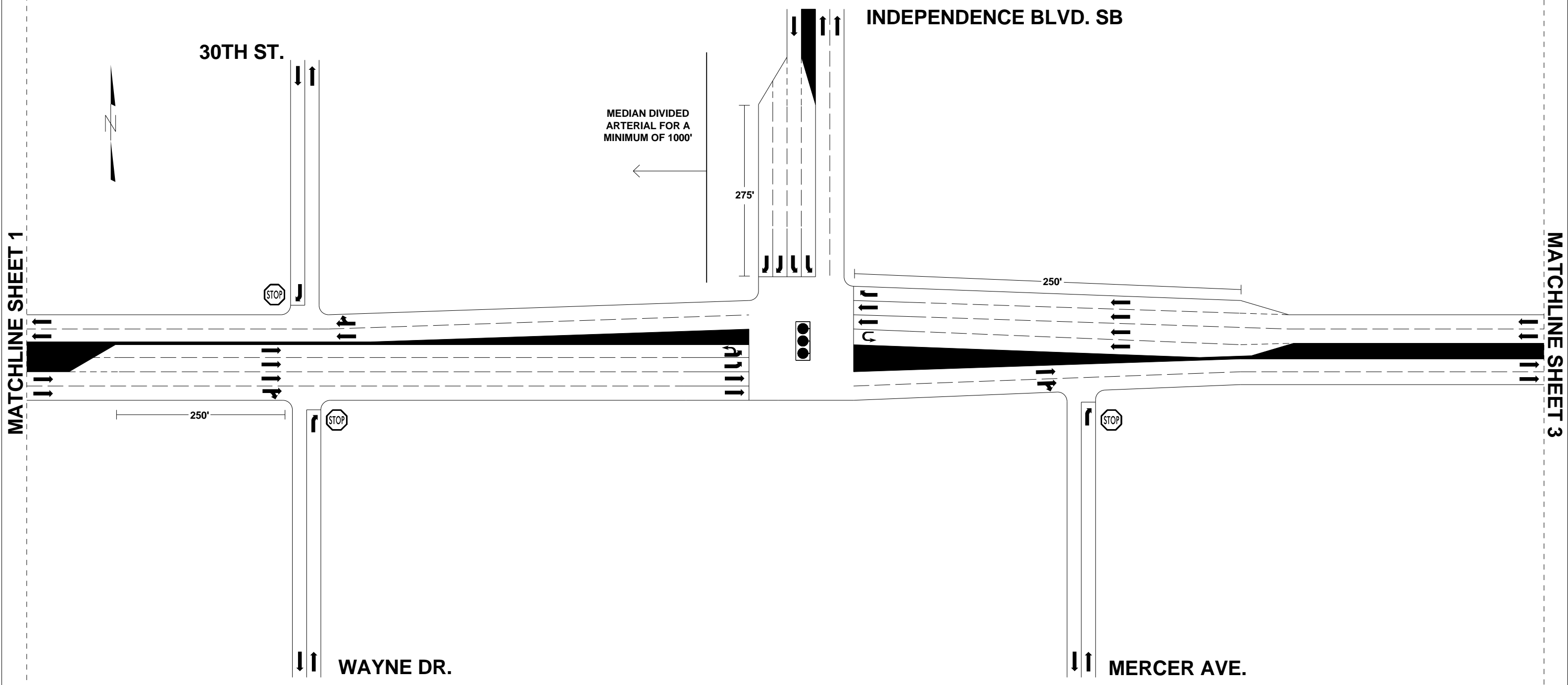
**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

233

**ALTERNATIVE 2  
QUADRANT AC**

**DESIGN DATA**

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



# SHEET 2

- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

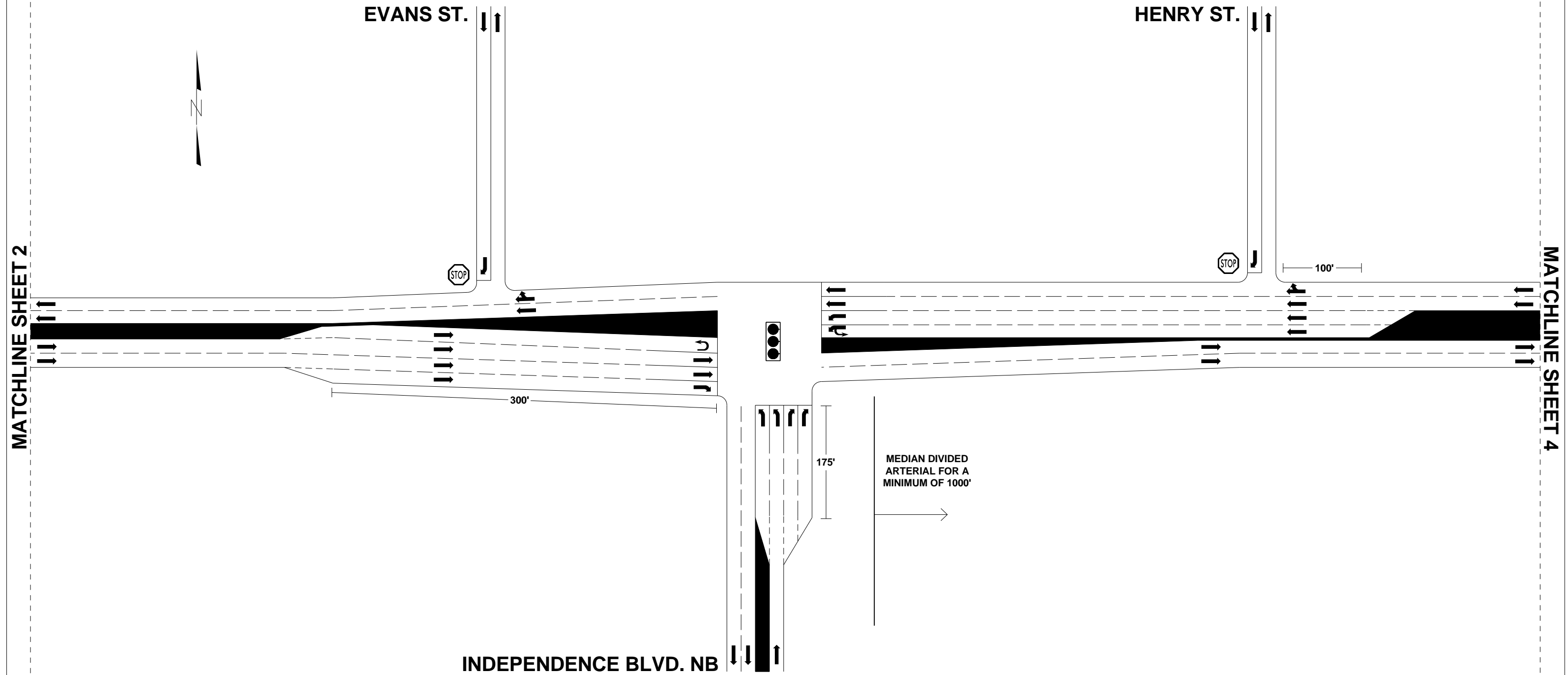
**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

234

**ALTERNATIVE 2  
QUADRANT AC**

**DESIGN DATA**

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

# SHEET 3

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

235

**ALTERNATIVE 2  
QUADRANT AC**

*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS INCLUDED IN PRELIMINARY  
DESIGNS FOR STIP U-4434

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS  
SHOWN TO BE CONSTRUCTED AS PART OF MARKET  
STREET CORRIDOR STUDY AND ARE ONLY INCLUDED  
IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS



MATCHLINE SHEET 3

BARCLAY HILLS DR.

275'

150'

225'

DARLINGTON AVE.

# SHEET 4

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

236

**ALTERNATIVE 2  
QUADRANT AC**

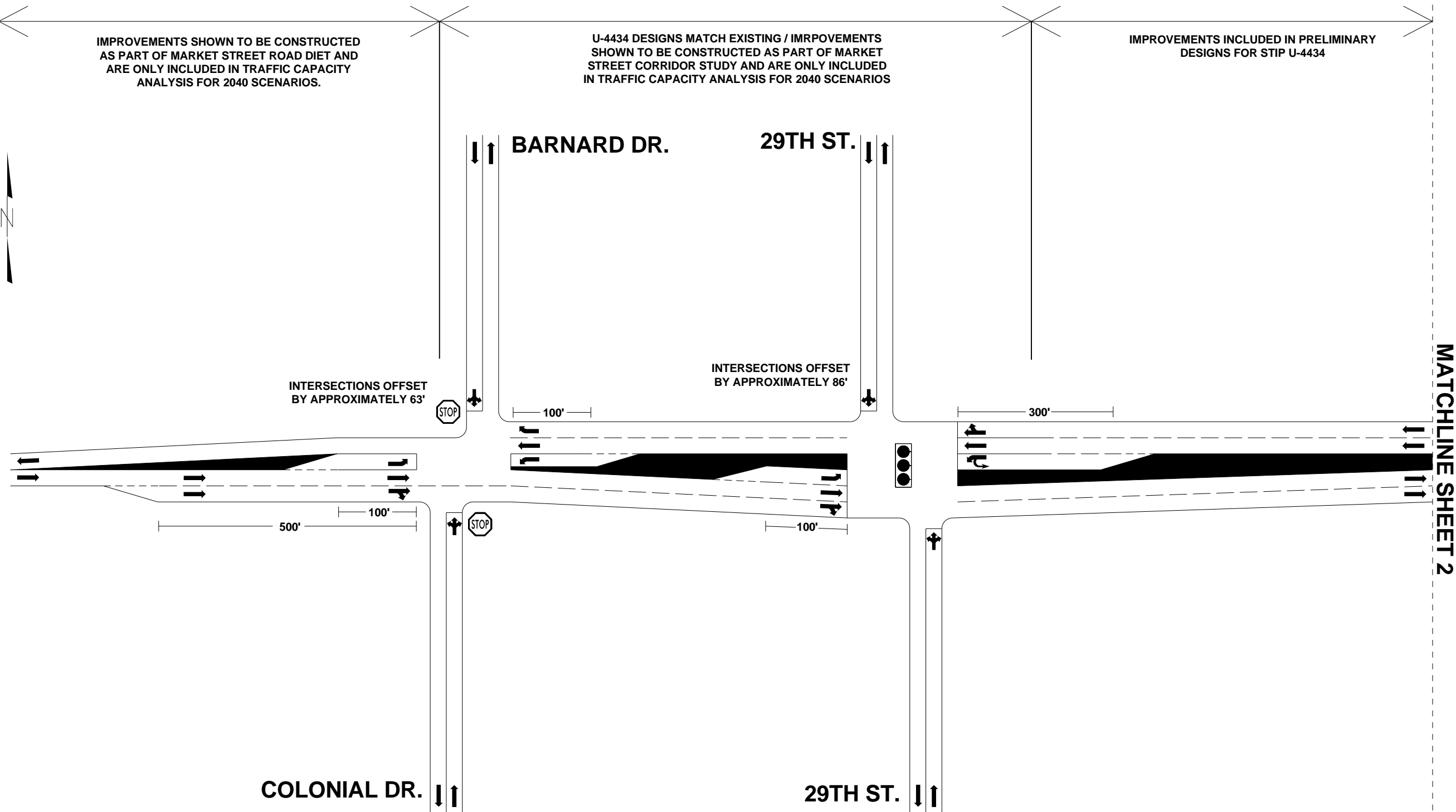
*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET ROAD DIET AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS.

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET CORRIDOR STUDY AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS

IMPROVEMENTS INCLUDED IN PRELIMINARY DESIGNS FOR STIP U-4434



# SHEET 1

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

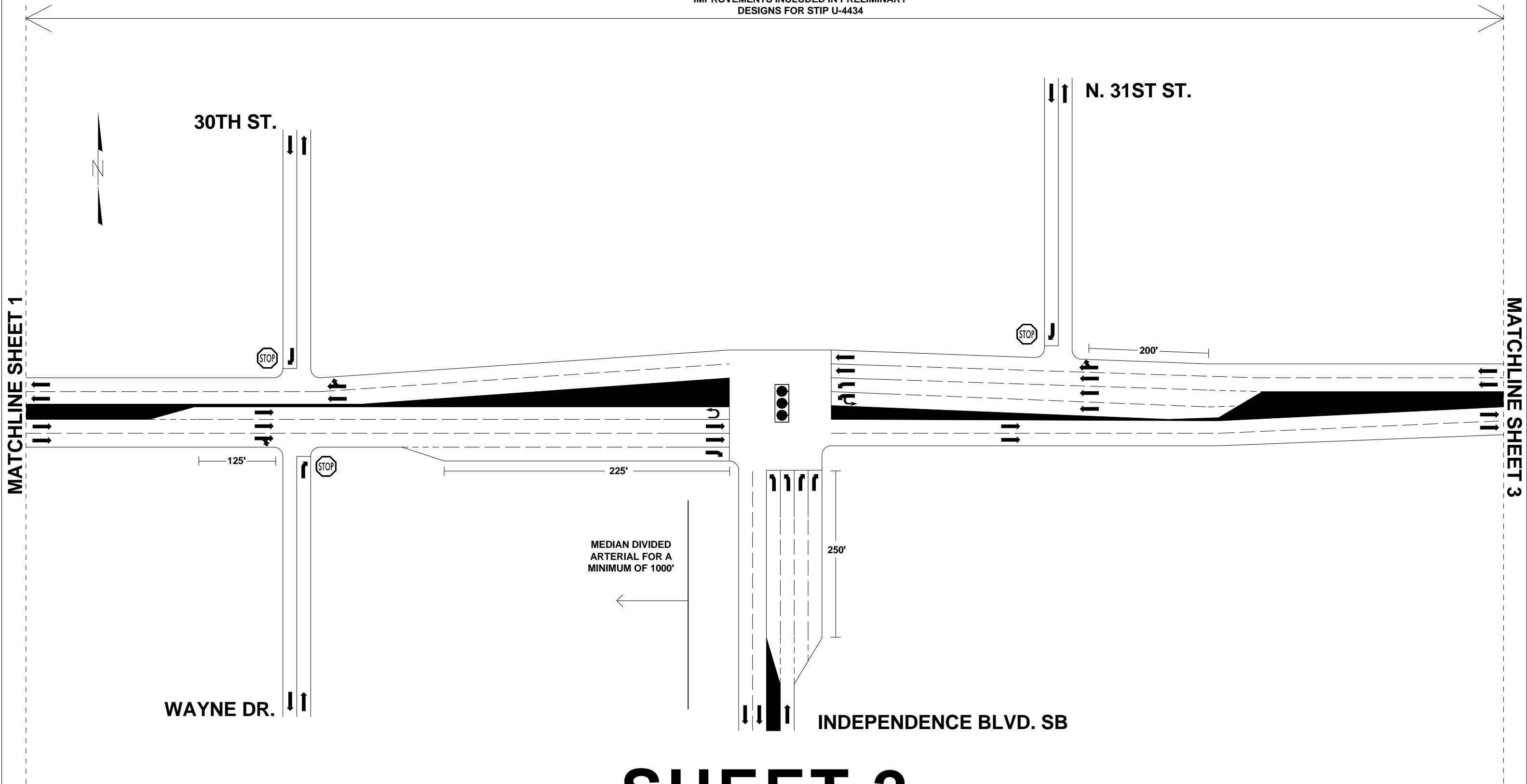
**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

237

**ALTERNATIVE 2  
QUADRANT BC**

**DESIGN DATA**

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



# SHEET 2

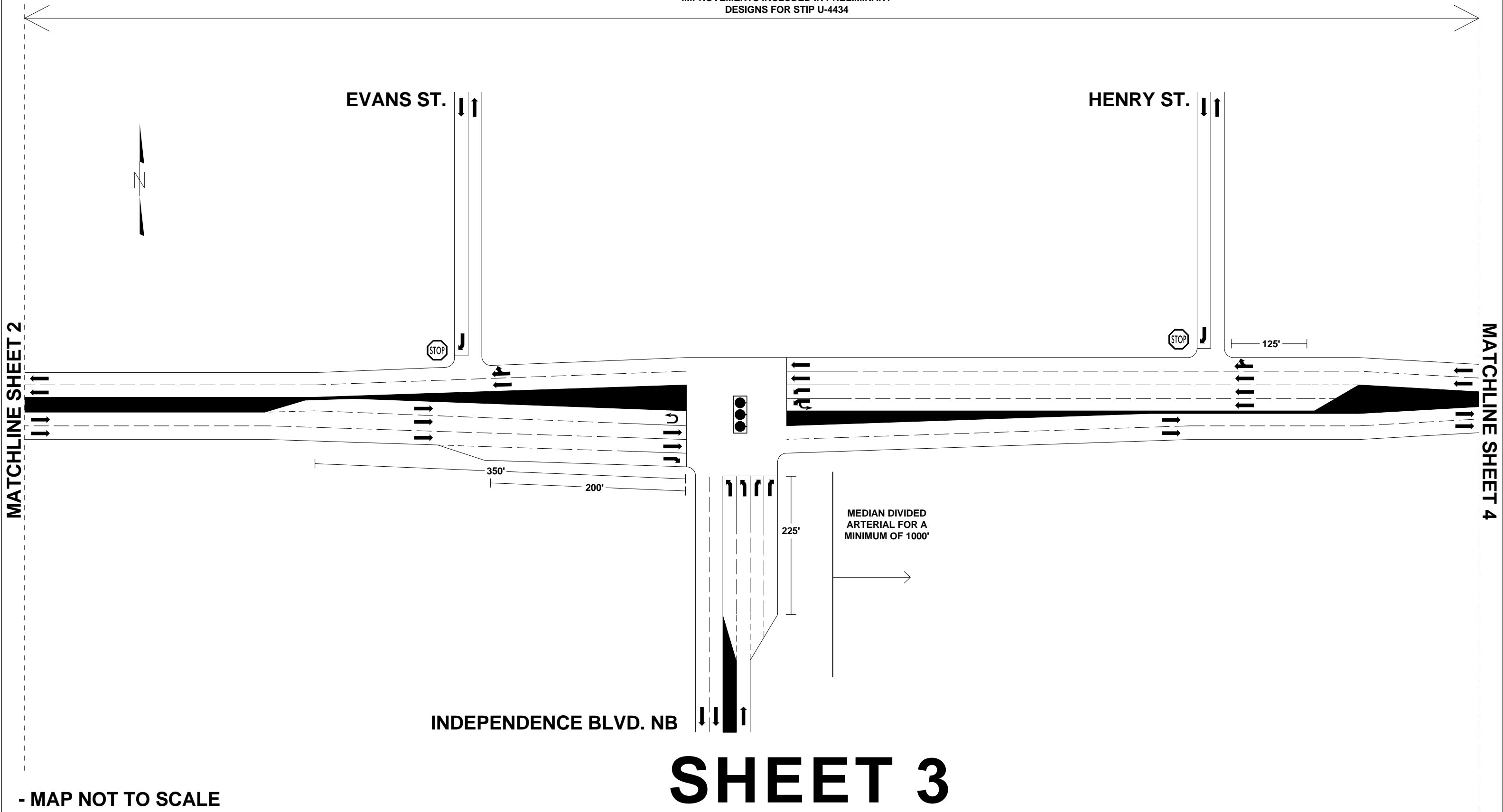
- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

238

**ALTERNATIVE 2  
QUADRANT BC**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

# SHEET 3

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

239

**ALTERNATIVE 2  
QUADRANT BC**

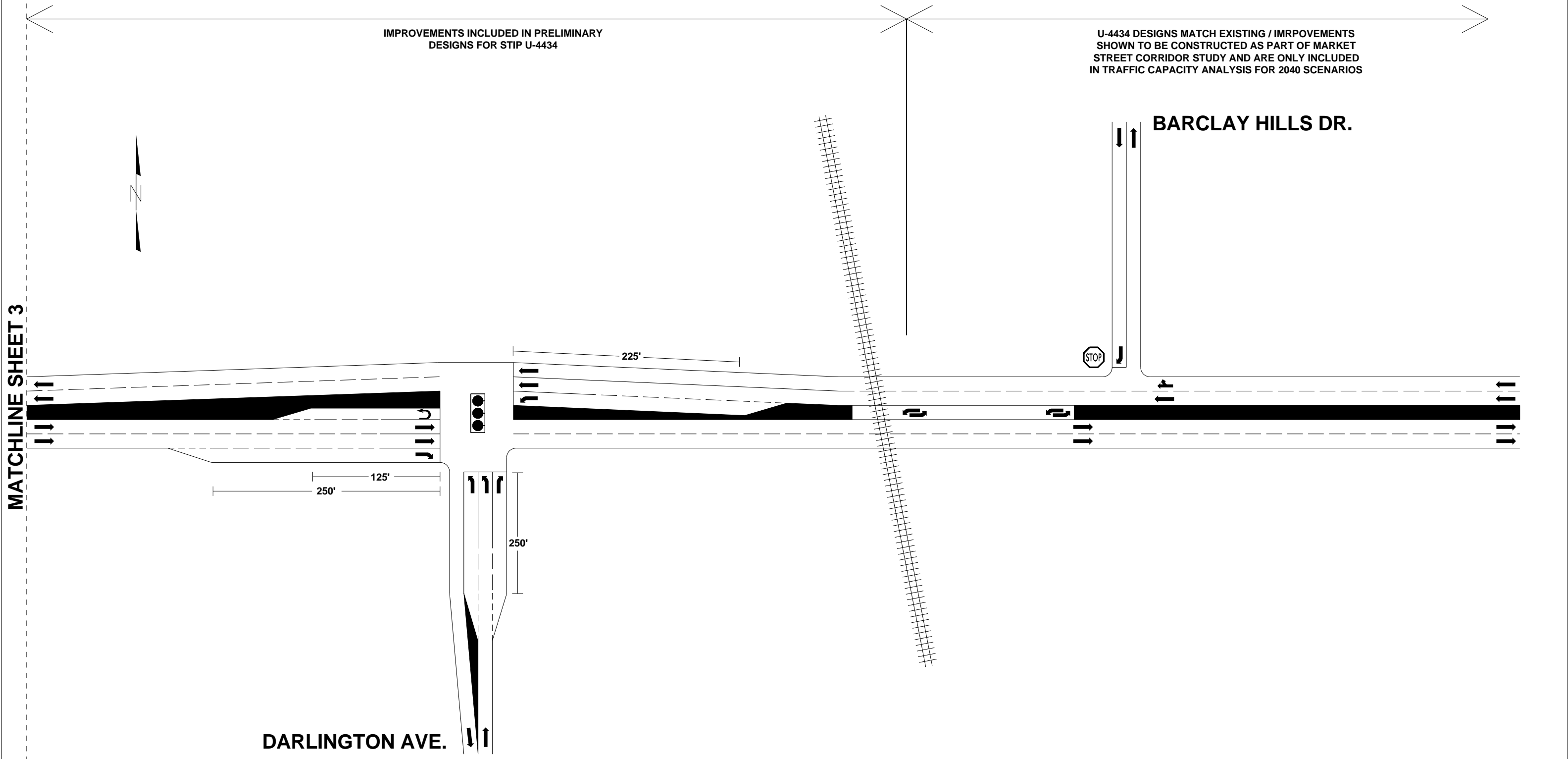
*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS INCLUDED IN PRELIMINARY  
DESIGNS FOR STIP U-4434

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS  
SHOWN TO BE CONSTRUCTED AS PART OF MARKET  
STREET CORRIDOR STUDY AND ARE ONLY INCLUDED  
IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS

MATCHLINE SHEET 3



# SHEET 4

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration** 240

**ALTERNATIVE 2  
QUADRANT BC**

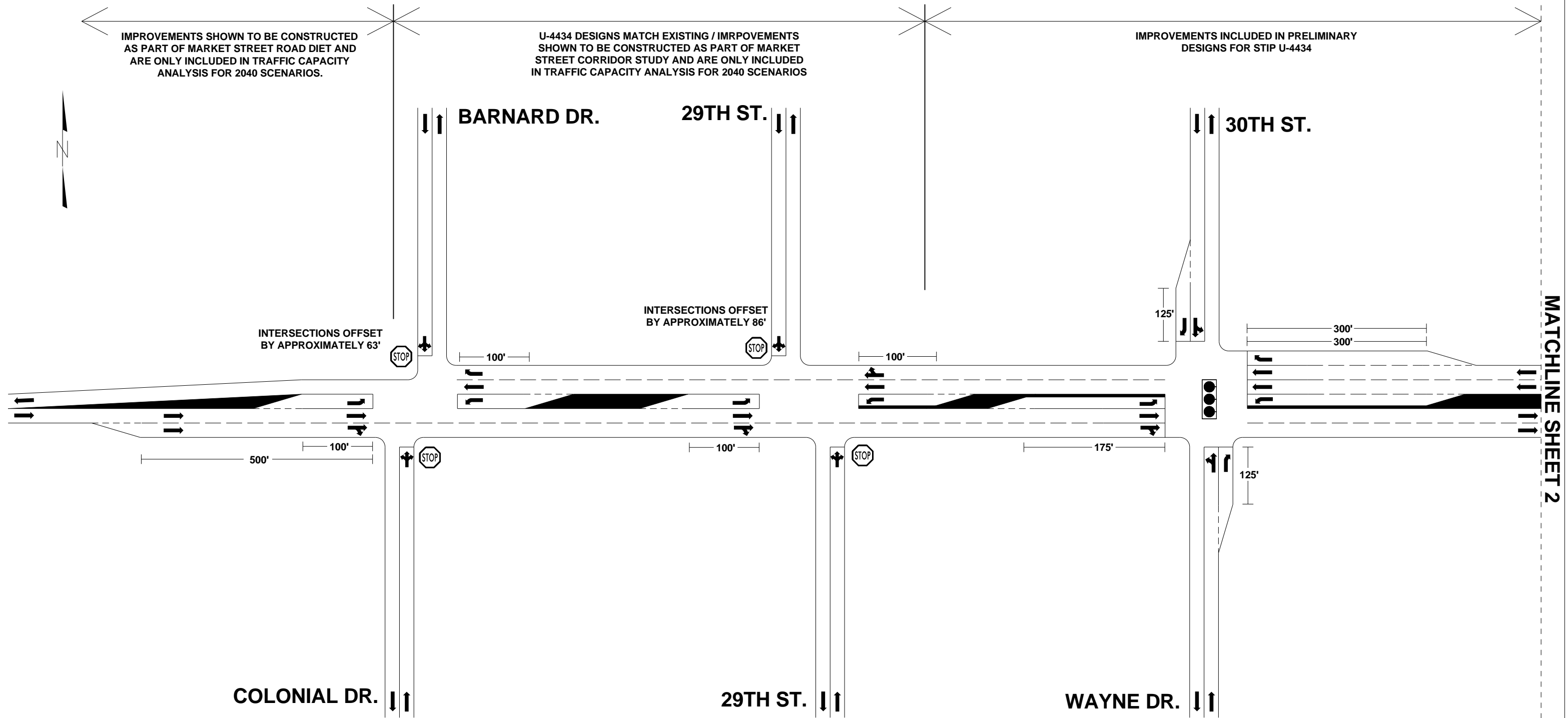
<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET ROAD DIET AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS.

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET CORRIDOR STUDY AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS

IMPROVEMENTS INCLUDED IN PRELIMINARY DESIGNS FOR STIP U-4434



# SHEET 1

- MAP NOT TO SCALE  
 - LANE WIDTHS ARE ASSUMED TO BE 12'

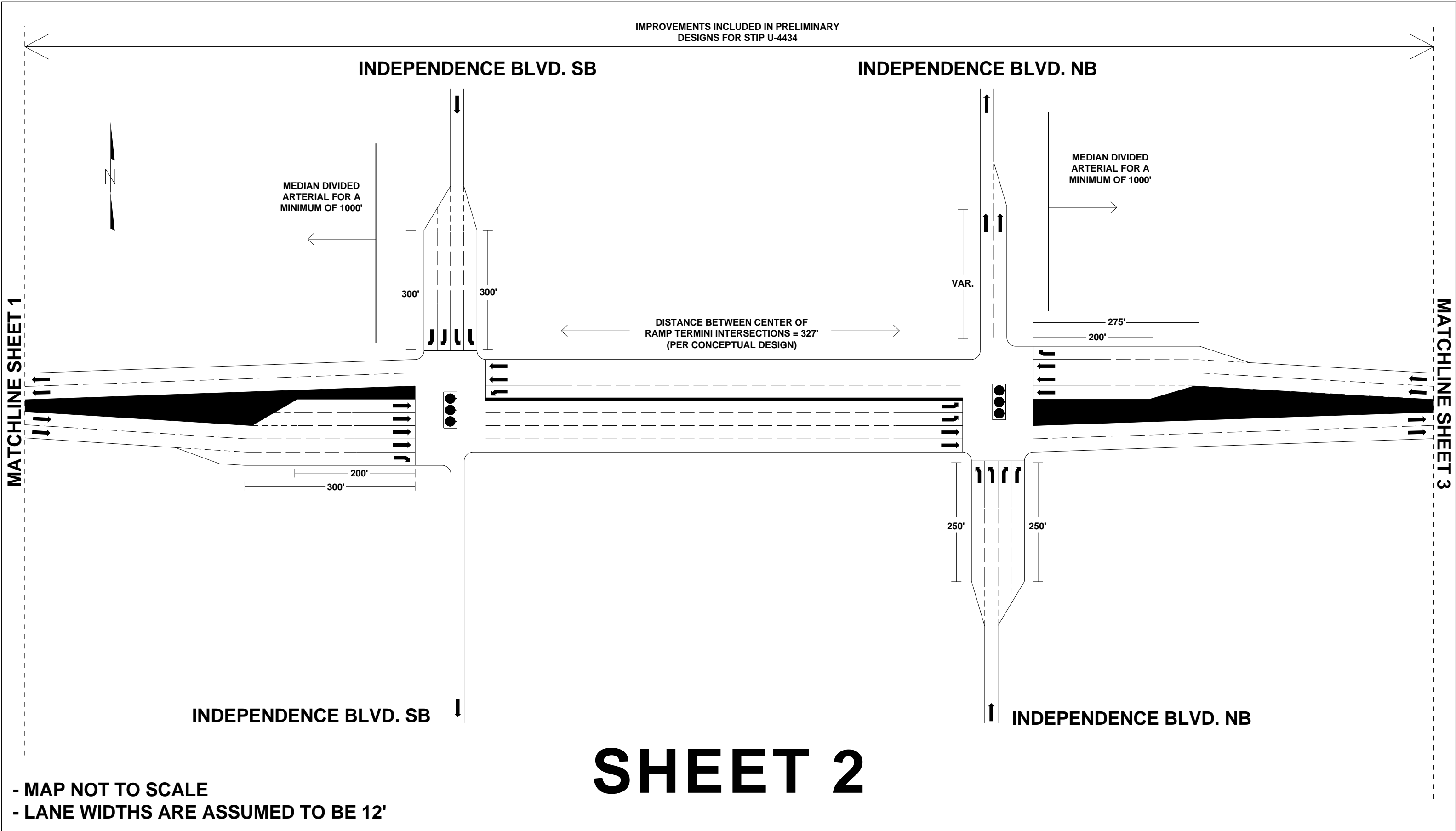
**U-4434 Independence Boulevard Extension  
 Market Street Corridor Lane Configuration**

241

**ALTERNATIVE 2  
 TIGHT URBAN DIAMOND**

*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



# SHEET 2

- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

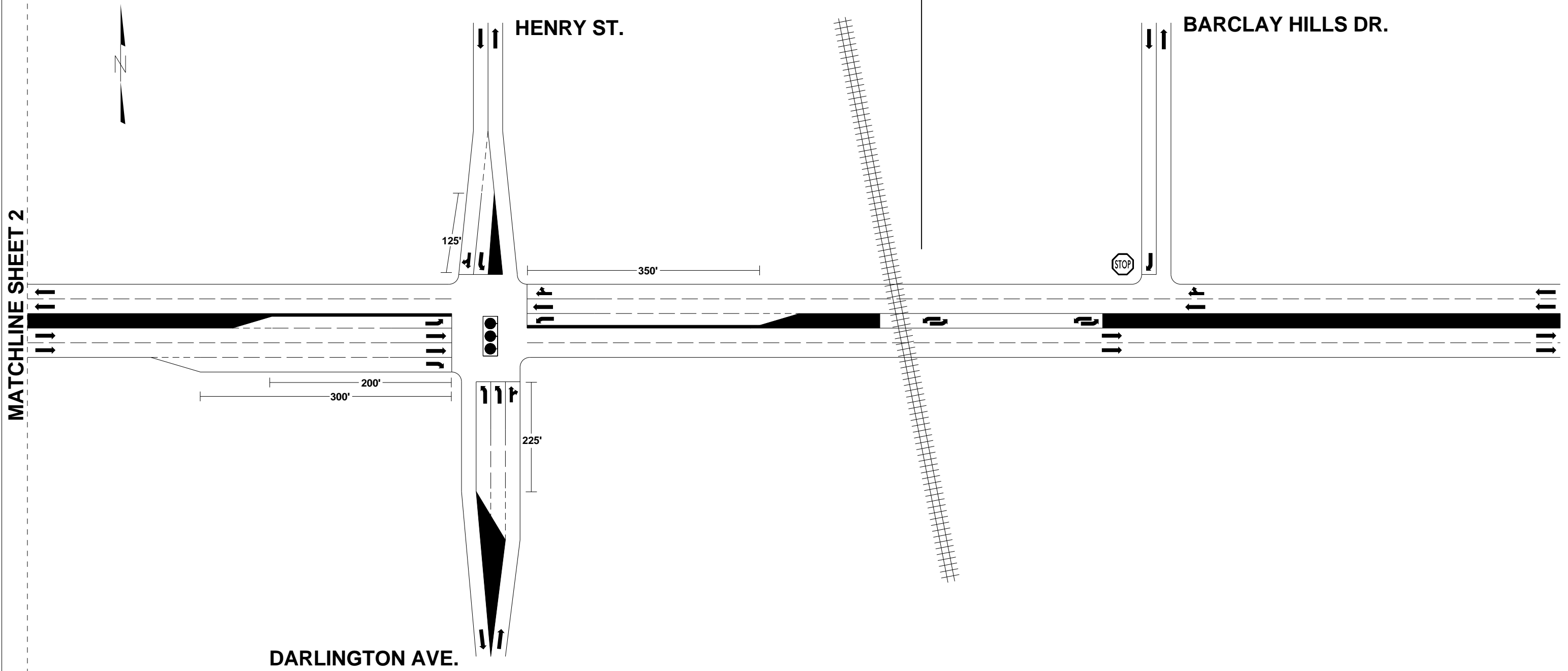
242

**ALTERNATIVE 2  
TIGHT URBAN DIAMOND**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS INCLUDED IN PRELIMINARY  
DESIGNS FOR STIP U-4434

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS  
SHOWN TO BE CONSTRUCTED AS PART OF MARKET  
STREET CORRIDOR STUDY AND ARE ONLY INCLUDED  
IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS



# SHEET 3

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

243

**ALTERNATIVE 2  
TIGHT URBAN DIAMOND**

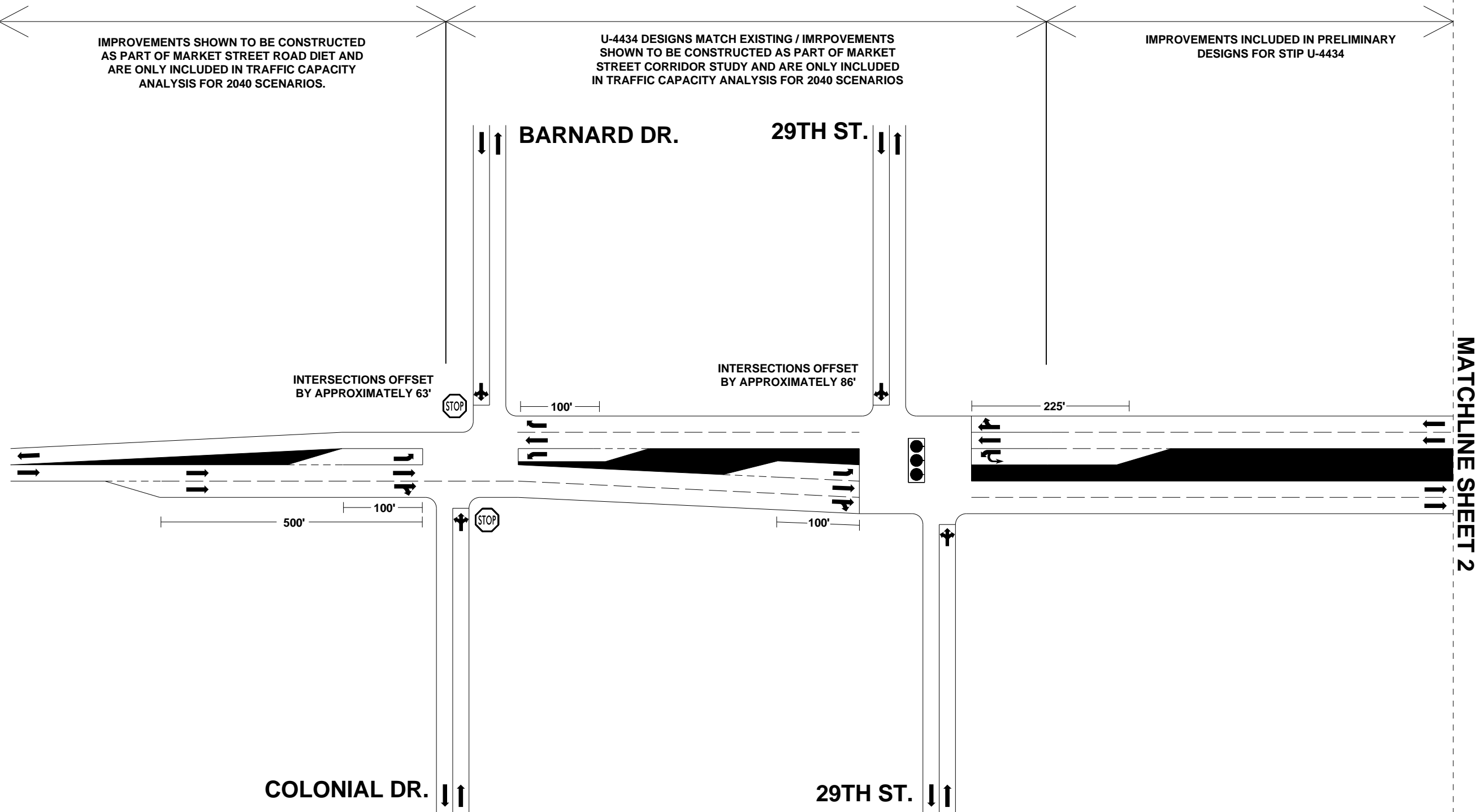
*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET ROAD DIET AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS.

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET CORRIDOR STUDY AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS

IMPROVEMENTS INCLUDED IN PRELIMINARY DESIGNS FOR STIP U-4434



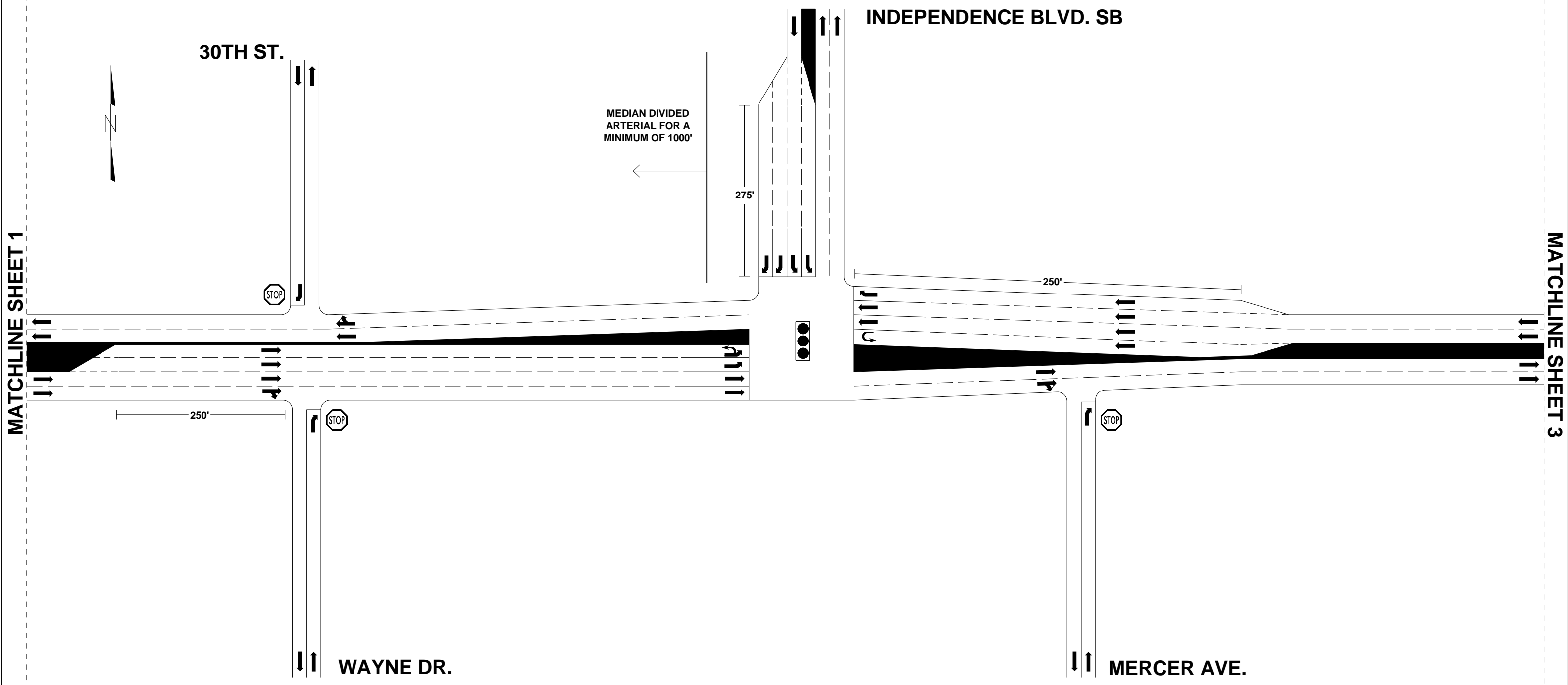
- MAP NOT TO SCALE  
 - LANE WIDTHS ARE ASSUMED TO BE 12'

# SHEET 1

**U-4434 Independence Boulevard Extension  
 Market Street Corridor Lane Configuration** 244

**ALTERNATIVE 7  
 QUADRANT AC**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



# SHEET 2

- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

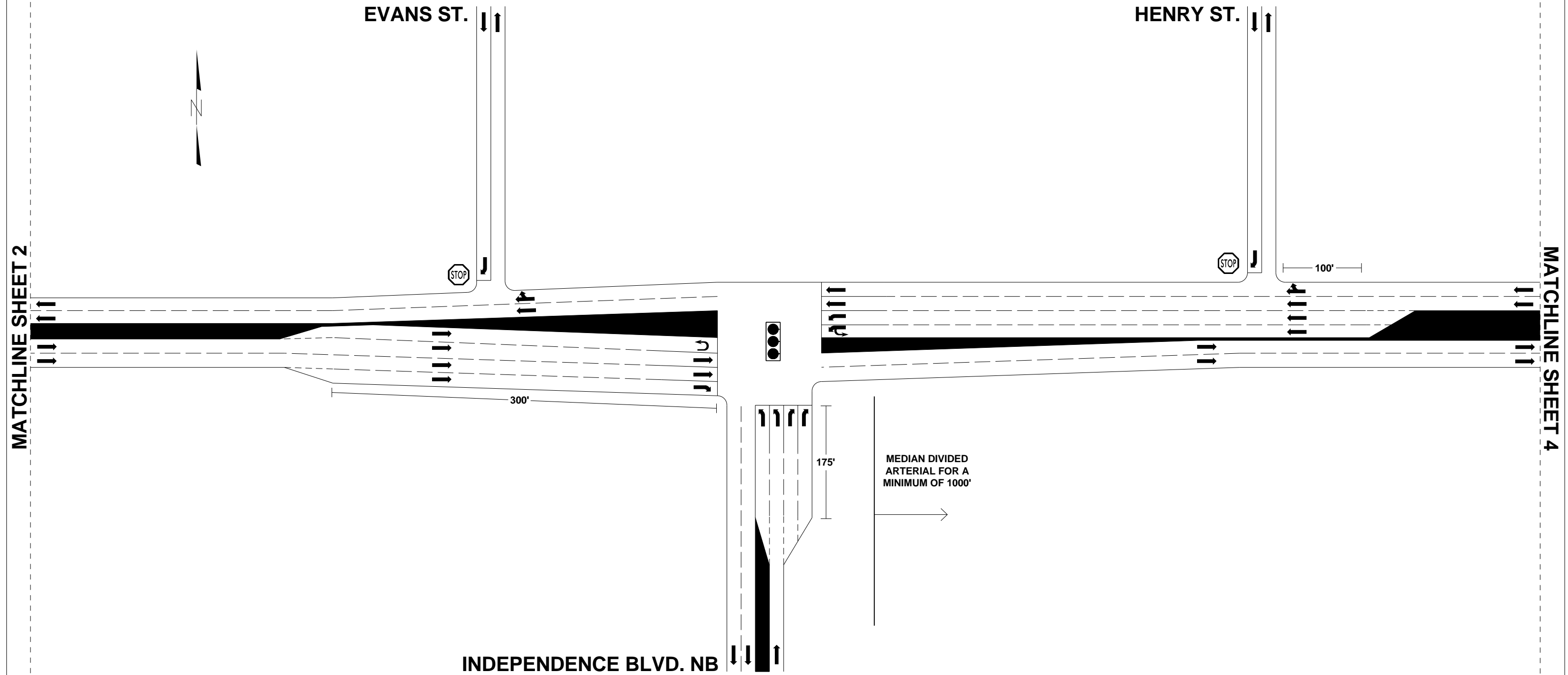
**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

245

**ALTERNATIVE 7  
QUADRANT AC**

**DESIGN DATA**

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



# SHEET 3

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

246

**ALTERNATIVE 7  
QUADRANT AC**

**DESIGN DATA**

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS INCLUDED IN PRELIMINARY  
DESIGNS FOR STIP U-4434

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS  
SHOWN TO BE CONSTRUCTED AS PART OF MARKET  
STREET CORRIDOR STUDY AND ARE ONLY INCLUDED  
IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS



MATCHLINE SHEET 3

BARCLAY HILLS DR.

275'

150'

225'

DARLINGTON AVE.

# SHEET 4

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

247

**ALTERNATIVE 7  
QUADRANT AC**

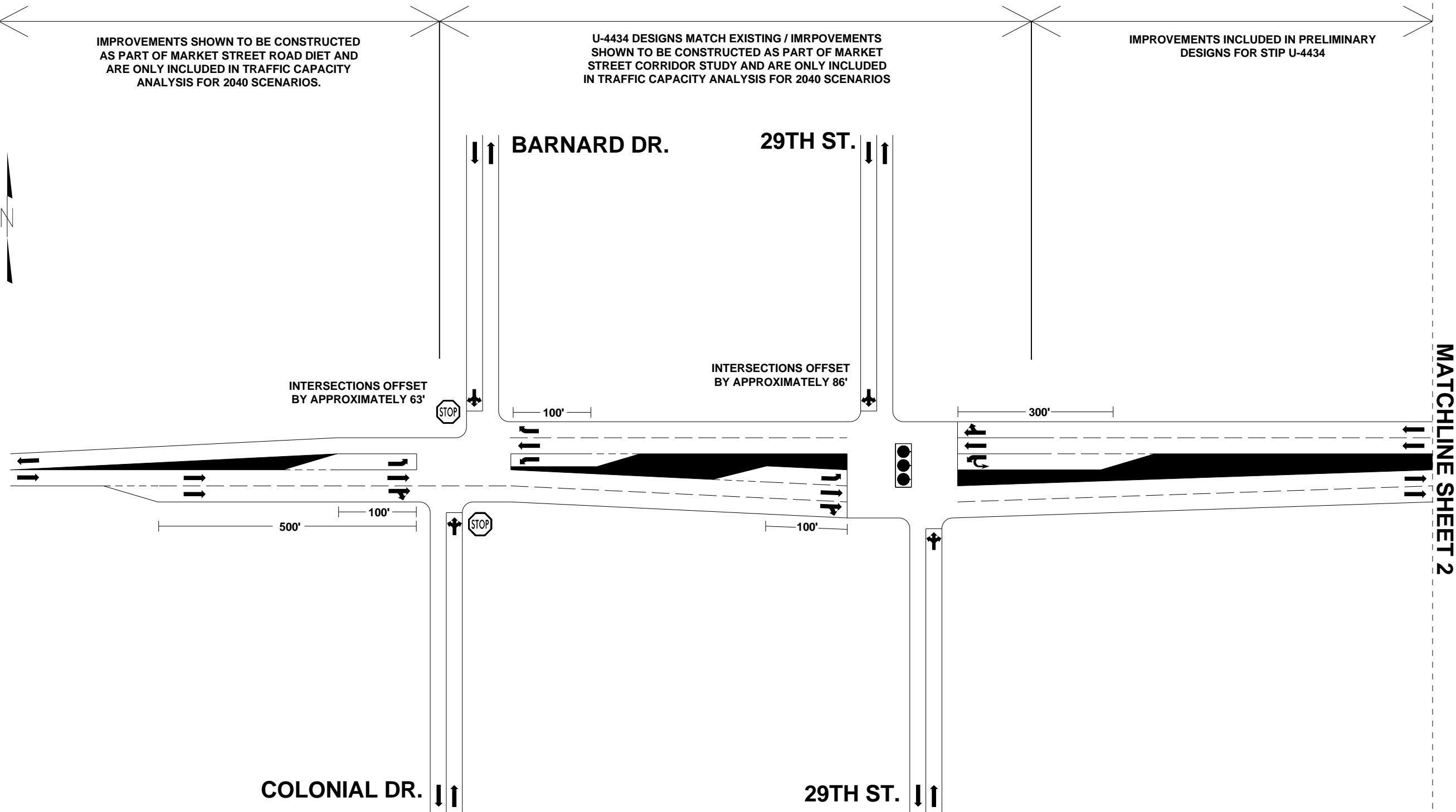
*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET ROAD DIET AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS.

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET CORRIDOR STUDY AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS

IMPROVEMENTS INCLUDED IN PRELIMINARY DESIGNS FOR STIP U-4434



MATCHLINE SHEET 2

# SHEET 1

- MAP NOT TO SCALE  
 - LANE WIDTHS ARE ASSUMED TO BE 12'

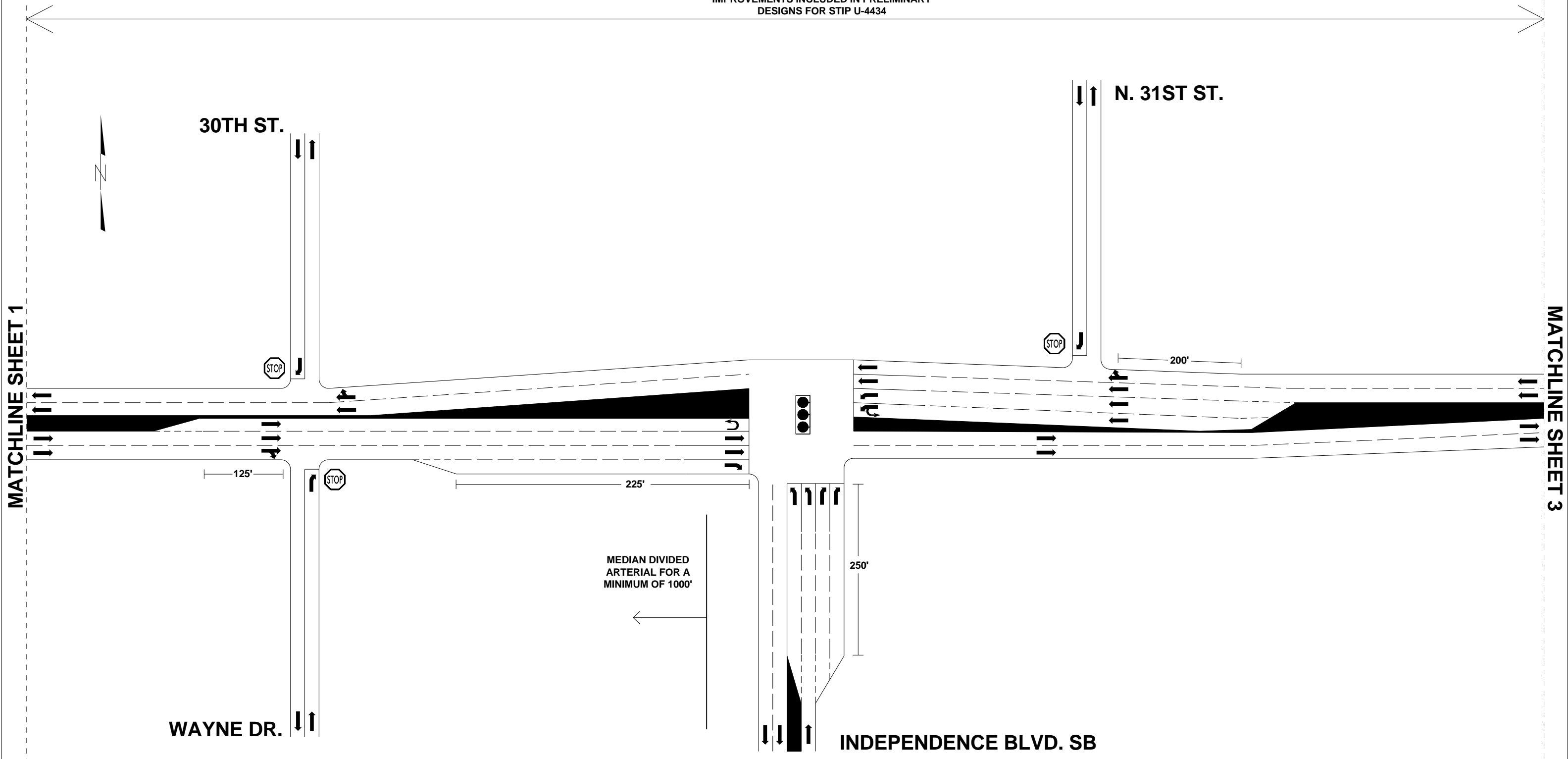
**U-4434 Independence Boulevard Extension  
 Market Street Corridor Lane Configuration**

248

**ALTERNATIVE 7  
 QUADRANT BC**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%





# SHEET 2

- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

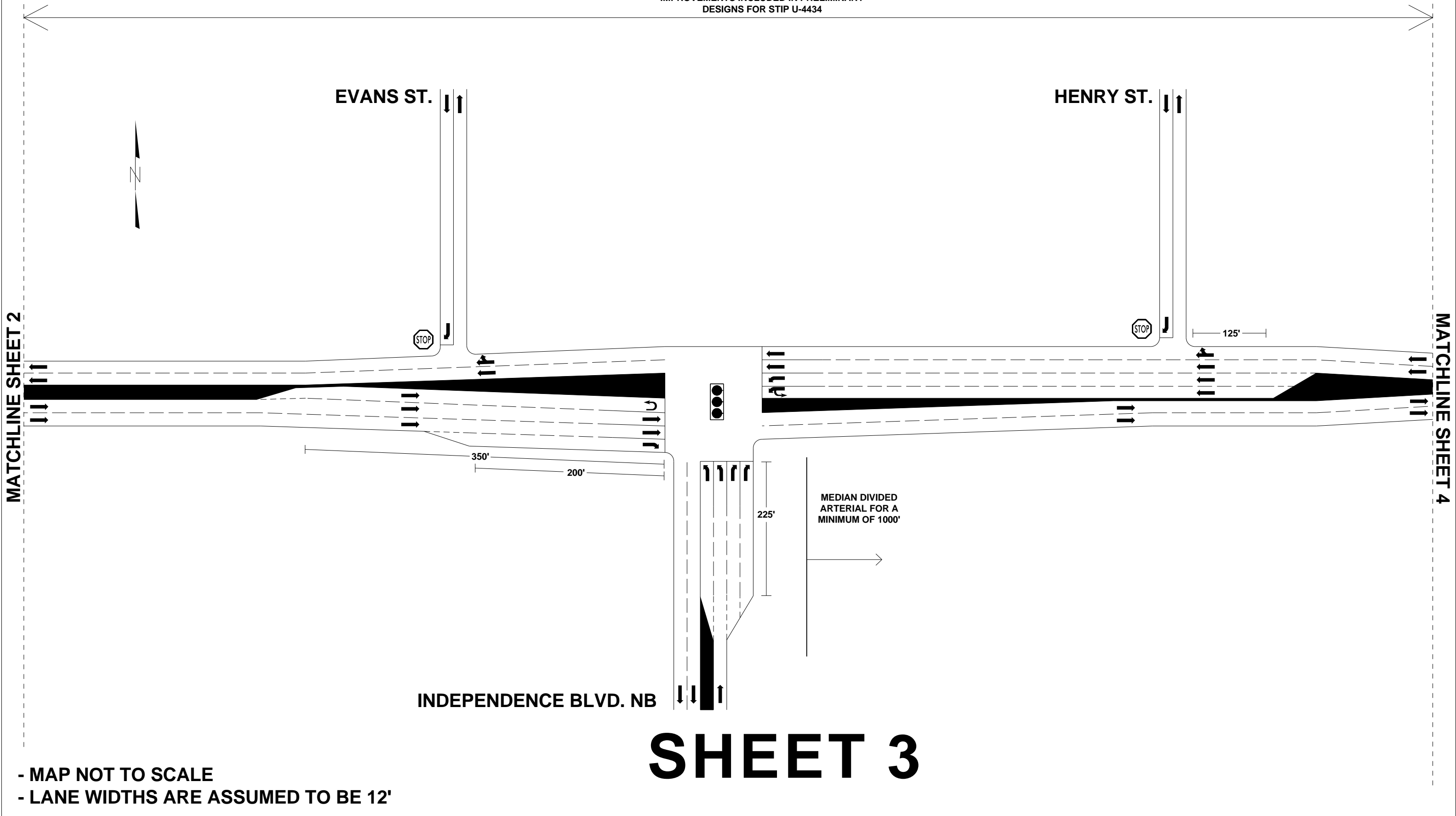
**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

249

**ALTERNATIVE 7  
QUADRANT BC**

*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



# SHEET 3

- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

250

**ALTERNATIVE 7  
QUADRANT BC**

*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS INCLUDED IN PRELIMINARY  
DESIGNS FOR STIP U-4434

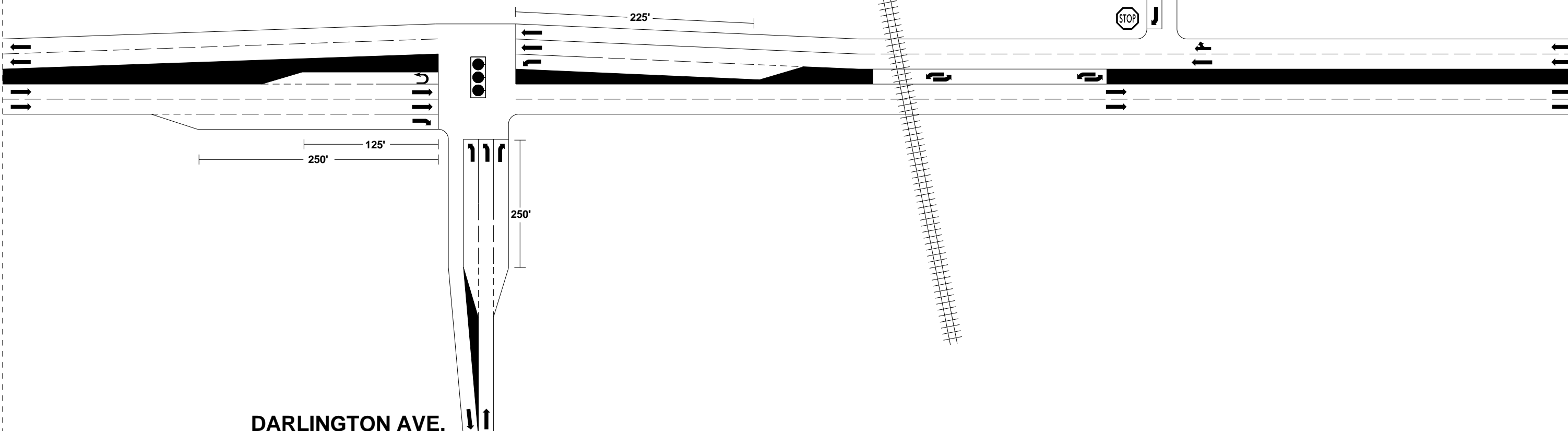
U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS  
SHOWN TO BE CONSTRUCTED AS PART OF MARKET  
STREET CORRIDOR STUDY AND ARE ONLY INCLUDED  
IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS



MATCHLINE SHEET 3

BARCLAY HILLS DR.

DARLINGTON AVE.



# SHEET 4

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

251

**ALTERNATIVE 7  
QUADRANT BC**

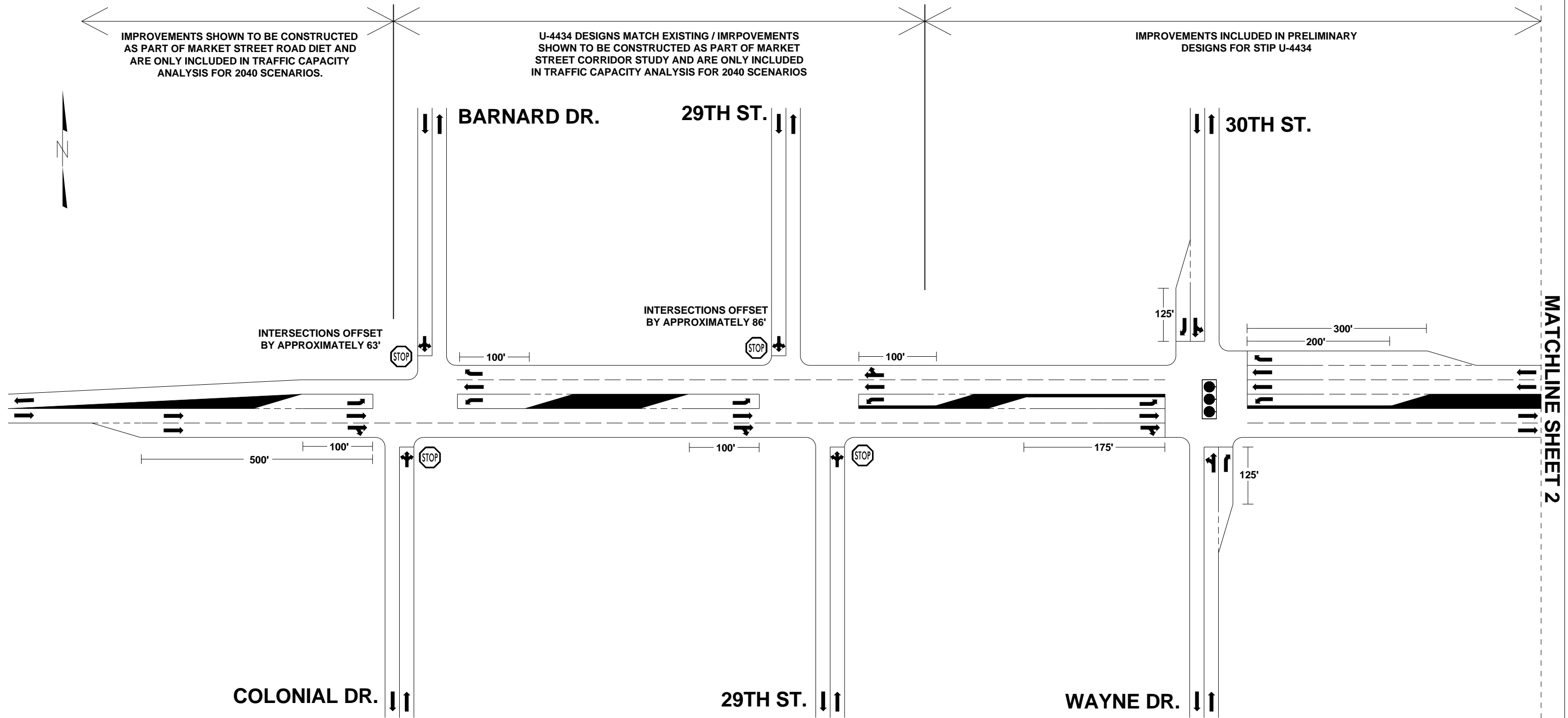
*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET ROAD DIET AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS.

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET CORRIDOR STUDY AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS

IMPROVEMENTS INCLUDED IN PRELIMINARY DESIGNS FOR STIP U-4434



# SHEET 1

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

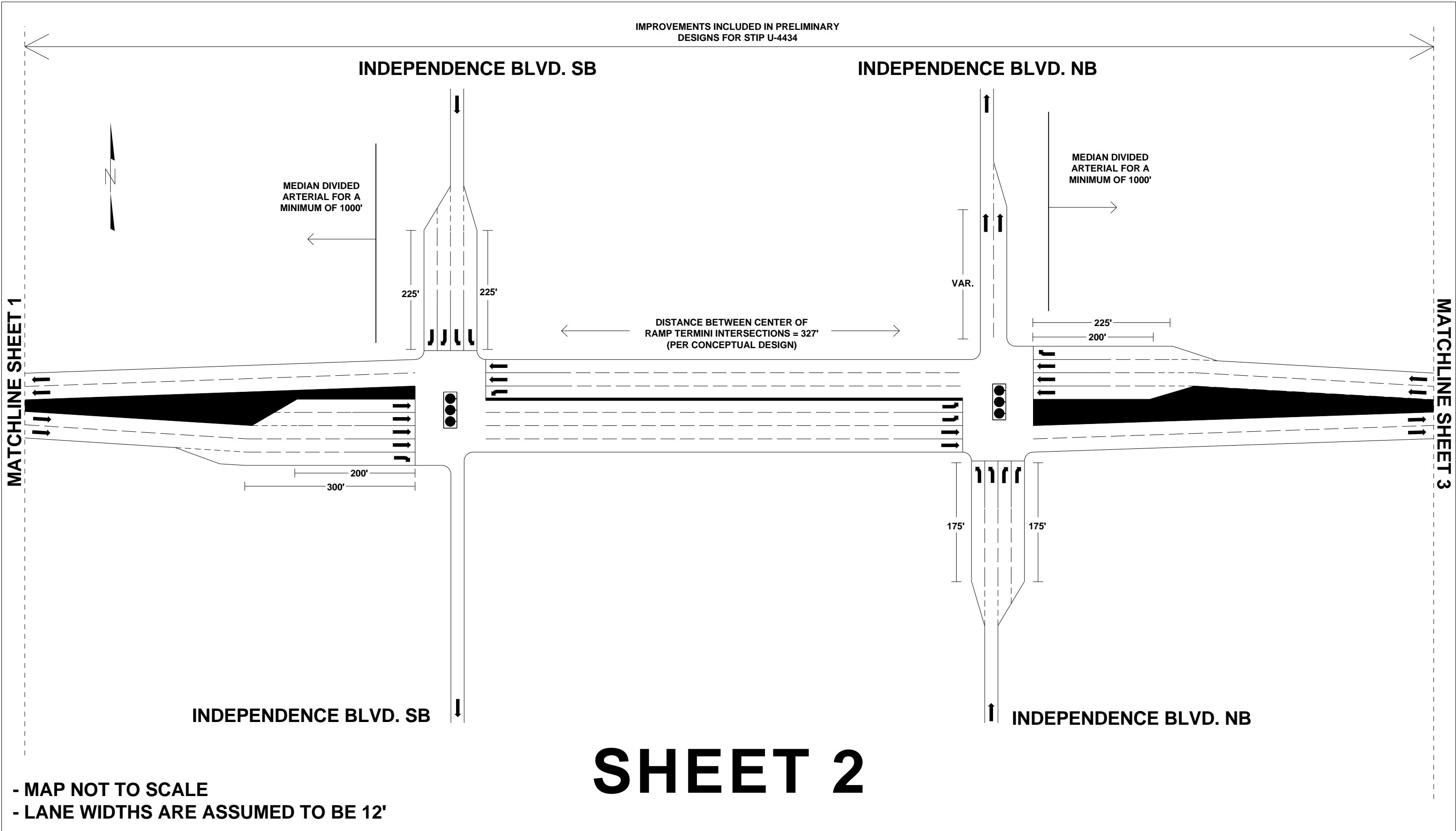
**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

252

**ALTERNATIVE 7  
TIGHT URBAN DIAMOND**

**DESIGN DATA**

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



# SHEET 2

- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

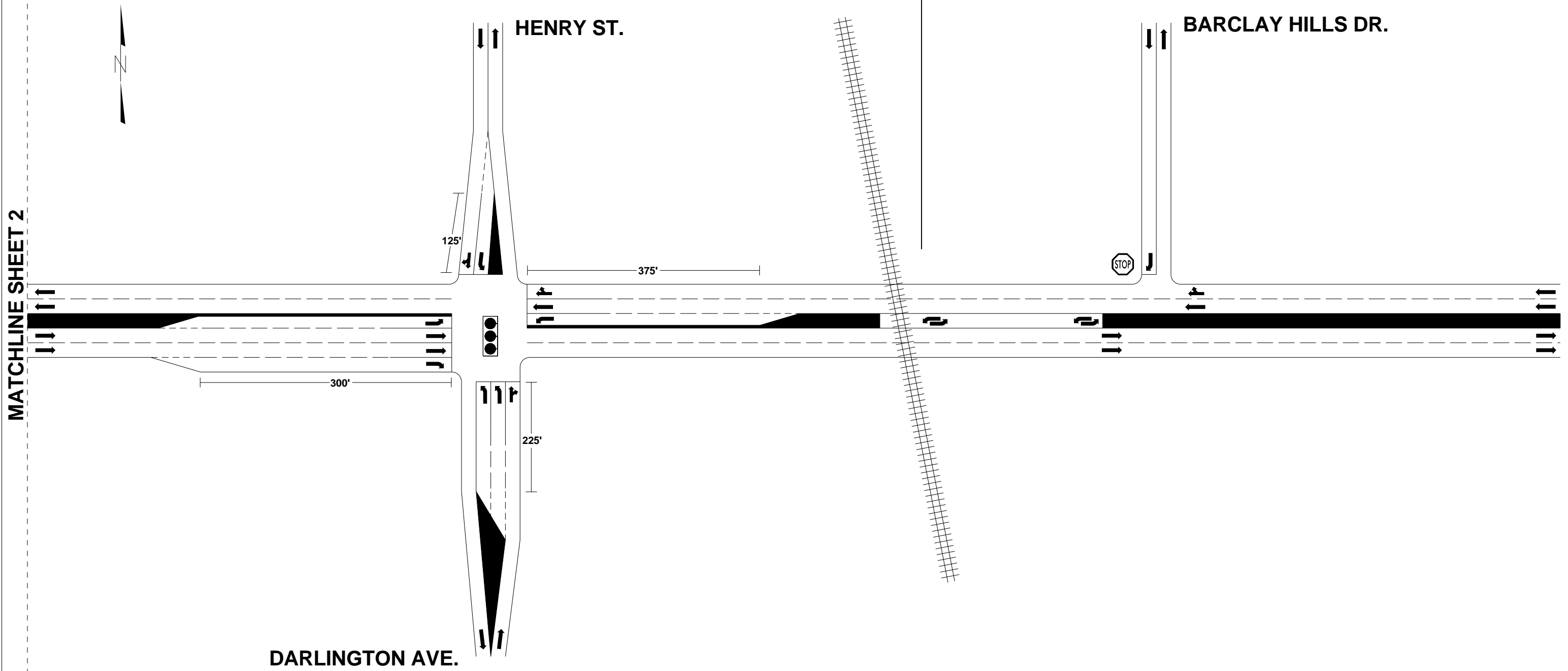
253

**ALTERNATIVE 7  
TIGHT URBAN DIAMOND**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS INCLUDED IN PRELIMINARY  
DESIGNS FOR STIP U-4434

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS  
SHOWN TO BE CONSTRUCTED AS PART OF MARKET  
STREET CORRIDOR STUDY AND ARE ONLY INCLUDED  
IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS



# SHEET 3

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

254

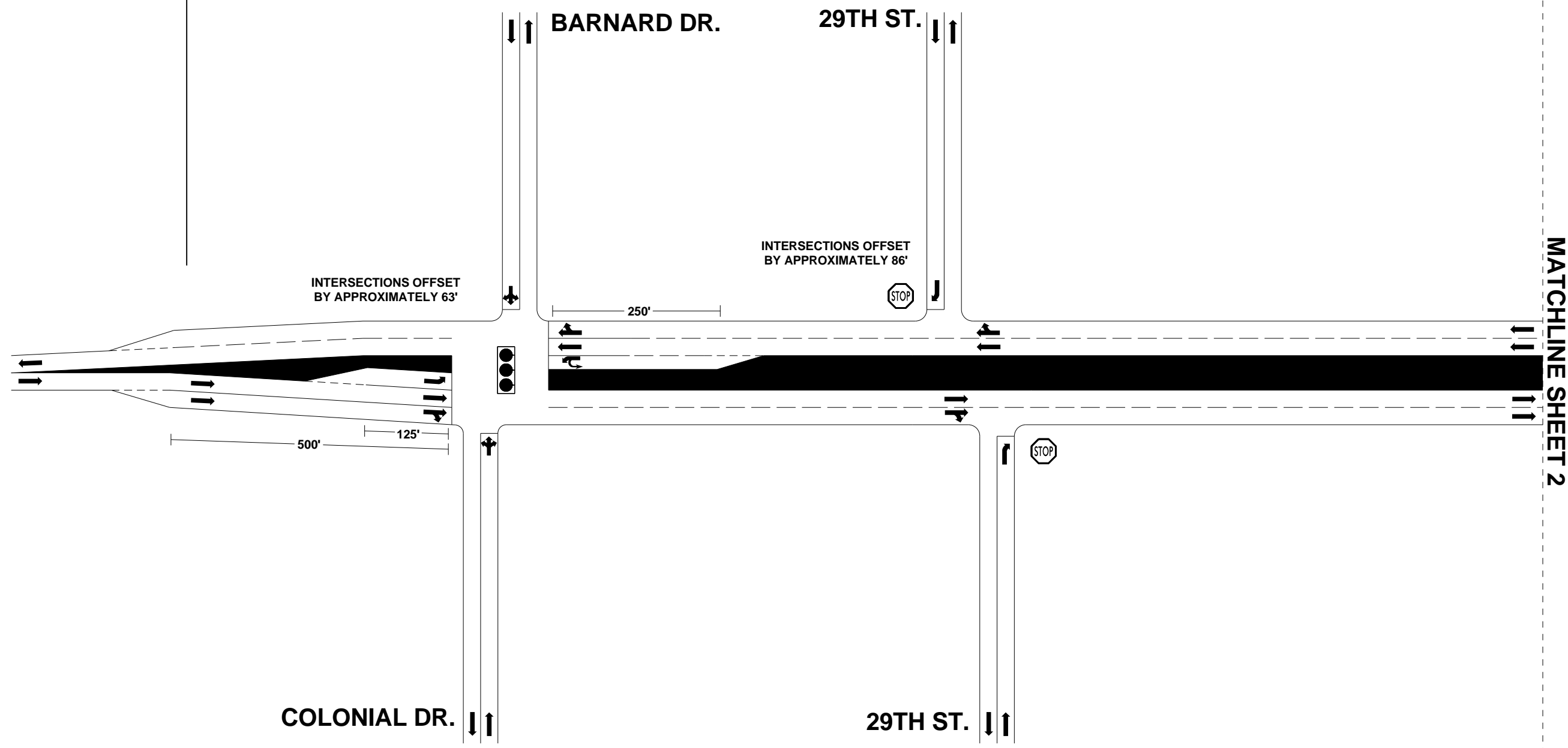
**ALTERNATIVE 7  
TIGHT URBAN DIAMOND**

*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET ROAD DIET AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS.

IMPROVEMENTS INCLUDED IN PRELIMINARY DESIGNS FOR STIP U-4434



MATCHLINE SHEET 2

# SHEET 1

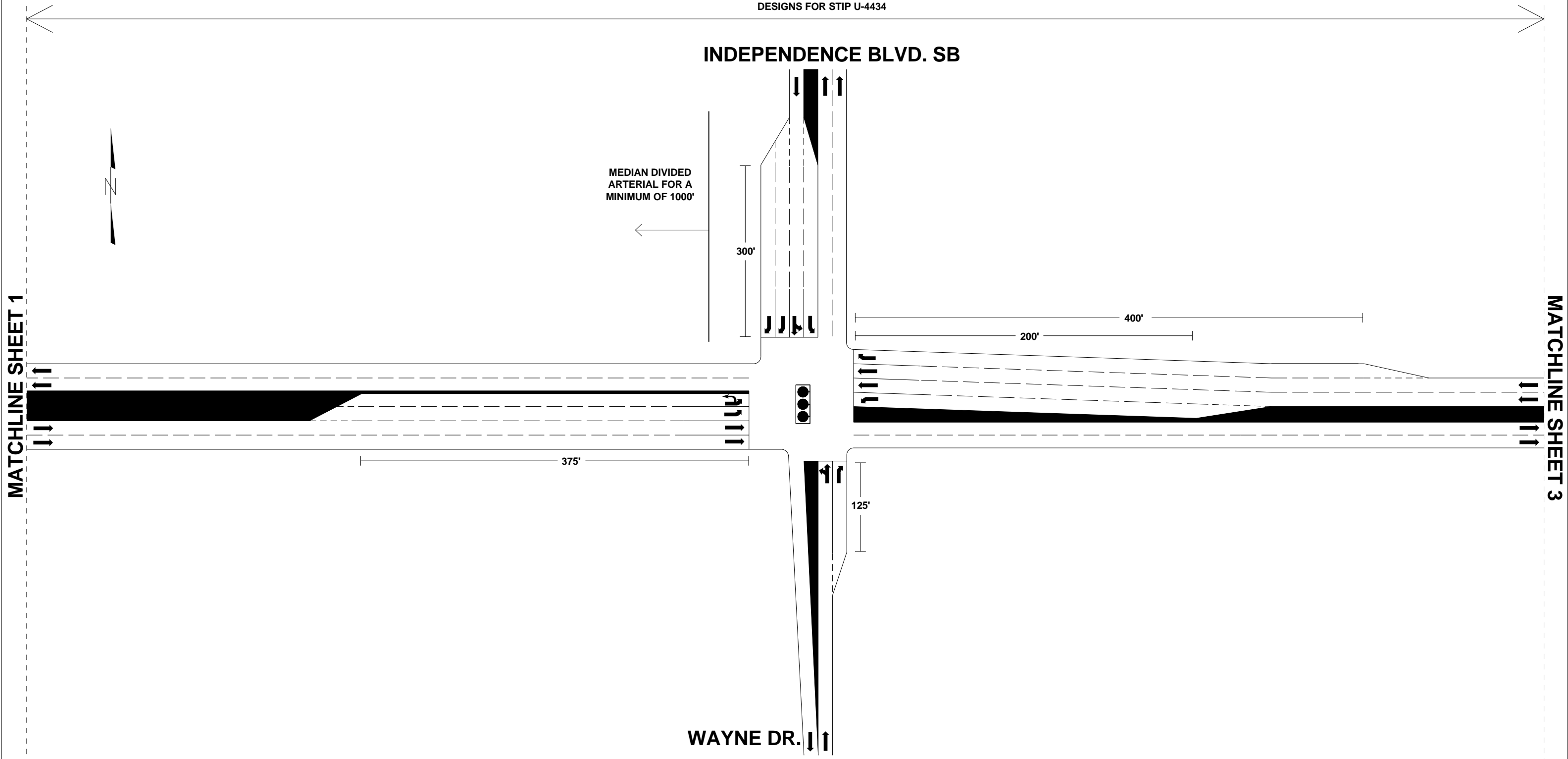
- MAP NOT TO SCALE  
 - LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
 Market Street Corridor Lane Configuration**

255

**ALTERNATIVE 8  
 QUADRANT AC**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



# SHEET 2

- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

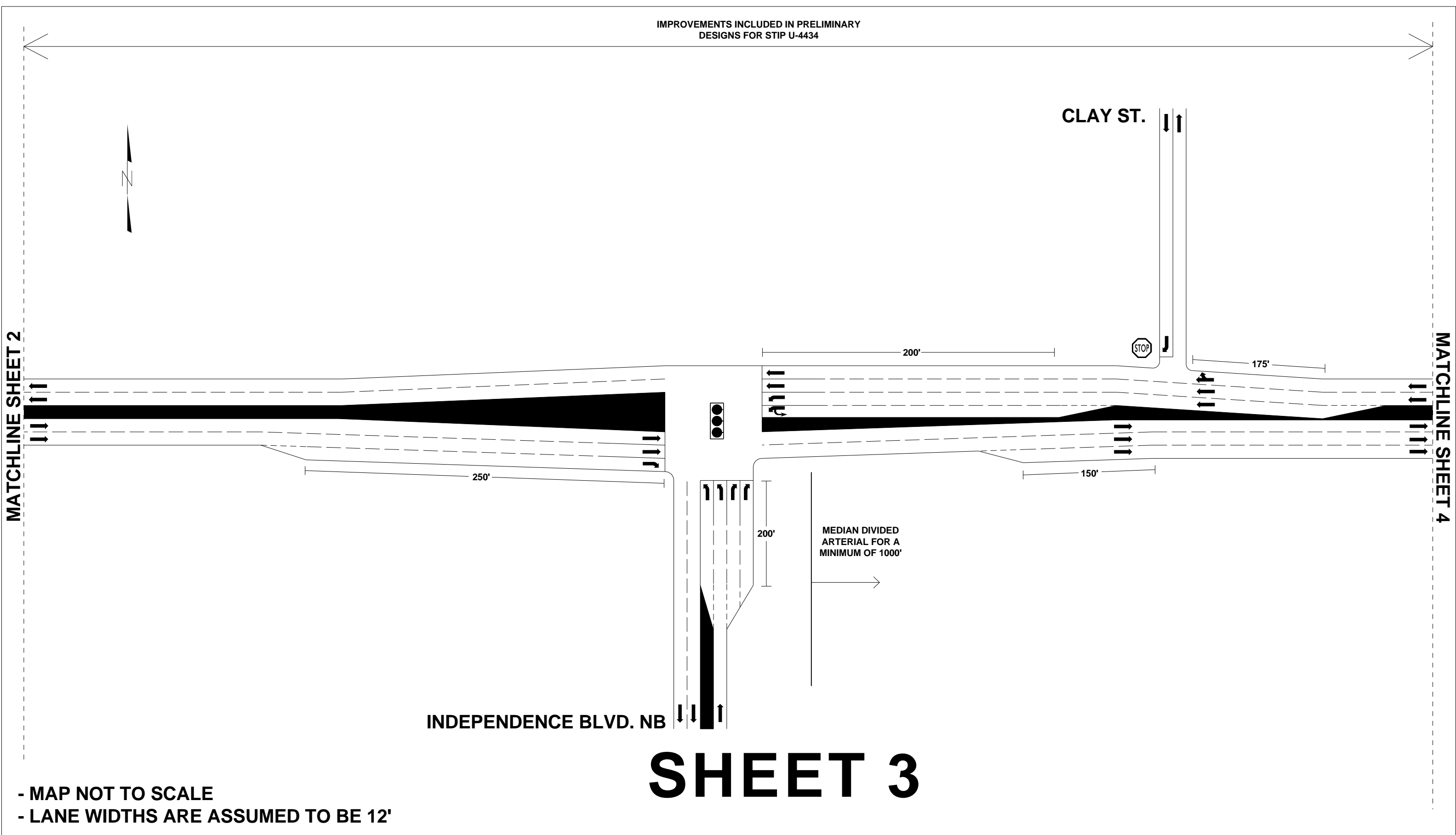
**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

256

**ALTERNATIVE 8  
QUADRANT AC**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%





- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

# SHEET 3

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

257

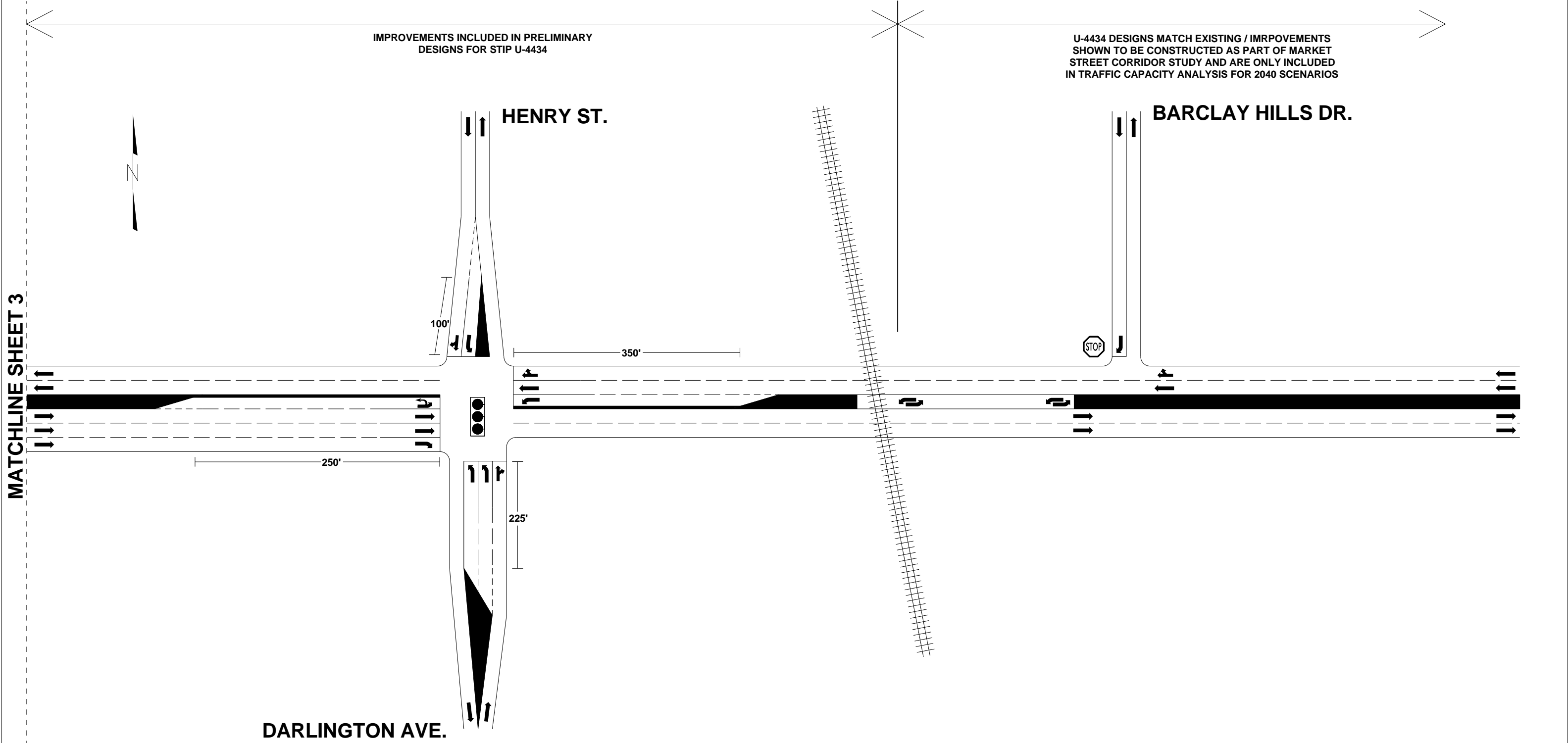
**ALTERNATIVE 8  
QUADRANT AC**

*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS INCLUDED IN PRELIMINARY  
DESIGNS FOR STIP U-4434

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS  
SHOWN TO BE CONSTRUCTED AS PART OF MARKET  
STREET CORRIDOR STUDY AND ARE ONLY INCLUDED  
IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS



MATCHLINE SHEET 3

DARLINGTON AVE.

HENRY ST.

BARCLAY HILLS DR.

# SHEET 4

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

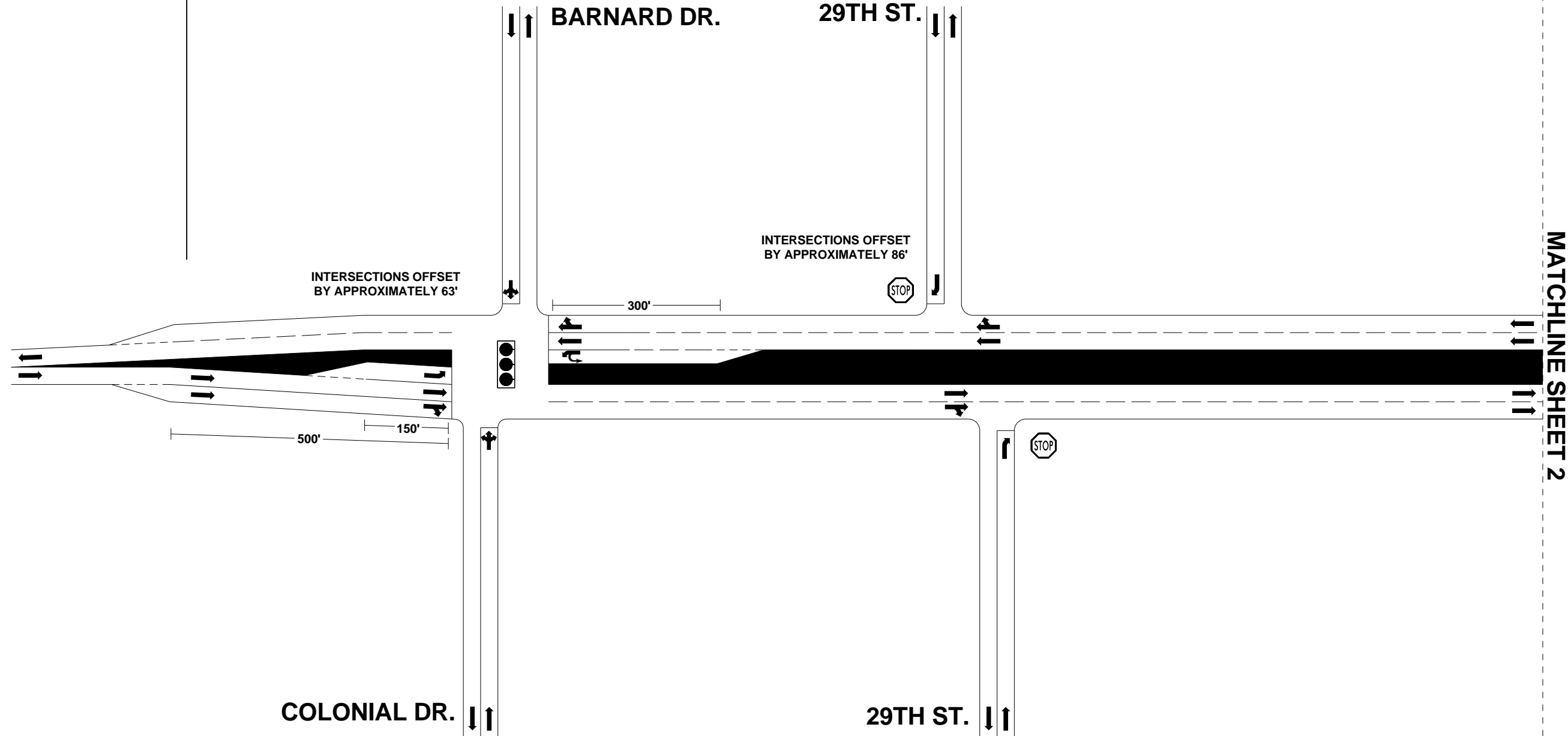
258

**ALTERNATIVE 8  
QUADRANT AC**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET ROAD DIET AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS.

IMPROVEMENTS INCLUDED IN PRELIMINARY DESIGNS FOR STIP U-4434



- MAP NOT TO SCALE  
 - LANE WIDTHS ARE ASSUMED TO BE 12'

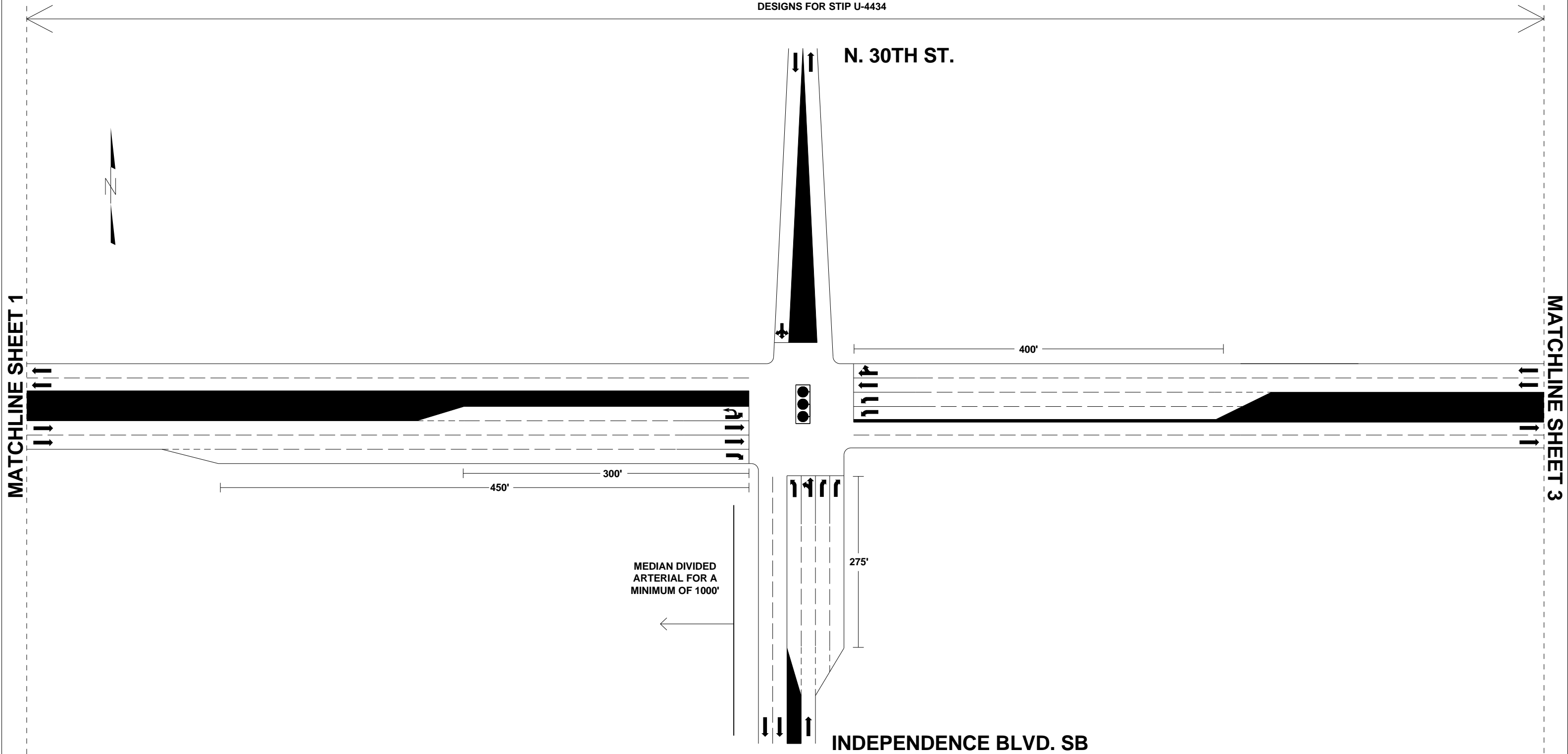
# SHEET 1

**U-4434 Independence Boulevard Extension  
 Market Street Corridor Lane Configuration**

259

**ALTERNATIVE 8  
 QUADRANT BC**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



# SHEET 2

- MAP NOT TO SCALE  
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

260

**ALTERNATIVE 8  
QUADRANT BC**

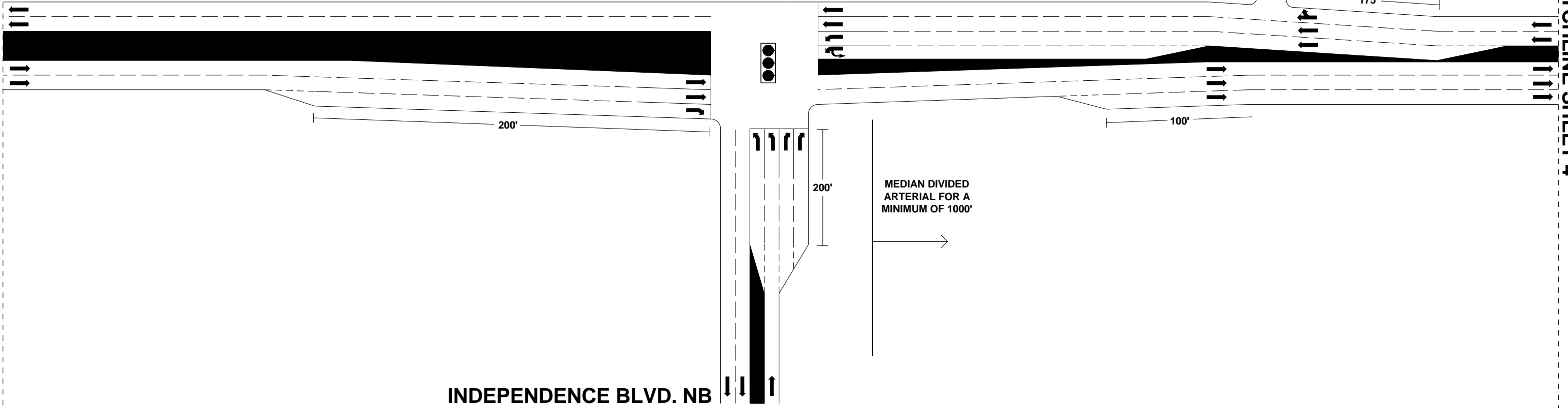
*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



MATCHLINE SHEET 2

MATCHLINE SHEET 4



- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

# SHEET 3

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

261

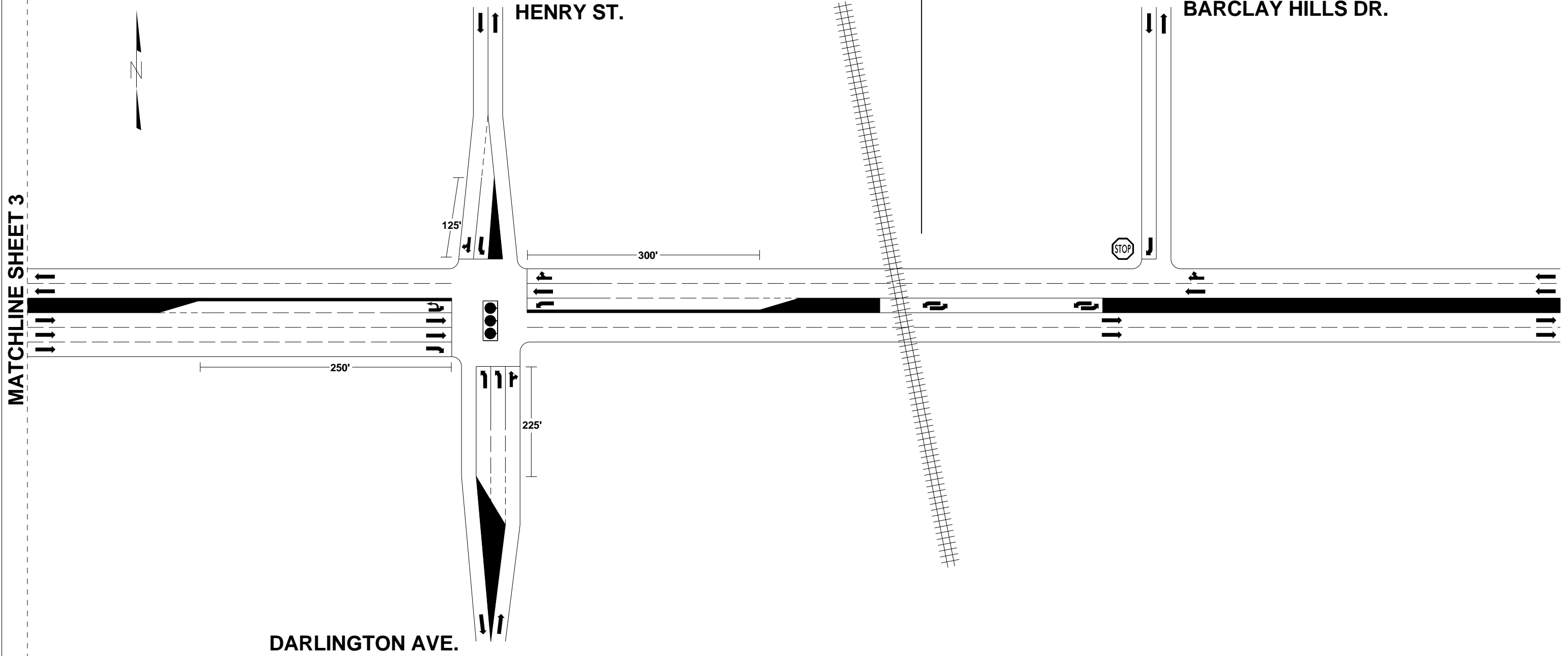
**ALTERNATIVE 8  
QUADRANT BC**

*DESIGN DATA*

Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

IMPROVEMENTS INCLUDED IN PRELIMINARY  
DESIGNS FOR STIP U-4434

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS  
SHOWN TO BE CONSTRUCTED AS PART OF MARKET  
STREET CORRIDOR STUDY AND ARE ONLY INCLUDED  
IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS



MATCHLINE SHEET 3

DARLINGTON AVE.

HENRY ST.

BARCLAY HILLS DR.

# SHEET 4

- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

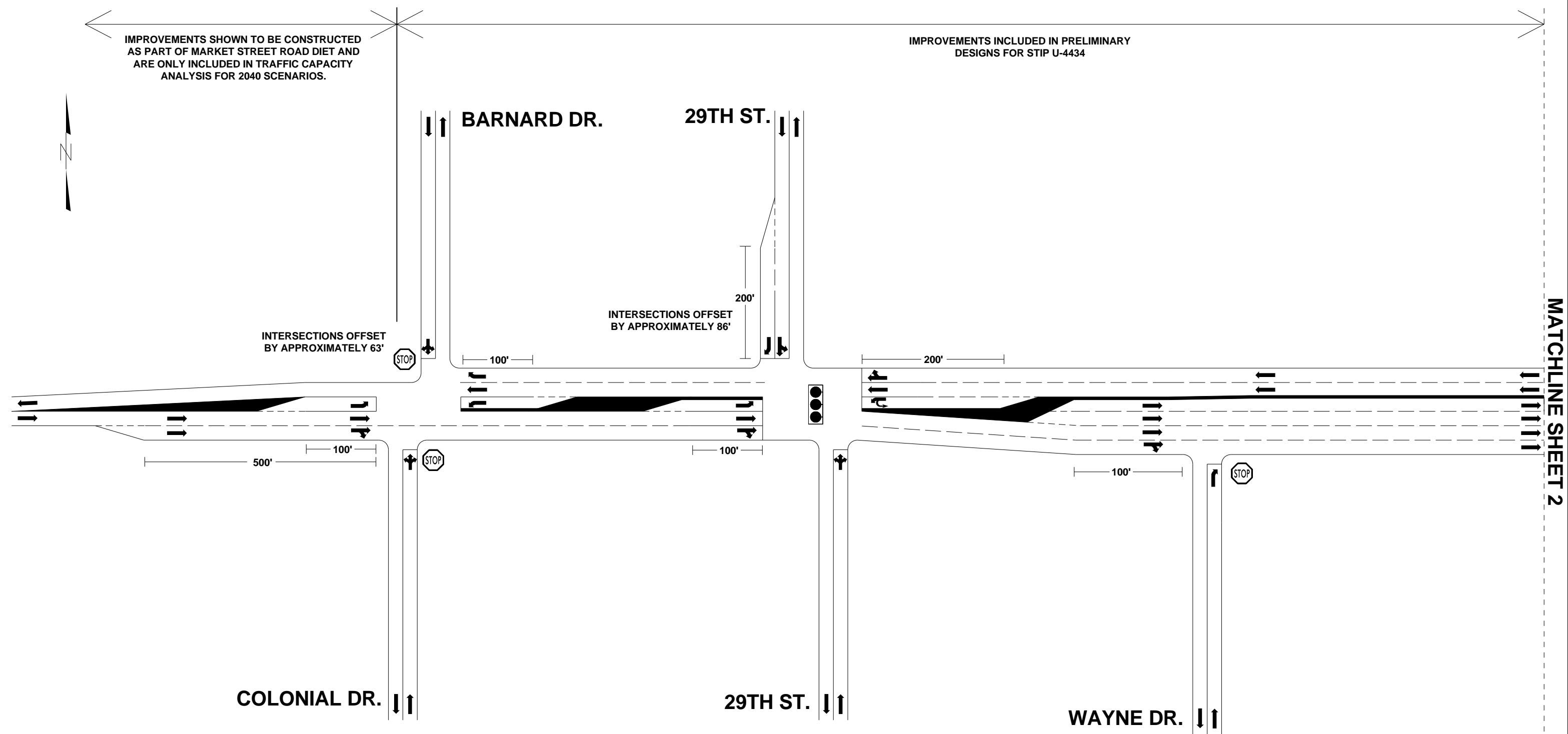
262

**ALTERNATIVE 8  
QUADRANT BC**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%

← IMPROVEMENTS SHOWN TO BE CONSTRUCTED AS PART OF MARKET STREET ROAD DIET AND ARE ONLY INCLUDED IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS.

→ IMPROVEMENTS INCLUDED IN PRELIMINARY DESIGNS FOR STIP U-4434



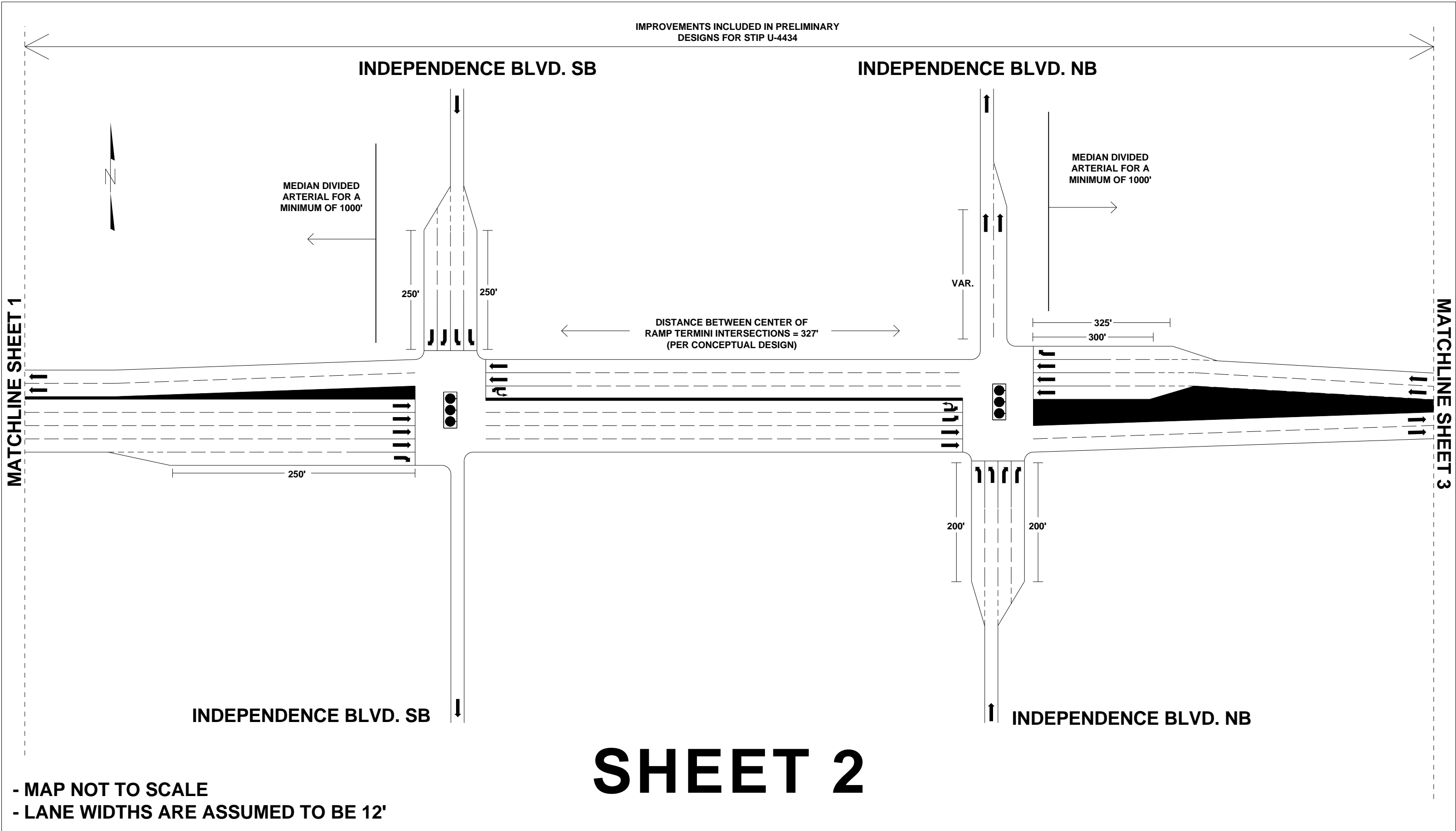
# SHEET 1

- MAP NOT TO SCALE  
 - LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
 Market Street Corridor Lane Configuration** 263

**ALTERNATIVE 8  
 TIGHT URBAN DIAMOND**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



# SHEET 2

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

264

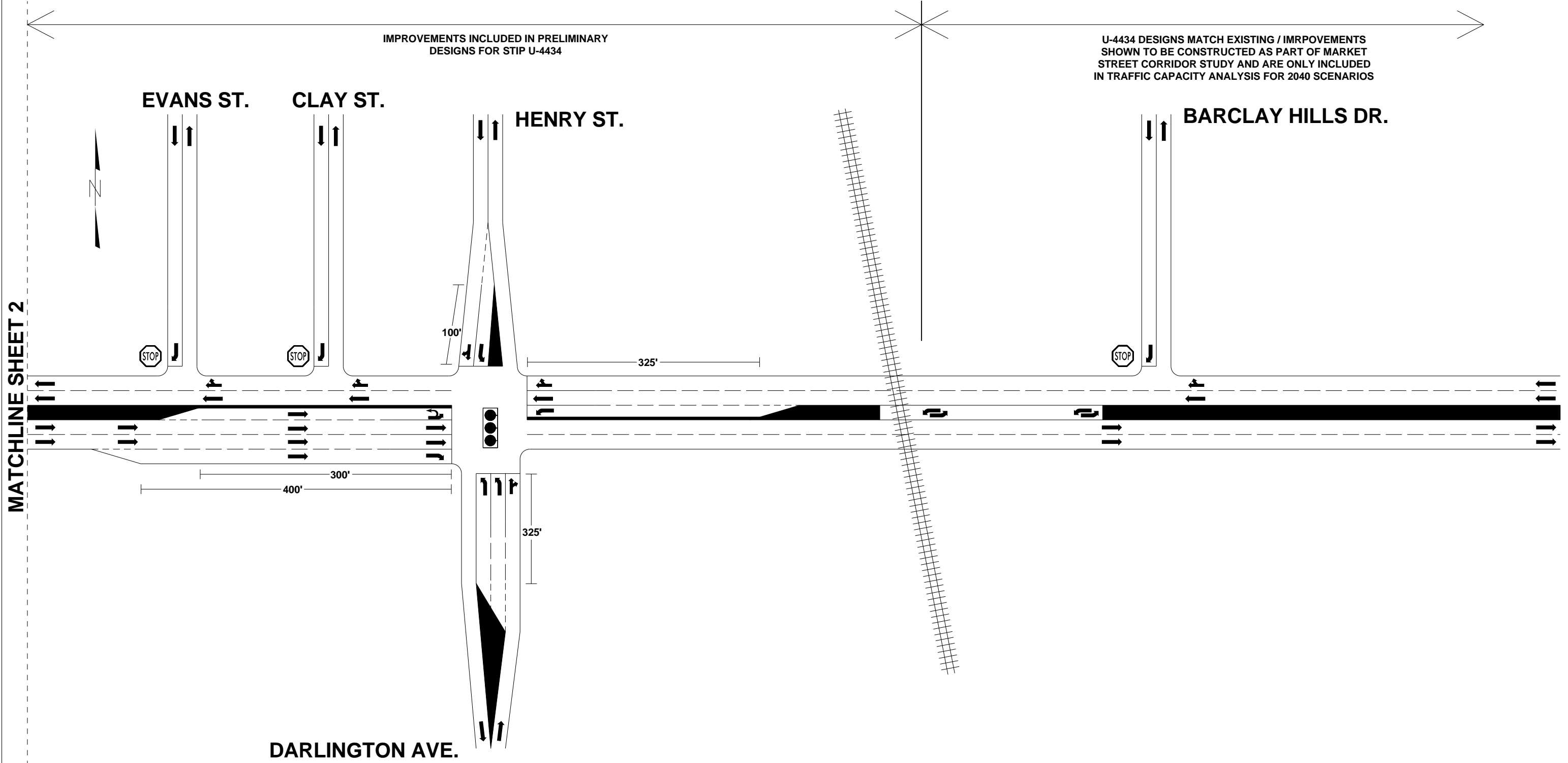
**ALTERNATIVE 8  
TIGHT URBAN DIAMOND**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



IMPROVEMENTS INCLUDED IN PRELIMINARY  
DESIGNS FOR STIP U-4434

U-4434 DESIGNS MATCH EXISTING / IMPROVEMENTS  
SHOWN TO BE CONSTRUCTED AS PART OF MARKET  
STREET CORRIDOR STUDY AND ARE ONLY INCLUDED  
IN TRAFFIC CAPACITY ANALYSIS FOR 2040 SCENARIOS



MATCHLINE SHEET 2

# SHEET 3

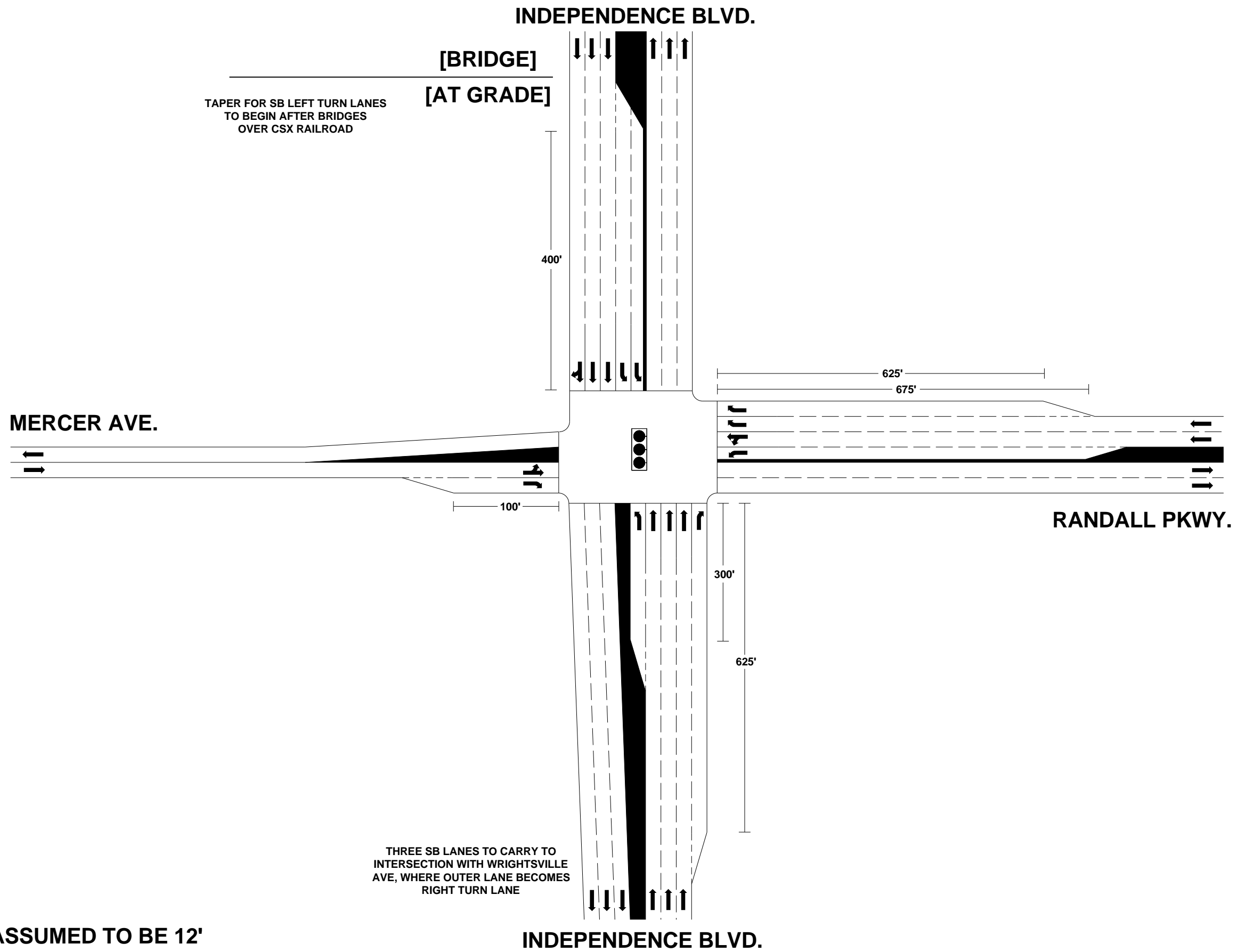
- MAP NOT TO SCALE
- LANE WIDTHS ARE ASSUMED TO BE 12'

**U-4434 Independence Boulevard Extension  
Market Street Corridor Lane Configuration**

265

**ALTERNATIVE 8  
TIGHT URBAN DIAMOND**

<i>DESIGN DATA</i>		
Functional Class.	=	Arterial
Design Speed	=	45 mph
Max. Superelev.	=	4%



- MAP NOT TO SCALE  
 - LANE WIDTHS ARE ASSUMED TO BE 12'

# U-4434 Independence Boulevard Extension Independence Blvd Lane Configuration

266

ALL ALTERNATIVES  
 INDEPENDENCE BLVD @  
 RANDALL PKWY / MERCER AVE

<i>DESIGN DATA</i>	
Functional Class.	= Arterial
Design Speed	= 55 mph
Max. Superelev.	= 4%

## Appendix E: Martin Luther King Jr. Parkway Travel-Time Runs and Speed Collection Data

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WESTBOUND MLK  
PARKWAY

Run #	College Road to Kerr Avenue	Time Stopped at Kerr Avenue Traffic Signal	Kerr Avenue to Kornegay Avenue	Korenegay Avenue to Bridge over 23rd Street	Bridge over 23rd Street to Bridge over NC 133	Total	Total Without Stopped Time
1	1:11	1:01	1:29	0:37	0:43	5:01	4:00
2	1:15	0:34	1:22	0:38	0:36	4:25	3:51
3	1:13	0:55	1:24	0:37	0:39	4:48	3:53
4	1:22	0:39	1:20	0:40	0:39	4:40	4:01
5	1:14	0:39	1:21	0:37	0:34	4:25	3:46
6	1:13	1:04	1:25	0:37	0:41	5:00	3:56
7	1:16	1:01	1:22	0:36	0:45	5:00	3:59
Average	1:14	0:50	1:23	0:37	0:39	4:45	3:55

EASTBOUND MLK  
PARKWAY

Run #	Bridge over NC 133 to Bridge over 23rd Street	Bridge over 23rd Street to Kornegay Avenue	Korenegay Avenue to Kerr Avenue	Time Stopped at Kerr Avenue Traffic Signal	Kerr Avenue to College Road	Total	Total Without Stopped Time
1	0:41	0:38	1:25	0:40	1:21	4:45	4:05
2	0:39	0:36	1:24	0:37	1:18	4:34	3:57
3	0:39	0:37	1:20	0:59	1:17	4:52	3:53
4	0:43	0:40	1:21	0:07	1:17	4:08	4:01
5	0:40	0:36	1:22	0:20	1:16	4:14	3:54
6	0:40	0:37	1:18	0:12	1:20	4:07	3:55
7	0:42	0:36	1:19	0:00	1:18	3:55	3:55
Average	0:40	0:37	1:21	0:25	1:18	4:22	3:57

Count	Speed		EB Speeds		WB Speeds		Combined EB + WB Speeds				
	Min Speed	Max Speed	Count	Running Count	Running Percent	Count	Running Count	Running Percent	Count	Running Count	Running Percent
1	0	2	0	0	0.0%	0	0	0.0%	0	0	0.0%
2	2	4	0	0	0.0%	0	0	0.0%	0	0	0.0%
3	4	6	0	0	0.0%	0	0	0.0%	0	0	0.0%
4	6	8	0	0	0.0%	0	0	0.0%	0	0	0.0%
5	8	10	0	0	0.0%	0	0	0.0%	0	0	0.0%
6	10	12	0	0	0.0%	0	0	0.0%	0	0	0.0%
7	12	14	0	0	0.0%	0	0	0.0%	0	0	0.0%
8	14	16	0	0	0.0%	0	0	0.0%	0	0	0.0%
9	16	18	0	0	0.0%	0	0	0.0%	0	0	0.0%
10	18	20	0	0	0.0%	0	0	0.0%	0	0	0.0%
11	20	22	0	0	0.0%	0	0	0.0%	0	0	0.0%
12	22	24	0	0	0.0%	0	0	0.0%	0	0	0.0%
13	24	26	0	0	0.0%	0	0	0.0%	0	0	0.0%
14	26	28	0	0	0.0%	0	0	0.0%	0	0	0.0%
15	28	30	0	0	0.0%	0	0	0.0%	0	0	0.0%
16	30	32	0	0	0.0%	0	0	0.0%	0	0	0.0%
17	32	34	0	0	0.0%	0	0	0.0%	0	0	0.0%
18	34	36	0	0	0.0%	0	0	0.0%	0	0	0.0%
19	36	38	0	0	0.0%	0	0	0.0%	0	0	0.0%
20	38	40	0	0	0.0%	0	0	0.0%	0	0	0.0%
21	40	42	0	0	0.0%	0	0	0.0%	0	0	0.0%
22	42	44	0	0	0.0%	0	0	0.0%	0	0	0.0%
23	44	46	2	2	6.3%	2	2	6.3%	2	2	4.2%
24	46	48	0	2	6.3%	2	0	0.0%	0	2	4.2%
25	48	50	2	4	12.5%	4	0	0.0%	2	4	8.3%
26	50	52	2	6	18.8%	6	1	6.3%	3	7	14.6%
27	52	54	8	14	43.8%	14	5	31.3%	12	19	39.6%
28	54	56	4	18	56.3%	18	11	68.8%	10	29	60.4%
29	56	58	4	22	68.8%	22	13	81.3%	6	35	72.9%
30	58	60	5	27	84.4%	27	15	93.8%	7	42	87.5%
31	60	62	4	31	96.9%	31	16	100.0%	5	47	97.9%
32	62	64	1	32	100.0%	32	16	100.0%	1	48	100.0%
33	64	66	0	32	100.0%	32	0	0.0%	0	48	100.0%
34	66	68	0	32	100.0%	32	0	0.0%	0	48	100.0%
35	68	70	0	32	100.0%	32	0	0.0%	0	48	100.0%

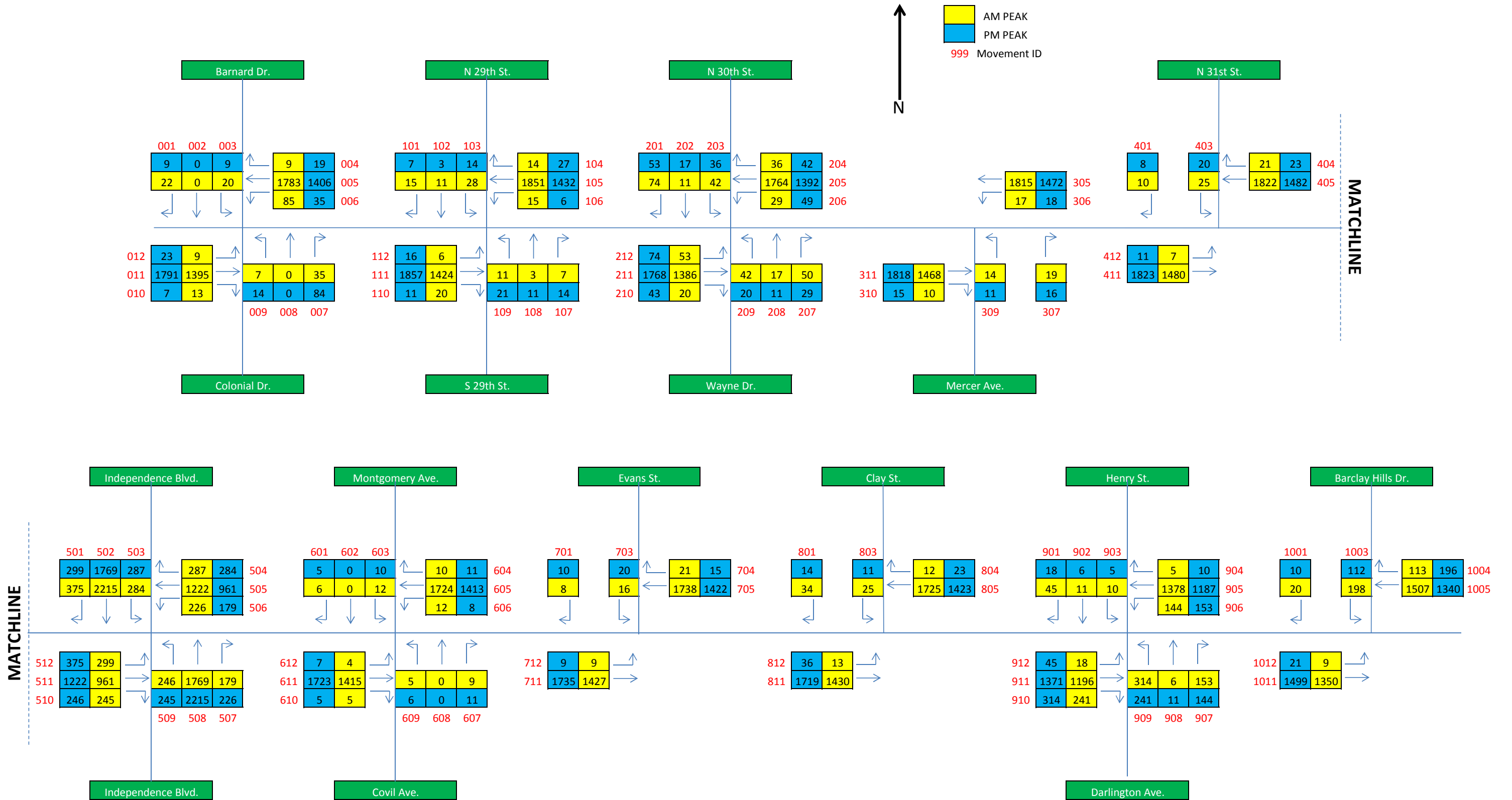
**Appendix F: 2040 Build Market Street Turning Movement  
Redistribution Sheets**

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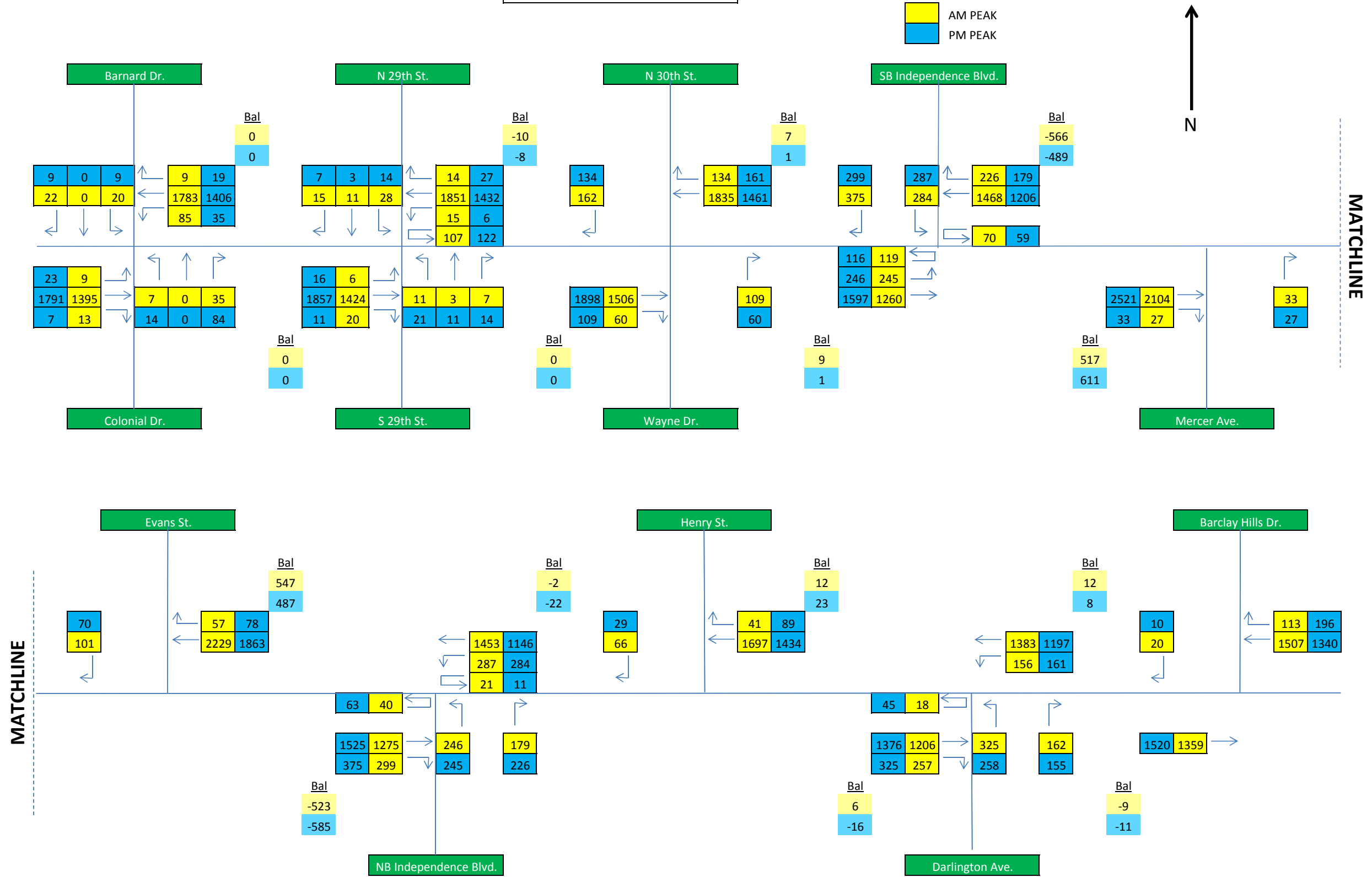
Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Base Breakout	Date:	September 2012
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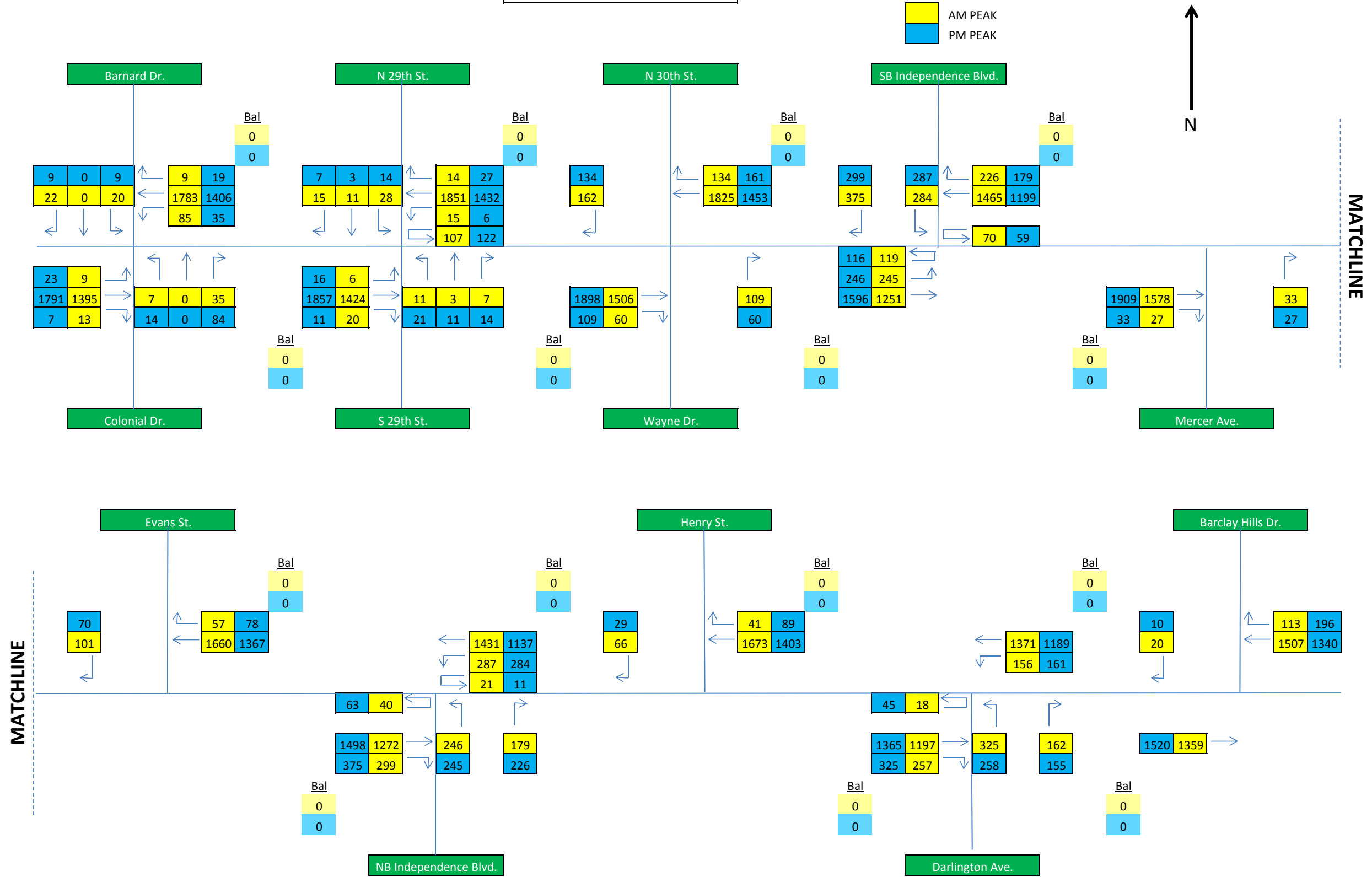
Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 2: Quadrant AC Interchange	Date:	September 2012
RAW VOLUMES							



Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 2: Quadrant AC Interchange	Date:	September 2012
BALANCED VOLUMES							

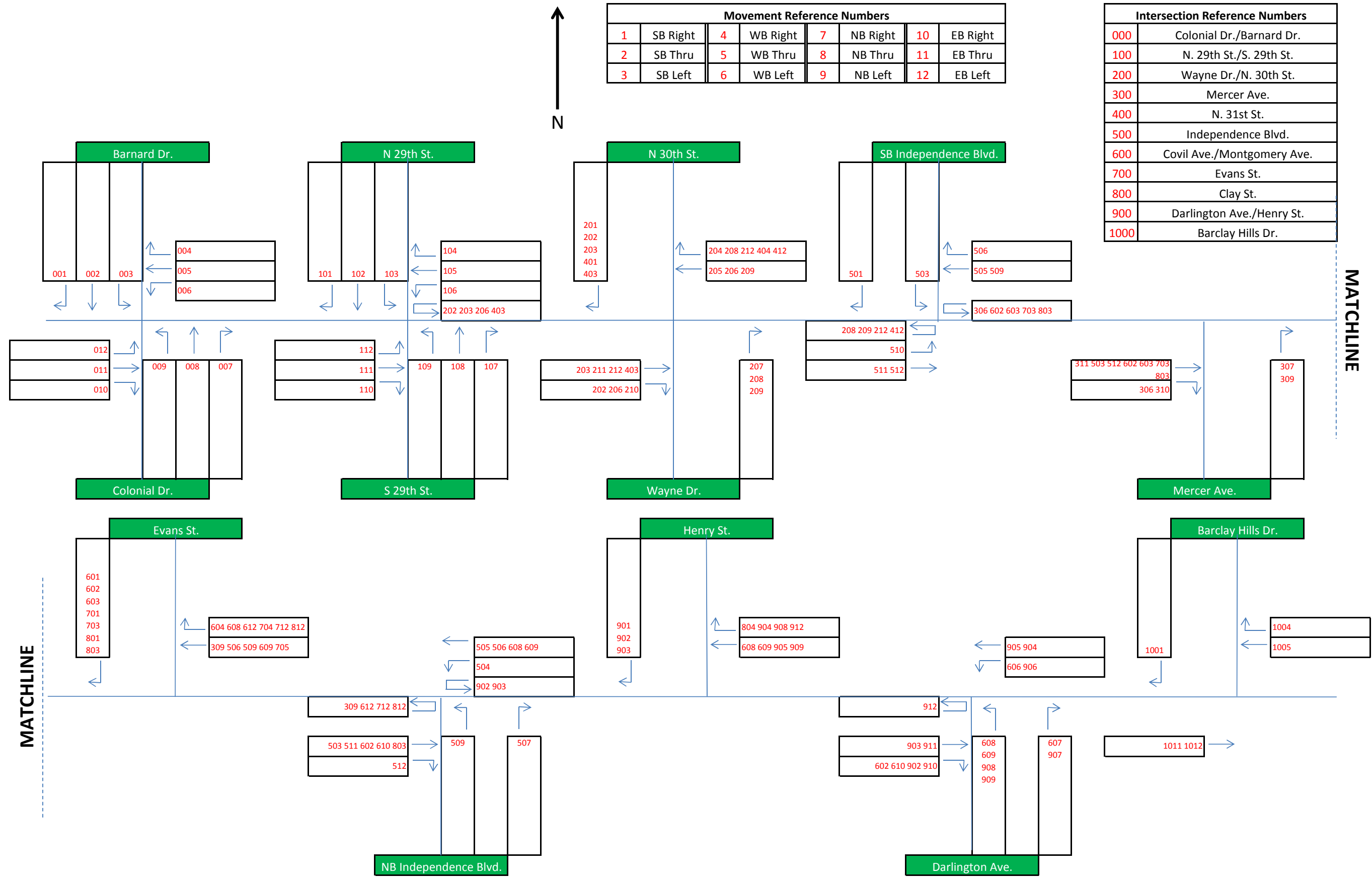


Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 2: Quadrant AC Interchange	Date:	September 2012
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Movement Reference Numbers							
1	SB Right	4	WB Right	7	NB Right	10	EB Right
2	SB Thru	5	WB Thru	8	NB Thru	11	EB Thru
3	SB Left	6	WB Left	9	NB Left	12	EB Left

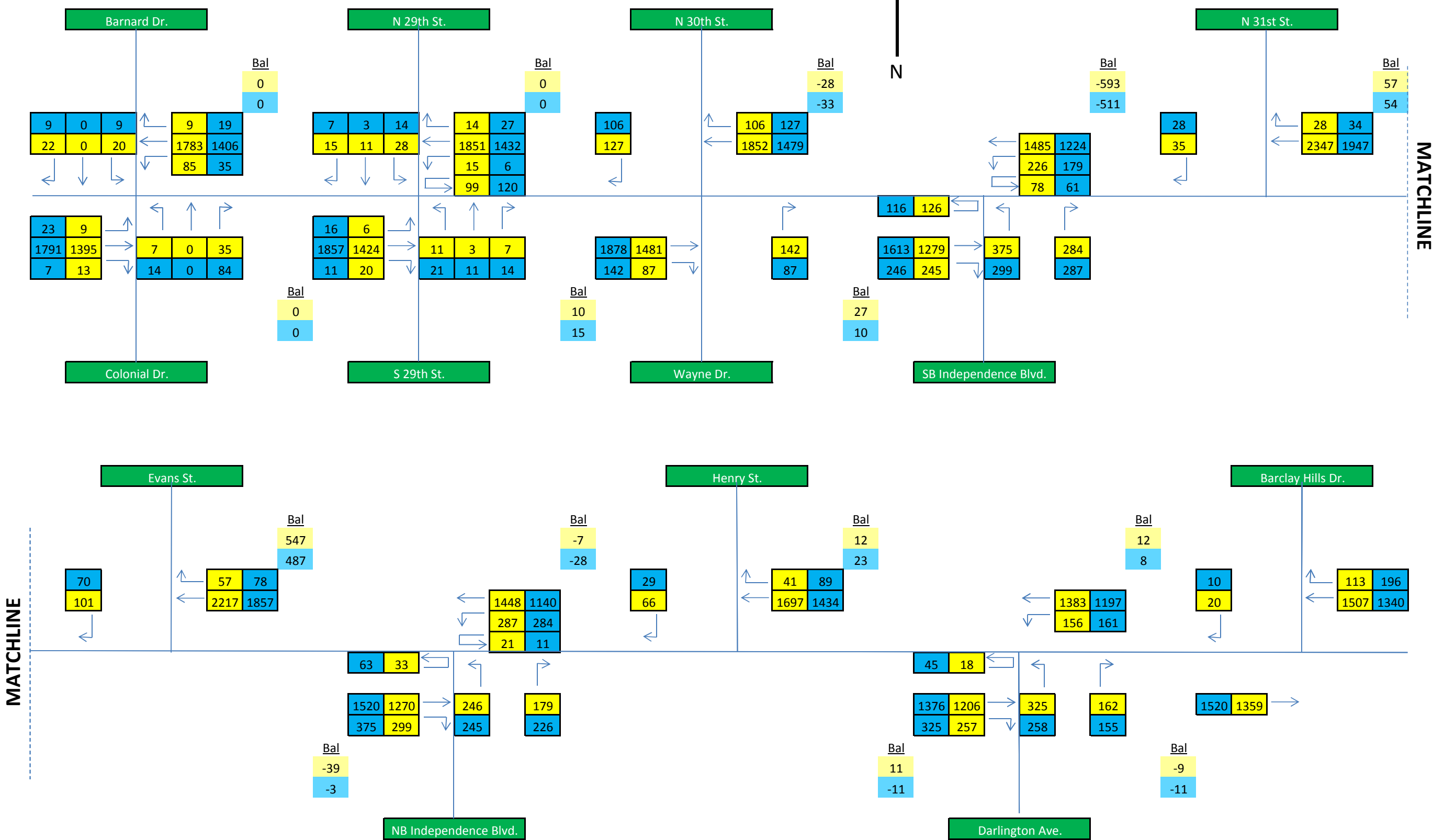
Intersection Reference Numbers	
000	Colonial Dr./Barnard Dr.
100	N. 29th St./S. 29th St.
200	Wayne Dr./N. 30th St.
300	Mercer Ave.
400	N. 31st St.
500	Independence Blvd.
600	Covil Ave./Montgomery Ave.
700	Evans St.
800	Clay St.
900	Darlington Ave./Henry St.
1000	Barclay Hills Dr.



Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

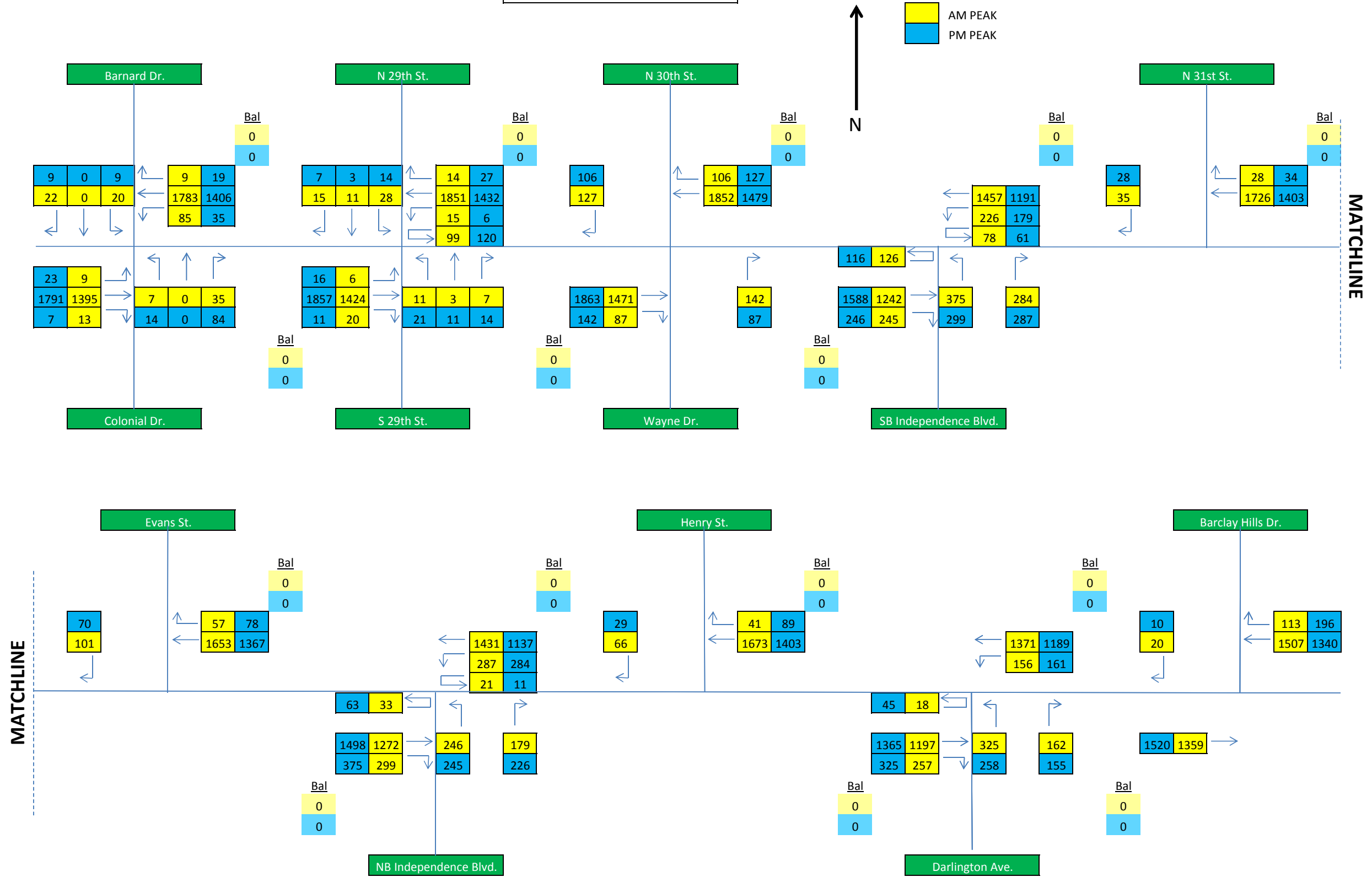
Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 2: Quadrant BC Interchange	Date:	September 2012
				RAW VOLUMES			

AM PEAK  
PM PEAK



Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 2: Quadrant BC Interchange	Date:	September 2012
BALANCED VOLUMES							

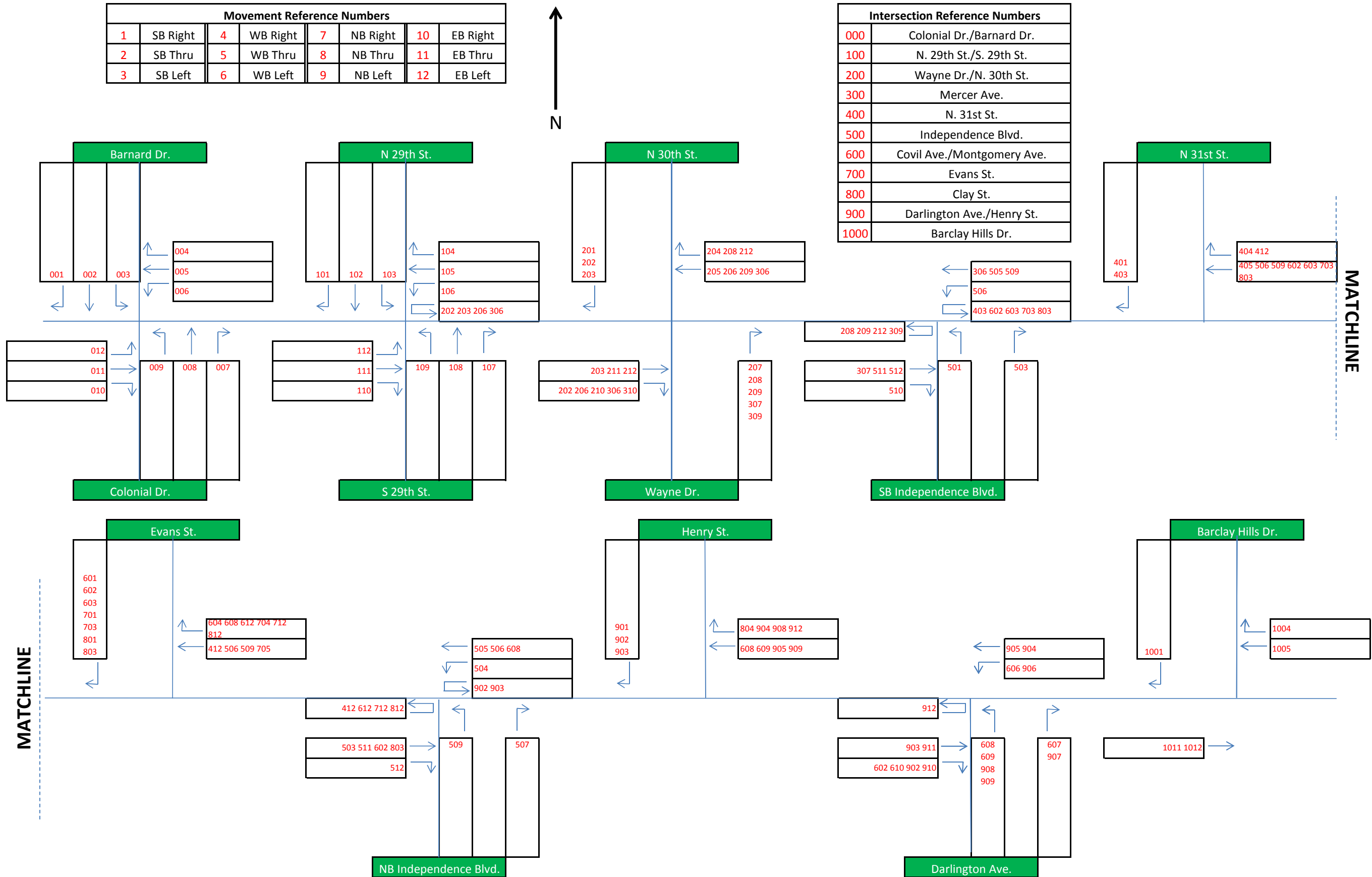


Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 2: Quadrant BC Interchange	Date:	September 2012
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Movement Reference Numbers					
1	SB Right	4	WB Right	7	NB Right
2	SB Thru	5	WB Thru	8	NB Thru
3	SB Left	6	WB Left	9	NB Left
10	EB Right	11	EB Thru	12	EB Left

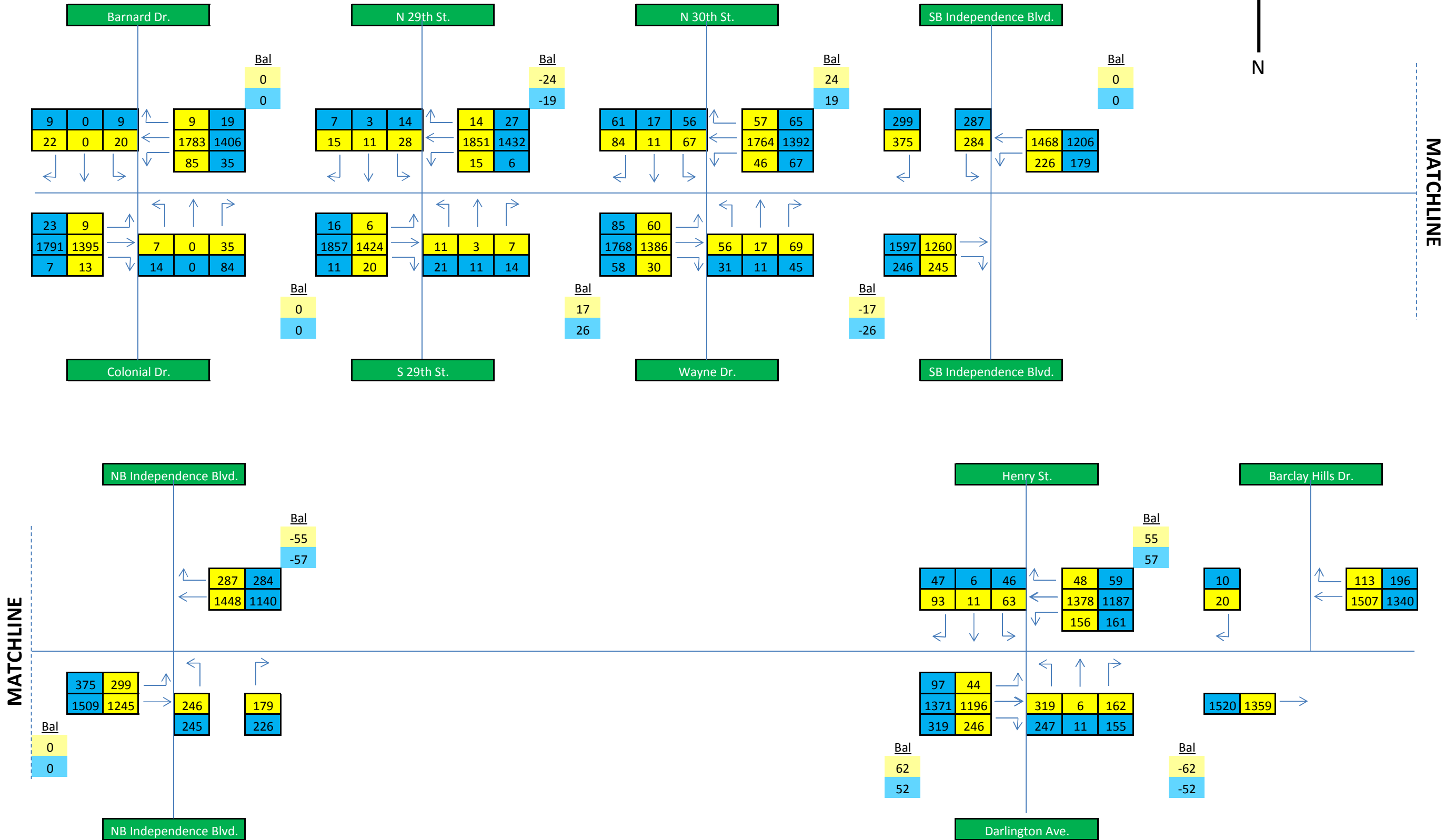
Intersection Reference Numbers	
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100	N. 29th St./S. 29th St.
200	Wayne Dr./N. 30th St.
300	Mercer Ave.
400	N. 31st St.
500	Independence Blvd.
600	Covil Ave./Montgomery Ave.
700	Evans St.
800	Clay St.
900	Darlington Ave./Henry St.
1000	Barclay Hills Dr.



Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 2: Tight Urban Diamond Interchange	Date:	September 2012
				RAW VOLUMES			

AM PEAK  
PM PEAK

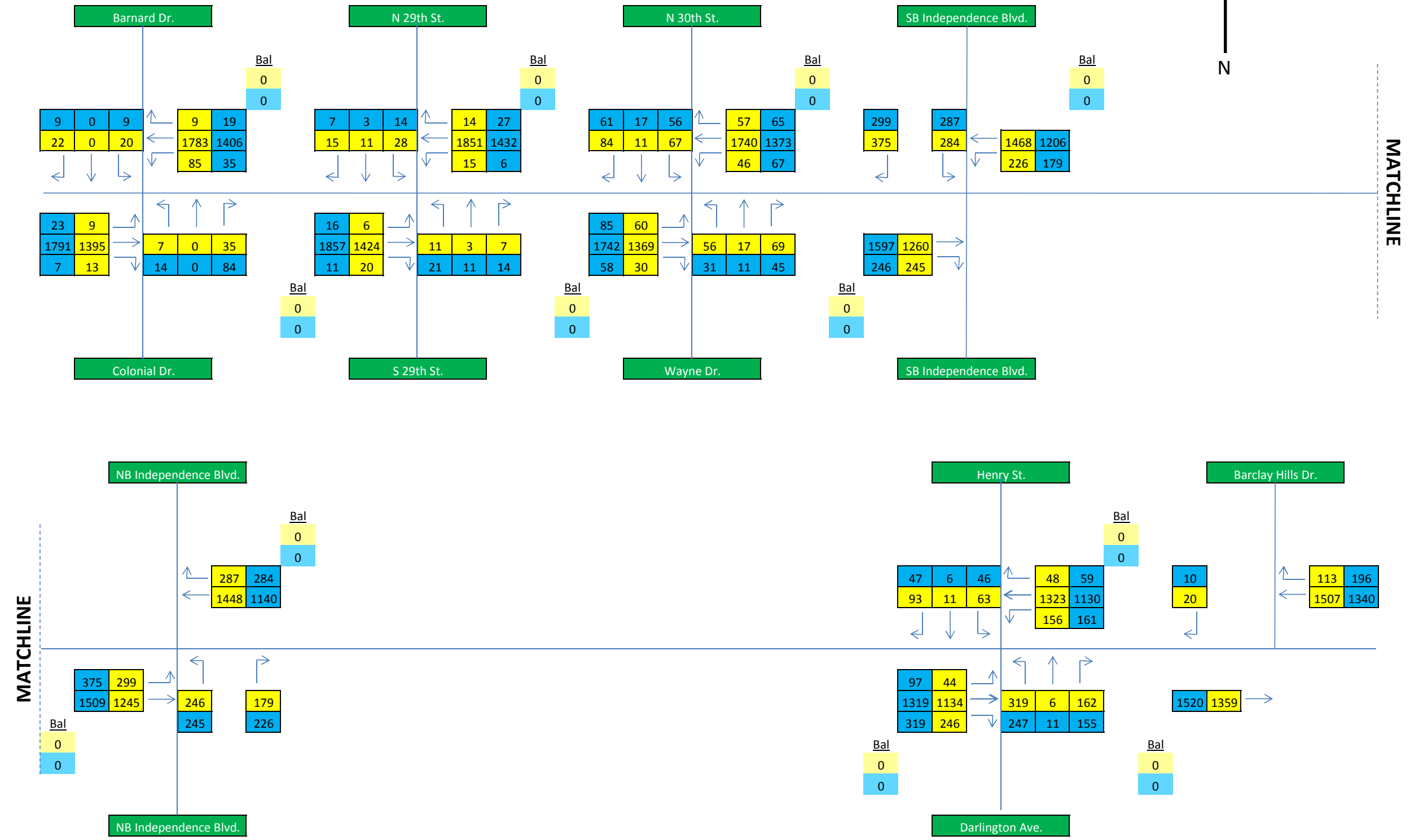




Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 2: Tight Urban Diamond Interchange	Date:	September 2012
BALANCED VOLUMES							

AM PEAK  
PM PEAK

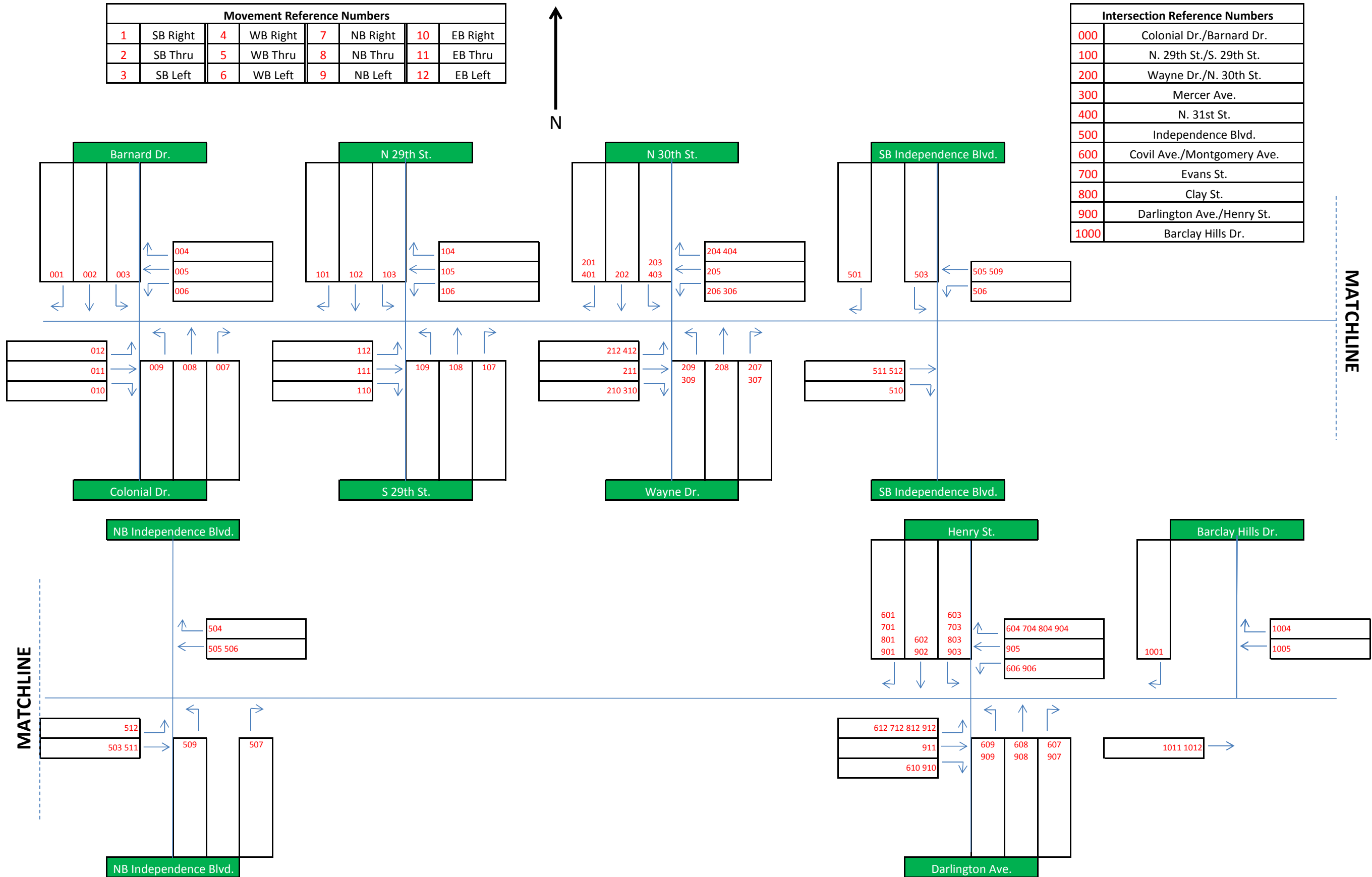


Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 2: Tight Urban Diamond Interchange	Date:	September 2012
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Movement Reference Numbers					
1	SB Right	4	WB Right	7	NB Right
2	SB Thru	5	WB Thru	8	NB Thru
3	SB Left	6	WB Left	9	NB Left
10	EB Right	11	EB Thru	12	EB Left

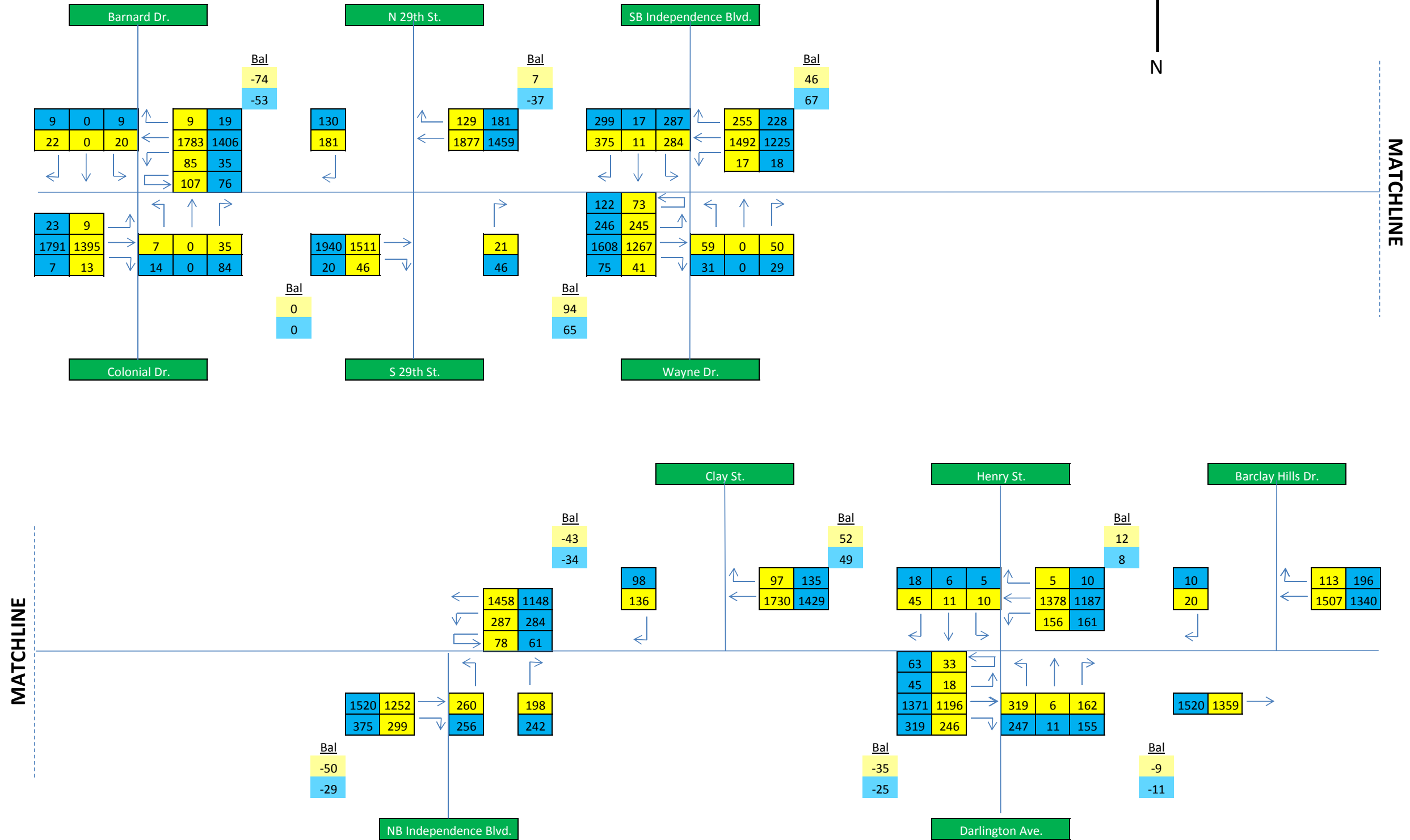
Intersection Reference Numbers	
000	Colonial Dr./Barnard Dr.
100	N. 29th St./S. 29th St.
200	Wayne Dr./N. 30th St.
300	Mercer Ave.
400	N. 31st St.
500	Independence Blvd.
600	Covil Ave./Montgomery Ave.
700	Evans St.
800	Clay St.
900	Darlington Ave./Henry St.
1000	Barclay Hills Dr.



Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 8: Quadrant AC Interchange	Date:	September 2012
RAW VOLUMES							

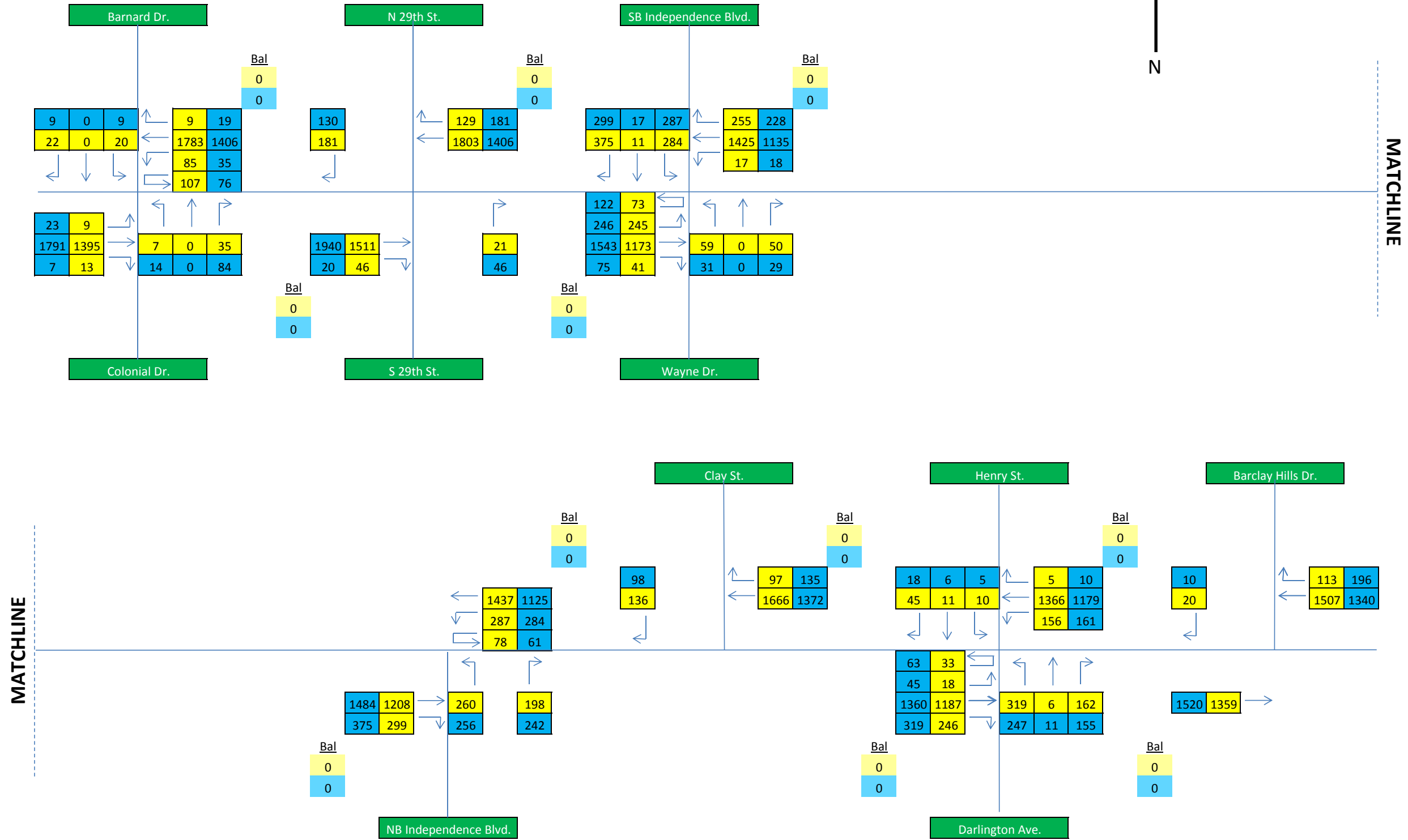
AM PEAK  
PM PEAK



Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 8: Quadrant AC Interchange	Date:	September 2012
BALANCED VOLUMES							

AM PEAK  
PM PEAK

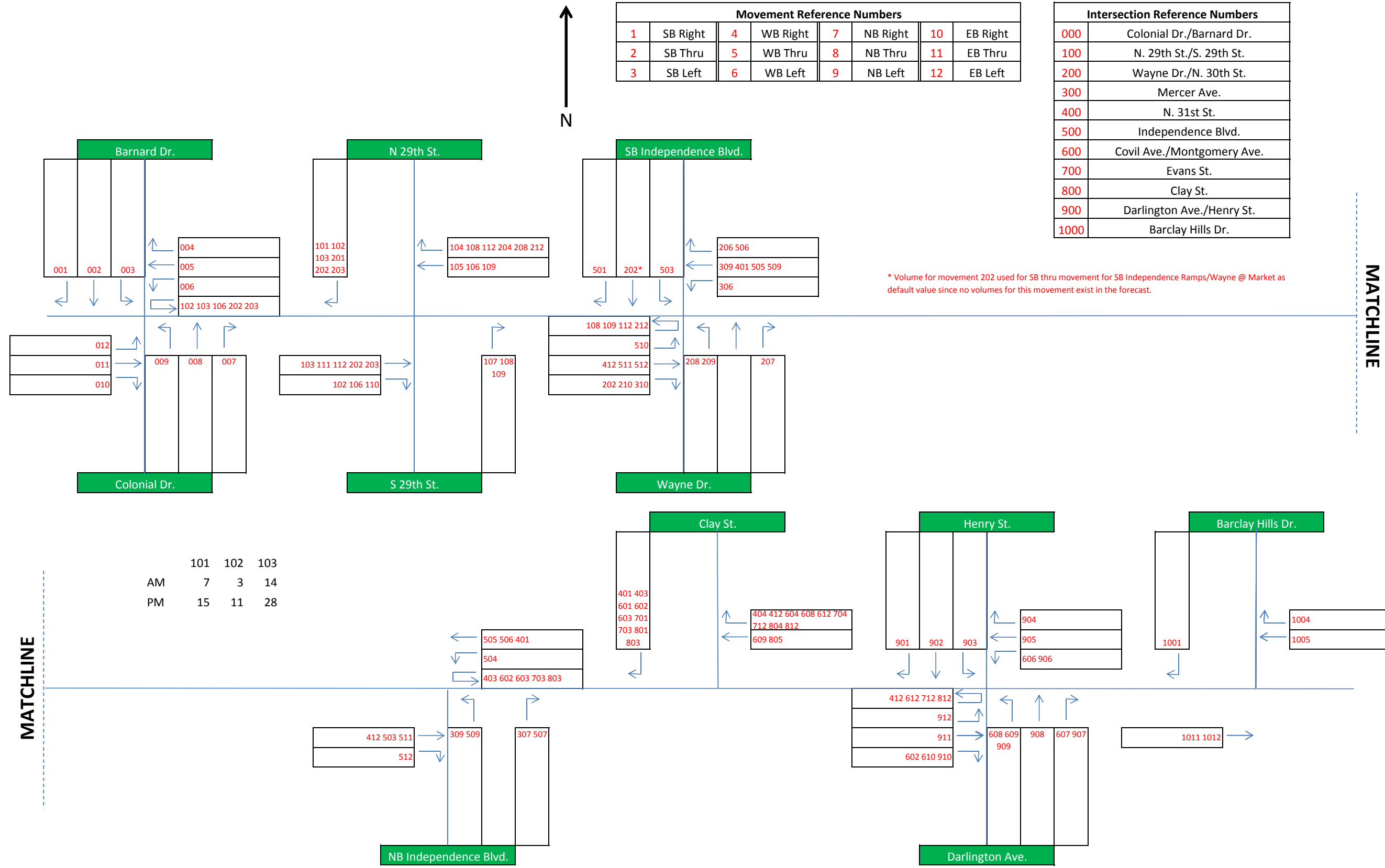


Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 8: Quadrant AC Interchange	Date:	September 2012
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Movement Reference Numbers							
1	SB Right	4	WB Right	7	NB Right	10	EB Right
2	SB Thru	5	WB Thru	8	NB Thru	11	EB Thru
3	SB Left	6	WB Left	9	NB Left	12	EB Left

Intersection Reference Numbers	
000	Colonial Dr./Barnard Dr.
100	N. 29th St./S. 29th St.
200	Wayne Dr./N. 30th St.
300	Mercer Ave.
400	N. 31st St.
500	Independence Blvd.
600	Covil Ave./Montgomery Ave.
700	Evans St.
800	Clay St.
900	Darlington Ave./Henry St.
1000	Barclay Hills Dr.



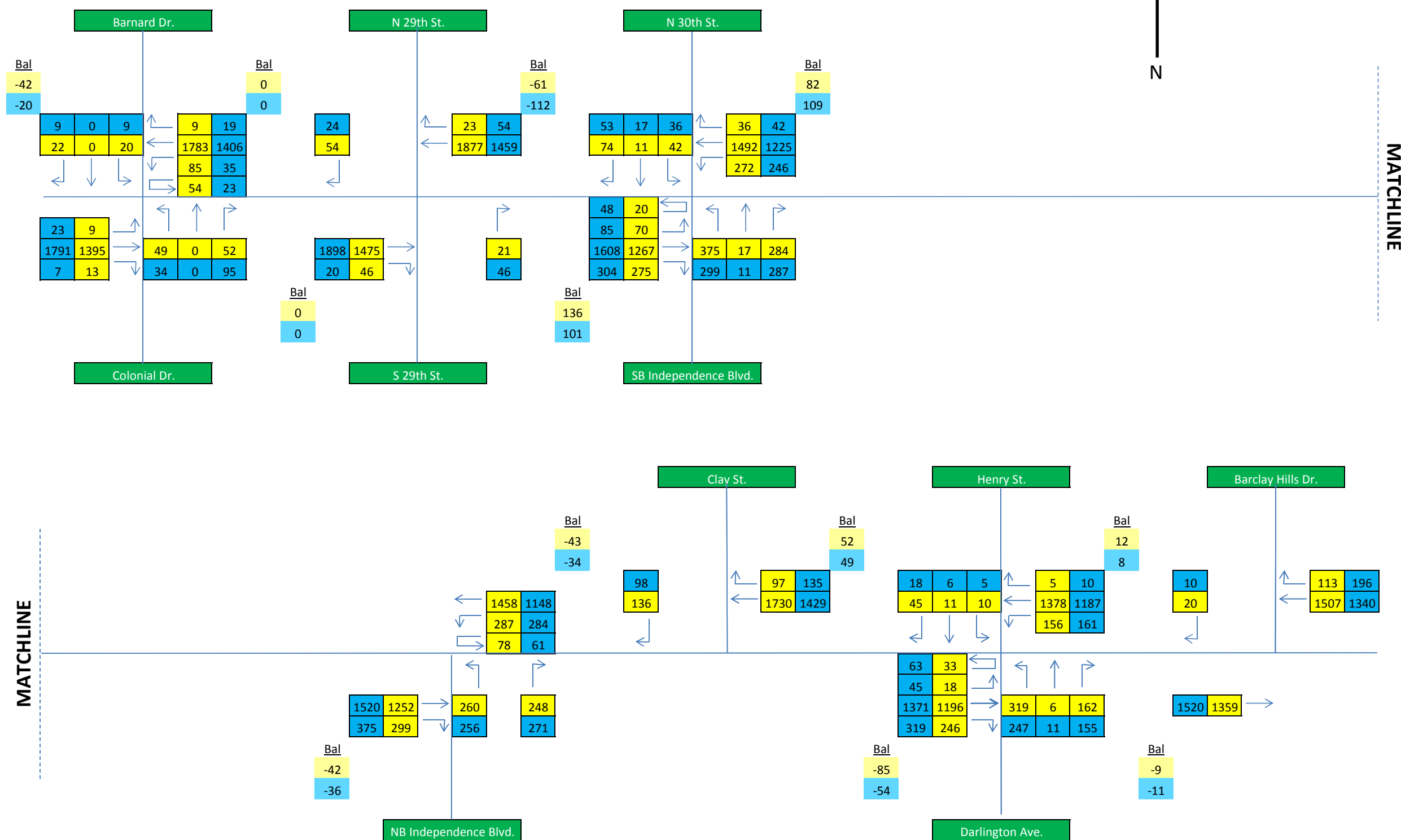
\* Volume for movement 202 used for SB thru movement for SB Independence Ramps/Wayne @ Market as default value since no volumes for this movement exist in the forecast.

	101	102	103
AM	7	3	14
PM	15	11	28

Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 8: Quadrant BC Interchange	Date:	September 2012
RAW VOLUMES							

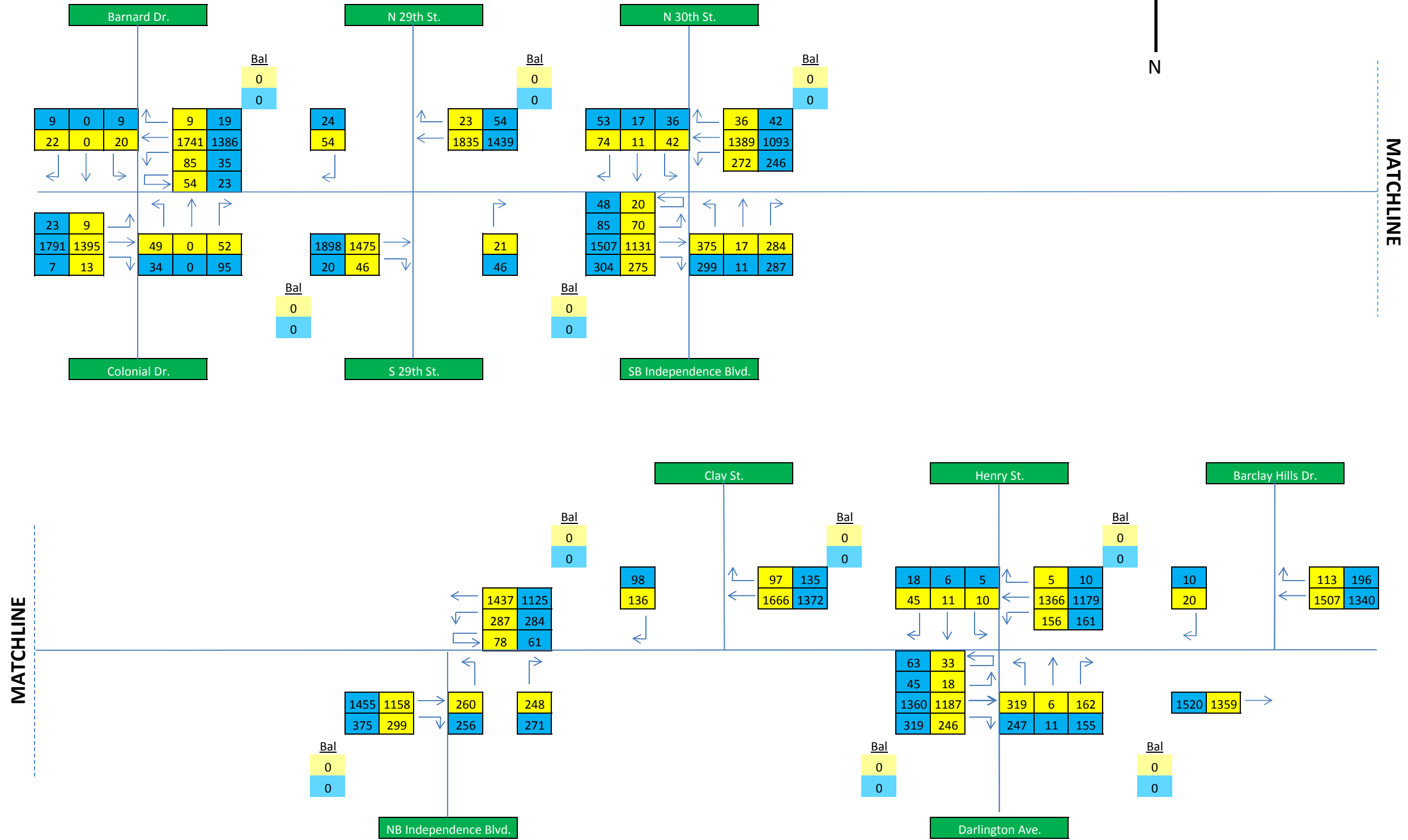
AM PEAK  
PM PEAK



Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 8: Quadrant BC Interchange	Date:	September 2012
BALANCED VOLUMES							

AM PEAK  
PM PEAK

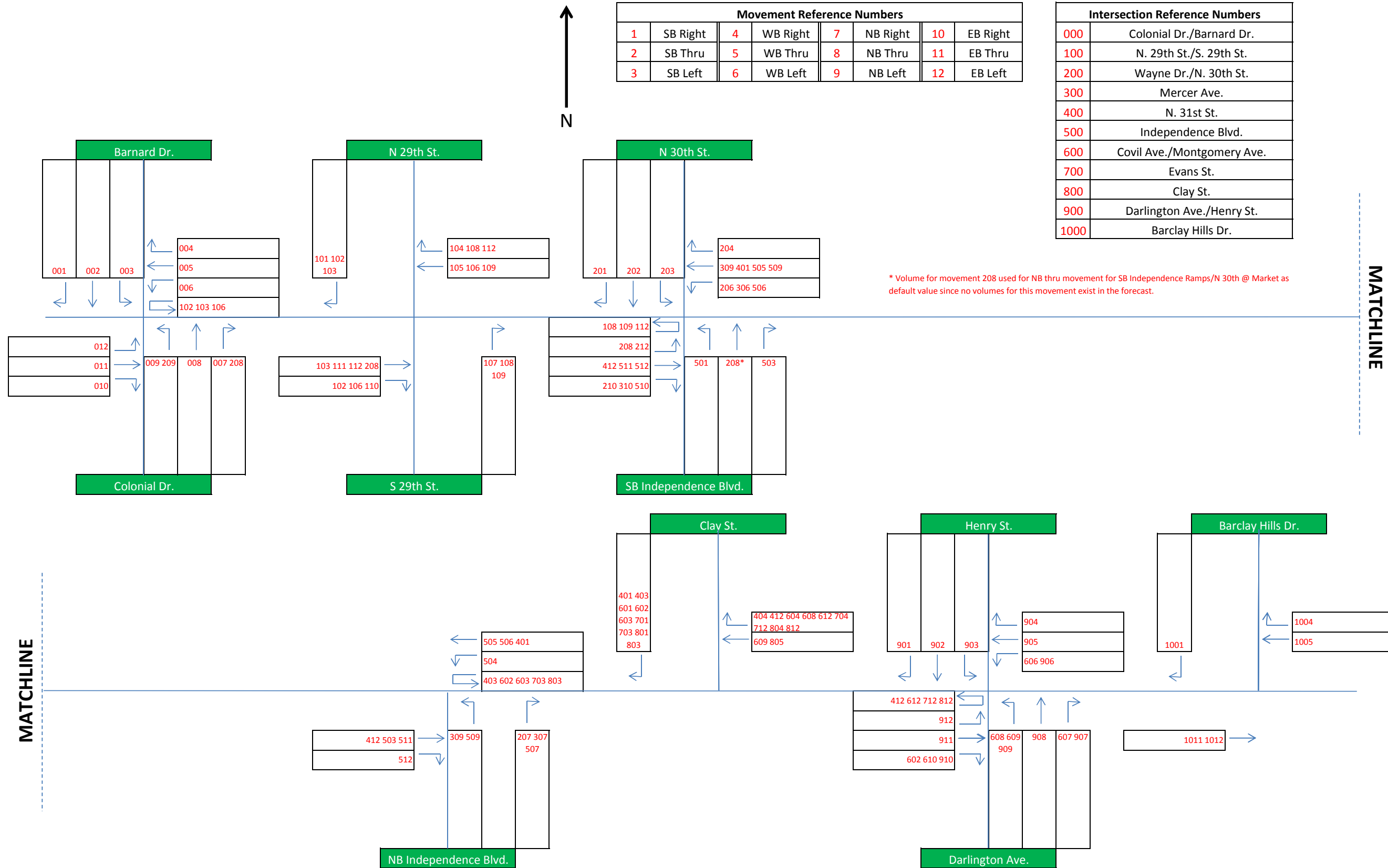


Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 8: Quadrant BC Interchange	Date:	September 2012
-------------	---	-----------	------------	--------------	--	-------	----------------

Movement Reference Numbers							
1	SB Right	4	WB Right	7	NB Right	10	EB Right
2	SB Thru	5	WB Thru	8	NB Thru	11	EB Thru
3	SB Left	6	WB Left	9	NB Left	12	EB Left

Intersection Reference Numbers	
000	Colonial Dr./Barnard Dr.
100	N. 29th St./S. 29th St.
200	Wayne Dr./N. 30th St.
300	Mercer Ave.
400	N. 31st St.
500	Independence Blvd.
600	Covil Ave./Montgomery Ave.
700	Evans St.
800	Clay St.
900	Darlington Ave./Henry St.
1000	Barclay Hills Dr.

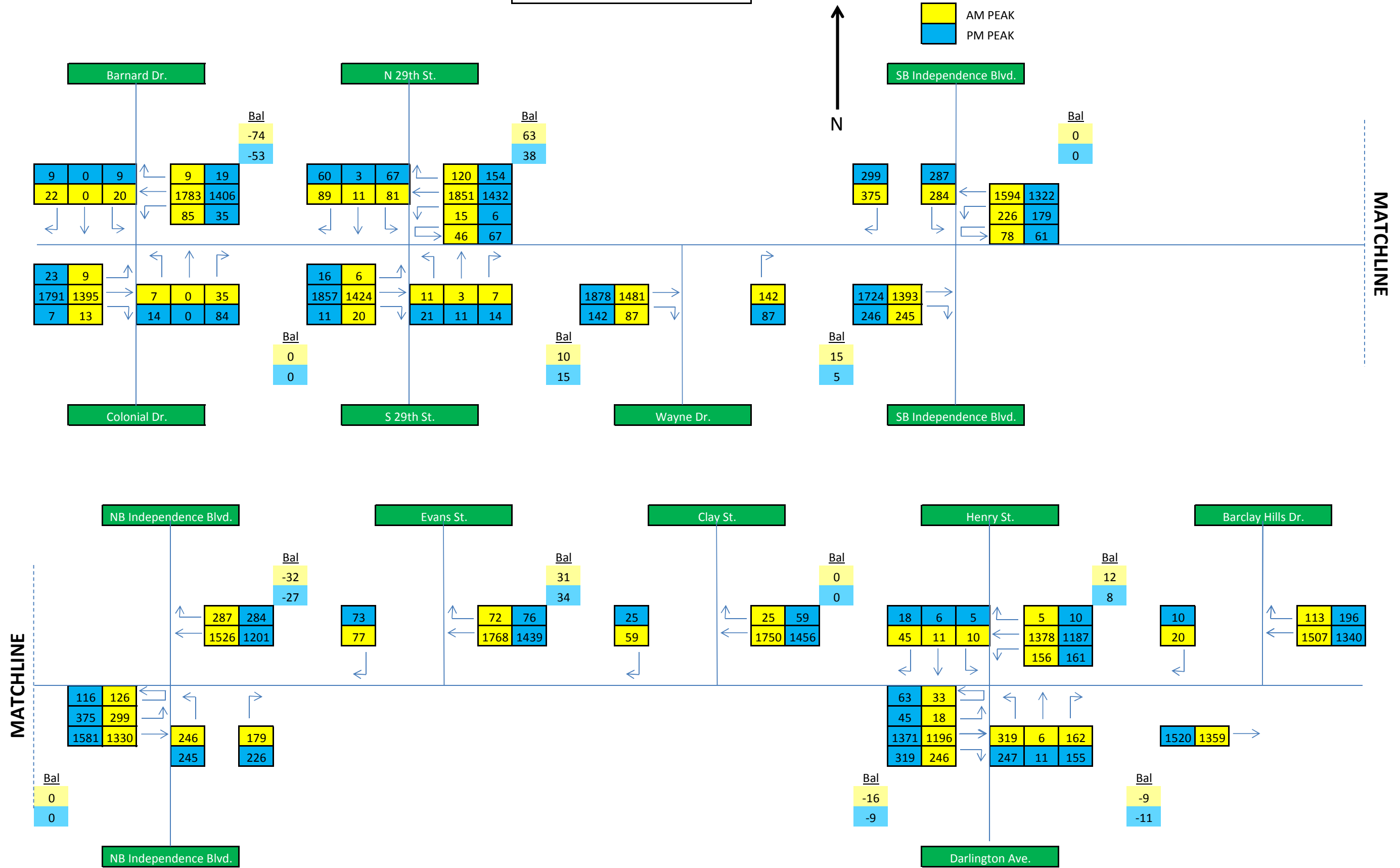




Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

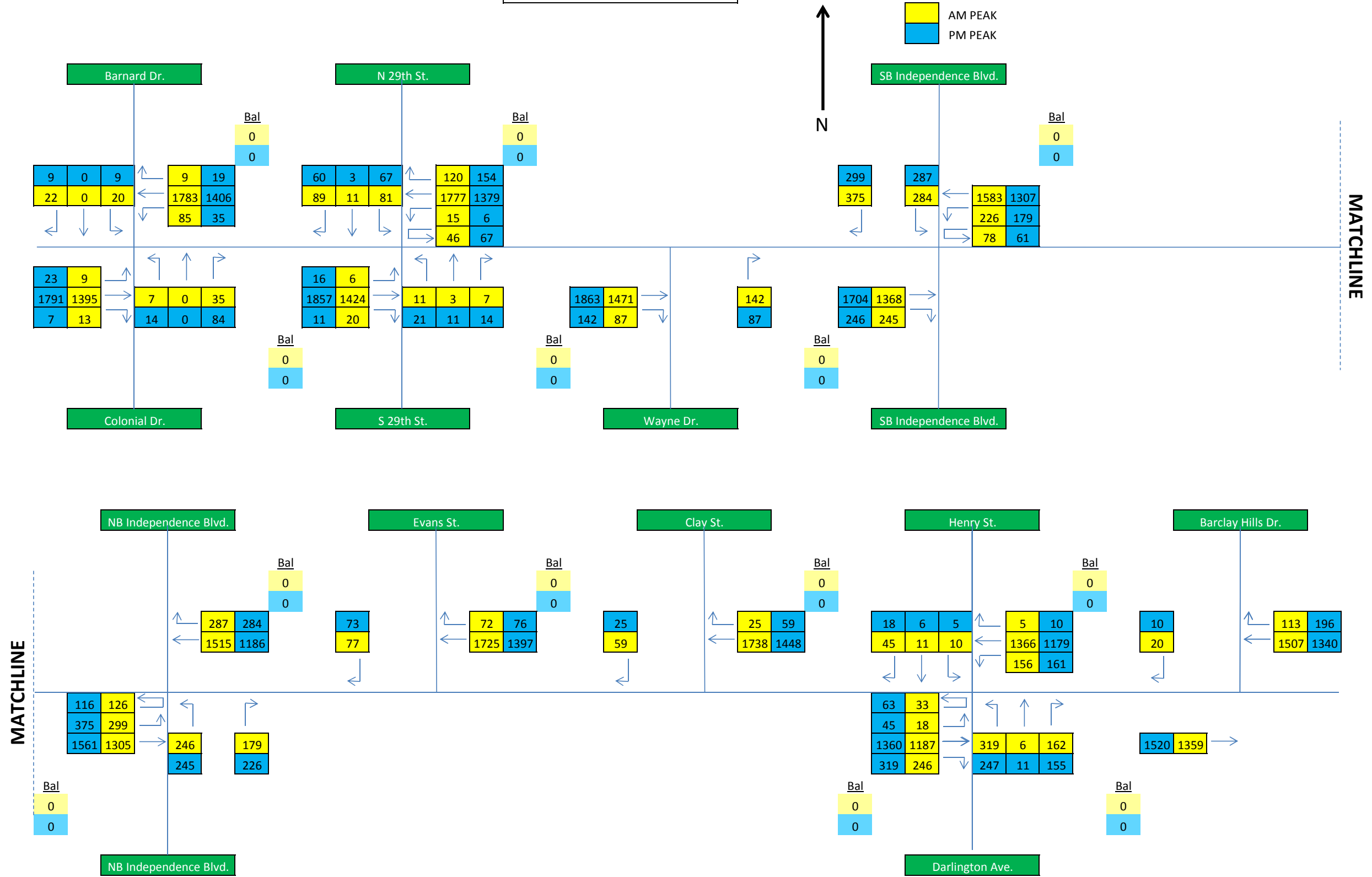
Project ID:	U-434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 8: Tight Urban Diamond Interchange	Date:	September 2012
				RAW VOLUMES			

AM PEAK  
PM PEAK



Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 8: Tight Urban Diamond Interchange	Date:	September 2012
BALANCED VOLUMES							

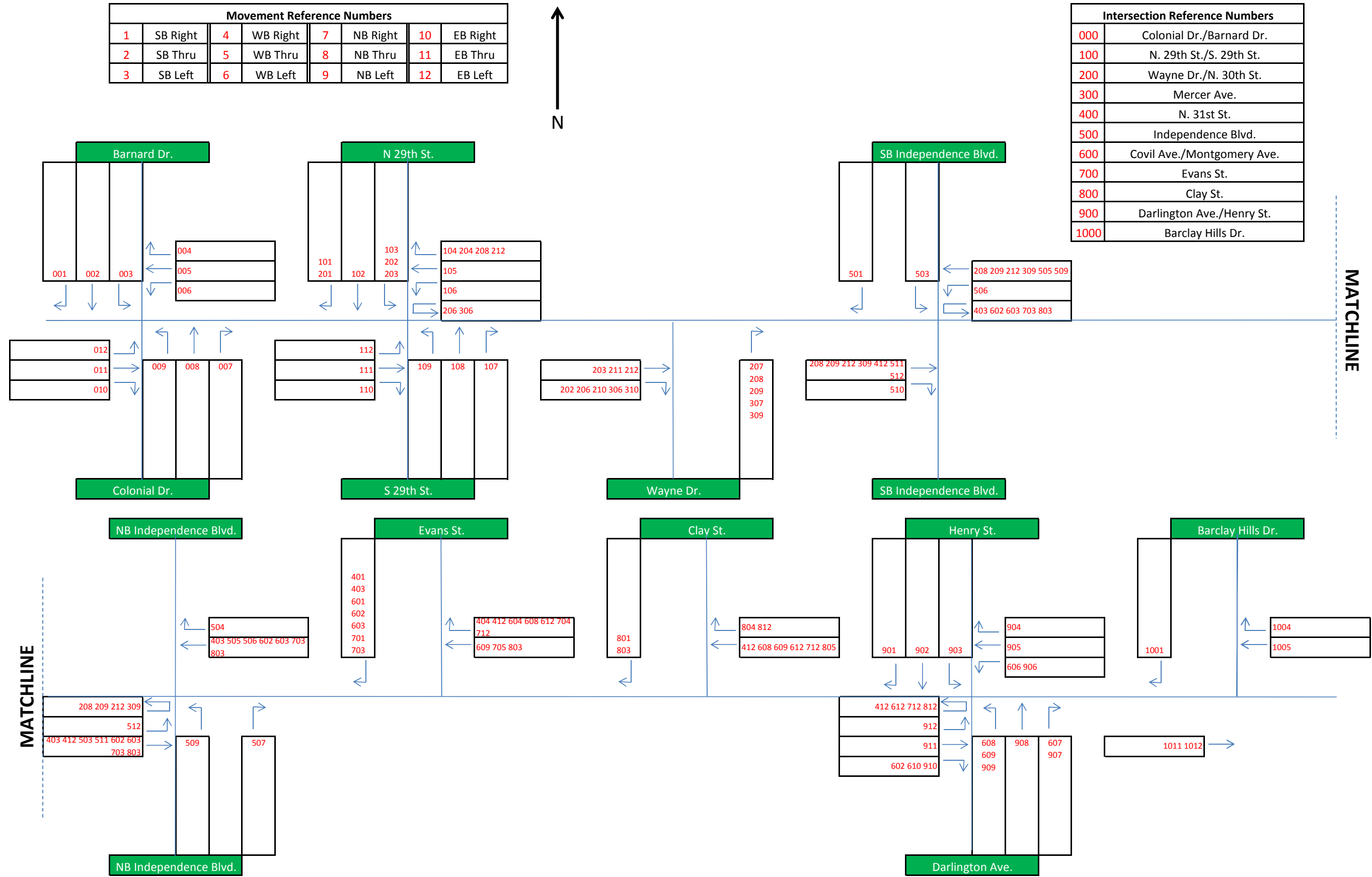


Turning Movement Redistribution Worksheet  
US-17 Business (Market St.)

Project ID:	U-4434 Independence Boulevard Extension	Scenario:	2040 Build	Alternative:	Alternative 8: Tight Urban Diamond Interchange	Date:	September 2012
-------------	---	-----------	------------	--------------	--	-------	----------------

Movement Reference Numbers					
1	SB Right	4	WB Right	7	NB Right
2	SB Thru	5	WB Thru	8	NB Thru
3	SB Left	6	WB Left	9	NB Left
				10	EB Right
				11	EB Thru
				12	EB Left

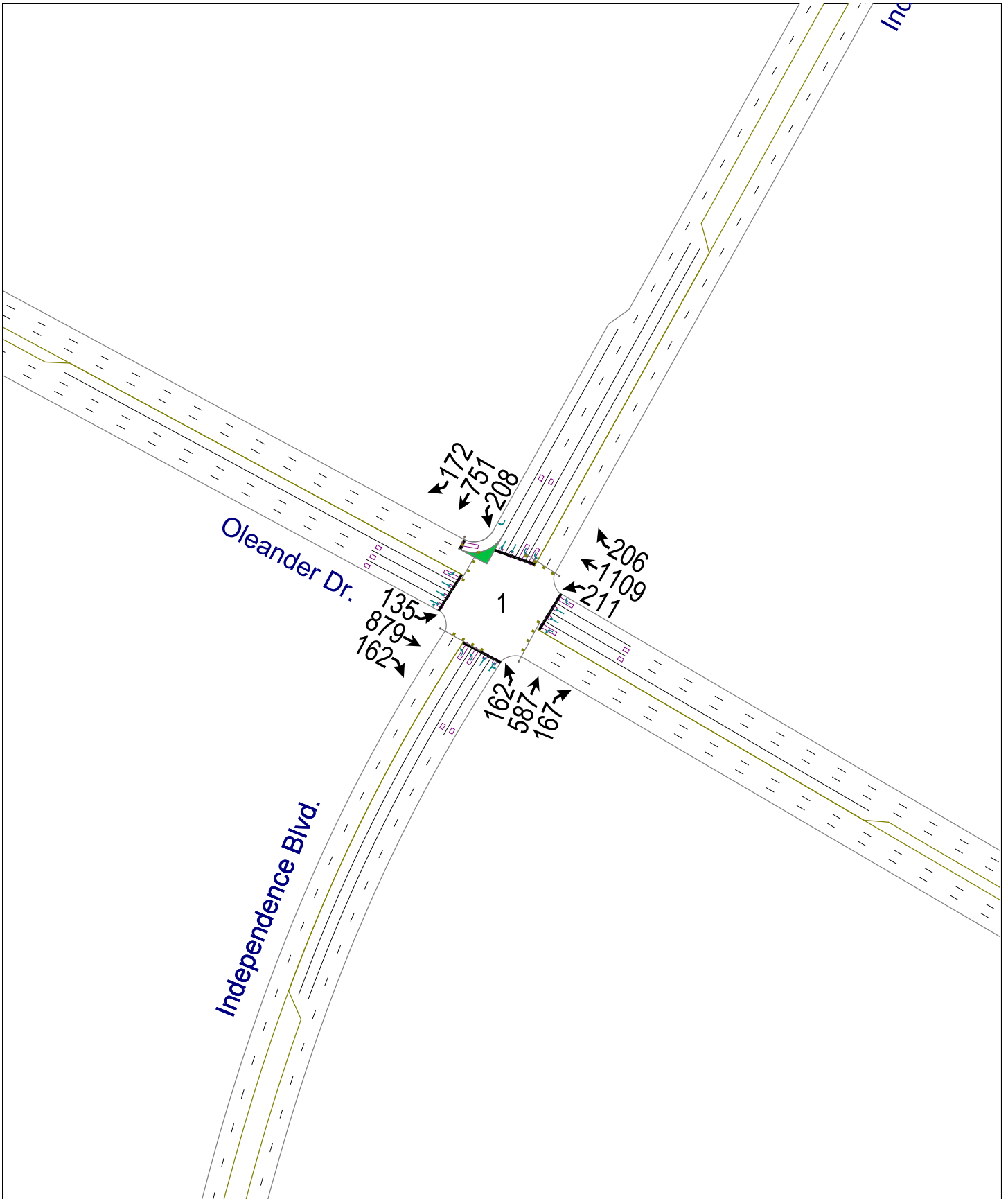
Intersection Reference Numbers	
000	Colonial Dr./Barnard Dr.
100	N. 29th St./S. 29th St.
200	Wayne Dr./N. 30th St.
300	Mercer Ave.
400	N. 31st St.
500	Independence Blvd.
600	Covil Ave./Montgomery Ave.
700	Evans St.
800	Clay St.
900	Darlington Ave./Henry St.
1000	Barclay Hills Dr.

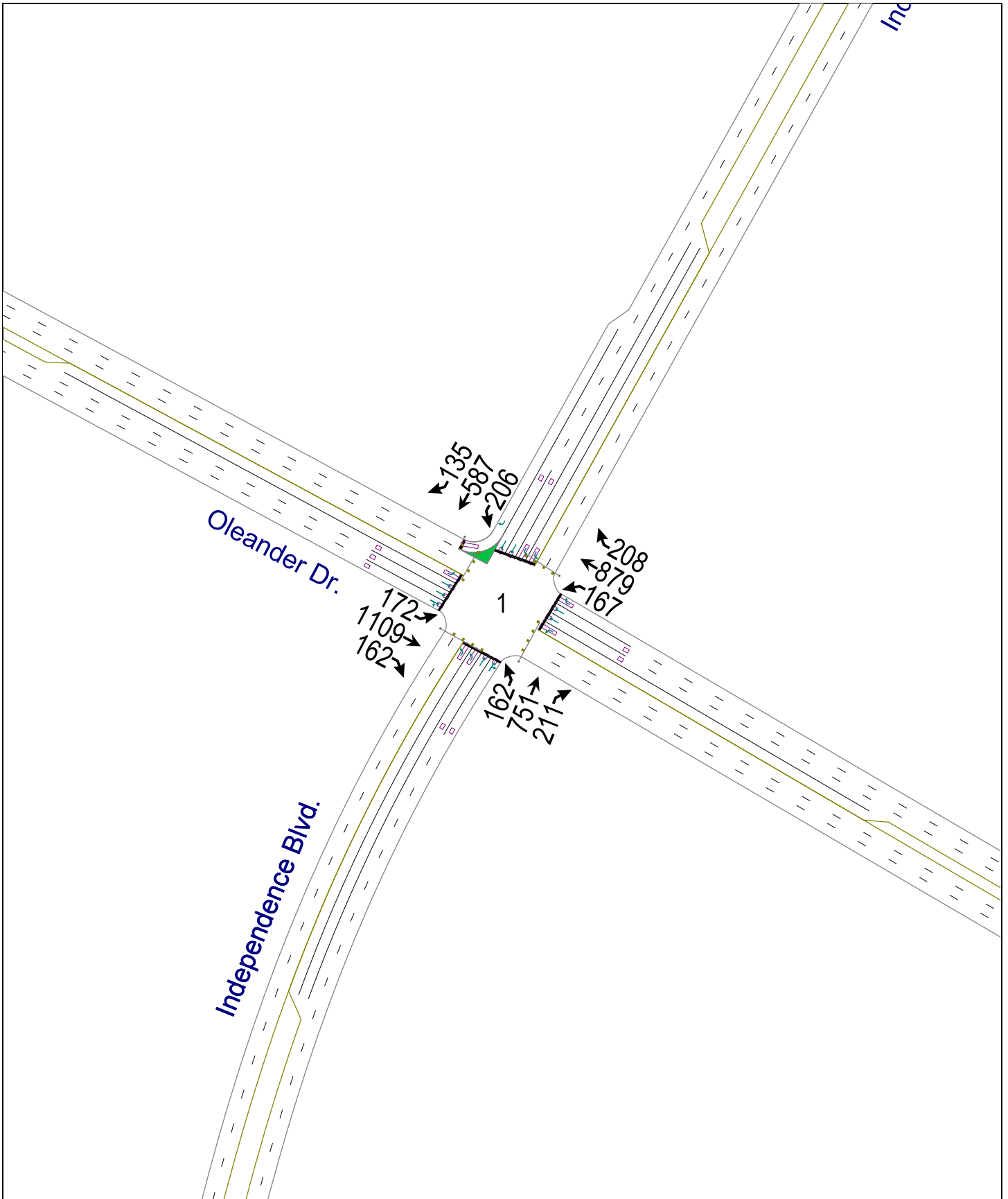


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## Appendix G: 2012 Base Year Traffic Capacity Analysis

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U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	879	162	211	1109	206	162	587	167	208	751	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	425		0	440		0	400		275
Storage Lanes	1		0	1		1	2		0	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	4873	0	1736	3471	1553	3400	3389	0	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	4873	0	1736	3471	1553	3400	3389	0	3400	3505	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			45			45	
Link Distance (ft)		949			990			888			1128	
Travel Time (s)		16.2			16.9			13.5			17.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	150	1157	0	234	1232	229	180	838	0	231	834	191
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		pm+ov	Prot			Prot		pm+ov
Protected Phases	3	8		7	4	5	1	6		5	2	3
Permitted Phases						4						2
Detector Phase	3	8		7	4	5	1	6		5	2	3
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	14.0	14.0	19.0		14.0	19.0	14.0
Total Split (s)	17.0	42.0	0.0	25.0	50.0	14.0	14.0	39.0	0.0	14.0	39.0	17.0
Total Split (%)	14.2%	35.0%	0.0%	20.8%	41.7%	11.7%	11.7%	32.5%	0.0%	11.7%	32.5%	14.2%
Maximum Green (s)	10.0	35.0		18.0	43.0	7.0	7.0	32.0		7.0	32.0	10.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	None
Act Effct Green (s)	12.0	37.6		19.4	45.0	54.0	9.0	34.0		9.0	34.0	51.0
Actuated g/C Ratio	0.10	0.31		0.16	0.38	0.45	0.08	0.28		0.08	0.28	0.42
v/c Ratio	0.86	0.76		0.84	0.95	0.33	0.71	0.87		0.91	0.84	0.29
Control Delay	93.3	41.1		73.6	51.8	14.2	69.8	52.2		67.6	29.9	13.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0

1: Oleander Dr. & Independence Blvd.  
2012 Base Year AM Peak

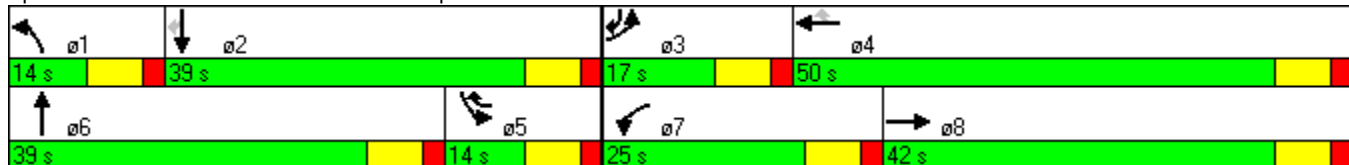


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	93.3	41.1		73.6	51.8	14.2	69.8	52.2		67.6	29.9	13.0
LOS	F	D		E	D	B	E	D		E	C	B
Approach Delay		47.1			49.7			55.3			34.2	
Approach LOS		D			D			E			C	
Queue Length 50th (ft)	116	297		177	481	71	71	325		94	248	47
Queue Length 95th (ft)	#237	353		#307	#629	110	#119	#431		m#147	327	m75
Internal Link Dist (ft)		869			910			808			1048	
Turn Bay Length (ft)	500			425			440			400		275
Base Capacity (vph)	174	1527		289	1302	699	255	960		255	993	666
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.86	0.76		0.81	0.95	0.33	0.71	0.87		0.91	0.84	0.29

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 56 (47%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 46.5  
 Intersection LOS: D  
 Intersection Capacity Utilization 82.3%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Oleander Dr. & Independence Blvd.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	1109	162	167	879	208	162	751	211	206	587	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	425		0	440		0	400		275
Storage Lanes	1		0	1		1	2		0	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	4893	0	1736	3471	1553	3400	3389	0	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	4893	0	1736	3471	1553	3400	3389	0	3400	3505	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			45			45	
Link Distance (ft)		949			990			888			1128	
Travel Time (s)		16.2			16.9			13.5			17.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	191	1412	0	186	977	231	180	1068	0	229	652	150
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		pm+ov	Prot			Prot		pm+ov
Protected Phases	3	8		7	4	5	1	6		5	2	3
Permitted Phases						4						2
Detector Phase	3	8		7	4	5	1	6		5	2	3
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	14.0	14.0	19.0		14.0	19.0	14.0
Total Split (s)	20.0	41.0	0.0	19.0	40.0	14.0	16.0	46.0	0.0	14.0	44.0	20.0
Total Split (%)	16.7%	34.2%	0.0%	15.8%	33.3%	11.7%	13.3%	38.3%	0.0%	11.7%	36.7%	16.7%
Maximum Green (s)	13.0	34.0		12.0	33.0	7.0	9.0	39.0		7.0	37.0	13.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	None
Act Effct Green (s)	15.0	36.0		14.0	35.0	44.0	11.0	41.0		9.0	39.0	59.0
Actuated g/C Ratio	0.12	0.30		0.12	0.29	0.37	0.09	0.34		0.08	0.32	0.49
v/c Ratio	0.88	0.96		0.92	0.97	0.41	0.58	0.92		0.90	0.57	0.19
Control Delay	88.6	57.6		97.5	63.3	18.2	60.2	51.8		72.7	24.5	7.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0

1: Oleander Dr. & Independence Blvd.  
2012 Base Year PM Peak

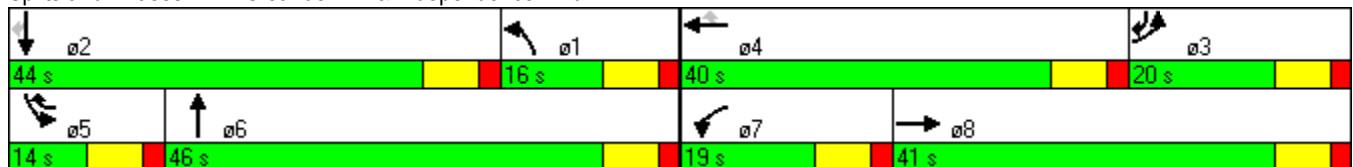


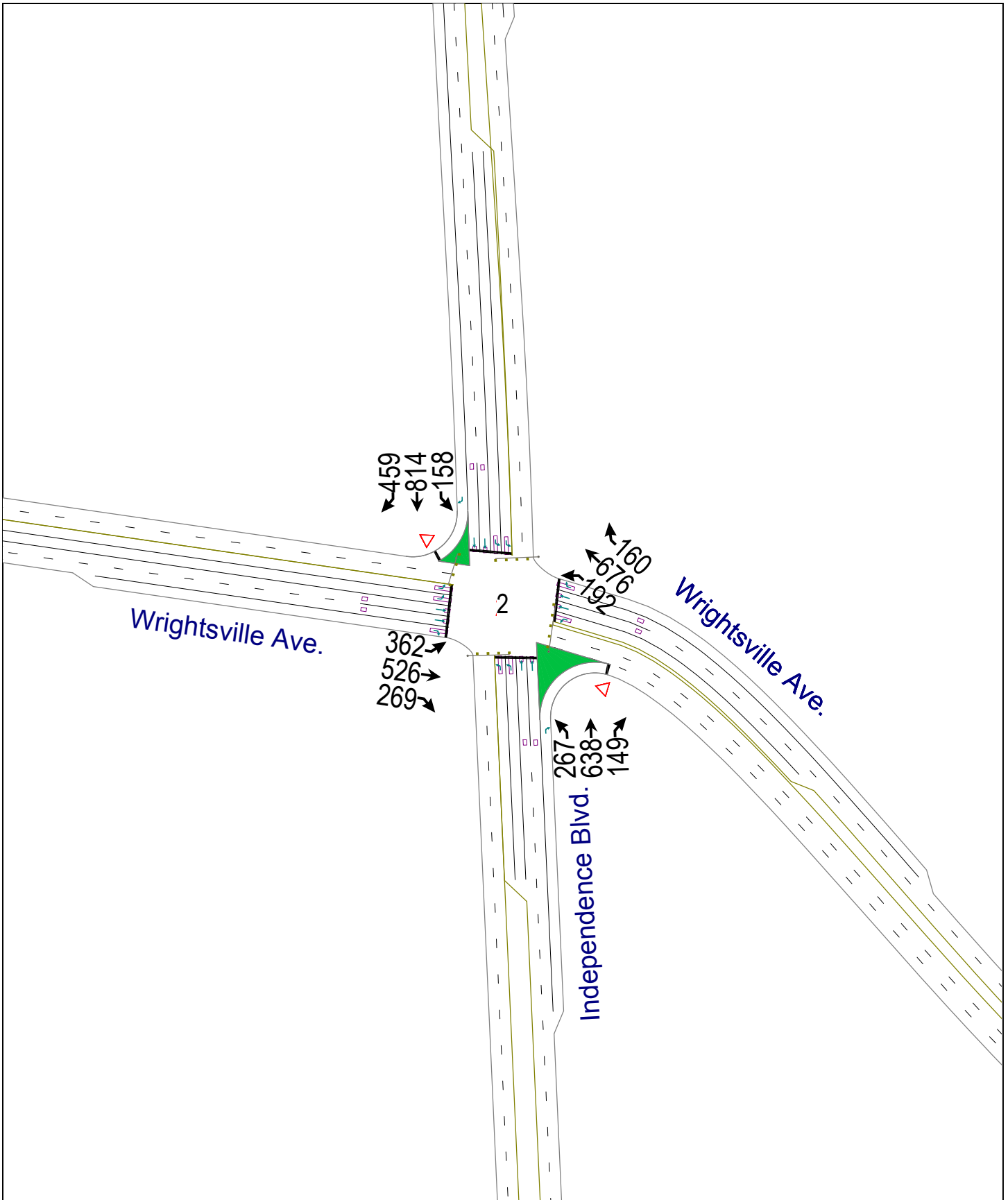
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	88.6	57.6		97.5	63.3	18.2	60.2	51.8		72.7	24.5	7.9
LOS	F	E		F	E	B	E	D		E	C	A
Approach Delay		61.3			60.4			53.0			32.8	
Approach LOS		E			E			D			C	
Queue Length 50th (ft)	148	393		145	392	85	70	416		88	226	29
Queue Length 95th (ft)	#283	#497		#285	#531	132	108	#548		#165	303	m54
Internal Link Dist (ft)		869			910			808			1048	
Turn Bay Length (ft)	500			425			440			400		275
Base Capacity (vph)	217	1468		203	1012	569	312	1158		255	1139	771
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.88	0.96		0.92	0.97	0.41	0.58	0.92		0.90	0.57	0.19

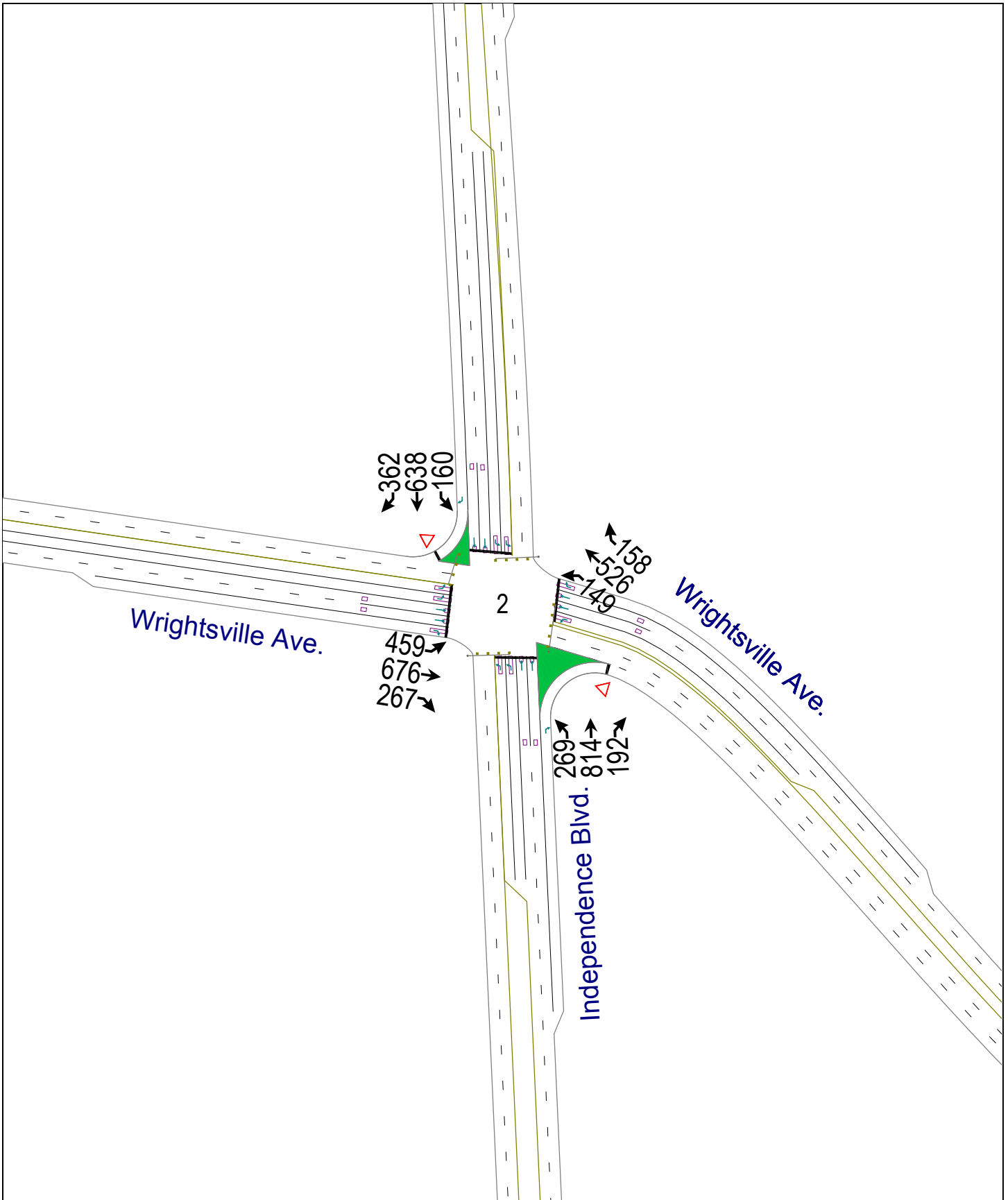
**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 64 (53%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 53.5  
 Intersection LOS: D  
 Intersection Capacity Utilization 84.3%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Oleander Dr. & Independence Blvd.































U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	362	526	269	192	676	160	267	638	149	158	814	459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	575		400	325		500	250		400	450		950
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	3400	3505	1568	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	3400	3505	1568	3400	3505	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1010			973			1006			1461	
Travel Time (s)		19.7			19.0			15.2			22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	402	584	299	213	751	178	297	709	166	176	904	510
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	7.0	10.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	17.0	14.0	14.0	17.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	23.0	34.0	18.0	23.0	34.0	16.0	18.0	47.0	23.0	16.0	45.0	23.0
Total Split (%)	19.2%	28.3%	15.0%	19.2%	28.3%	13.3%	15.0%	39.2%	19.2%	13.3%	37.5%	19.2%
Maximum Green (s)	16.0	27.0	11.0	16.0	27.0	9.0	11.0	40.0	16.0	9.0	38.0	16.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	18.1	26.5	39.7	20.3	28.7	39.6	13.2	42.4	62.7	10.9	40.0	58.1
Actuated g/C Ratio	0.15	0.22	0.33	0.17	0.24	0.33	0.11	0.35	0.52	0.09	0.33	0.48
v/c Ratio	0.78	0.75	0.57	0.71	0.89	0.34	0.80	0.57	0.20	0.57	0.77	0.67
Control Delay	60.5	50.0	22.2	62.0	57.6	18.5	52.4	27.6	6.6	56.5	36.9	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2: Wrightsville Ave. & Independence Blvd.  
2012 Base Year AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 9/11/2012

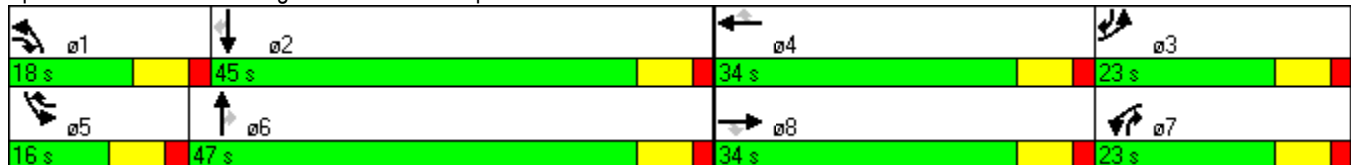


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	60.5	50.0	22.2	62.0	57.6	18.5	52.4	27.6	6.6	56.5	36.9	13.9
LOS	E	D	C	E	E	B	D	C	A	E	D	B
Approach Delay	46.8			52.3			30.9			31.7		
Approach LOS	D			D			C			C		
Queue Length 50th (ft)	156	220	113	159	296	64	114	246	37	72	364	139
Queue Length 95th (ft)	#222	282	169	#286	#398	103	m135	m283	m55	m103	434	m189
Internal Link Dist (ft)	930			893			926			1381		
Turn Bay Length (ft)	575		400	325		500	250		400	450		950
Base Capacity (vph)	517	855	523	300	855	524	373	1237	819	312	1169	759
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.68	0.57	0.71	0.88	0.34	0.80	0.57	0.20	0.56	0.77	0.67

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 39.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 75.8%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Wrightsville Ave. & Independence Blvd.



























2: Wrightsville Ave. & Independence Blvd.  
 2012 Base Year AM Peak



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	459	676	267	149	526	158	269	814	192	160	638	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	575		400	325		500	250		400	450		950
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	3400	3505	1568	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	3400	3505	1568	3400	3505	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1010			973			1006			1461	
Travel Time (s)		19.7			19.0			15.2			22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	510	751	297	166	584	176	299	904	213	178	709	402
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	7.0	10.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	17.0	14.0	14.0	17.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	28.0	36.0	20.0	22.0	30.0	14.0	20.0	48.0	22.0	14.0	42.0	28.0
Total Split (%)	23.3%	30.0%	16.7%	18.3%	25.0%	11.7%	16.7%	40.0%	18.3%	11.7%	35.0%	23.3%
Maximum Green (s)	21.0	29.0	13.0	15.0	23.0	7.0	13.0	41.0	15.0	7.0	35.0	21.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	22.3	30.2	50.2	16.4	24.3	33.6	15.0	44.1	60.5	9.3	38.4	65.7
Actuated g/C Ratio	0.19	0.25	0.42	0.14	0.20	0.28	0.12	0.37	0.50	0.08	0.32	0.55
v/c Ratio	0.80	0.84	0.45	0.69	0.82	0.40	0.70	0.70	0.27	0.67	0.63	0.47
Control Delay	57.0	52.5	27.5	64.4	55.8	21.4	44.2	22.0	5.3	65.3	28.9	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2: Wrightsville Ave. & Independence Blvd.  
2012 Base Year PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

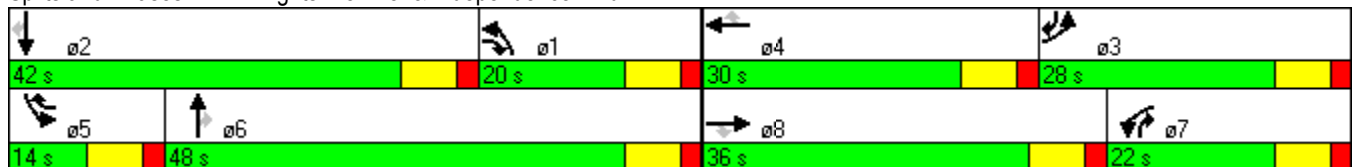


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	57.0	52.5	27.5	64.4	55.8	21.4	44.2	22.0	5.3	65.3	28.9	11.4
LOS	E	D	C	E	E	C	D	C	A	E	C	B
Approach Delay	49.2			50.8			24.2			28.5		
Approach LOS	D			D			C			C		
Queue Length 50th (ft)	195	288	160	123	227	65	119	290	23	73	210	134
Queue Length 95th (ft)	257	365	240	#203	295	104	m143	m350	m32	#118	253	207
Internal Link Dist (ft)	930			893			926			1381		
Turn Bay Length (ft)	575		400	325		500	250		400	450		950
Base Capacity (vph)	658	914	662	252	737	443	425	1288	799	264	1122	854
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.82	0.45	0.66	0.79	0.40	0.70	0.70	0.27	0.67	0.63	0.47

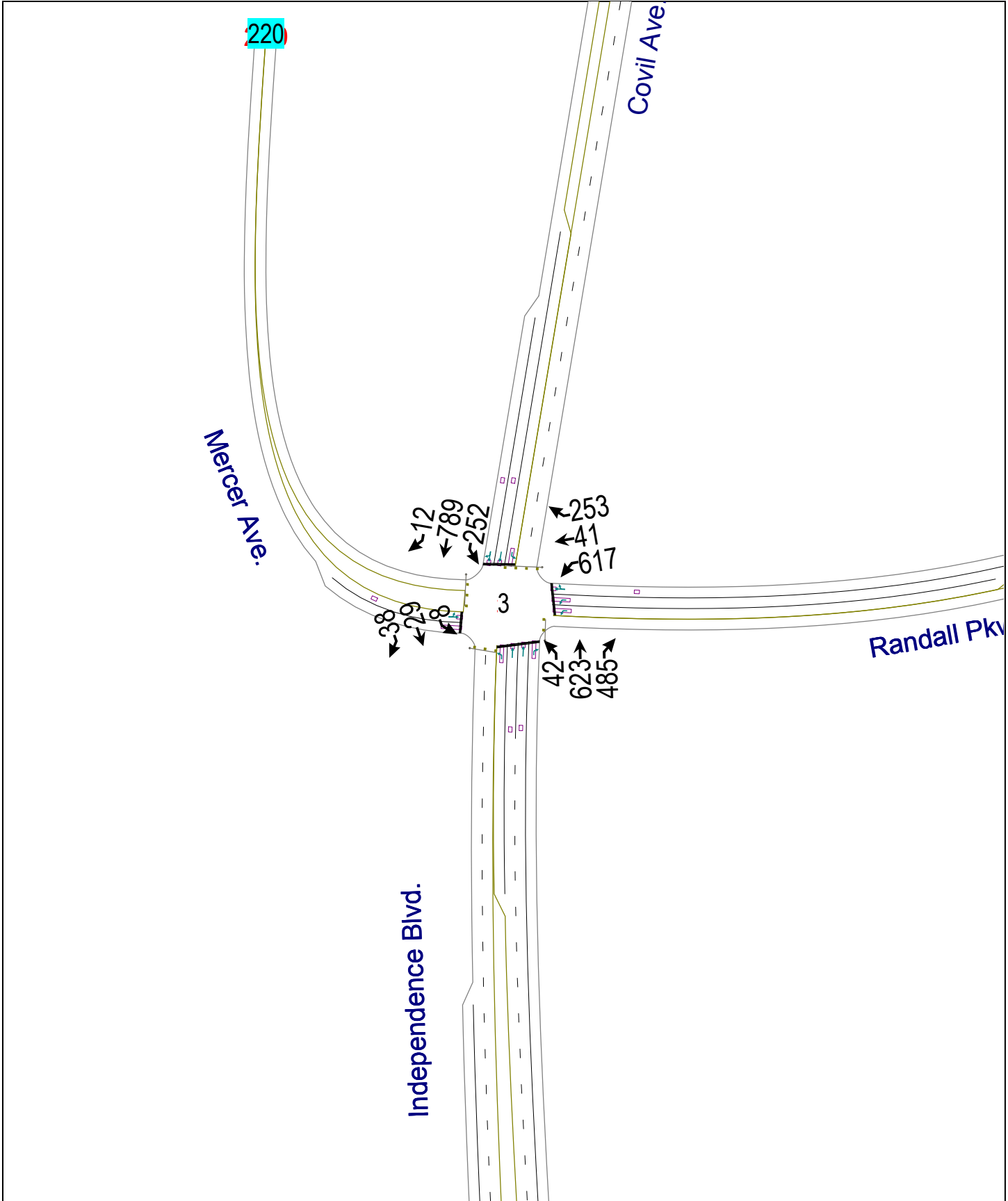
Intersection Summary

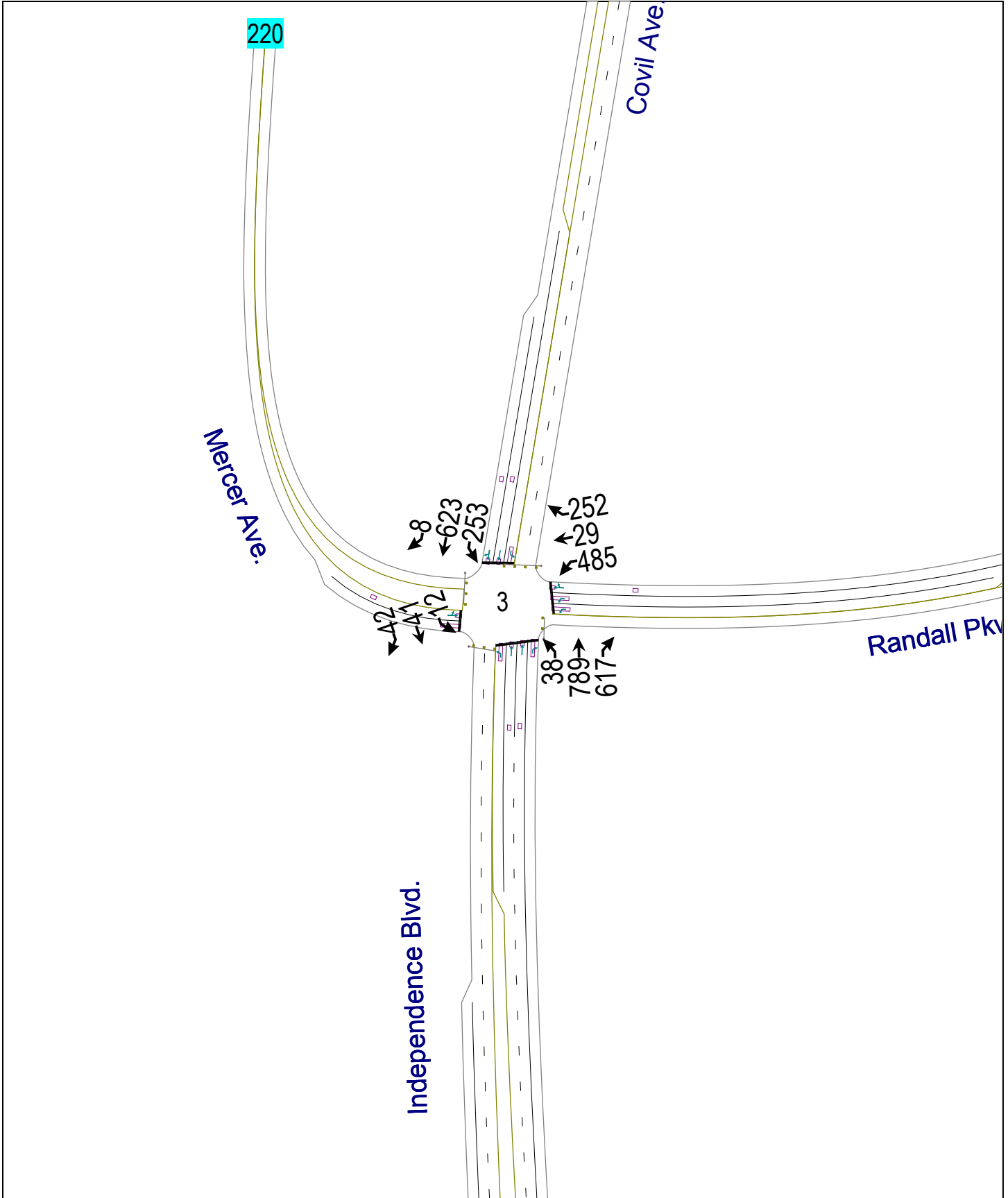
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 37.5  
 Intersection LOS: D  
 Intersection Capacity Utilization 72.6%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Wrightsville Ave. & Independence Blvd.



2: Wrightsville Ave. & Independence Blvd.  
 2012 Base Year PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖↗	↖		↖	↕	↗	↖	↕↗	
Volume (vph)	8	29	38	617	41	253	42	623	485	252	789	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	500		825	275		750	375		275
Storage Lanes	0		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1842	1583	3400	1607	0	1752	3505	1568	1752	3498	0
Flt Permitted		0.830		0.950			0.320			0.950		
Satd. Flow (perm)	0	1546	1583	3400	1607	0	590	3505	1568	1752	3498	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45				35
Link Distance (ft)		801			965			1461				786
Travel Time (s)		21.8			18.8			22.1				15.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	42	686	327	0	47	692	539	280	890	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm		Perm	Prot			Perm		pm+ov	Prot		
Protected Phases		8		7	4			6	7	5	2	
Permitted Phases	8		8				6		6			
Detector Phase	8	8	8	7	4		6	6	7	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	14.0	14.0	19.0	
Total Split (s)	14.0	14.0	14.0	35.0	49.0	0.0	39.0	39.0	35.0	32.0	71.0	0.0
Total Split (%)	11.7%	11.7%	11.7%	29.2%	40.8%	0.0%	32.5%	32.5%	29.2%	26.7%	59.2%	0.0%
Maximum Green (s)	7.0	7.0	7.0	28.0	42.0		32.0	32.0	28.0	25.0	64.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	None	None	C-Max	
Act Effct Green (s)		9.0	9.0	29.2	40.4		40.3	40.3	74.4	24.4	69.6	
Actuated g/C Ratio		0.08	0.08	0.24	0.34		0.34	0.34	0.62	0.20	0.58	
v/c Ratio		0.35	0.35	0.83	0.60		0.24	0.59	0.55	0.79	0.44	
Control Delay		61.8	61.5	52.7	37.6		20.6	20.2	16.2	61.3	15.9	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	

3: Mercer Ave. & Covil Ave.  
2012 Base Year AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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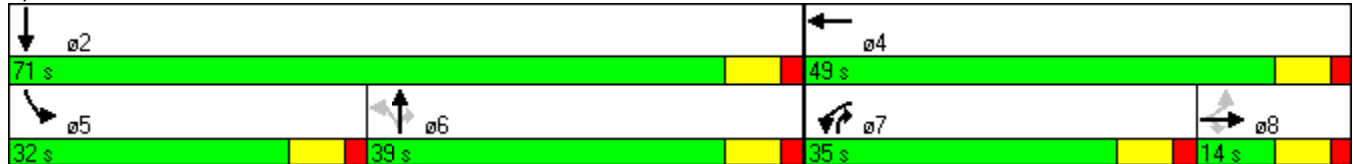


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		61.8	61.5	52.7	37.6		20.6	20.2	16.2	61.3	15.9	
LOS		E	E	D	D		C	C	B	E	B	
Approach Delay		61.6			47.8			18.5			26.8	
Approach LOS		E			D			B			C	
Queue Length 50th (ft)		31	32	258	200		19	147	386	203	209	
Queue Length 95th (ft)		69	70	330	296		m33	213	495	301	261	
Internal Link Dist (ft)		721			885			1381			706	
Turn Bay Length (ft)			150	500			275		750	375		
Base Capacity (vph)		116	119	850	589		198	1176	984	394	2030	
Starvation Cap Reductn		0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0		0	0	0	0	0	
Storage Cap Reductn		0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio		0.35	0.35	0.81	0.56		0.24	0.59	0.55	0.71	0.44	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 22 (18%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 30.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 69.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Mercer Ave. & Covil Ave.



3: Mercer Ave. & Covil Ave.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	41	42	485	29	252	38	789	617	253	623	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	500		825	275		750	375		275
Storage Lanes	0		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1842	1583	3400	1596	0	1752	3505	1568	1752	3498	0
Flt Permitted		0.834		0.950			0.385			0.950		
Satd. Flow (perm)	0	1554	1583	3400	1596	0	710	3505	1568	1752	3498	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45				35
Link Distance (ft)		801			965			1461				786
Travel Time (s)		21.8			18.8			22.1				15.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	59	47	539	312	0	42	877	686	281	701	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm		Perm	Prot			Perm		pm+ov	Prot		
Protected Phases		8		7	4			6	7	5	2	
Permitted Phases	8		8				6		6			
Detector Phase	8	8	8	7	4		6	6	7	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	7.0	7.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	14.0	14.0	19.0	
Total Split (s)	14.0	14.0	14.0	34.0	48.0	0.0	42.0	42.0	34.0	30.0	72.0	0.0
Total Split (%)	11.7%	11.7%	11.7%	28.3%	40.0%	0.0%	35.0%	35.0%	28.3%	25.0%	60.0%	0.0%
Maximum Green (s)	7.0	7.0	7.0	27.0	41.0		35.0	35.0	27.0	23.0	65.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	None	None	C-Max	
Act Effct Green (s)		9.5	9.5	26.5	38.2		43.3	43.3	74.8	23.5	71.8	
Actuated g/C Ratio		0.08	0.08	0.22	0.32		0.36	0.36	0.62	0.20	0.60	
v/c Ratio		0.48	0.37	0.72	0.61		0.16	0.69	0.70	0.82	0.34	
Control Delay		66.5	61.6	48.9	39.3		23.1	24.9	17.8	65.5	13.7	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	

3: Mercer Ave. & Covil Ave.  
2012 Base Year PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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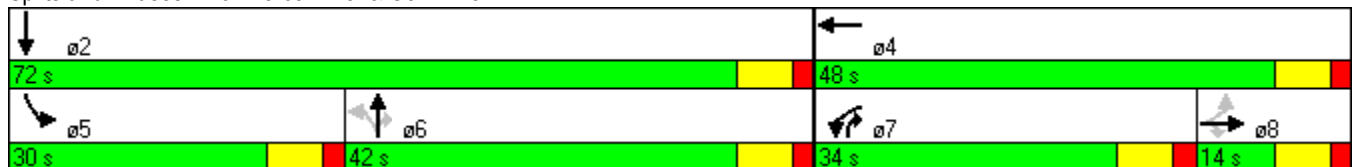


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		66.5	61.6	48.9	39.3		23.1	24.9	17.8	65.5	13.7	
LOS		E	E	D	D		C	C	B	E	B	
Approach Delay		64.4			45.4			21.8			28.5	
Approach LOS		E			D			C			C	
Queue Length 50th (ft)		44	35	197	191		17	195	513	207	150	
Queue Length 95th (ft)		91	76	255	285		m30	343	650	#333	192	
Internal Link Dist (ft)		721			885			1381			706	
Turn Bay Length (ft)			150	500			275		750	375		
Base Capacity (vph)		123	126	822	572		256	1264	1010	365	2092	
Starvation Cap Reductn		0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0		0	0	0	0	0	
Storage Cap Reductn		0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio		0.48	0.37	0.66	0.55		0.16	0.69	0.68	0.77	0.34	

Intersection Summary

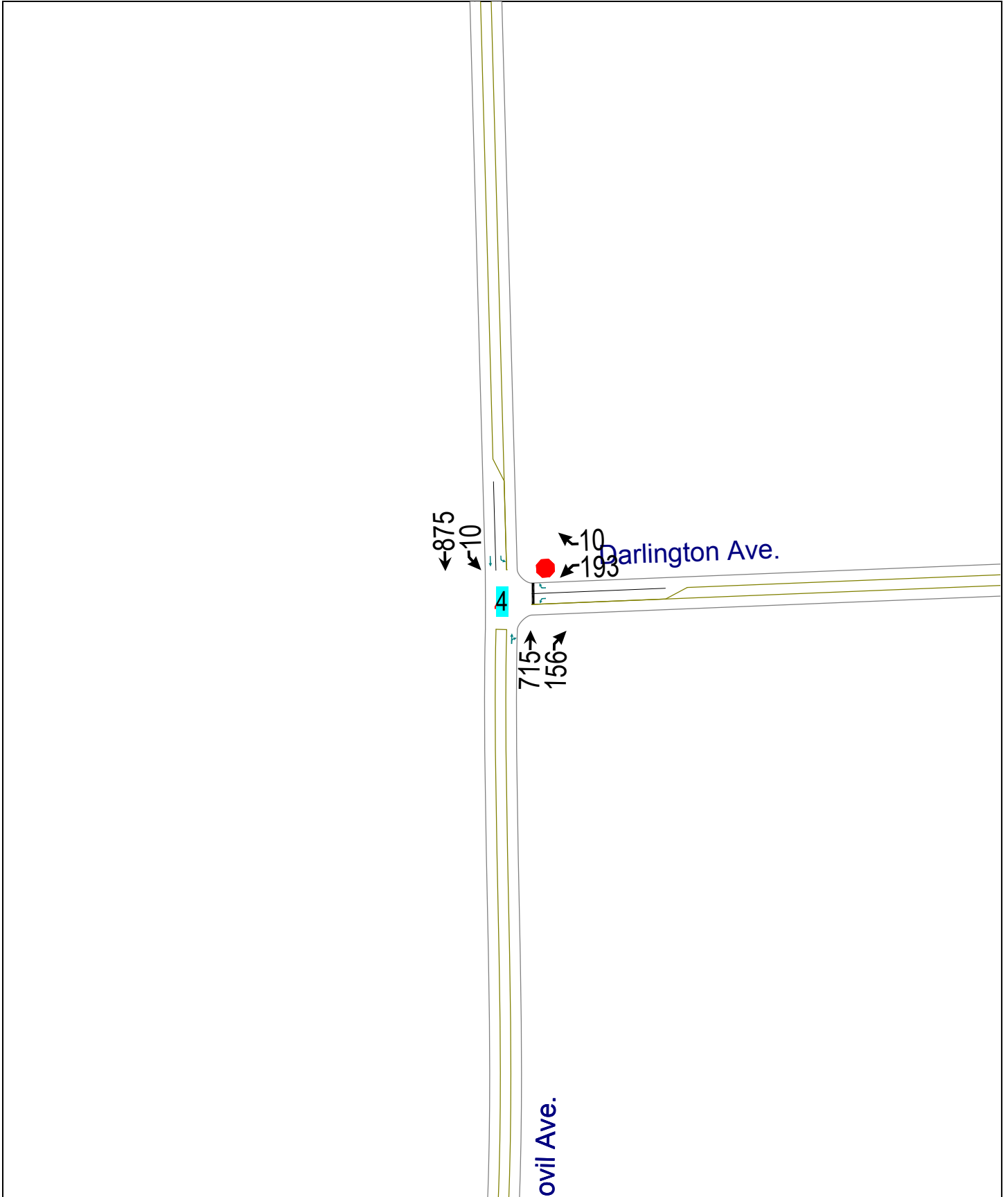
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 12 (10%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 30.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 70.6%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

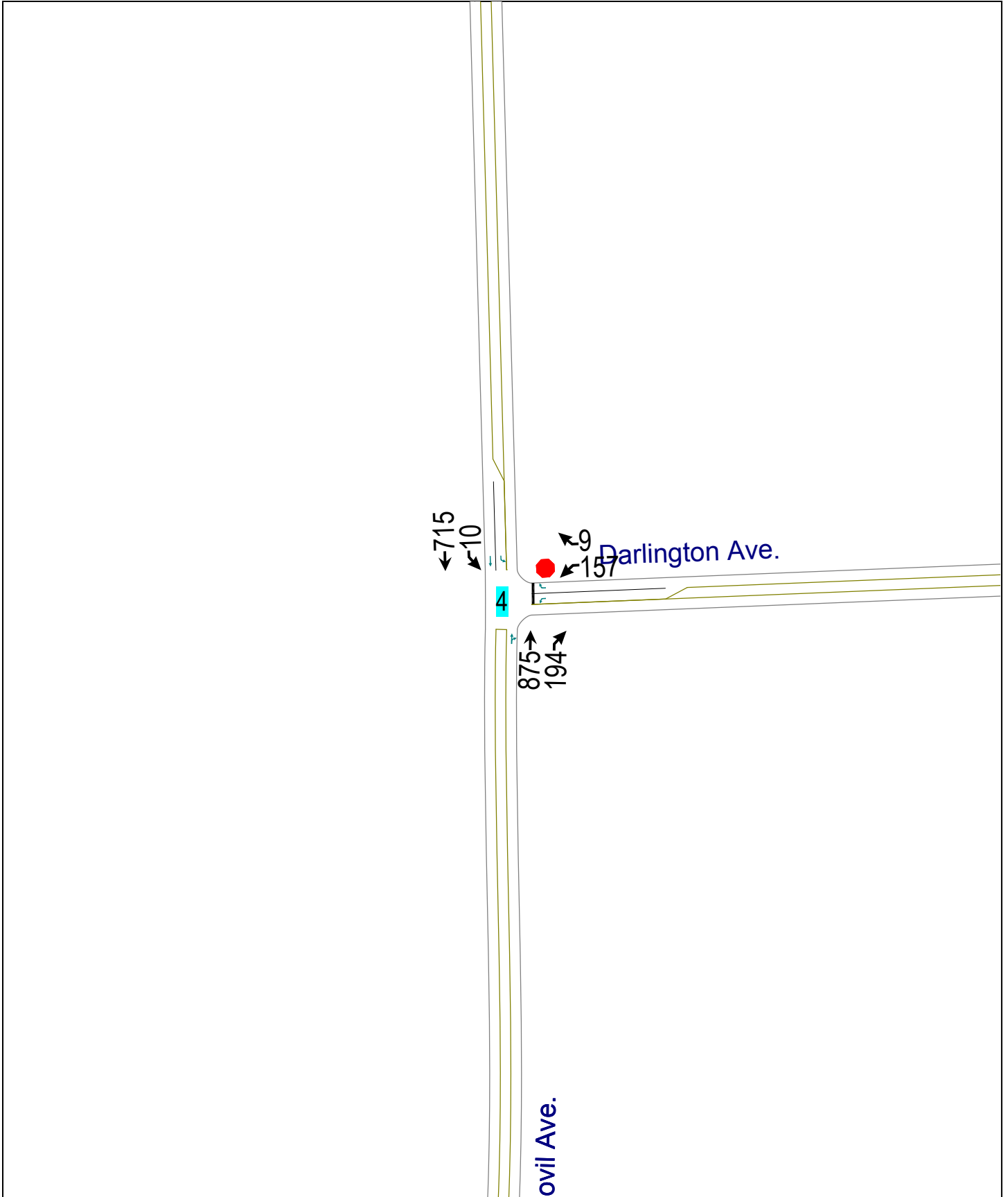
Splits and Phases: 3: Mercer Ave. & Covil Ave.



3: Mercer Ave. & Covil Ave.  
 2012 Base Year PM Peak







U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	193	10	715	156	10	875
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0		0	100	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25	25		25	25	
Satd. Flow (prot)	1770	1583	1800	0	1752	1845
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1800	0	1752	1845
Link Speed (mph)	25		35			35
Link Distance (ft)	991		906			1149
Travel Time (s)	27.0		17.6			22.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	214	11	967	0	11	972
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.5%
	ICU Level of Service C
Analysis Period (min)	15

4: Darlington Ave. & Covil Ave.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/11/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	193	10	715	156	10	875
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	214	11	794	173	11	972
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1876	881			968	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1876	881			968	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	97			98	
cM capacity (veh/h)	78	346			708	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	214	11	968	11	972
Volume Left	214	0	0	11	0
Volume Right	0	11	173	0	0
cSH	78	346	1700	708	1700
Volume to Capacity	2.77	0.03	0.57	0.02	0.57
Queue Length 95th (ft)	524	2	0	1	0
Control Delay (s)	913.5	15.8	0.0	10.2	0.0
Lane LOS	F	C		B	
Approach Delay (s)	869.3		0.0	0.1	
Approach LOS	F				

Intersection Summary					
Average Delay			90.1		
Intersection Capacity Utilization			64.5%	ICU Level of Service	C
Analysis Period (min)			15		

4: Darlington Ave. & Covil Ave.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	157	9	875	194	10	715
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0		0	100	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25	25		25	25	
Satd. Flow (prot)	1770	1583	1799	0	1752	1845
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1799	0	1752	1845
Link Speed (mph)	25		35			35
Link Distance (ft)	991		906			1149
Travel Time (s)	27.0		17.6			22.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	174	10	1188	0	11	794
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type: Other  
 Control Type: Unsignalized  
 Intersection Capacity Utilization 73.2% ICU Level of Service D  
 Analysis Period (min) 15

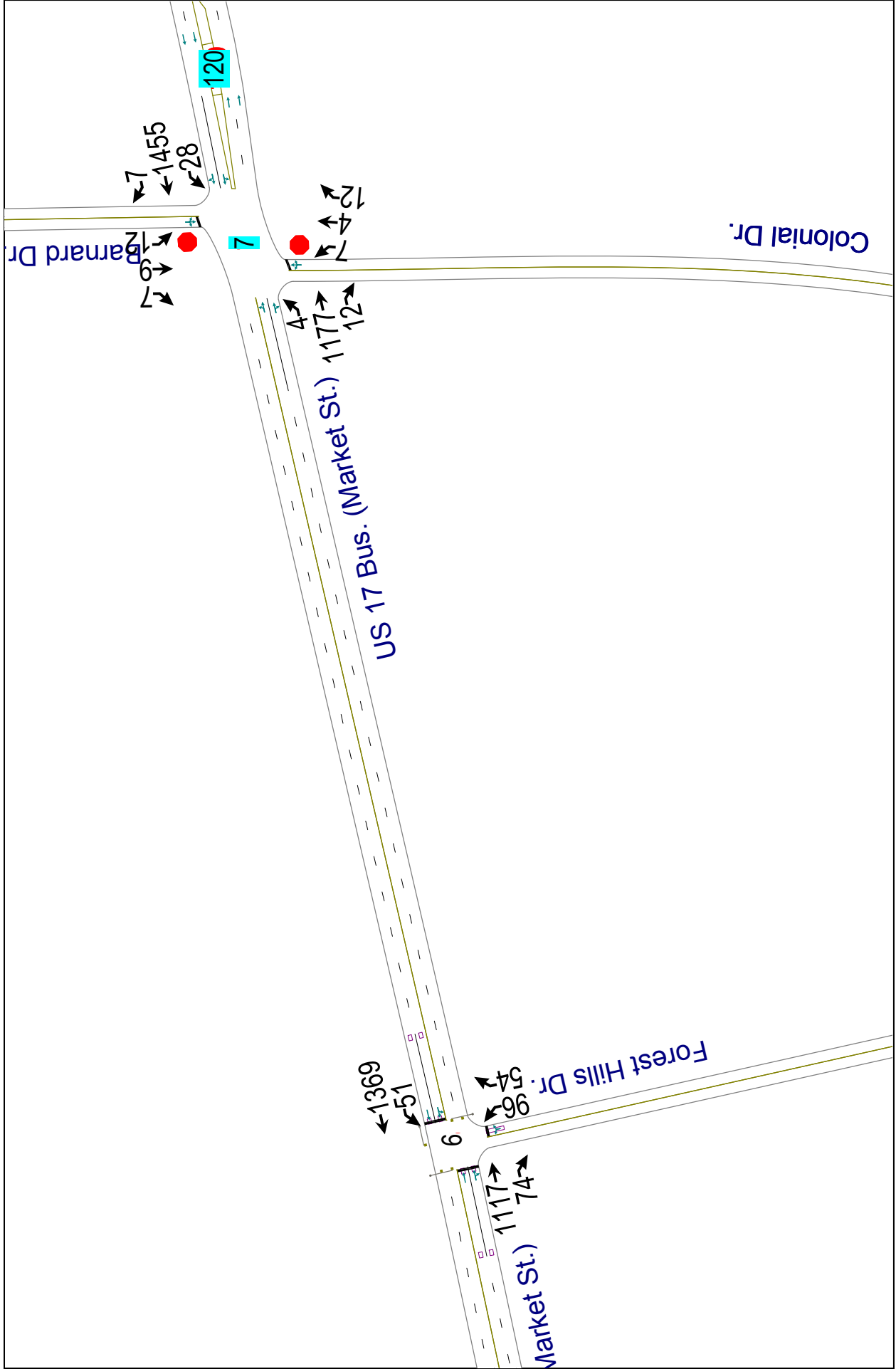
U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

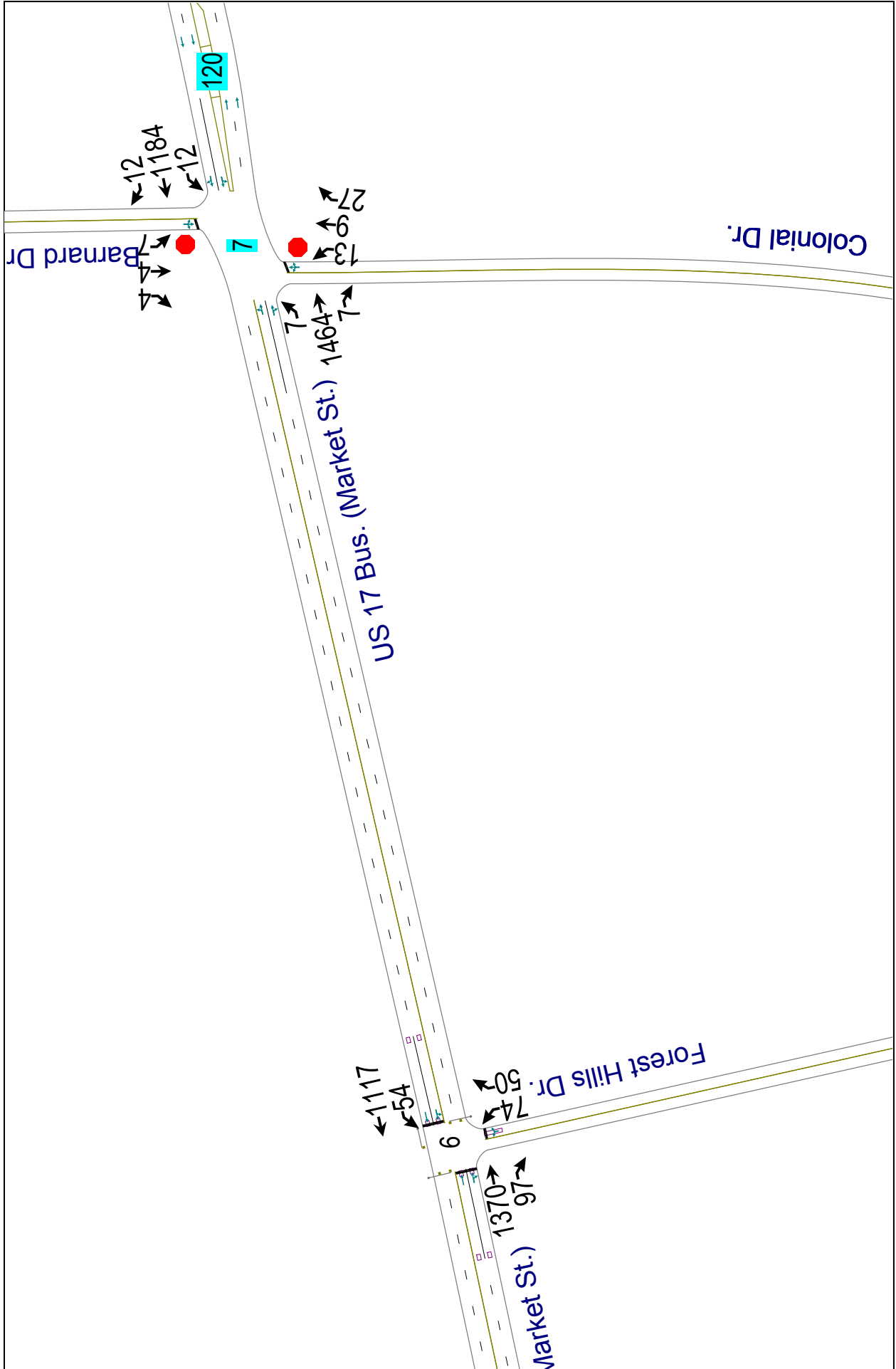
URS  
 9/11/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	157	9	875	194	10	715
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	174	10	972	216	11	794
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1897	1080			1188	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1897	1080			1188	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	96			98	
cM capacity (veh/h)	75	265			584	
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2	
Volume Total	174	10	1188	11	794	
Volume Left	174	0	0	11	0	
Volume Right	0	10	216	0	0	
cSH	75	265	1700	584	1700	
Volume to Capacity	2.33	0.04	0.70	0.02	0.47	
Queue Length 95th (ft)	411	3	0	1	0	
Control Delay (s)	725.4	19.1	0.0	11.3	0.0	
Lane LOS	F	C		B		
Approach Delay (s)	687.1		0.0	0.2		
Approach LOS	F					
Intersection Summary						
Average Delay			58.3			
Intersection Capacity Utilization			73.2%		ICU Level of Service	D
Analysis Period (min)			15			

4: Darlington Ave. & Covil Ave.  
 2012 Base Year PM Peak







U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	1117	74	51	1369	96	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3507	0	0	3532	1717	0
Flt Permitted				0.791	0.969	
Satd. Flow (perm)	3507	0	0	2800	1717	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	25	
Link Distance (ft)	1021			1010	949	
Travel Time (s)	19.9			19.7	25.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1323	0	0	1578	167	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Detector Phase	2		6	6	8	
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	7.0	
Minimum Split (s)	17.0		17.0	17.0	14.0	
Total Split (s)	120.0	0.0	120.0	120.0	30.0	0.0
Total Split (%)	80.0%	0.0%	80.0%	80.0%	20.0%	0.0%
Maximum Green (s)	113.0		113.0	113.0	23.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	2.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Act Effct Green (s)	119.0			119.0	21.0	
Actuated g/C Ratio	0.79			0.79	0.14	
v/c Ratio	0.48			0.71	0.69	
Control Delay	6.1			6.0	76.2	
Queue Delay	0.0			0.0	0.0	
Total Delay	6.1			6.0	76.2	
LOS	A			A	E	
Approach Delay	6.1			6.0	76.2	

6: US 17 Bus. (Market St.) & Forest Hills Dr.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	A			A	E	
Queue Length 50th (ft)	200			123	157	
Queue Length 95th (ft)	263			m228	235	
Internal Link Dist (ft)	941			930	869	
Turn Bay Length (ft)						
Base Capacity (vph)	2781			2221	286	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.48			0.71	0.58	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 58 (39%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 9.8  
 Intersection LOS: A  
 Intersection Capacity Utilization 92.0%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

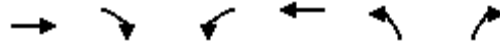
Splits and Phases: 6: US 17 Bus. (Market St.) & Forest Hills Dr.



6: US 17 Bus. (Market St.) & Forest Hills Dr.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Volume (vph)	1370	97	54	1117	74	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3504	0	0	3532	1709	0
Flt Permitted				0.701	0.971	
Satd. Flow (perm)	3504	0	0	2481	1709	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	25	
Link Distance (ft)	1021			1010	949	
Travel Time (s)	19.9			19.7	25.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1630	0	0	1301	138	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Detector Phase	2		6	6	8	
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	7.0	
Minimum Split (s)	17.0		17.0	17.0	14.0	
Total Split (s)	121.0	0.0	121.0	121.0	29.0	0.0
Total Split (%)	80.7%	0.0%	80.7%	80.7%	19.3%	0.0%
Maximum Green (s)	114.0		114.0	114.0	22.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	2.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Act Effct Green (s)	121.0			121.0	19.0	
Actuated g/C Ratio	0.81			0.81	0.13	
v/c Ratio	0.58			0.65	0.64	
Control Delay	6.6			5.6	75.1	
Queue Delay	0.0			0.0	0.0	
Total Delay	6.6			5.6	75.1	
LOS	A			A	E	
Approach Delay	6.6			5.6	75.1	

6: US 17 Bus. (Market St.) & Forest Hills Dr.  
2012 Base Year PM Peak



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Approach LOS	A			A	E	
Queue Length 50th (ft)	261			110	130	
Queue Length 95th (ft)	362			m162	200	
Internal Link Dist (ft)	941			930	869	
Turn Bay Length (ft)						
Base Capacity (vph)	2826			2001	273	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.58			0.65	0.51	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 44 (29%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.65  
 Intersection Signal Delay: 9.2  
 Intersection LOS: A  
 Intersection Capacity Utilization 86.3%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: US 17 Bus. (Market St.) & Forest Hills Dr.



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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔			↔	
Volume (vph)	4	1177	12	28	1455	7	7	4	12	12	9	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3536	0	0	3532	0	0	1705	0	0	1760	0
Flt Permitted					0.999			0.984			0.979	
Satd. Flow (perm)	0	3536	0	0	3532	0	0	1705	0	0	1760	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			194			978			871	
Travel Time (s)		19.7			3.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1325	0	0	1656	0	0	25	0	0	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	70.4%
Analysis Period (min)	15
	ICU Level of Service C

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔			↔	
Volume (veh/h)	4	1177	12	28	1455	7	7	4	12	12	9	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	1308	13	31	1617	8	8	4	13	13	10	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1010										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	1624			1321			2207	3010	661	2361	3013	812
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1624			1087			2096	3011	335	2272	3015	812
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			0	59	98	0	7	98
cM capacity (veh/h)	396			559			4	11	580	12	11	322

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	658	667	839	816	26	31
Volume Left	4	0	31	0	8	13
Volume Right	0	13	0	8	13	8
cSH	396	1700	559	1700	11	15
Volume to Capacity	0.01	0.39	0.06	0.48	2.24	2.06
Queue Length 95th (ft)	1	0	4	0	103	114
Control Delay (s)	0.4	0.0	1.6	0.0	1226.5	1008.6
Lane LOS	A		A		F	F
Approach Delay (s)	0.2		0.8		1226.5	1008.6
Approach LOS					F	F

Intersection Summary		
Average Delay		21.2
Intersection Capacity Utilization	70.4%	ICU Level of Service C
Analysis Period (min)		15

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	7	1464	7	12	1184	12	13	9	27	7	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3536	0	0	3536	0	0	1701	0	0	1756	0
Flt Permitted								0.987			0.976	
Satd. Flow (perm)	0	3536	0	0	3536	0	0	1701	0	0	1756	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			194			978			871	
Travel Time (s)		19.7			3.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1643	0	0	1342	0	0	54	0	0	16	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.6%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (veh/h)	7	1464	7	12	1184	12	13	9	27	7	4	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	1627	8	13	1316	13	14	10	30	8	4	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1010										
pX, platoon unblocked				0.82			0.82	0.82	0.82	0.82	0.82	
vC, conflicting volume	1329			1634			2337	3002	817	2213	2999	664
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1329			1330			2190	3002	331	2037	2999	664
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			0	4	94	0	57	99
cM capacity (veh/h)	515			421			13	10	544	3	10	403

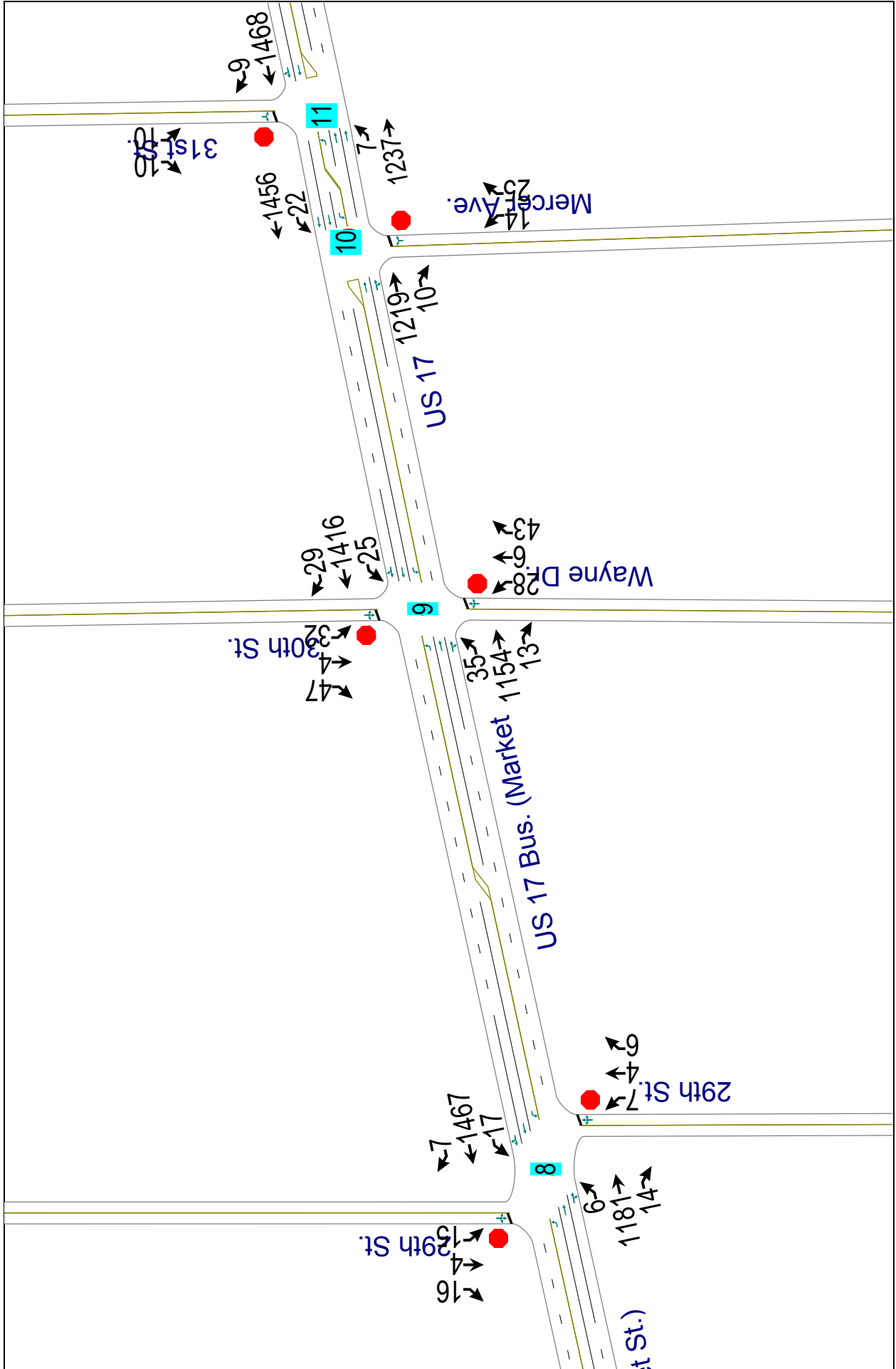
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	821	821	671	671	54	17
Volume Left	8	0	13	0	14	8
Volume Right	0	8	0	13	30	4
cSH	515	1700	421	1700	26	6
Volume to Capacity	0.02	0.48	0.03	0.39	2.11	2.89
Queue Length 95th (ft)	1	0	2	0	166	82
Control Delay (s)	0.5	0.0	1.0	0.0	836.6	2046.9
Lane LOS	A		A		F	F
Approach Delay (s)	0.2		0.5		836.6	2046.9
Approach LOS					F	F

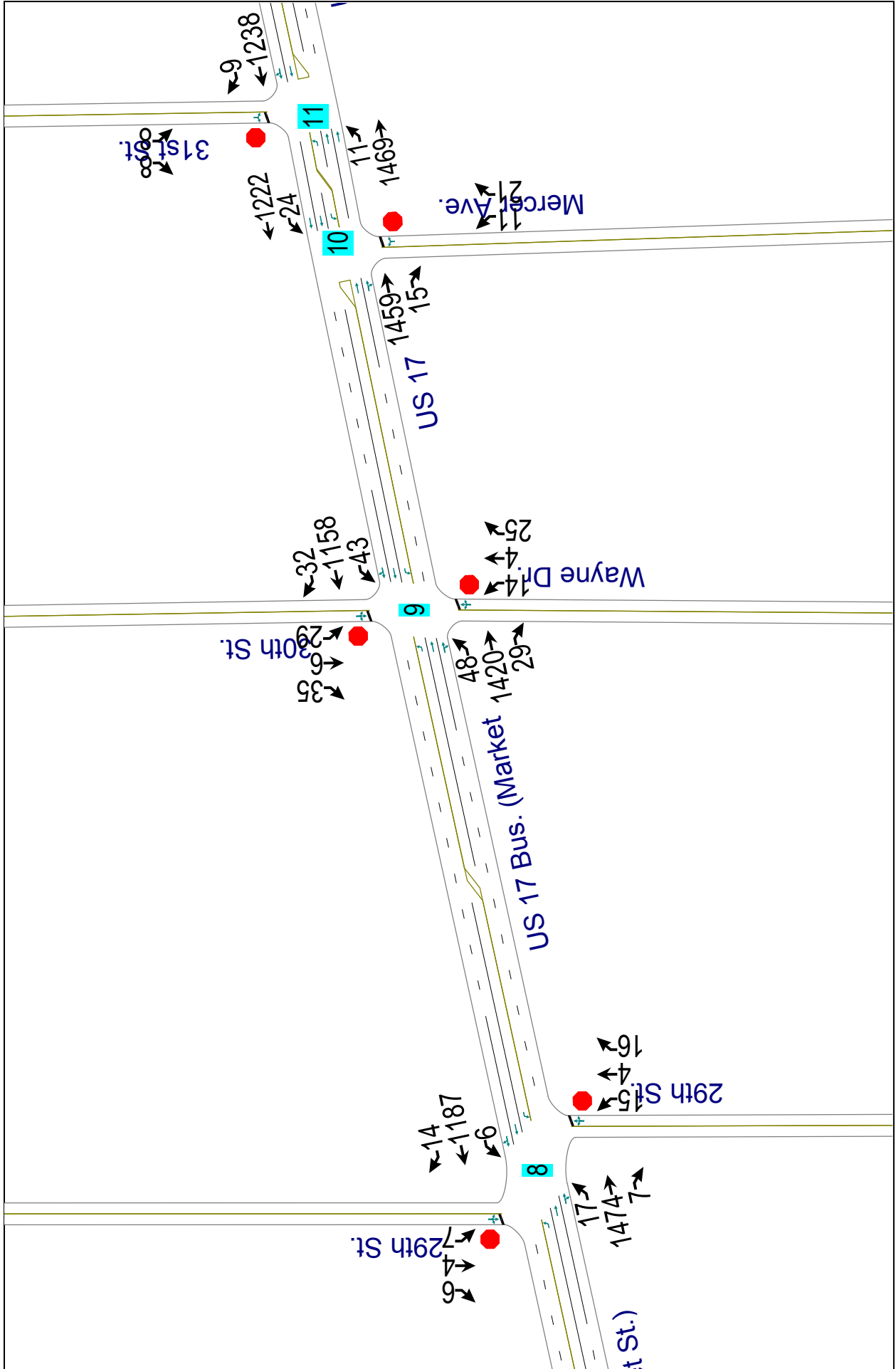
Intersection Summary

Average Delay		26.4				
Intersection Capacity Utilization		55.6%		ICU Level of Service		B
Analysis Period (min)		15				

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	1181	14	17	1467	7	7	4	6	15	4	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	225		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3532	0	1770	3536	0	0	1732	0	0	1694	0
Flt Permitted	0.950			0.950				0.979			0.979	
Satd. Flow (perm)	1770	3532	0	1770	3536	0	0	1732	0	0	1694	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		668			630			952			799	
Travel Time (s)		11.4			10.7			26.0			21.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1328	0	19	1638	0	0	19	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			48			48	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.8%
ICU Level of Service	A
Analysis Period (min)	15

8: US 17 Bus. (Market St.) & 29th St.  
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	1181	14	17	1467	7	7	4	6	15	4	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	1312	16	19	1630	8	8	4	7	17	4	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1638			1328			2206	3009	664	2350	3013	819
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1638			1328			2206	3009	664	2350	3013	819
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			51	64	98	0	64	94
cM capacity (veh/h)	392			516			16	12	403	13	12	317

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	7	875	453	19	1087	551	19	39
Volume Left	7	0	0	19	0	0	8	17
Volume Right	0	0	16	0	0	8	7	18
cSH	392	1700	1700	516	1700	1700	22	23
Volume to Capacity	0.02	0.51	0.27	0.04	0.64	0.32	0.86	1.72
Queue Length 95th (ft)	1	0	0	3	0	0	62	124
Control Delay (s)	14.3	0.0	0.0	12.2	0.0	0.0	390.6	711.6
Lane LOS	B			B			F	F
Approach Delay (s)	0.1			0.1			390.6	711.6
Approach LOS							F	F

Intersection Summary

Average Delay	11.6
Intersection Capacity Utilization	50.8%
ICU Level of Service	A
Analysis Period (min)	15

8: US 17 Bus. (Market St.) & 29th St.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	1474	7	6	1187	14	15	4	16	7	4	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	225		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3532	0	0	1711	0	0	1716	0
Flt Permitted	0.950			0.950				0.979			0.979	
Satd. Flow (perm)	1770	3536	0	1770	3532	0	0	1711	0	0	1716	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		668			630			952			799	
Travel Time (s)		11.4			10.7			26.0			21.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	1646	0	7	1335	0	0	39	0	0	19	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			48			48	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.0%
ICU Level of Service	A
Analysis Period (min)	15

8: US 17 Bus. (Market St.) & 29th St.  
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	1474	7	6	1187	14	15	4	16	7	4	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	1638	8	7	1319	16	17	4	18	8	4	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1334			1646			2361	3027	823	2217	3023	667
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1334			1646			2361	3027	823	2217	3023	667
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			98			0	63	94	50	63	98
cM capacity (veh/h)	513			389			13	12	317	15	12	399

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	19	1092	554	7	879	455	39	19
Volume Left	19	0	0	7	0	0	17	8
Volume Right	0	0	8	0	0	16	18	7
cSH	513	1700	1700	389	1700	1700	22	21
Volume to Capacity	0.04	0.64	0.33	0.02	0.52	0.27	1.75	0.89
Queue Length 95th (ft)	3	0	0	1	0	0	125	63
Control Delay (s)	12.3	0.0	0.0	14.4	0.0	0.0	730.2	412.1
Lane LOS	B			B			F	F
Approach Delay (s)	0.1			0.1			730.2	412.1
Approach LOS							F	F

**Intersection Summary**

Average Delay	11.9
Intersection Capacity Utilization	51.0%
ICU Level of Service	A
Analysis Period (min)	15

8: US 17 Bus. (Market St.) & 29th St.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	1154	13	25	1416	29	28	6	43	32	4	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	300		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3532	0	1770	3529	0	0	1692	0	0	1688	0
Flt Permitted	0.950			0.950				0.982			0.981	
Satd. Flow (perm)	1770	3532	0	1770	3529	0	0	1692	0	0	1688	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			411			873			738	
Travel Time (s)		10.7			7.0			23.8			20.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	1296	0	28	1605	0	0	86	0	0	92	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	53.2%
ICU Level of Service	A
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	1154	13	25	1416	29	28	6	43	32	4	47
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	1282	14	28	1573	32	31	7	48	36	4	52
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					834							
pX, platoon unblocked	0.78						0.78	0.78		0.78	0.78	0.78
vC, conflicting volume	1606			1297			2264	3028	648	2415	3019	803
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1222			1297			2062	3036	648	2254	3025	199
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			95			0	22	88	0	49	92
cM capacity (veh/h)	444			530			12	9	413	5	9	634

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	39	855	442	28	1049	557	86	92
Volume Left	39	0	0	28	0	0	31	36
Volume Right	0	0	14	0	0	32	48	52
cSH	444	1700	1700	530	1700	1700	25	12
Volume to Capacity	0.09	0.50	0.26	0.05	0.62	0.33	3.41	7.52
Queue Length 95th (ft)	7	0	0	4	0	0	Err	Err
Control Delay (s)	13.9	0.0	0.0	12.2	0.0	0.0	Err	Err
Lane LOS	B			B			F	F
Approach Delay (s)	0.4			0.2			Err	Err
Approach LOS							F	F

Intersection Summary

Average Delay		565.2	
Intersection Capacity Utilization	53.2%		ICU Level of Service A
Analysis Period (min)	15		

9: US 17 Bus. (Market St.) & 30th St.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	1420	29	43	1158	32	14	4	25	29	6	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	300		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3529	0	1770	3525	0	0	1688	0	0	1701	0
Flt Permitted	0.950			0.950				0.984			0.980	
Satd. Flow (perm)	1770	3529	0	1770	3525	0	0	1688	0	0	1701	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			411			873			738	
Travel Time (s)		10.7			7.0			23.8			20.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	1610	0	48	1323	0	0	48	0	0	78	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.7%
ICU Level of Service	A
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
 2012 Base Year PM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	48	1420	29	43	1158	32	14	4	25	29	6	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	53	1578	32	48	1287	36	16	4	28	32	7	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					834							
pX, platoon unblocked	0.86						0.86	0.86		0.86	0.86	0.86
vC, conflicting volume	1322			1610			2482	3118	805	2326	3117	661
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1043			1610			2395	3138	805	2213	3136	272
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			88			0	40	91	0	10	94
cM capacity (veh/h)	568			402			3	7	325	9	7	622

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	53	1052	558	48	858	464	48	78
Volume Left	53	0	0	48	0	0	16	32
Volume Right	0	0	32	0	0	36	28	39
cSH	568	1700	1700	402	1700	1700	8	16
Volume to Capacity	0.09	0.62	0.33	0.12	0.50	0.27	6.25	4.72
Queue Length 95th (ft)	8	0	0	10	0	0	Err	Err
Control Delay (s)	12.0	0.0	0.0	15.2	0.0	0.0	Err	Err
Lane LOS	B			C			F	F
Approach Delay (s)	0.4			0.5			Err	Err
Approach LOS							F	F

Intersection Summary			
Average Delay		397.9	
Intersection Capacity Utilization	52.7%		ICU Level of Service A
Analysis Period (min)	15		

9: US 17 Bus. (Market St.) & 30th St.  
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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Volume (vph)	1219	10	22	1456	14	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	40		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3536	0	1770	3539	1672	0
Flt Permitted			0.950		0.982	
Satd. Flow (perm)	3536	0	1770	3539	1672	0
Link Speed (mph)	40			40	25	
Link Distance (ft)	411			142	909	
Travel Time (s)	7.0			2.4	24.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1365	0	24	1618	44	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.2%
ICU Level of Service	A
Analysis Period (min)	15

10: US 17 Bus. (Market St.) & Mercer Ave.  
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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Volume (veh/h)	1219	10	22	1456	14	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1354	11	24	1618	16	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	423					
pX, platoon unblocked					0.78	
vC, conflicting volume			1366	2218	683	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1366	2003	683	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			95	60	93	
cM capacity (veh/h)			499	39	392	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	903	463	24	809	809	43
Volume Left	0	0	24	0	0	16
Volume Right	0	11	0	0	0	28
cSH	1700	1700	499	1700	1700	92
Volume to Capacity	0.53	0.27	0.05	0.48	0.48	0.47
Queue Length 95th (ft)	0	0	4	0	0	50
Control Delay (s)	0.0	0.0	12.6	0.0	0.0	75.4
Lane LOS	B			F		
Approach Delay (s)	0.0		0.2			75.4
Approach LOS				F		

Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			50.2%	ICU Level of Service	A	
Analysis Period (min)			15			

10: US 17 Bus. (Market St.) & Mercer Ave.  
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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Volume (vph)	1459	15	24	1222	11	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	40		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3532	0	1770	3539	1668	0
Flt Permitted			0.950		0.983	
Satd. Flow (perm)	3532	0	1770	3539	1668	0
Link Speed (mph)	40			40	25	
Link Distance (ft)	411			142	909	
Travel Time (s)	7.0			2.4	24.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1638	0	27	1358	35	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.8%
ICU Level of Service	A
Analysis Period (min)	15

10: US 17 Bus. (Market St.) & Mercer Ave.  
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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (veh/h)	1459	15	24	1222	11	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1621	17	27	1358	12	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	423					
pX, platoon unblocked					0.85	
vC, conflicting volume			1638		2362	819
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1638		2251	819
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		56	93
cM capacity (veh/h)			392		28	319

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1081	557	27	679	679	36
Volume Left	0	0	27	0	0	12
Volume Right	0	17	0	0	0	23
cSH	1700	1700	392	1700	1700	70
Volume to Capacity	0.64	0.33	0.07	0.40	0.40	0.51
Queue Length 95th (ft)	0	0	5	0	0	52
Control Delay (s)	0.0	0.0	14.9	0.0	0.0	101.7
Lane LOS	B			F		
Approach Delay (s)	0.0		0.3	101.7		
Approach LOS				F		

Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			50.8%	ICU Level of Service	A	
Analysis Period (min)			15			

10: US 17 Bus. (Market St.) & Mercer Ave.  
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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	7	1237	1468	9	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	40			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	1770	3539	3536	0	1694	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1770	3539	3536	0	1694	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		142	281		960	
Travel Time (s)		2.4	4.8		26.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	1374	1641	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.9%
	ICU Level of Service A
Analysis Period (min)	15

11: US 17 Bus. (Market St.) & 31st St.  
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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	7	1237	1468	9	10	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	1374	1631	10	11	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			281			
pX, platoon unblocked	0.78				0.78	0.78
vC, conflicting volume	1641				2339	821
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1268				2157	222
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				65	98
cM capacity (veh/h)	427				31	613
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	8	687	687	1087	554	22
Volume Left	8	0	0	0	0	11
Volume Right	0	0	0	0	10	11
cSH	427	1700	1700	1700	1700	60
Volume to Capacity	0.02	0.40	0.40	0.64	0.33	0.37
Queue Length 95th (ft)	1	0	0	0	0	34
Control Delay (s)	13.6	0.0	0.0	0.0	0.0	97.4
Lane LOS	B					F
Approach Delay (s)	0.1			0.0		97.4
Approach LOS						F
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			50.9%		ICU Level of Service	A
Analysis Period (min)			15			

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	11	1469	1238	9	8	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	40			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	1770	3539	3536	0	1694	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1770	3539	3536	0	1694	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		142	281		960	
Travel Time (s)		2.4	4.8		26.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	1632	1386	0	18	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.6%
ICU Level of Service	A
Analysis Period (min)	15

11: US 17 Bus. (Market St.) & 31st St.  
 2012 Base Year PM Peak

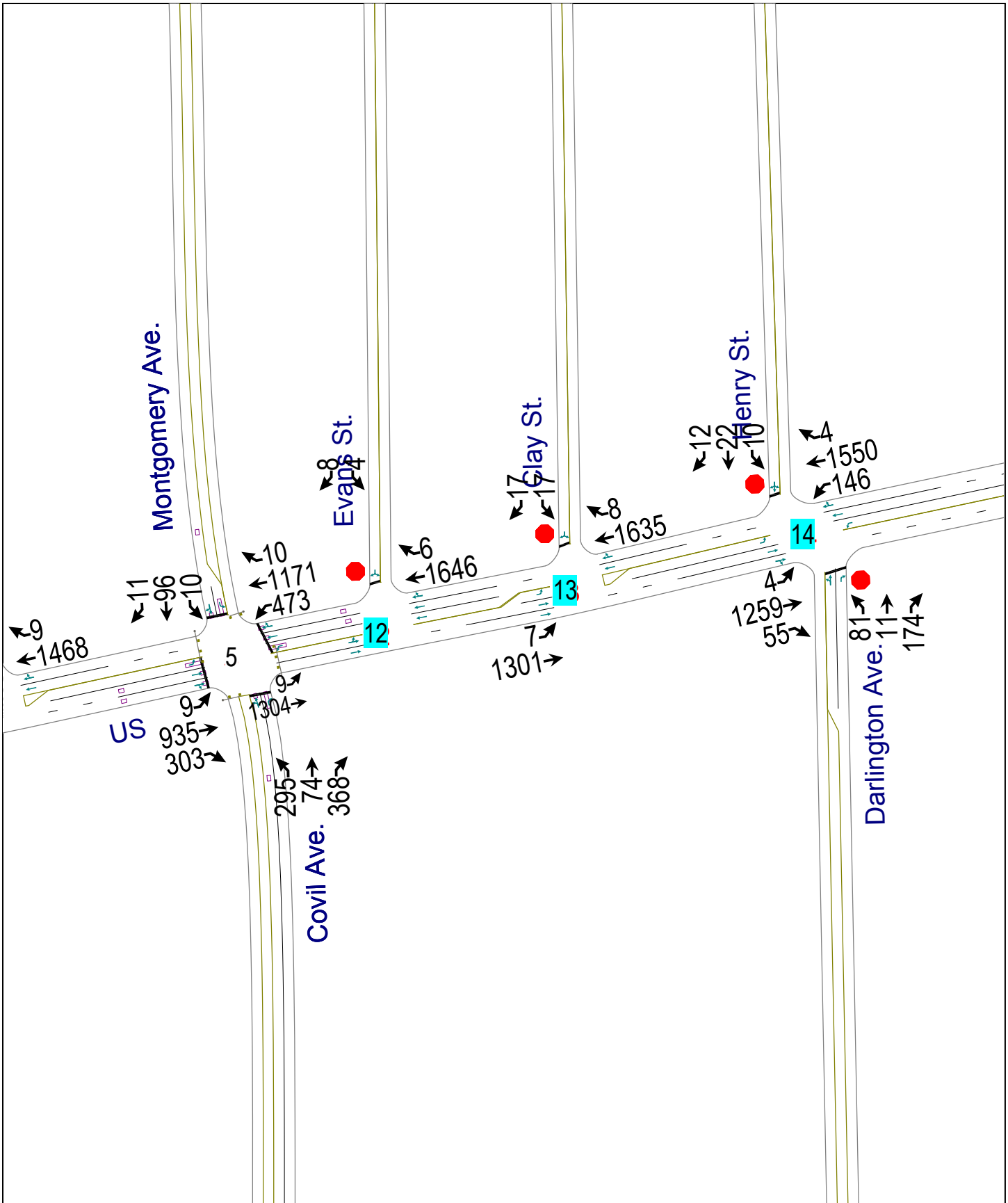
U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

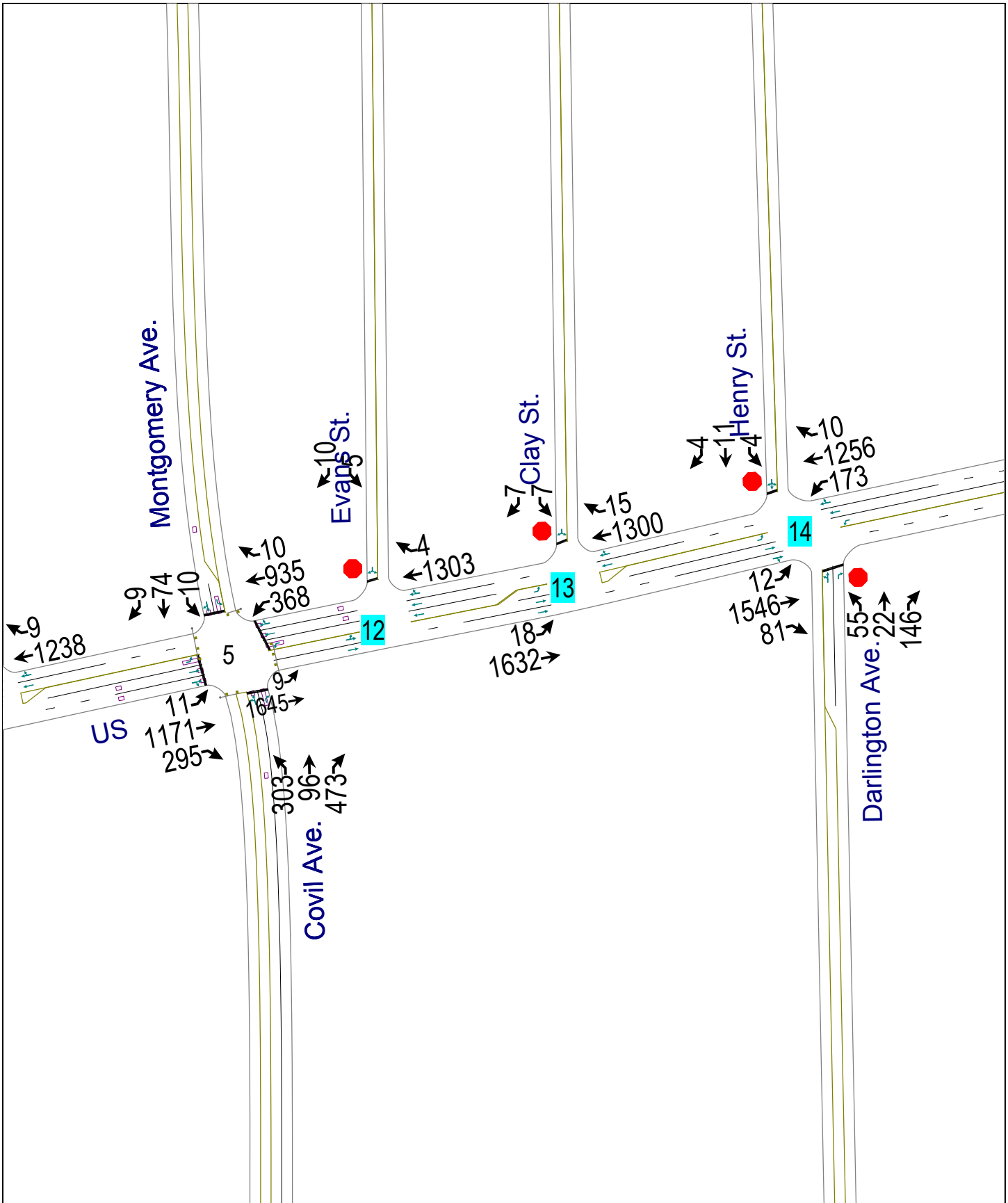
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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	11	1469	1238	9	8	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	1632	1376	10	9	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			281			
pX, platoon unblocked	0.85				0.85	0.85
vC, conflicting volume	1386				2221	693
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1102				2084	287
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				77	99
cM capacity (veh/h)	535				38	604
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	12	816	816	917	469	18
Volume Left	12	0	0	0	0	9
Volume Right	0	0	0	0	10	9
cSH	535	1700	1700	1700	1700	71
Volume to Capacity	0.02	0.48	0.48	0.54	0.28	0.25
Queue Length 95th (ft)	2	0	0	0	0	22
Control Delay (s)	11.9	0.0	0.0	0.0	0.0	71.3
Lane LOS	B					F
Approach Delay (s)	0.1			0.0		71.3
Approach LOS						F
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			50.6%		ICU Level of Service	A
Analysis Period (min)			15			






















11: US 17 Bus. (Market St.) & 31st St.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	935	303	473	1171	10	295	74	368	10	96	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		0	0		650	35		0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3408	0	1752	3501	0	0	1775	1568	1770	1835	0
Flt Permitted	0.210			0.950				0.649		0.199		
Satd. Flow (perm)	391	3408	0	1752	3501	0	0	1197	1568	371	1835	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35				25
Link Distance (ft)		281			164			1137				915
Travel Time (s)		4.8			2.8			22.1				25.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1376	0	526	1312	0	0	410	409	11	119	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Prot			Perm		pm+ov	Perm		
Protected Phases		2		1	6			8	1			4
Permitted Phases	2						8		8	4		
Detector Phase	2	2		1	6		8	8	1	4		4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	19.0	19.0		14.0	19.0		14.0	14.0	14.0	14.0		14.0
Total Split (s)	59.0	59.0	0.0	43.0	102.0	0.0	48.0	48.0	43.0	48.0	48.0	0.0
Total Split (%)	39.3%	39.3%	0.0%	28.7%	68.0%	0.0%	32.0%	32.0%	28.7%	32.0%	32.0%	0.0%
Maximum Green (s)	52.0	52.0		36.0	95.0		41.0	41.0	36.0	41.0		41.0
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0		5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag		Lead								Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None		None
Act Effct Green (s)	54.0	54.0		38.0	97.0			43.0	86.0	43.0		43.0
Actuated g/C Ratio	0.36	0.36		0.25	0.65			0.29	0.57	0.29		0.29
v/c Ratio	0.07	1.12		1.18	0.58			1.20	0.45	0.10		0.23
Control Delay	32.4	105.0		145.6	5.2			158.3	20.5	42.8		42.3
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0

5: US 17 Bus. (Market St.) & Montgomery Ave.  
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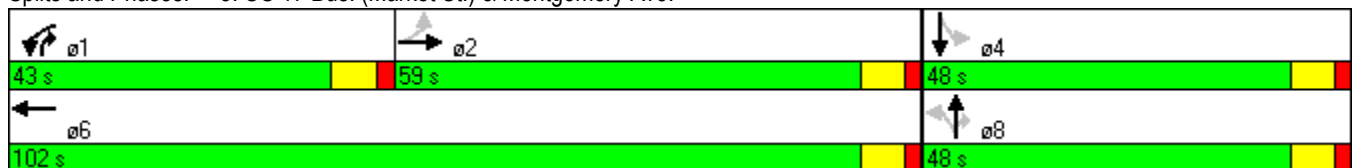


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	32.4	105.0		145.6	5.2			158.3	20.5	42.8	42.3	
LOS	C	F		F	A			F	C	D	D	
Approach Delay		104.5			45.4			89.5				42.3
Approach LOS		F			D			F				D
Queue Length 50th (ft)	6	~816		~609	153			~484	223	8	89	
Queue Length 95th (ft)	m13	#937		#846	178			#699	309	26	145	
Internal Link Dist (ft)		201			84			1057				835
Turn Bay Length (ft)	175								650	35		
Base Capacity (vph)	141	1227		444	2264			343	899	106	526	
Starvation Cap Reductn	0	0		0	0			0	0	0	0	
Spillback Cap Reductn	0	0		0	0			0	0	0	0	
Storage Cap Reductn	0	0		0	0			0	0	0	0	
Reduced v/c Ratio	0.07	1.12		1.18	0.58			1.20	0.45	0.10	0.23	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 90 (60%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.20  
 Intersection Signal Delay: 73.6  
 Intersection LOS: E  
 Intersection Capacity Utilization 101.1%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: US 17 Bus. (Market St.) & Montgomery Ave.



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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	1171	295	368	935	10	303	96	473	10	74	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		0	0		650	35		0
Storage Lanes	1		0	1		0	0		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3433	0	1752	3498	0	0	1776	1568	1770	1833	0
Flt Permitted	0.273			0.950				0.704		0.140		
Satd. Flow (perm)	509	3433	0	1752	3498	0	0	1299	1568	261	1833	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35				25
Link Distance (ft)		281			164			1137				915
Travel Time (s)		4.8			2.8			22.1				25.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	1629	0	409	1050	0	0	444	526	11	92	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Prot			Perm		pm+ov		Perm	
Protected Phases		2		1	6			8	1			4
Permitted Phases	2						8		8	4		
Detector Phase	2	2		1	6		8	8	1	4		4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0		7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	19.0	19.0		14.0	19.0		14.0	14.0	14.0	14.0		14.0
Total Split (s)	68.0	68.0	0.0	35.0	103.0	0.0	47.0	47.0	35.0	47.0	47.0	0.0
Total Split (%)	45.3%	45.3%	0.0%	23.3%	68.7%	0.0%	31.3%	31.3%	23.3%	31.3%	31.3%	0.0%
Maximum Green (s)	61.0	61.0		28.0	96.0		40.0	40.0	28.0	40.0		40.0
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0		5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag		Lead								Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None		None
Act Effct Green (s)	63.0	63.0		30.0	98.0			42.0	77.0	42.0		42.0
Actuated g/C Ratio	0.42	0.42		0.20	0.65			0.28	0.51	0.28		0.28
v/c Ratio	0.06	1.13		1.17	0.46			1.22	0.65	0.15		0.18
Control Delay	25.7	102.9		148.0	3.7			166.2	31.5	47.1		42.1
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0

5: US 17 Bus. (Market St.) & Montgomery Ave.  
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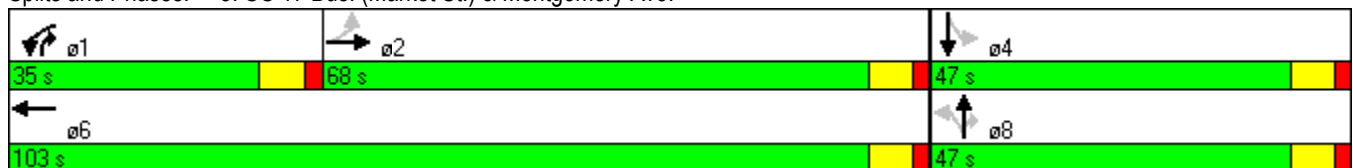


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	25.7	102.9		148.0	3.7			166.2	31.5	47.1	42.1	
LOS	C	F		F	A			F	C	D	D	
Approach Delay		102.4			44.2			93.2				42.7
Approach LOS		F			D			F				D
Queue Length 50th (ft)	7	~972		~466	113			~532	368	8	69	
Queue Length 95th (ft)	m13	#1096		#683	97			#753	503	28	117	
Internal Link Dist (ft)		201			84			1057				835
Turn Bay Length (ft)	175								650	35		
Base Capacity (vph)	214	1442		350	2285			364	805	73	513	
Starvation Cap Reductn	0	0		0	0			0	0	0	0	
Spillback Cap Reductn	0	0		0	0			0	0	0	0	
Storage Cap Reductn	0	0		0	0			0	0	0	0	
Reduced v/c Ratio	0.06	1.13		1.17	0.46			1.22	0.65	0.15	0.18	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 80 (53%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.22  
 Intersection Signal Delay: 78.4  
 Intersection LOS: E  
 Intersection Capacity Utilization 103.2%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: US 17 Bus. (Market St.) & Montgomery Ave.



5: US 17 Bus. (Market St.) & Montgomery Ave.  
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕↕		↕↕	
Volume (vph)	9	1304	1646	6	4	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	5031	0	1632	0
Flt Permitted					0.985	
Satd. Flow (perm)	0	3505	5031	0	1632	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		164	218		894	
Travel Time (s)		2.8	3.7		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1459	1836	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.3%
ICU Level of Service	A
Analysis Period (min)	15

12: US 17 Bus. (Market St.) & Evans St.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕↕		↕↕	
Volume (veh/h)	9	1304	1646	6	4	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1449	1829	7	4	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		164				
pX, platoon unblocked					0.65	
vC, conflicting volume	1836				2577	613
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1836				2346	613
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				76	98
cM capacity (veh/h)	324				18	431
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	493	966	732	732	372	13
Volume Left	10	0	0	0	0	4
Volume Right	0	0	0	0	7	9
cSH	324	1700	1700	1700	1700	51
Volume to Capacity	0.03	0.57	0.43	0.43	0.22	0.26
Queue Length 95th (ft)	2	0	0	0	0	22
Control Delay (s)	1.0	0.0	0.0	0.0	0.0	98.9
Lane LOS	A					F
Approach Delay (s)	0.3		0.0			98.9
Approach LOS						F
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			52.3%		ICU Level of Service	A
Analysis Period (min)			15			

12: US 17 Bus. (Market St.) & Evans St.  
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕↕		↕↕	
Volume (vph)	9	1645	1303	4	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	5036	0	1640	0
Flt Permitted					0.983	
Satd. Flow (perm)	0	3505	5036	0	1640	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		164	218		894	
Travel Time (s)		2.8	3.7		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1838	1452	0	17	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.8%
ICU Level of Service	B
Analysis Period (min)	15

12: US 17 Bus. (Market St.) & Evans St.  
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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕↕		↕↕	
Volume (veh/h)	9	1645	1303	4	5	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1828	1448	4	6	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		164				
pX, platoon unblocked					0.59	
vC, conflicting volume	1452				2384	485
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1452				1948	485
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				82	98
cM capacity (veh/h)	457				32	523

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	619	1219	579	579	294	17
Volume Left	10	0	0	0	0	6
Volume Right	0	0	0	0	4	11
cSH	457	1700	1700	1700	1700	85
Volume to Capacity	0.02	0.72	0.34	0.34	0.17	0.20
Queue Length 95th (ft)	2	0	0	0	0	17
Control Delay (s)	0.6	0.0	0.0	0.0	0.0	57.7
Lane LOS	A					F
Approach Delay (s)	0.2		0.0			57.7
Approach LOS						F

Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			61.8%		ICU Level of Service	B
Analysis Period (min)			15			

12: US 17 Bus. (Market St.) & Evans St.  
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	7	1301	1635	8	17	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	35			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	1752	3505	3501	0	1694	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1752	3505	3501	0	1694	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		218	274		819	
Travel Time (s)		3.7	4.7		22.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	8	1446	1826	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.5%
	ICU Level of Service B
Analysis Period (min)	15

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↑↑↗		↘↙	
Volume (veh/h)	7	1301	1635	8	17	17
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	1446	1817	9	19	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		382				
pX, platoon unblocked					0.66	
vC, conflicting volume	1826				2559	913
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1826				2327	913
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				5	93
cM capacity (veh/h)	327				20	276

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	8	723	723	1211	614	38
Volume Left	8	0	0	0	0	19
Volume Right	0	0	0	0	9	19
cSH	327	1700	1700	1700	1700	37
Volume to Capacity	0.02	0.43	0.43	0.71	0.36	1.02
Queue Length 95th (ft)	2	0	0	0	0	95
Control Delay (s)	16.3	0.0	0.0	0.0	0.0	316.2
Lane LOS	C					F
Approach Delay (s)	0.1			0.0		316.2
Approach LOS						F

Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			55.5%	ICU Level of Service		B
Analysis Period (min)			15			

13: US 17 Bus. (Market St.) & Clay St.  
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	18	1632	1300	15	7	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	35			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	1752	3505	3498	0	1694	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1752	3505	3498	0	1694	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		218	274		819	
Travel Time (s)		3.7	4.7		22.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	20	1813	1461	0	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.1%
ICU Level of Service	B
Analysis Period (min)	15

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↗		↘↘	
Volume (veh/h)	18	1632	1300	15	7	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	20	1813	1444	17	8	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		382				
pX, platoon unblocked					0.59	
vC, conflicting volume	1461				2399	731
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1461				1985	731
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				74	98
cM capacity (veh/h)	453				30	364

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	20	907	907	963	498	16
Volume Left	20	0	0	0	0	8
Volume Right	0	0	0	0	17	8
cSH	453	1700	1700	1700	1700	56
Volume to Capacity	0.04	0.53	0.53	0.57	0.29	0.28
Queue Length 95th (ft)	3	0	0	0	0	24
Control Delay (s)	13.3	0.0	0.0	0.0	0.0	92.9
Lane LOS	B					F
Approach Delay (s)	0.1			0.0		92.9
Approach LOS						F

Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			55.1%		ICU Level of Service	B
Analysis Period (min)			15			

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	1259	55	146	1550	4	81	11	174	10	22	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	500		0	150		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3484	0	1752	3505	0	0	1785	1583	0	1757	0
Flt Permitted	0.950			0.950				0.958			0.989	
Satd. Flow (perm)	1752	3484	0	1752	3505	0	0	1785	1583	0	1757	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		274			1024			913			767	
Travel Time (s)		4.7			17.5			24.9			20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	1460	0	162	1726	0	0	102	193	0	48	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			24			24	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	68.0%
ICU Level of Service	C
Analysis Period (min)	15

14: US 17 Bus. (Market St.) & Henry St.  
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	1259	55	146	1550	4	81	11	174	10	22	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	4	1399	61	162	1722	4	90	12	193	11	24	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		656										
pX, platoon unblocked				0.66			0.66	0.66	0.66	0.66	0.66	0.66
vC, conflicting volume	1727			1460			2649	3489	730	2957	3518	863
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1727			682			2472	3737	0	2935	3779	863
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			73			0	0	73	0	0	95
cM capacity (veh/h)	357			598			0	2	720	0	2	296

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	4	933	527	162	1148	579	102	193	49
Volume Left	4	0	0	162	0	0	90	0	11
Volume Right	0	0	61	0	0	4	0	193	13
cSH	357	1700	1700	598	1700	1700	0	720	0
Volume to Capacity	0.01	0.55	0.31	0.27	0.68	0.34	Err	0.27	Err
Queue Length 95th (ft)	1	0	0	27	0	0	Err	27	Err
Control Delay (s)	15.2	0.0	0.0	13.2	0.0	0.0	Err	11.8	Err
Lane LOS	C			B			F	B	F
Approach Delay (s)	0.0			1.1			Err		Err
Approach LOS							F		F

Intersection Summary		
Average Delay		Err
Intersection Capacity Utilization	68.0%	ICU Level of Service
Analysis Period (min)	15	C

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	1546	81	173	1256	10	55	22	146	4	11	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	500		0	150		0	0		0
Storage Lanes	1		0	1		0	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3480	0	1752	3501	0	0	1798	1583	0	1777	0
Flt Permitted	0.950			0.950				0.965			0.990	
Satd. Flow (perm)	1752	3480	0	1752	3501	0	0	1798	1583	0	1777	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		274			1024			913			767	
Travel Time (s)		4.7			17.5			24.9			20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	1808	0	192	1407	0	0	85	162	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			24			24	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	75.8%
ICU Level of Service	D
Analysis Period (min)	15

14: US 17 Bus. (Market St.) & Henry St.  
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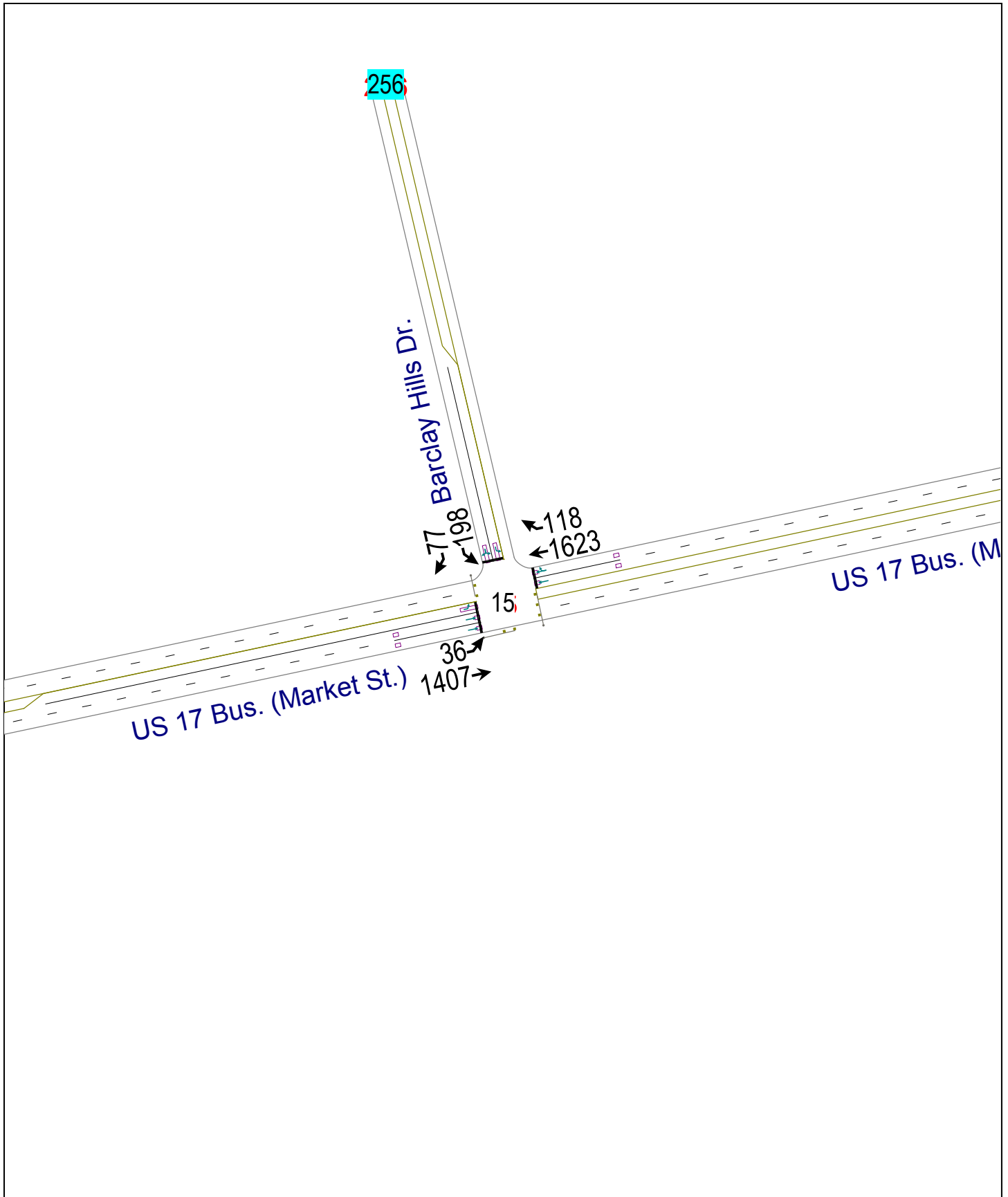


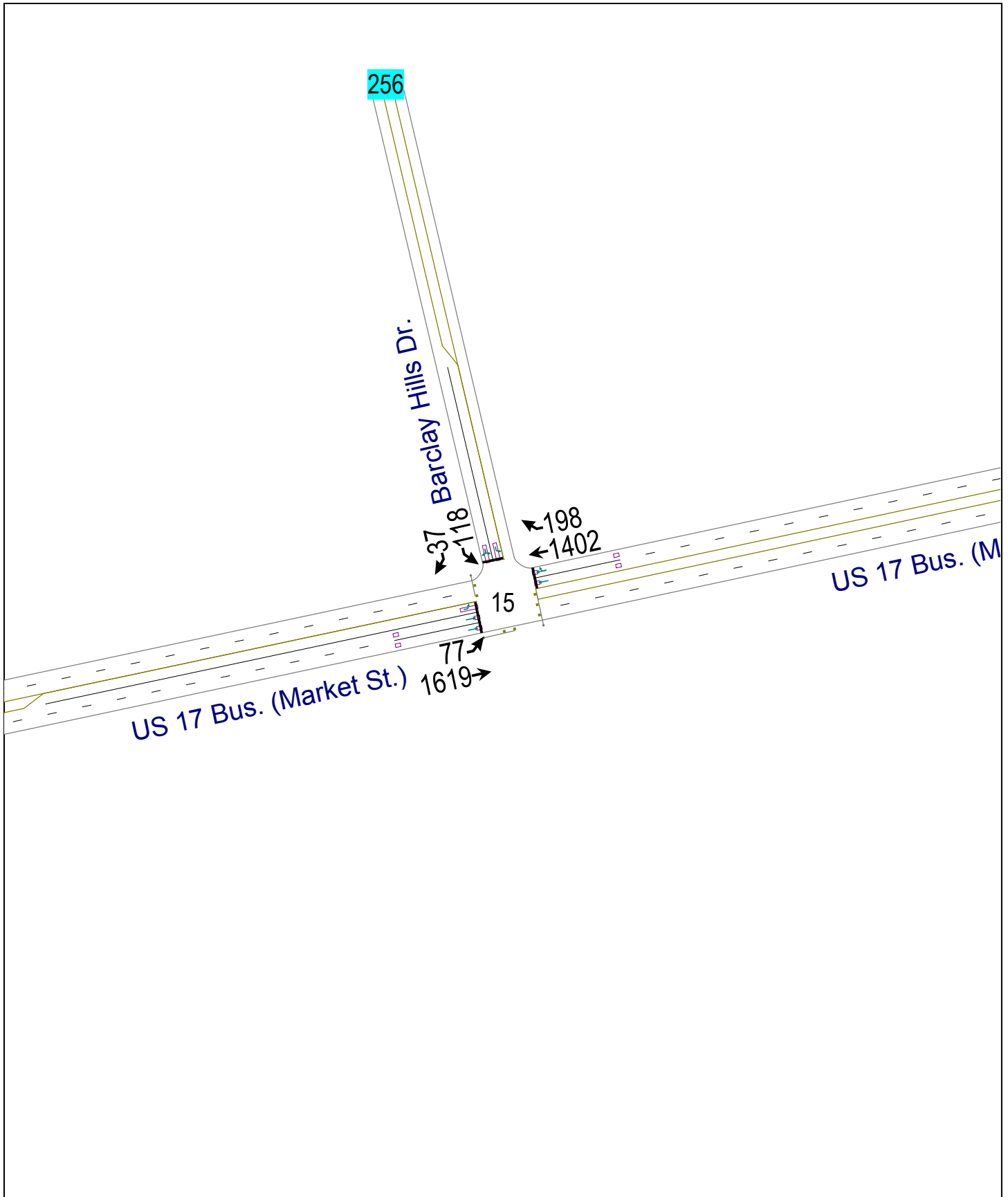
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	1546	81	173	1256	10	55	22	146	4	11	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	1718	90	192	1396	11	61	24	162	4	12	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		656										
pX, platoon unblocked				0.60			0.60	0.60	0.60	0.60	0.60	0.60
vC, conflicting volume	1407			1808			2882	3581	904	2846	3620	703
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1407			1009			2803	3970	0	2742	4035	703
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			53			0	0	75	0	0	99
cM capacity (veh/h)	476			405			0	1	649	0	1	378

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	13	1145	663	192	930	476	86	162	21
Volume Left	13	0	0	192	0	0	61	0	4
Volume Right	0	0	90	0	0	11	0	162	4
cSH	476	1700	1700	405	1700	1700	0	649	0
Volume to Capacity	0.03	0.67	0.39	0.47	0.55	0.28	Err	0.25	Err
Queue Length 95th (ft)	2	0	0	62	0	0	Err	25	Err
Control Delay (s)	12.8	0.0	0.0	21.7	0.0	0.0	Err	12.4	Err
Lane LOS	B			C			F	B	F
Approach Delay (s)	0.1			2.6			Err		Err
Approach LOS							F		F

Intersection Summary		
Average Delay		Err
Intersection Capacity Utilization	75.8%	ICU Level of Service
Analysis Period (min)	15	D

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	36	1407	1623	118	198	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500			0	225	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	1752	3505	3470	0	3341	0
Flt Permitted	0.950				0.965	
Satd. Flow (perm)	1752	3505	3470	0	3341	0
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (mph)		40	40		35	
Link Distance (ft)		923	771		600	
Travel Time (s)		15.7	13.1		11.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	1563	1934	0	306	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Turn Type	Prot					
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	7.0	12.0	12.0		7.0	
Minimum Split (s)	14.0	19.0	19.0		14.0	
Total Split (s)	14.0	124.0	110.0	0.0	26.0	0.0
Total Split (%)	9.3%	82.7%	73.3%	0.0%	17.3%	0.0%
Maximum Green (s)	7.0	117.0	103.0		19.0	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	2.0	5.0	2.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Act Effct Green (s)	9.1	120.4	109.1		19.6	
Actuated g/C Ratio	0.06	0.80	0.73		0.13	
v/c Ratio	0.38	0.56	0.77		0.70	
Control Delay	96.1	2.0	5.4		71.5	
Queue Delay	0.0	0.0	0.0		0.0	

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Delay	96.1	2.0	5.4		71.5	
LOS	F	A	A		E	
Approach Delay		4.4	5.4		71.5	
Approach LOS		A	A		E	
Queue Length 50th (ft)	39	66	102		148	
Queue Length 95th (ft)	m53	m64	78		201	
Internal Link Dist (ft)		843	691		520	
Turn Bay Length (ft)	500				225	
Base Capacity (vph)	106	2814	2524		468	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.38	0.56	0.77		0.65	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 144 (96%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 10.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 65.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: US 17 Bus. (Market St.) & Barclay Hills Dr.





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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖		↘	↘
Volume (vph)	77	1619	1402	198	118	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500			0	225	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	1752	3505	3438	0	3355	0
Flt Permitted	0.950				0.963	
Satd. Flow (perm)	1752	3505	3438	0	3355	0
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (mph)		40	40		35	
Link Distance (ft)		923	771		600	
Travel Time (s)		15.7	13.1		11.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	1799	1778	0	172	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		24	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Turn Type	Prot					
Protected Phases	5	2	6		4	
Permitted Phases						
Detector Phase	5	2	6		4	
Switch Phase						
Minimum Initial (s)	7.0	12.0	12.0		7.0	
Minimum Split (s)	14.0	19.0	19.0		14.0	
Total Split (s)	22.0	131.0	109.0	0.0	19.0	0.0
Total Split (%)	14.7%	87.3%	72.7%	0.0%	12.7%	0.0%
Maximum Green (s)	15.0	124.0	102.0		12.0	
Yellow Time (s)	5.0	5.0	5.0		5.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	2.0	5.0	2.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	C-Max	C-Max		None	
Act Effct Green (s)	14.2	126.6	107.4		13.4	
Actuated g/C Ratio	0.09	0.84	0.72		0.09	
v/c Ratio	0.52	0.61	0.72		0.58	
Control Delay	84.5	1.2	6.6		73.5	
Queue Delay	0.0	0.0	0.0		0.0	

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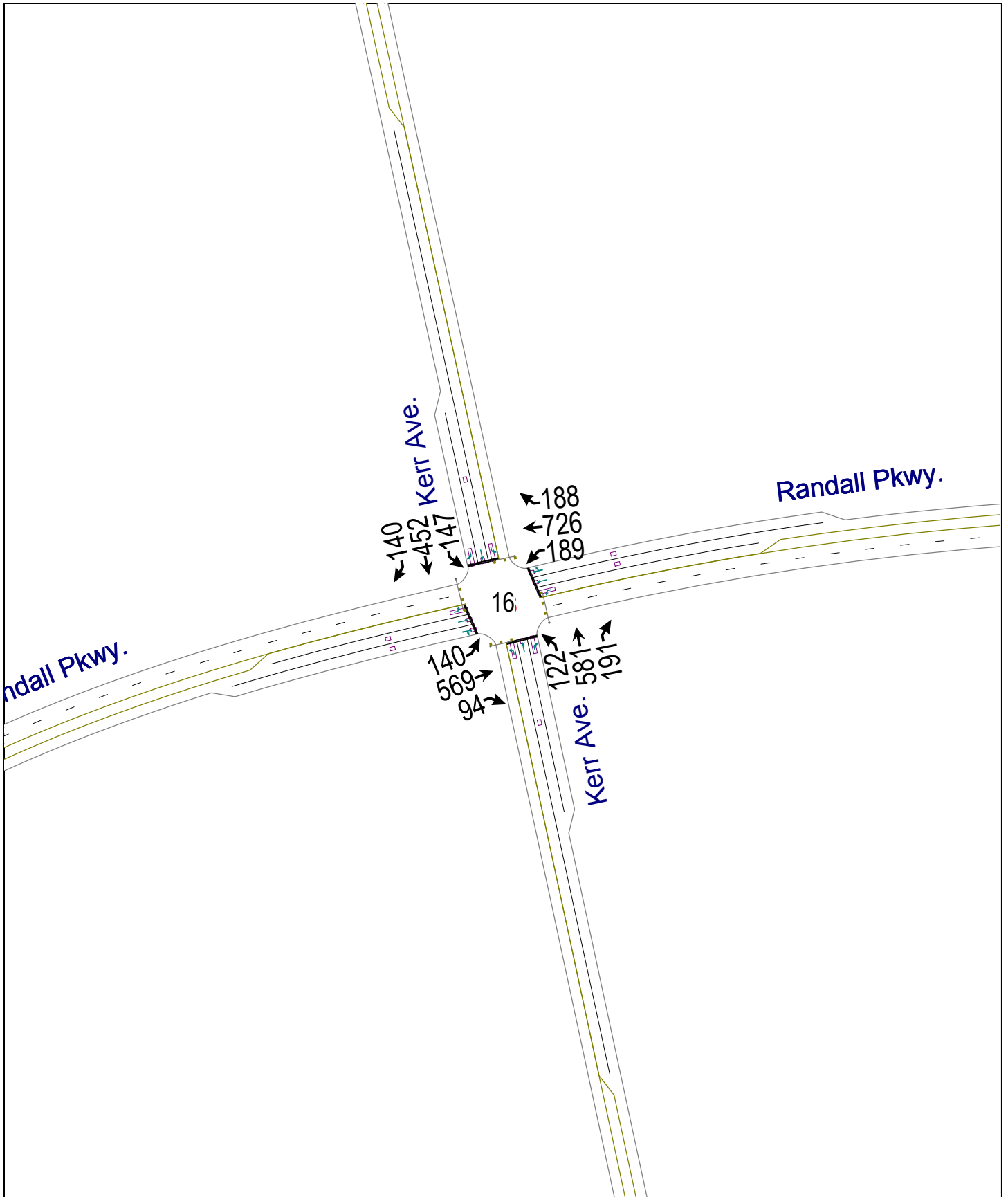
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Delay	84.5	1.2	6.6		73.5	
LOS	F	A	A		E	
Approach Delay		5.0	6.6		73.5	
Approach LOS		A	A		E	
Queue Length 50th (ft)	79	52	182		84	
Queue Length 95th (ft)	m88	m51	m126		125	
Internal Link Dist (ft)		843	691		520	
Turn Bay Length (ft)	500				225	
Base Capacity (vph)	199	2959	2463		313	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.43	0.61	0.72		0.55	

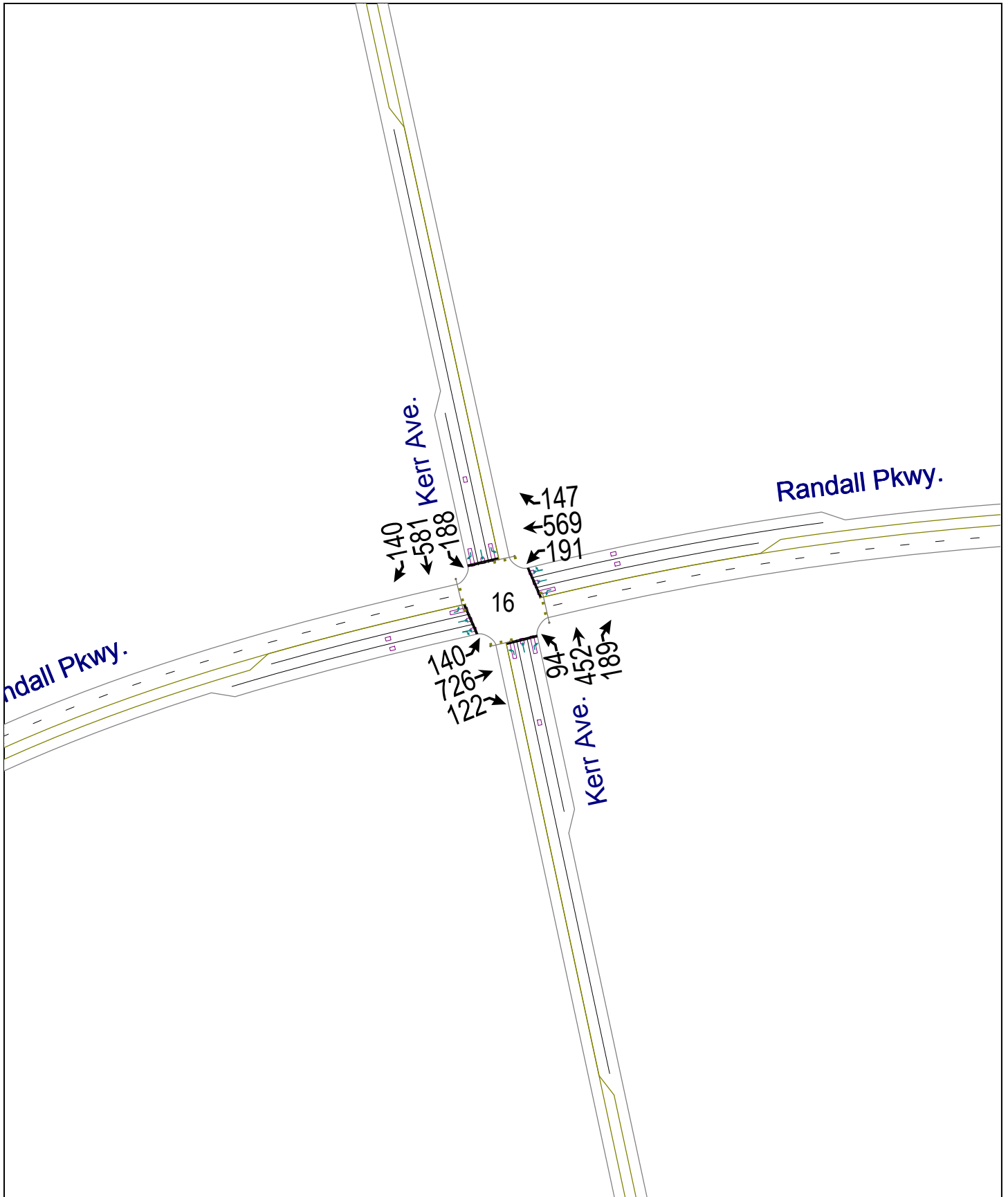
**Intersection Summary**

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 142 (95%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 8.8  
 Intersection LOS: A  
 Intersection Capacity Utilization 69.2%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: US 17 Bus. (Market St.) & Barclay Hills Dr.







U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	569	94	189	726	188	122	581	191	147	452	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)			275	250		325	500		200	500		175
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3431	0	1752	3396	0	1736	1827	1553	1736	1827	1553
Flt Permitted	0.950			0.950			0.450			0.950		
Satd. Flow (perm)	1752	3431	0	1752	3396	0	822	1827	1553	1736	1827	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45				35
Link Distance (ft)		976			976			1067				1046
Travel Time (s)		19.0			19.0			16.2				20.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	736	0	210	1016	0	136	646	212	163	502	156
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot			Perm		pm+ov	Prot		pm+ov
Protected Phases	3	8		7	4			6	7	5	2	3
Permitted Phases							6		6			2
Detector Phase	3	8		7	4		6	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		12.0	12.0	7.0	7.0	10.0	7.0
Minimum Split (s)	14.0	17.0		14.0	17.0		19.0	19.0	14.0	14.0	17.0	14.0
Total Split (s)	16.0	36.0	0.0	20.0	40.0	0.0	48.0	48.0	20.0	16.0	64.0	16.0
Total Split (%)	13.3%	30.0%	0.0%	16.7%	33.3%	0.0%	40.0%	40.0%	16.7%	13.3%	53.3%	13.3%
Maximum Green (s)	9.0	29.0		13.0	33.0		41.0	41.0	13.0	9.0	57.0	9.0
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		Max	Max	None	None	Max	None
Act Effct Green (s)	11.0	30.3		15.7	35.0		43.0	43.0	58.7	11.0	59.0	75.0
Actuated g/C Ratio	0.09	0.25		0.13	0.29		0.36	0.36	0.49	0.09	0.49	0.62
v/c Ratio	0.97	0.85		0.91	1.03		0.46	0.99	0.28	1.03	0.56	0.16
Control Delay	118.0	53.2		93.1	77.2		35.9	70.7	11.2	131.8	24.4	9.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

16: Randall Pkwy. & Kerr Ave.  
2012 Base Year AM Peak

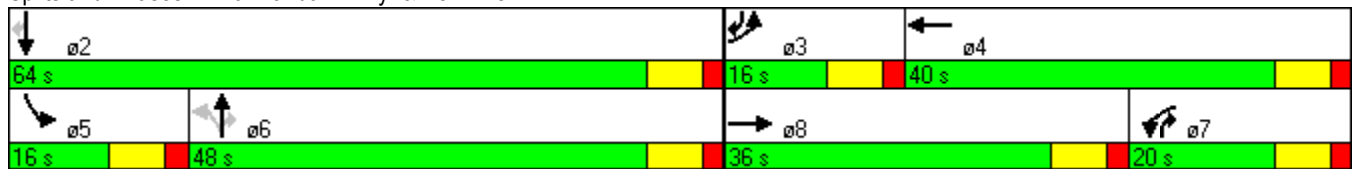


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	118.0	53.2		93.1	77.2		35.9	70.7	11.2	131.8	24.4	9.9
LOS	F	D		F	E		D	E	B	F	C	A
Approach Delay		64.5			80.0			53.3			43.0	
Approach LOS		E			E			D			D	
Queue Length 50th (ft)	122	284		164	~441		80	493	60	~135	265	47
Queue Length 95th (ft)	#261	360		#318	#574		146	#743	94	#275	371	78
Internal Link Dist (ft)		896			896			987			966	
Turn Bay Length (ft)	225			250			500		200	500		175
Base Capacity (vph)	161	886		230	991		295	655	760	159	898	971
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.83		0.91	1.03		0.46	0.99	0.28	1.03	0.56	0.16

**Intersection Summary**























Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 62.0  
 Intersection LOS: E  
 Intersection Capacity Utilization 89.2%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 16: Randall Pkwy. & Kerr Ave.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	726	122	191	569	147	94	452	189	188	581	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	225		275	250		325	500		200	500		175
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3428	0	1752	3396	0	1736	1827	1553	1736	1827	1553
Flt Permitted	0.950			0.950			0.293			0.950		
Satd. Flow (perm)	1752	3428	0	1752	3396	0	535	1827	1553	1736	1827	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			35	
Link Distance (ft)		976			976			1067			1046	
Travel Time (s)		19.0			19.0			16.2			20.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	943	0	212	795	0	104	502	210	209	646	156
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot			Perm		pm+ov	Prot		pm+ov
Protected Phases	3	8		7	4			6	7	5	2	3
Permitted Phases							6		6			2
Detector Phase	3	8		7	4		6	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		12.0	12.0	7.0	7.0	10.0	7.0
Minimum Split (s)	14.0	17.0		14.0	17.0		19.0	19.0	14.0	14.0	17.0	14.0
Total Split (s)	19.0	39.0	0.0	20.0	40.0	0.0	41.0	41.0	20.0	20.0	61.0	19.0
Total Split (%)	15.8%	32.5%	0.0%	16.7%	33.3%	0.0%	34.2%	34.2%	16.7%	16.7%	50.8%	15.8%
Maximum Green (s)	12.0	32.0		13.0	33.0		34.0	34.0	13.0	13.0	54.0	12.0
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		Max	Max	None	None	Max	None
Act Effct Green (s)	13.7	34.0		15.0	35.3		36.0	36.0	51.0	15.0	56.0	74.7
Actuated g/C Ratio	0.11	0.28		0.12	0.29		0.30	0.30	0.42	0.12	0.47	0.62
v/c Ratio	0.78	0.97		0.97	0.80		0.65	0.92	0.32	0.96	0.76	0.16
Control Delay	77.5	65.5		105.8	46.2		57.2	63.7	13.8	105.0	33.4	9.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

16: Randall Pkwy. & Kerr Ave.  
2012 Base Year PM Peak

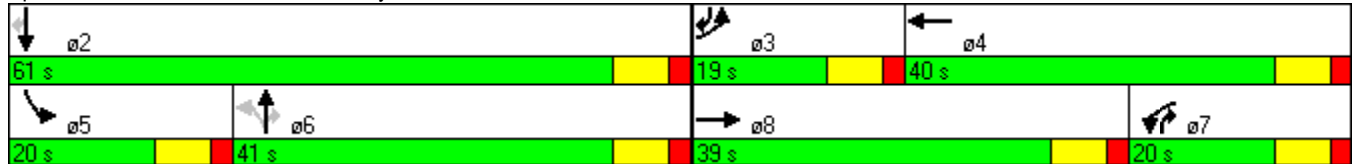


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	77.5	65.5		105.8	46.2		57.2	63.7	13.8	105.0	33.4	9.9
LOS	E	E		F	D		E	E	B	F	C	A
Approach Delay		67.2			58.7			50.0			44.6	
Approach LOS		E			E			D			D	
Queue Length 50th (ft)	119	380		166	299		70	375	64	163	403	47
Queue Length 95th (ft)	#225	#519		#322	377		#154	#580	101	#317	558	78
Internal Link Dist (ft)		896			896			987			966	
Turn Bay Length (ft)	225			250			500		200	500		175
Base Capacity (vph)	204	971		219	998		161	548	660	217	853	971
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.97		0.97	0.80		0.65	0.92	0.32	0.96	0.76	0.16

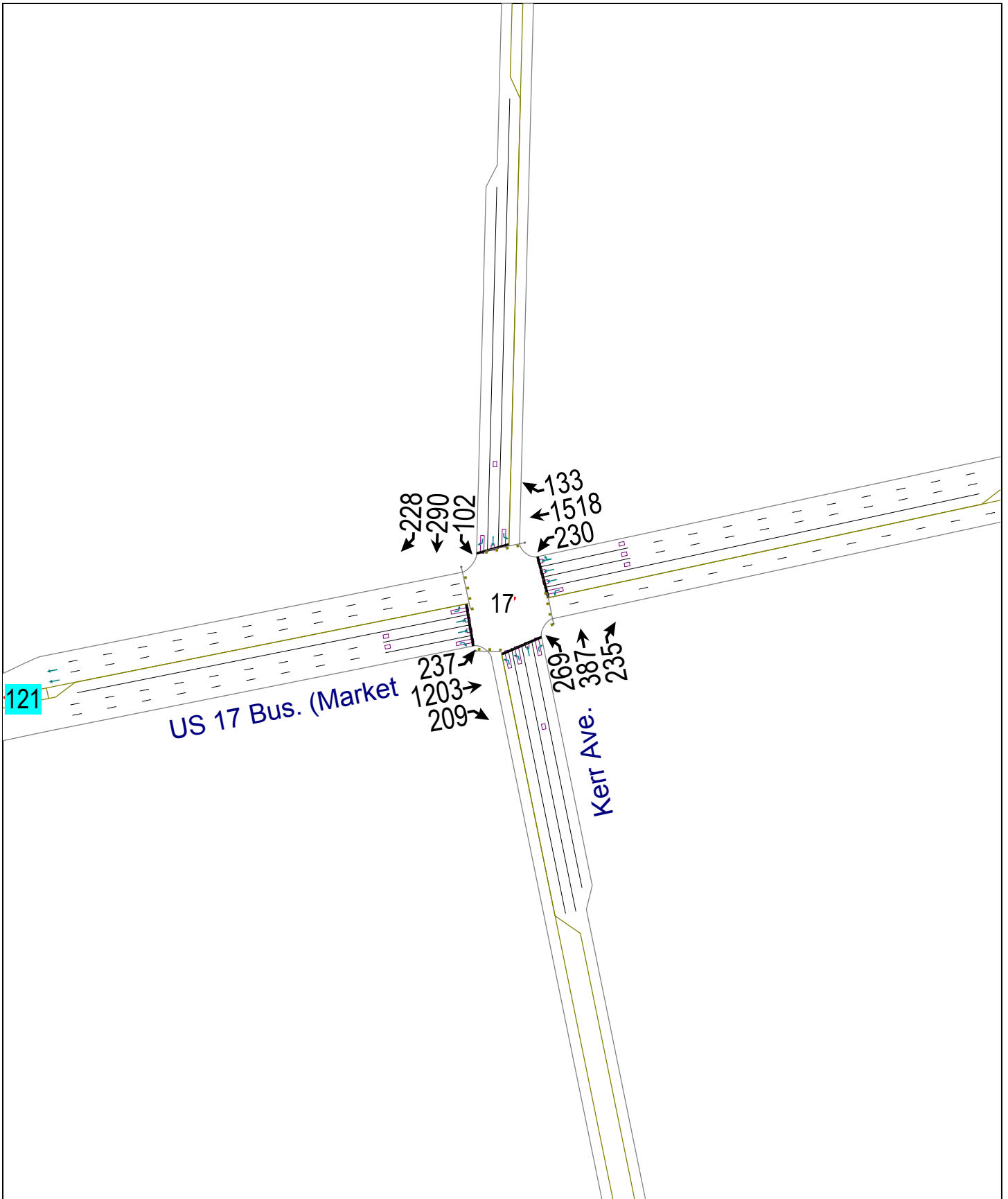
**Intersection Summary**

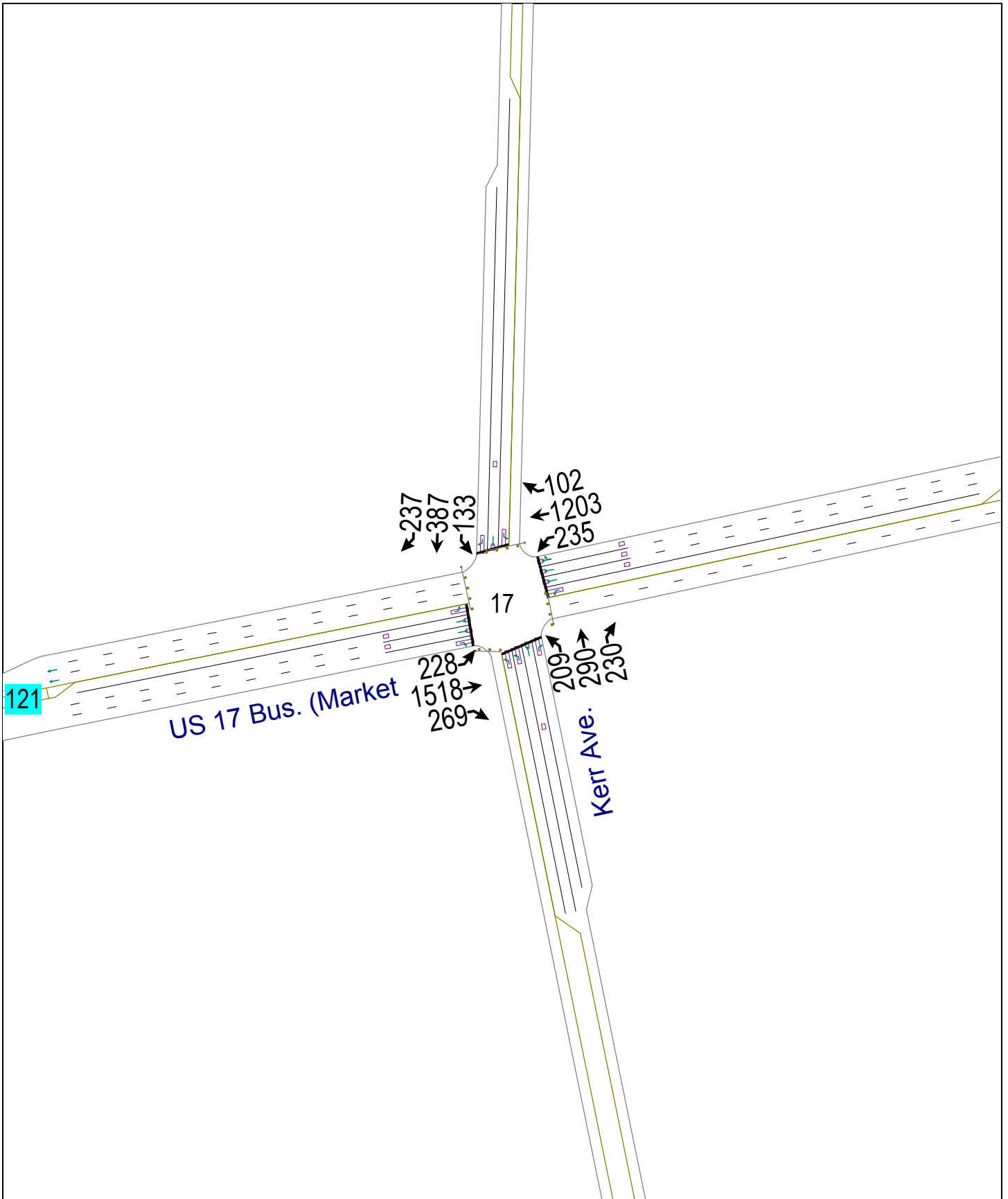
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Natural Cycle:	90
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.97
Intersection Signal Delay:	55.7
Intersection LOS:	E
Intersection Capacity Utilization:	91.8%
ICU Level of Service:	F
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 16: Randall Pkwy. & Kerr Ave.





































U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/12/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			  		 				 	
Volume (vph)	237	1203	209	230	1518	133	269	387	235	102	290	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	450		0	500		0	300		275	500		400
Storage Lanes	1		1	1		0	2		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3505	1568	1752	4975	0	3367	1827	1553	1736	1827	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	3505	1568	1752	4975	0	3367	1827	1553	1736	1827	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35			45	
Link Distance (ft)		551			982			915			1044	
Travel Time (s)		9.4			16.7			17.8			15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	263	1337	232	256	1835	0	299	430	261	113	322	253
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot			Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8	1	7	4	5
Permitted Phases			2						8			4
Detector Phase	5	2	3	1	6		3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0		7.0	10.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0		14.0	17.0	14.0	14.0	19.0	14.0
Total Split (s)	28.0	66.0	20.0	28.0	66.0	0.0	20.0	41.0	28.0	15.0	36.0	28.0
Total Split (%)	18.7%	44.0%	13.3%	18.7%	44.0%	0.0%	13.3%	27.3%	18.7%	10.0%	24.0%	18.7%
Maximum Green (s)	21.0	59.0	13.0	21.0	59.0		13.0	34.0	21.0	8.0	29.0	21.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	None	C-Max		None	None	None	None	None	None
Act Effct Green (s)	23.0	61.0	77.1	23.0	61.0		16.1	36.0	59.0	10.0	29.9	57.9
Actuated g/C Ratio	0.15	0.41	0.51	0.15	0.41		0.11	0.24	0.39	0.07	0.20	0.39
v/c Ratio	0.98	0.94	0.29	0.95	0.91		0.83	0.98	0.43	0.97	0.88	0.42
Control Delay	91.8	37.7	7.6	105.9	49.4		84.8	94.7	24.3	144.8	83.3	36.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

17: US 17 Bus. (Market St.) & Kerr Ave.  
2012 Base Year AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 9/12/2012

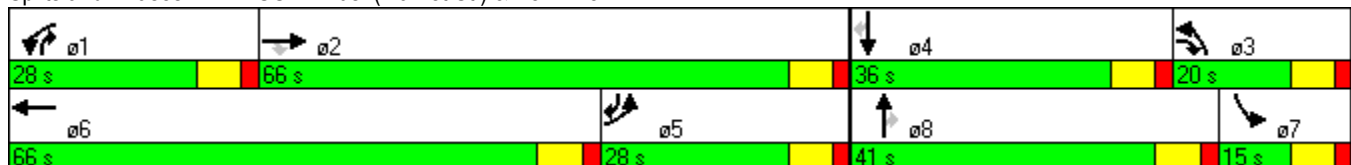


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	91.8	37.7	7.6	105.9	49.4		84.8	94.7	24.3	144.8	83.3	36.1
LOS	F	D	A	F	D		F	F	C	F	F	D
Approach Delay		41.7			56.4			73.2			76.1	
Approach LOS		D			E			E			E	
Queue Length 50th (ft)	249	536	44	252	613		151	422	142	113	307	178
Queue Length 95th (ft)	#443	#793	63	#431	683		#236	#645	206	#246	#469	260
Internal Link Dist (ft)		471			902			835			964	
Turn Bay Length (ft)	450			500			300		275	500		400
Base Capacity (vph)	269	1425	805	269	2023		361	438	611	116	378	600
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.94	0.29	0.95	0.91		0.83	0.98	0.43	0.97	0.85	0.42

**Intersection Summary**

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 8 (5%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 56.9  
 Intersection LOS: E  
 Intersection Capacity Utilization 88.9%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 17: US 17 Bus. (Market St.) & Kerr Ave.



17: US 17 Bus. (Market St.) & Kerr Ave.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	228	1518	269	235	1203	102	209	290	230	133	387	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	450		0	500		0	300		275	500		400
Storage Lanes	1		1	1		0	2		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3505	1568	1752	4975	0	3367	1827	1553	1736	1827	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	3505	1568	1752	4975	0	3367	1827	1553	1736	1827	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35			45	
Link Distance (ft)		551			982			915			1044	
Travel Time (s)		9.4			16.7			17.8			15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	253	1687	299	261	1450	0	232	322	256	148	430	263
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot			Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8	1	7	4	5
Permitted Phases			2						8			4
Detector Phase	5	2	3	1	6		3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0		7.0	10.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0		14.0	17.0	14.0	14.0	19.0	14.0
Total Split (s)	37.0	74.0	15.0	25.0	62.0	0.0	15.0	33.0	25.0	18.0	36.0	37.0
Total Split (%)	24.7%	49.3%	10.0%	16.7%	41.3%	0.0%	10.0%	22.0%	16.7%	12.0%	24.0%	24.7%
Maximum Green (s)	30.0	67.0	8.0	18.0	55.0		8.0	26.0	18.0	11.0	29.0	30.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	None	C-Max		None	None	None	None	None	None
Act Effct Green (s)	32.0	69.0	79.0	20.0	57.0		10.0	28.0	48.0	13.0	31.0	68.0
Actuated g/C Ratio	0.21	0.46	0.53	0.13	0.38		0.07	0.19	0.32	0.09	0.21	0.45
v/c Ratio	0.68	1.05	0.36	1.12	0.77		1.04	0.94	0.52	0.99	1.14	0.37
Control Delay	49.3	61.1	7.4	150.4	44.0		135.7	96.1	31.2	136.8	141.2	29.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

17: US 17 Bus. (Market St.) & Kerr Ave.  
2012 Base Year PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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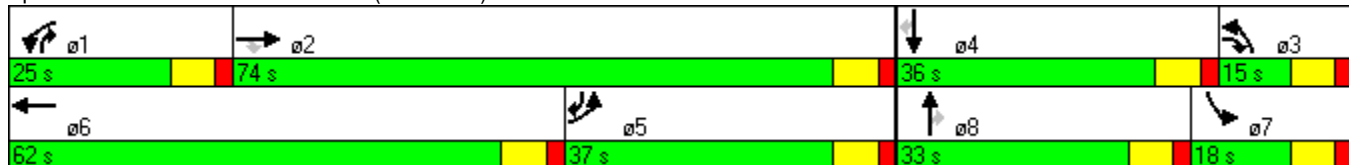


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	49.3	61.1	7.4	150.4	44.0		135.7	96.1	31.2	136.8	141.2	29.0
LOS	D	E	A	F	D		F	F	C	F	F	C
Approach Delay		52.6			60.3			86.9			105.3	
Approach LOS		D			E			F			F	
Queue Length 50th (ft)	211	~930	65	~293	453		~125	315	155	147	~489	167
Queue Length 95th (ft)	316	#1070	74	#477	512		#217	#506	227	#296	#706	243
Internal Link Dist (ft)		471			902			835			964	
Turn Bay Length (ft)	450			500			300		275	500		400
Base Capacity (vph)	374	1612	826	234	1891		224	341	497	150	378	704
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.05	0.36	1.12	0.77		1.04	0.94	0.52	0.99	1.14	0.37

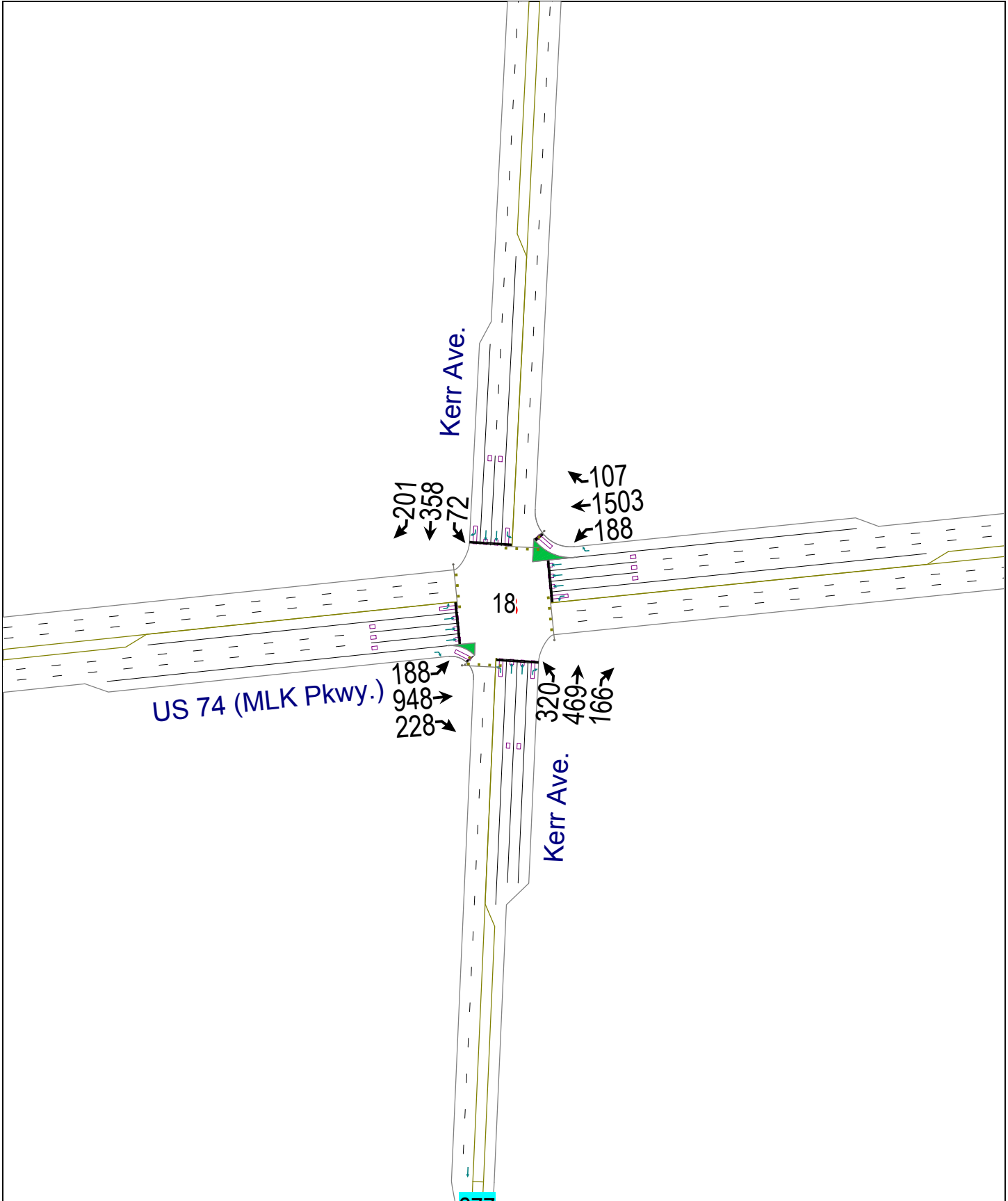
**Intersection Summary**

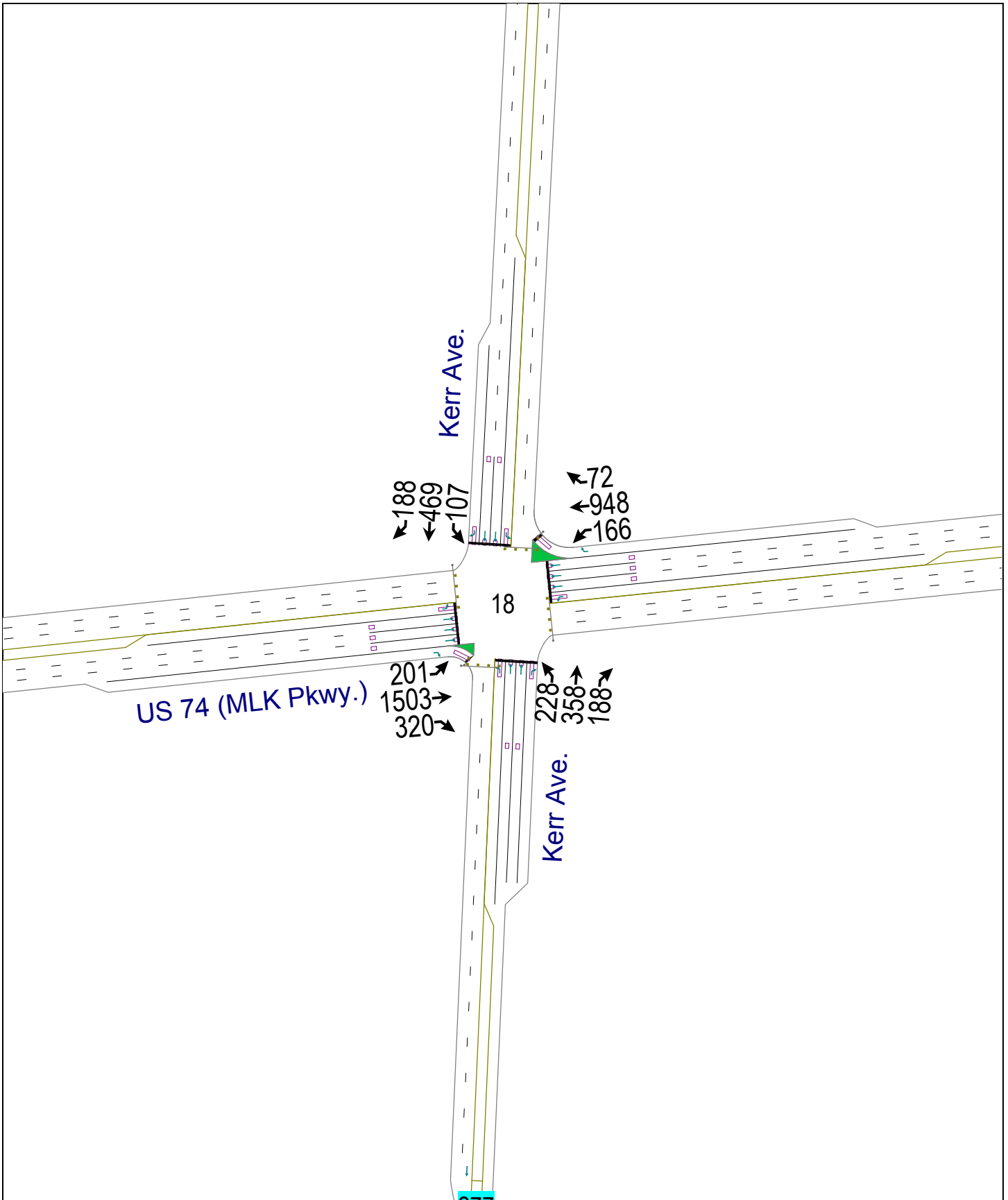
Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.14  
 Intersection Signal Delay: 67.8      Intersection LOS: E  
 Intersection Capacity Utilization 98.0%      ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 17: US 17 Bus. (Market St.) & Kerr Ave.



17: US 17 Bus. (Market St.) & Kerr Ave.  
 2012 Base Year PM Peak





































U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Volume (vph)	188	948	228	188	1503	107	320	469	166	72	358	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		400	425		350	275		250	325		225
Storage Lanes	1		1	1		1	1		2	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1719	4940	1538	1719	4940	1538	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1719	4940	1538	1719	4940	1538	1736	3471	1553	1736	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		1140			1309			680			1100	
Travel Time (s)		14.1			16.2			10.3			16.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	209	1053	253	209	1670	119	356	521	184	80	398	223
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6			8			4
Detector Phase	5	2	3	1	6	7	3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	21.0	40.0	31.0	29.0	48.0	17.0	31.0	34.0	29.0	17.0	20.0	21.0
Total Split (%)	17.5%	33.3%	25.8%	24.2%	40.0%	14.2%	25.8%	28.3%	24.2%	14.2%	16.7%	17.5%
Maximum Green (s)	14.0	33.0	24.0	22.0	41.0	10.0	24.0	27.0	22.0	10.0	13.0	14.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	16.0	35.0	66.0	24.0	43.0	59.2	26.0	29.8	53.8	11.2	15.0	31.0
Actuated g/C Ratio	0.13	0.29	0.55	0.20	0.36	0.49	0.22	0.25	0.45	0.09	0.12	0.26
v/c Ratio	0.91	0.73	0.30	0.61	0.94	0.16	0.95	0.60	0.26	0.49	0.92	0.56
Control Delay	92.4	41.8	15.8	28.0	23.5	9.4	81.6	43.6	12.9	62.2	78.9	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

18: US 74 (MLK Pkwy.) & Kerr Ave.  
2012 Base Year AM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	92.4	41.8	15.8	28.0	23.5	9.4	81.6	43.6	12.9	62.2	78.9	25.8
LOS	F	D	B	C	C	A	F	D	B	E	E	C
Approach Delay	44.4			23.1			51.1			60.1		
Approach LOS	D			C			D			E		
Queue Length 50th (ft)	162	269	101	87	247	32	274	190	57	59	162	85
Queue Length 95th (ft)	#307	322	154	m92	m241	m37	#459	250	90	112	#257	133
Internal Link Dist (ft)	1060			1229			600			1020		
Turn Bay Length (ft)	350		400	425		350	275		250	325		225
Base Capacity (vph)	229	1441	846	344	1770	769	376	862	696	174	434	401
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.73	0.30	0.61	0.94	0.15	0.95	0.60	0.26	0.46	0.92	0.56

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 20 (17%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 39.8      Intersection LOS: D  
 Intersection Capacity Utilization 83.9%      ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.



































Splits and Phases: 18: US 74 (MLK Pkwy.) & Kerr Ave.



18: US 74 (MLK Pkwy.) & Kerr Ave.  
 2012 Base Year AM Peak

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  		  		  
Volume (vph)	201	1503	320	166	948	72	228	358	188	107	469	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		400	425		350	275		250	325		225
Storage Lanes	1		1	1		1	1		2	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1719	4940	1538	1719	4940	1538	1736	3471	1553	1736	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1719	4940	1538	1719	4940	1538	1736	3471	1553	1736	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		1140			1309			680			1100	
Travel Time (s)		14.1			16.2			10.3			16.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	223	1670	356	184	1053	80	253	398	209	119	521	209
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	5
Permitted Phases			2			6			8			4
Detector Phase	5	2	3	1	6	7	3	8	1	7	4	5
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	30.0	49.0	26.0	20.0	39.0	20.0	26.0	31.0	20.0	20.0	25.0	30.0
Total Split (%)	25.0%	40.8%	21.7%	16.7%	32.5%	16.7%	21.7%	25.8%	16.7%	16.7%	20.8%	25.0%
Maximum Green (s)	23.0	42.0	19.0	13.0	32.0	13.0	19.0	24.0	13.0	13.0	18.0	23.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	None	None	C-Max	None	None	None	None	None	None	None
Act Effct Green (s)	21.6	44.5	70.0	15.0	37.9	56.7	20.5	26.7	41.7	13.7	20.0	41.6
Actuated g/C Ratio	0.18	0.37	0.58	0.12	0.32	0.47	0.17	0.22	0.35	0.11	0.17	0.35
v/c Ratio	0.72	0.91	0.40	0.86	0.67	0.11	0.85	0.51	0.39	0.60	0.90	0.39
Control Delay	59.6	44.6	15.2	60.4	20.7	8.3	74.4	43.9	19.4	63.2	68.9	17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

18: US 74 (MLK Pkwy.) & Kerr Ave.  
2012 Base Year PM Peak



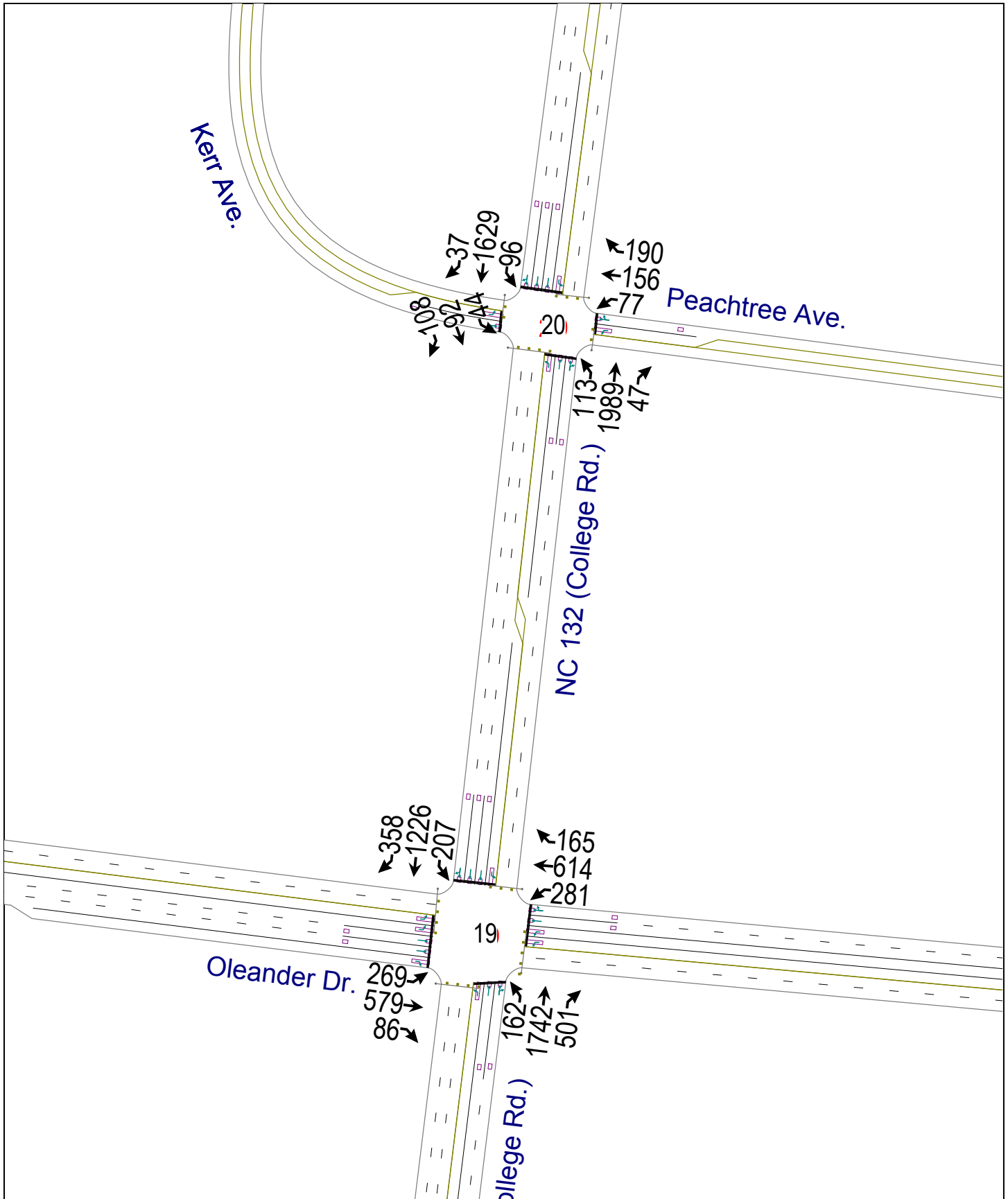
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	59.6	44.6	15.2	60.4	20.7	8.3	74.4	43.9	19.4	63.2	68.9	17.4
LOS	E	D	B	E	C	A	E	D	B	E	E	B
Approach Delay	41.4			25.5			46.9			55.4		
Approach LOS	D			C			D			E		
Queue Length 50th (ft)	163	449	142	140	201	23	191	144	80	88	210	68
Queue Length 95th (ft)	245	#530	209	m#215	m332	m33	#329	196	127	151	#309	100
Internal Link Dist (ft)	1060			1229			600			1020		
Turn Bay Length (ft)	350		400	425		350	275		250	325		225
Base Capacity (vph)	358	1833	891	215	1562	743	304	773	540	217	579	582
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.91	0.40	0.86	0.67	0.11	0.83	0.51	0.39	0.55	0.90	0.36

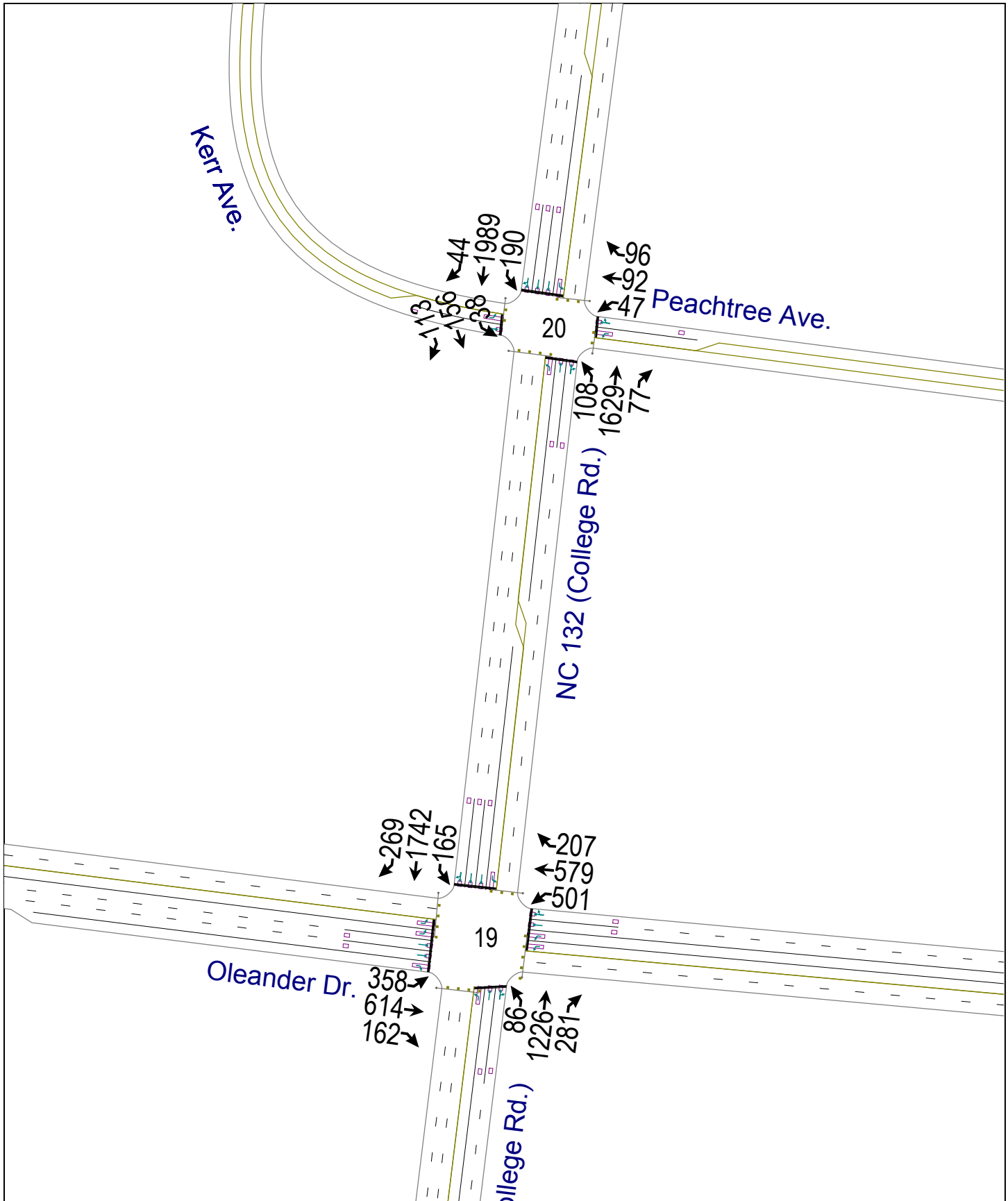
**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 10 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 40.6  
 Intersection LOS: D  
 Intersection Capacity Utilization 80.5%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: US 74 (MLK Pkwy.) & Kerr Ave.







U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	269	579	86	281	614	165	162	1742	501	207	1226	358
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)			450	775		0	500		0	275		0
Storage Lanes	1		1	2		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3367	3471	1553	3367	3360	0	1719	3321	0	1719	4772	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3360	0	1719	3321	0	1719	4772	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			45			45			45	
Link Distance (ft)		967			928			1037			690	
Travel Time (s)		16.5			14.1			15.7			10.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	299	643	96	312	865	0	180	2493	0	230	1760	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot			Prot			Prot		
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									
Detector Phase	3	8	1	7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0		14.0	19.0		14.0	19.0	
Total Split (s)	16.0	32.0	26.0	19.0	35.0	0.0	26.0	88.0	0.0	21.0	83.0	0.0
Total Split (%)	10.0%	20.0%	16.3%	11.9%	21.9%	0.0%	16.3%	55.0%	0.0%	13.1%	51.9%	0.0%
Maximum Green (s)	9.0	25.0	19.0	12.0	28.0		19.0	81.0		14.0	76.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	11.0	27.0	48.0	14.0	30.0		21.0	83.0		16.0	78.0	
Actuated g/C Ratio	0.07	0.17	0.30	0.09	0.19		0.13	0.52		0.10	0.49	
v/c Ratio	1.29	1.10	0.21	1.06	1.37		0.80	1.45		1.34	0.76	
Control Delay	215.3	126.1	29.0	135.5	224.1		92.0	235.6		225.6	15.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.2	

19: Oleander Dr. & NC 132 (College Rd.)  
2012 Base Year AM Peak

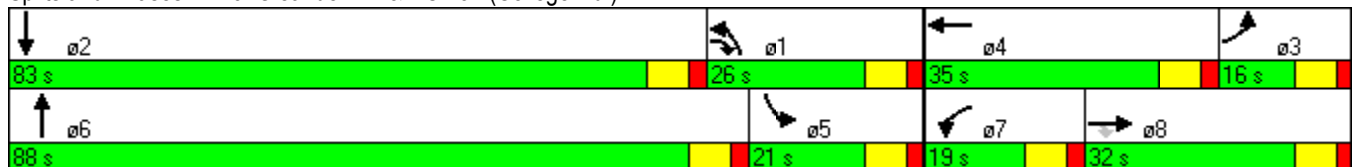


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	215.3	126.1	29.0	135.5	224.1		92.0	235.6		225.6	16.0	
LOS	F	F	C	F	F		F	F		F	B	
Approach Delay		142.8			200.6			226.0			40.3	
Approach LOS		F			F			F			D	
Queue Length 50th (ft)	~204	~399	58	~184	~627		186	~1861		~321	382	
Queue Length 95th (ft)	#307	#529	98	#288	#764		#313	#1977		#504	341	
Internal Link Dist (ft)		887			848			957			610	
Turn Bay Length (ft)	550		450	775			500			275		
Base Capacity (vph)	231	586	466	295	630		226	1723		172	2326	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	83	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.29	1.10	0.21	1.06	1.37		0.80	1.45		1.34	0.78	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 8 (5%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 180  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.45  
 Intersection Signal Delay: 155.4  
 Intersection LOS: F  
 Intersection Capacity Utilization 122.2%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.























Splits and Phases: 19: Oleander Dr. & NC 132 (College Rd.)





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	358	614	162	501	579	207	86	1226	281	165	1742	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)			450	775		0	500		0	275		0
Storage Lanes	1		1	2		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3367	3471	1553	3367	3332	0	1719	3342	0	1719	4841	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3332	0	1719	3342	0	1719	4841	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			45			45			45	
Link Distance (ft)		967			928			1037			690	
Travel Time (s)		16.5			14.1			15.7			10.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	398	682	180	557	873	0	96	1674	0	183	2235	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot			Prot			Prot		
Protected Phases	3	8	1	7	4		1	6		5	2	
Permitted Phases			8									
Detector Phase	3	8	1	7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0		14.0	19.0		14.0	19.0	
Total Split (s)	20.0	32.0	14.0	27.0	39.0	0.0	14.0	73.0	0.0	18.0	77.0	0.0
Total Split (%)	13.3%	21.3%	9.3%	18.0%	26.0%	0.0%	9.3%	48.7%	0.0%	12.0%	51.3%	0.0%
Maximum Green (s)	13.0	25.0	7.0	20.0	32.0		7.0	66.0		11.0	70.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead		Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	15.0	27.0	36.0	22.0	34.0		9.0	68.0		13.0	72.0	
Actuated g/C Ratio	0.10	0.18	0.24	0.15	0.23		0.06	0.45		0.09	0.48	
v/c Ratio	1.18	1.09	0.48	1.13	1.16		0.93	1.10		1.23	0.96	
Control Delay	163.6	119.2	39.1	136.4	135.1		140.1	96.1		176.1	27.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	3.1		0.0	2.1	

19: Oleander Dr. & NC 132 (College Rd.)  
2012 Base Year PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

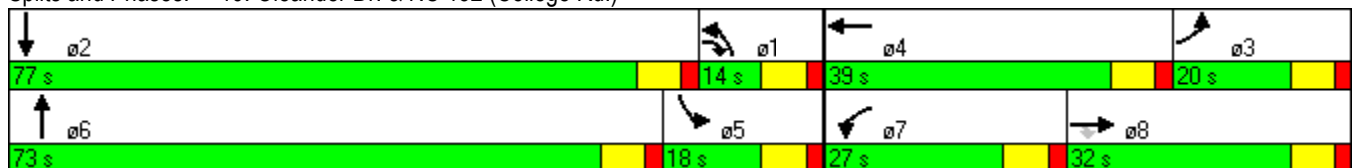


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	163.6	119.2	39.1	136.4	135.1		140.1	99.2		176.1	29.2	
LOS	F	F	D	F	F		F	F		F	C	
Approach Delay		121.8			135.6			101.5			40.3	
Approach LOS		F			F			F			D	
Queue Length 50th (ft)	~240	~394	107	~324	~528		95	~978		~221	772	
Queue Length 95th (ft)	#350	#523	164	#444	#664		#216	#1117		m#330	m#863	
Internal Link Dist (ft)		887			848			957			610	
Turn Bay Length (ft)	550		450	775			500			275		
Base Capacity (vph)	337	625	373	494	755		103	1515		149	2324	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	44	
Spillback Cap Reductn	0	0	0	0	0		0	10		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	1.18	1.09	0.48	1.13	1.16		0.93	1.11		1.23	0.98	

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 12 (8%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 160  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.23  
 Intersection Signal Delay: 90.8  
 Intersection LOS: F  
 Intersection Capacity Utilization 101.5%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Oleander Dr. & NC 132 (College Rd.)



19: Oleander Dr. & NC 132 (College Rd.)  
 2012 Base Year PM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	92	108	77	156	190	113	1989	47	96	1629	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	115		0	275		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	1679	0	1736	1677	0	1719	3428	0	1719	4925	0
Flt Permitted	0.118			0.388			0.950			0.950		
Satd. Flow (perm)	216	1679	0	709	1677	0	1719	3428	0	1719	4925	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		912			981			690			868	
Travel Time (s)		17.8			19.1			10.5			13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	222	0	86	384	0	126	2262	0	107	1851	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0		14.0	19.0	
Total Split (s)	39.0	39.0	0.0	39.0	39.0	0.0	25.0	106.0	0.0	15.0	96.0	0.0
Total Split (%)	24.4%	24.4%	0.0%	24.4%	24.4%	0.0%	15.6%	66.3%	0.0%	9.4%	60.0%	0.0%
Maximum Green (s)	32.0	32.0		32.0	32.0		18.0	99.0		8.0	89.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag							Lag	Lead		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	34.0	34.0		34.0	34.0		20.0	101.0		10.0	91.0	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.12	0.63		0.06	0.57	
v/c Ratio	1.07	0.62		0.57	1.08		0.59	1.05		1.00	0.66	
Control Delay	209.9	65.9		72.9	127.6		56.0	28.5		159.1	25.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	78.2		0.0	0.0	

20: Kerr Ave. & NC 132 (College Rd.)  
2012 Base Year AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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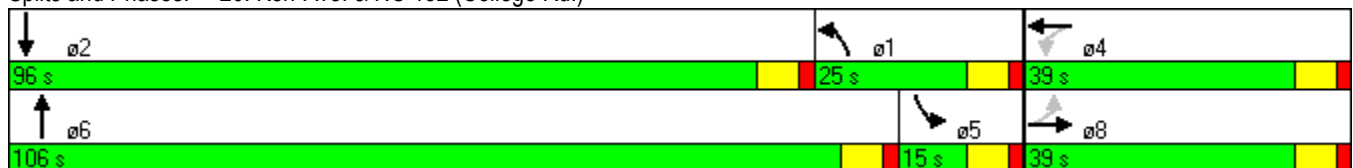


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	209.9	65.9		72.9	127.6		56.0	106.7		159.1	25.3	
LOS	F	E		E	F		E	F		F	C	
Approach Delay		91.9			117.6			104.0			32.6	
Approach LOS		F			F			F			C	
Queue Length 50th (ft)	~56	213		82	~446		140	~1328		114	475	
Queue Length 95th (ft)	#154	309		148	#661		m95	m75		#250	526	
Internal Link Dist (ft)		832			901			610			788	
Turn Bay Length (ft)	100			115			275			250		
Base Capacity (vph)	46	357		151	356		215	2164		107	2801	
Starvation Cap Reductn	0	0		0	0		0	319		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	49	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	1.07	0.62		0.57	1.08		0.59	1.23		1.00	0.67	

Intersection Summary

Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 77.2      Intersection LOS: E  
 Intersection Capacity Utilization 104.7%      ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: Kerr Ave. & NC 132 (College Rd.)



20: Kerr Ave. & NC 132 (College Rd.)  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	156	113	47	92	96	108	1629	77	190	1989	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	115		0	275		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	1712	0	1736	1686	0	1719	3414	0	1719	4925	0
Flt Permitted	0.368			0.160			0.950			0.950		
Satd. Flow (perm)	672	1712	0	292	1686	0	1719	3414	0	1719	4925	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		912			981			690			868	
Travel Time (s)		17.8			19.1			10.5			13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	299	0	52	209	0	120	1896	0	211	2259	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0		14.0	19.0	
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	23.0	94.0	0.0	24.0	95.0	0.0
Total Split (%)	21.3%	21.3%	0.0%	21.3%	21.3%	0.0%	15.3%	62.7%	0.0%	16.0%	63.3%	0.0%
Maximum Green (s)	25.0	25.0		25.0	25.0		16.0	87.0		17.0	88.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag							Lag	Lead		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	27.0	27.0		27.0	27.0		18.0	89.0		19.0	90.0	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.12	0.59		0.13	0.60	
v/c Ratio	0.35	0.97		0.98	0.69		0.58	0.94		0.97	0.76	
Control Delay	63.2	104.7		178.6	70.5		63.8	8.9		117.3	24.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	22.7		0.0	0.8	

20: Kerr Ave. & NC 132 (College Rd.)  
2012 Base Year PM Peak



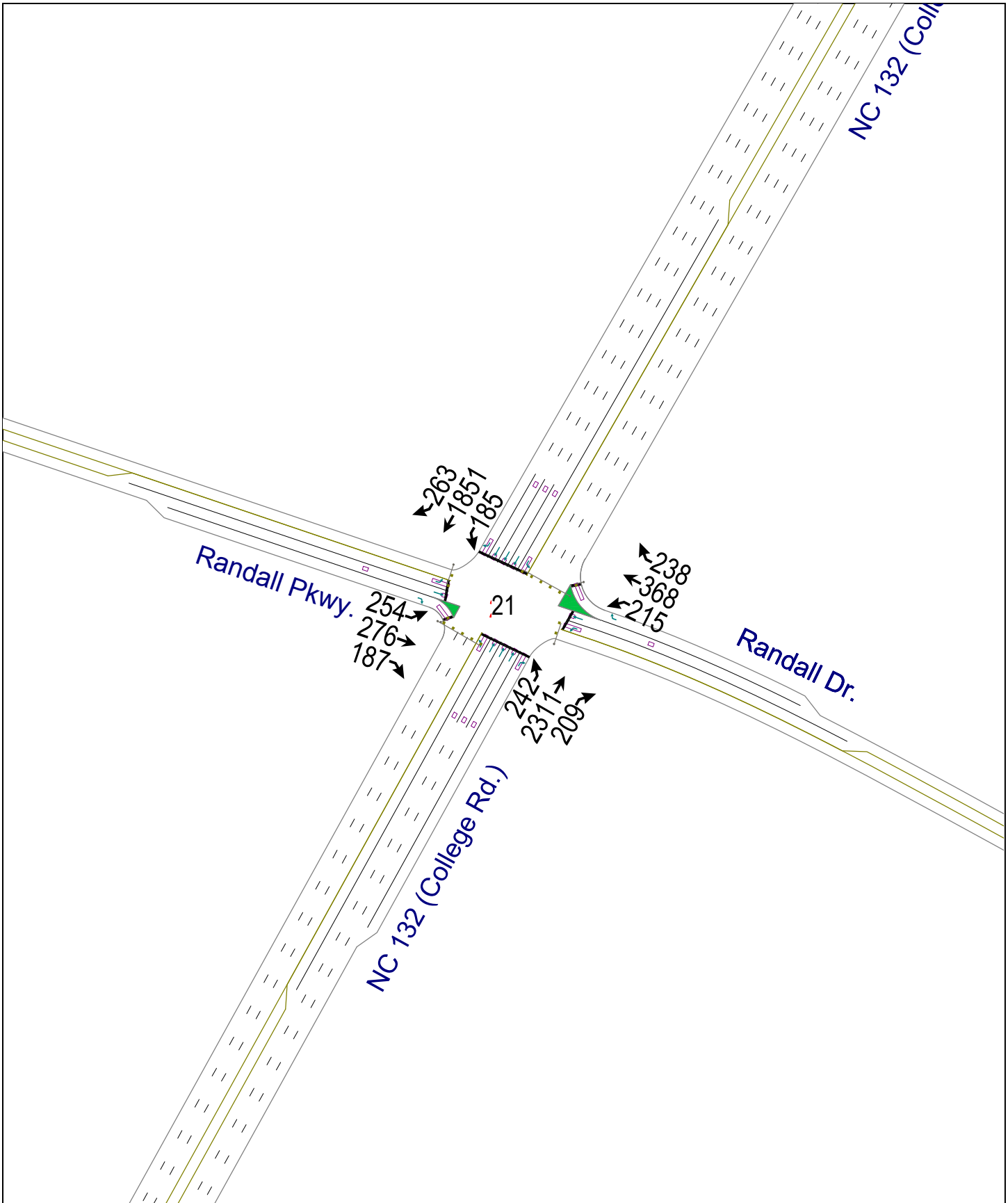
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	63.2	104.7		178.6	70.5		63.8	31.6		117.3	25.2	
LOS	E	F		F	E		E	C		F	C	
Approach Delay		99.5			92.1			33.6			33.1	
Approach LOS		F			F			C			C	
Queue Length 50th (ft)	36	294		51	194		125	345		209	573	
Queue Length 95th (ft)	79	#487		#148	288		m0	m307		#378	631	
Internal Link Dist (ft)		832			901			610			788	
Turn Bay Length (ft)	100			115			275			250		
Base Capacity (vph)	121	308		53	303		206	2026		218	2955	
Starvation Cap Reductn	0	0		0	0		0	214		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	370	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.35	0.97		0.98	0.69		0.58	1.05		0.97	0.87	

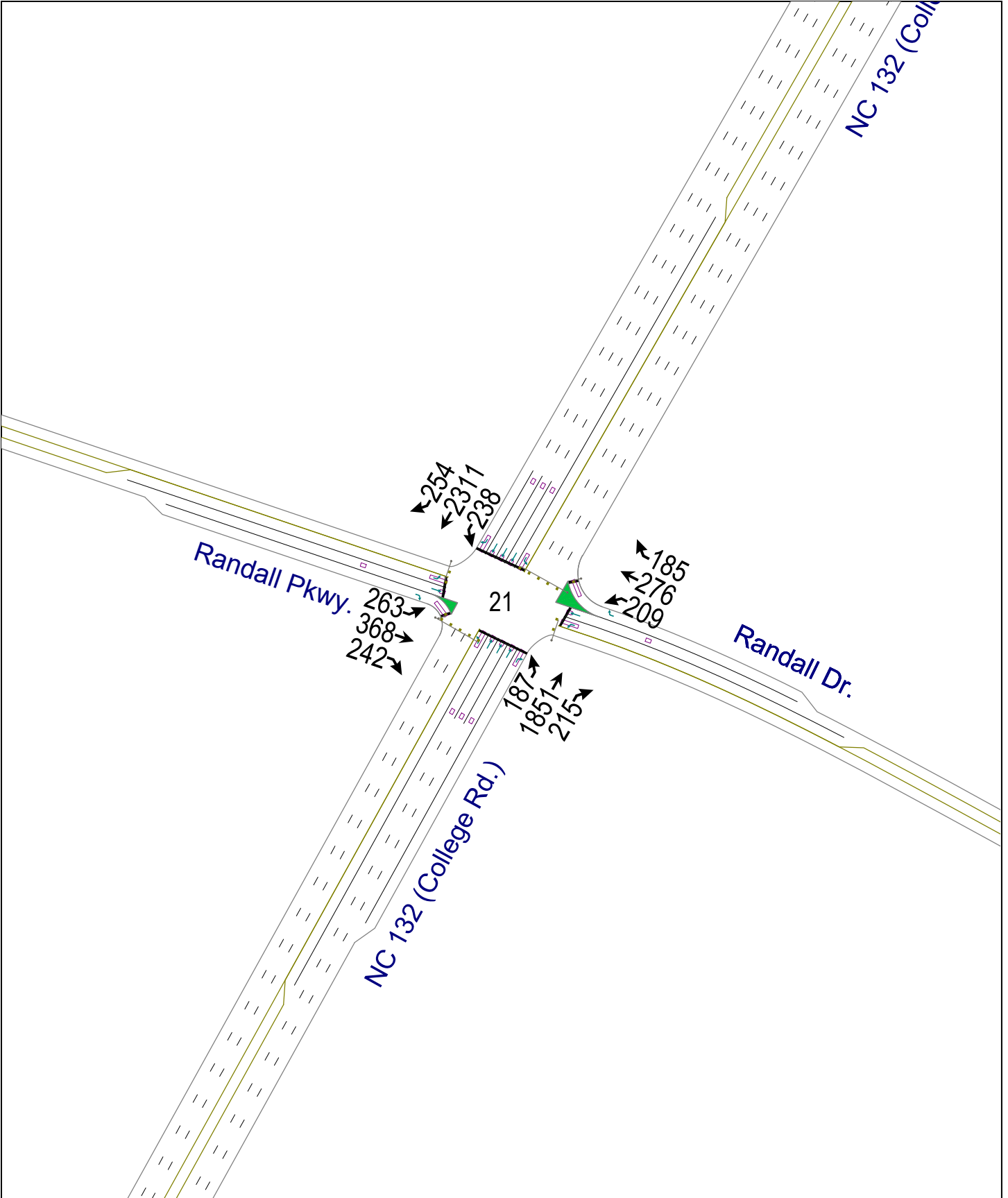
**Intersection Summary**

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 40.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 95.6%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: Kerr Ave. & NC 132 (College Rd.)

































U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	254	276	187	215	368	238	242	2311	209	185	1851	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	375		325	340		275	450		350	450		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1719	4940	1538	1719	4940	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1719	4940	1538	1719	4940	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		1005			988			1040			1025	
Travel Time (s)		19.6			26.9			15.8			15.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	282	307	208	239	409	264	269	2568	232	206	2057	292
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	28.0	36.0	29.0	29.0	37.0	22.0	29.0	83.0	29.0	22.0	76.0	28.0
Total Split (%)	16.5%	21.2%	17.1%	17.1%	21.8%	12.9%	17.1%	48.8%	17.1%	12.9%	44.7%	16.5%
Maximum Green (s)	21.0	29.0	22.0	22.0	30.0	15.0	22.0	76.0	22.0	15.0	69.0	21.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	23.0	30.5	54.5	24.5	32.0	49.0	24.0	78.0	102.5	17.0	71.0	94.0
Actuated g/C Ratio	0.14	0.18	0.32	0.14	0.19	0.29	0.14	0.46	0.60	0.10	0.42	0.55
v/c Ratio	1.19	0.93	0.41	0.95	1.18	0.58	1.11	1.13	0.25	1.20	1.00	0.34
Control Delay	178.7	101.8	29.1	115.3	163.1	37.1	153.0	108.0	9.0	192.4	67.9	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

21: Randall Pkwy. & NC 132 (College Rd.)  
2012 Base Year AM Peak

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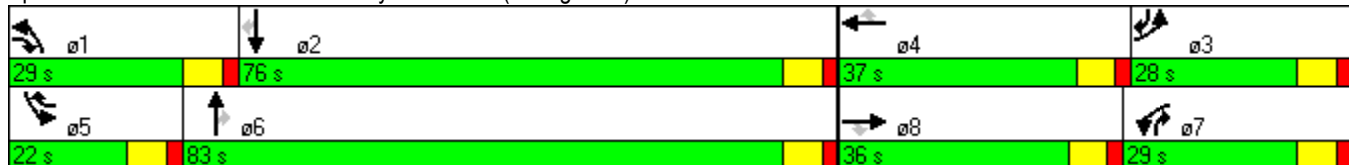


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	178.7	101.8	29.1	115.3	163.1	37.1	153.0	108.0	9.0	192.4	67.9	11.9
LOS	F	F	C	F	F	D	F	F	A	F	E	B
Approach Delay	110.0			114.1			104.4			71.5		
Approach LOS	F			F			F			E		
Queue Length 50th (ft)	~377	340	125	269	~543	181	~341	~1212	66	~277	834	90
Queue Length 95th (ft)	#575	#525	181	#453	#767	255	#537	#1287	95	#457	#953	126
Internal Link Dist (ft)	925			908			960			945		
Turn Bay Length (ft)	375		325	340		275	450		350	450		
Base Capacity (vph)	237	336	503	252	347	452	243	2267	927	172	2063	850
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.91	0.41	0.95	1.18	0.58	1.11	1.13	0.25	1.20	1.00	0.34

**Intersection Summary**

Area Type: Other  
 Cycle Length: 170  
 Actuated Cycle Length: 170  
 Natural Cycle: 170  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.20  
 Intersection Signal Delay: 94.8  
 Intersection LOS: F  
 Intersection Capacity Utilization 105.0%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 21: Randall Pkwy. & NC 132 (College Rd.)



21: Randall Pkwy. & NC 132 (College Rd.)  
 2012 Base Year AM Peak

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	263	368	242	209	276	185	187	1851	215	238	2311	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	375		325	340		275	450		350	450		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1719	4940	1538	1719	4940	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1719	4940	1538	1719	4940	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		1005			988			1040			1025	
Travel Time (s)		19.6			26.9			15.8			15.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	292	409	269	232	307	206	208	2057	239	264	2568	282
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	32.0	40.0	23.0	25.0	33.0	32.0	23.0	83.0	25.0	32.0	92.0	32.0
Total Split (%)	17.8%	22.2%	12.8%	13.9%	18.3%	17.8%	12.8%	46.1%	13.9%	17.8%	51.1%	17.8%
Maximum Green (s)	25.0	33.0	16.0	18.0	26.0	25.0	16.0	76.0	18.0	25.0	85.0	25.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	27.0	35.0	53.0	20.0	28.0	55.0	18.0	78.0	98.0	27.0	87.0	114.0
Actuated g/C Ratio	0.15	0.19	0.29	0.11	0.16	0.31	0.10	0.43	0.54	0.15	0.48	0.63
v/c Ratio	1.11	1.14	0.58	1.19	1.07	0.43	1.21	0.96	0.29	1.02	1.08	0.29
Control Delay	154.5	152.5	40.3	188.5	141.3	32.3	199.0	61.5	12.2	134.3	86.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

21: Randall Pkwy. & NC 132 (College Rd.)  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	154.5	152.5	40.3	188.5	141.3	32.3	199.0	61.5	12.2	134.3	86.4	8.4
LOS	F	F	D	F	F	C	F	E	B	F	F	A
Approach Delay	122.0			125.9			68.2			83.4		
Approach LOS	F			F			E			F		
Queue Length 50th (ft)	~393	~561	205	~329	~400	135	~298	861	77	~330	~1230	77
Queue Length 95th (ft)	#598	#789	286	#520	#608	195	#482	#940	109	#531	#1301	106
Internal Link Dist (ft)	925			908			960			945		
Turn Bay Length (ft)	375		325	340		275	450		350	450		
Base Capacity (vph)	263	359	462	195	287	479	172	2141	837	258	2388	974
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	1.14	0.58	1.19	1.07	0.43	1.21	0.96	0.29	1.02	1.08	0.29

**Intersection Summary**

Area Type: Other

Cycle Length: 180

Actuated Cycle Length: 180

Natural Cycle: 180

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.21

Intersection Signal Delay: 87.6      Intersection LOS: F

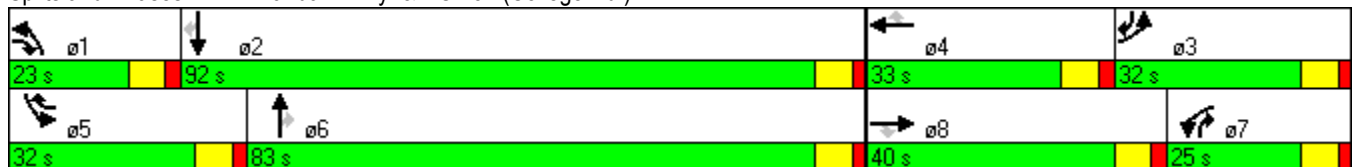
Intersection Capacity Utilization 102.6%      ICU Level of Service G

Analysis Period (min) 15

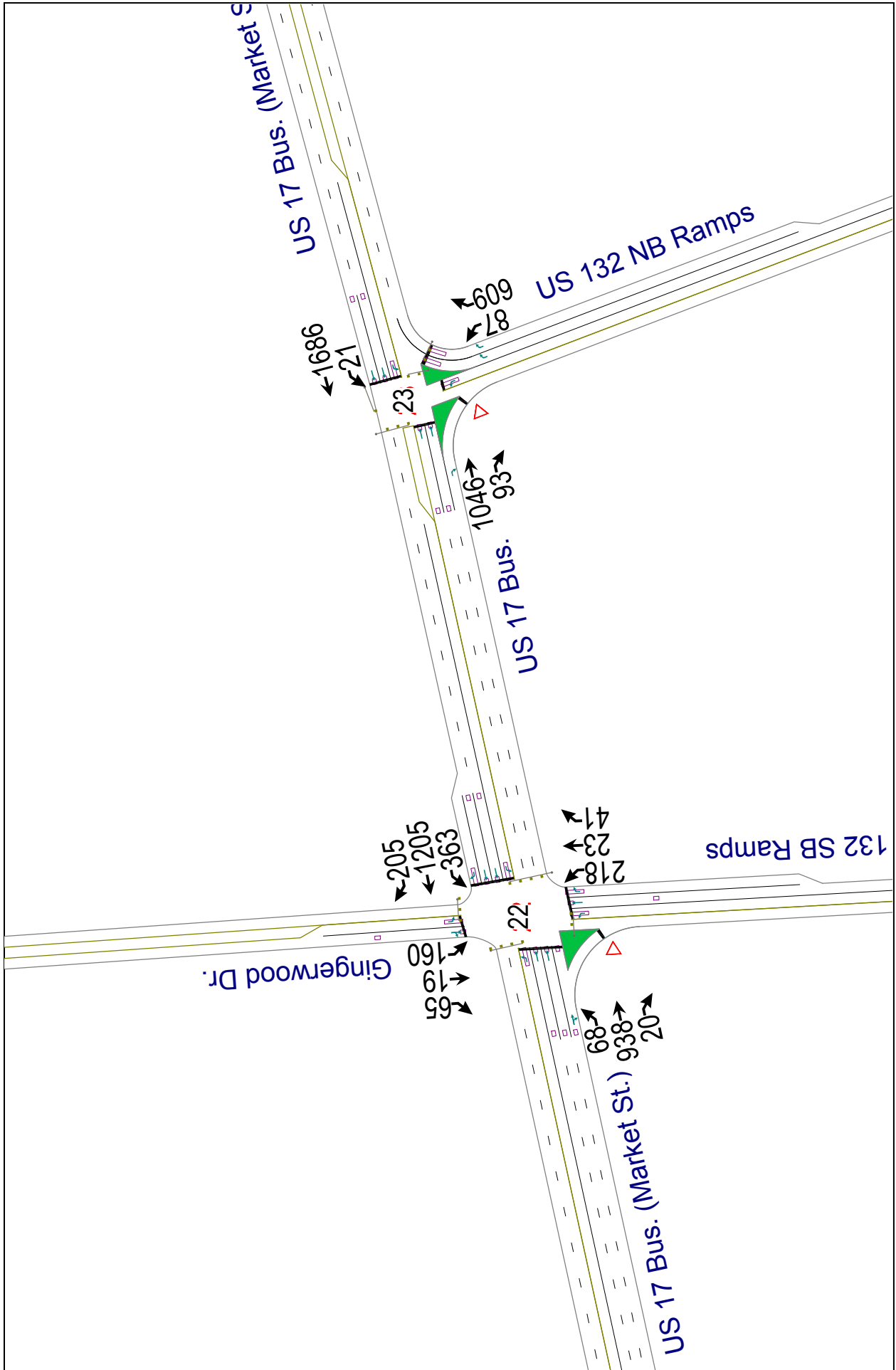
~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

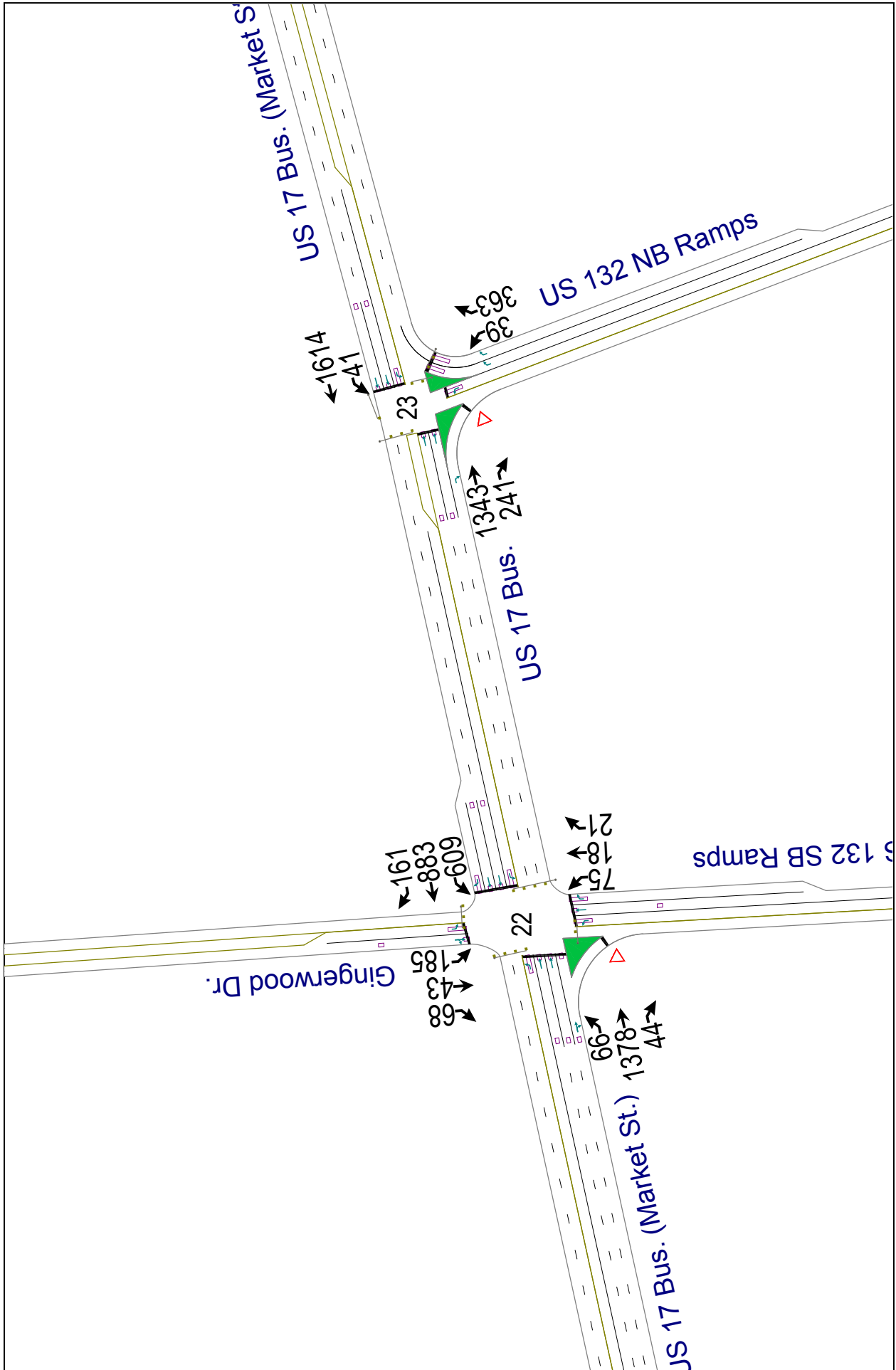
# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 21: Randall Pkwy. & NC 132 (College Rd.)





























21: Randall Pkwy. & NC 132 (College Rd.)  
 2012 Base Year PM Peak





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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Volume (vph)	68	938	20	363	1205	205	218	23	41	160	19	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	750		0	400		100	400		250	150		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	5021	0	1752	3505	1568	1752	1845	1568	1770	1647	0
Flt Permitted	0.950			0.950			0.697			0.740		
Satd. Flow (perm)	1752	5021	0	1752	3505	1568	1286	1845	1568	1378	1647	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25			35	
Link Distance (ft)		1082			581			996			905	
Travel Time (s)		18.4			9.9			27.2			17.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	1064	0	403	1339	228	242	26	46	178	93	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases						6	8		8	4		
Detector Phase	5	2		1	6	6	8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	15.0	39.0	0.0	43.0	67.0	67.0	38.0	38.0	43.0	38.0	38.0	0.0
Total Split (%)	12.5%	32.5%	0.0%	35.8%	55.8%	55.8%	31.7%	31.7%	35.8%	31.7%	31.7%	0.0%
Maximum Green (s)	8.0	32.0		36.0	60.0	60.0	31.0	31.0	36.0	31.0	31.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag		Lead	Lead	Lead			Lead			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	9.8	43.4		33.4	69.8	69.8	28.2	28.2	66.6	28.2	28.2	
Actuated g/C Ratio	0.08	0.36		0.28	0.58	0.58	0.24	0.24	0.56	0.24	0.24	
v/c Ratio	0.53	0.59		0.83	0.66	0.25	0.80	0.06	0.05	0.55	0.24	
Control Delay	66.9	34.5		57.2	16.4	13.4	62.5	33.5	9.8	46.1	37.3	
Queue Delay	0.0	0.0		0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	

22: US 17 Bus. (Market St.) & Gingerwood Dr.  
2012 Base Year AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	66.9	34.5		57.2	16.7	13.4	62.5	33.5	9.8	46.1	37.3	
LOS	E	C		E	B	B	E	C	A	D	D	
Approach Delay		36.7			24.6			52.4				43.1
Approach LOS		D			C			D				D
Queue Length 50th (ft)	57	252		258	256	76	175	15	15	120	58	
Queue Length 95th (ft)	110	328		356	302	116	264	38	27	187	101	
Internal Link Dist (ft)		1002			501			916				825
Turn Bay Length (ft)	750			400		100	400		250	150		
Base Capacity (vph)	146	1816		555	2039	912	354	507	930	379	453	
Starvation Cap Reductn	0	0		0	213	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.59		0.73	0.73	0.25	0.68	0.05	0.05	0.47	0.21	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 4 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 32.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 70.4%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 22: US 17 Bus. (Market St.) & Gingerwood Dr.





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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	66	1378	44	609	883	161	75	18	21	185	43	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	750		0	400		100	400		250	150		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	5011	0	1752	3505	1568	1752	1845	1568	1770	1691	0
Flt Permitted	0.950			0.950			0.573			0.744		
Satd. Flow (perm)	1752	5011	0	1752	3505	1568	1057	1845	1568	1386	1691	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25				35
Link Distance (ft)		1082			581			996				905
Travel Time (s)		18.4			9.9			27.2				17.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	73	1580	0	677	981	179	83	20	23	206	124	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1			4
Permitted Phases						6	8		8	4		
Detector Phase	5	2		1	6	6	8	8	1	4		4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	19.0	14.0	14.0	14.0	14.0		14.0
Total Split (s)	15.0	46.0	0.0	52.0	83.0	83.0	22.0	22.0	52.0	22.0		22.0
Total Split (%)	12.5%	38.3%	0.0%	43.3%	69.2%	69.2%	18.3%	18.3%	43.3%	18.3%		18.3%
Maximum Green (s)	8.0	39.0		45.0	76.0	76.0	15.0	15.0	45.0	15.0		15.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag				Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes				Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None		None
Act Effct Green (s)	9.8	41.0		47.0	81.0	81.0	17.0	17.0	69.0	17.0		17.0
Actuated g/C Ratio	0.08	0.34		0.39	0.68	0.68	0.14	0.14	0.58	0.14		0.14
v/c Ratio	0.51	0.92		0.99	0.41	0.17	0.55	0.08	0.03	1.05		0.52
Control Delay	65.8	48.1		62.4	7.9	7.3	63.1	45.7	11.2	128.1		56.2
Queue Delay	0.0	0.0		7.4	0.2	0.0	0.0	0.0	0.0	0.0		0.0

22: US 17 Bus. (Market St.) & Gingerwood Dr.  
2012 Base Year PM Peak

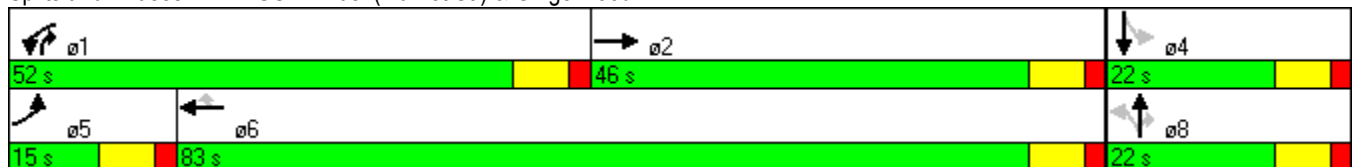


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	65.8	48.1		69.7	8.0	7.3	63.1	45.7	11.2	128.1	56.2	
LOS	E	D		E	A	A	E	D	B	F	E	
Approach Delay		48.9			30.7			50.9				101.1
Approach LOS		D			C			D				F
Queue Length 50th (ft)	55	428		366	118	41	61	14	7	~174	90	
Queue Length 95th (ft)	106	#524		#755	137	62	117	37	19	#329	155	
Internal Link Dist (ft)		1002			501			916				825
Turn Bay Length (ft)	750			400		100	400		250	150		
Base Capacity (vph)	146	1712		686	2366	1058	150	261	902	196	240	
Starvation Cap Reductn	0	0		20	492	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.50	0.92		1.02	0.52	0.17	0.55	0.08	0.03	1.05	0.52	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 14 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 44.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 90.8%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 22: US 17 Bus. (Market St.) & Gingerwood Dr.



22: US 17 Bus. (Market St.) & Gingerwood Dr.  
 2012 Base Year PM Peak

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓↓
Volume (vph)	1046	93	21	1686	87	609
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	225		750	425
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3505	1568	1752	3505	1752	2760
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3505	1568	1752	3505	1752	2760
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	40			40	45	
Link Distance (ft)	581			1044	982	
Travel Time (s)	9.9			17.8	14.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1162	103	23	1873	97	677
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type		Perm	Prot			pm+ov
Protected Phases	2		1	6	8	1
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	1
Switch Phase						
Minimum Initial (s)	12.0	12.0	7.0	12.0	7.0	7.0
Minimum Split (s)	19.0	19.0	14.0	19.0	14.0	14.0
Total Split (s)	67.0	67.0	33.0	100.0	20.0	33.0
Total Split (%)	55.8%	55.8%	27.5%	83.3%	16.7%	27.5%
Maximum Green (s)	60.0	60.0	26.0	93.0	13.0	26.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	None	Max	None
Act Effct Green (s)	68.3	68.3	21.7	95.0	15.0	41.7
Actuated g/C Ratio	0.57	0.57	0.18	0.79	0.12	0.35
v/c Ratio	0.58	0.12	0.07	0.67	0.44	0.71
Control Delay	6.7	3.9	38.6	7.1	55.7	37.8
Queue Delay	0.3	0.0	0.0	0.0	0.0	0.0

23: US 17 Bus. (Market St.) & US 132 NB Ramps  
2012 Base Year AM Peak



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Delay	7.1	3.9	38.6	7.1	55.7	37.8
LOS	A	A	D	A	E	D
Approach Delay	6.8			7.5	40.1	
Approach LOS	A			A	D	
Queue Length 50th (ft)	80	6	15	279	71	255
Queue Length 95th (ft)	80	15	36	337	127	303
Internal Link Dist (ft)	501			964	902	
Turn Bay Length (ft)			225		750	425
Base Capacity (vph)	1996	893	409	2775	219	1104
Starvation Cap Reductn	314	0	0	0	0	0
Spillback Cap Reductn	0	0	0	5	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.12	0.06	0.68	0.44	0.61

**Intersection Summary**

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	13.7
Intersection LOS:	B
Intersection Capacity Utilization	60.8%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 23: US 17 Bus. (Market St.) & US 132 NB Ramps



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑↑
Volume (vph)	1343	241	41	1614	39	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	225		750	425
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3505	1568	1752	3505	1752	2760
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3505	1568	1752	3505	1752	2760
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	40			40	45	
Link Distance (ft)	581			1044	982	
Travel Time (s)	9.9			17.8	14.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1492	268	46	1793	43	403
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type		Perm	Prot			pm+ov
Protected Phases	2		1	6	8	1
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	1
Switch Phase						
Minimum Initial (s)	12.0	12.0	7.0	12.0	7.0	7.0
Minimum Split (s)	19.0	19.0	14.0	19.0	14.0	14.0
Total Split (s)	81.0	81.0	23.0	104.0	16.0	23.0
Total Split (%)	67.5%	67.5%	19.2%	86.7%	13.3%	19.2%
Maximum Green (s)	74.0	74.0	16.0	97.0	9.0	16.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	None	Max	None
Act Effct Green (s)	80.4	80.4	13.6	99.0	11.0	29.6
Actuated g/C Ratio	0.67	0.67	0.11	0.82	0.09	0.25
v/c Ratio	0.64	0.25	0.23	0.62	0.27	0.59
Control Delay	7.0	2.9	49.7	4.9	55.4	43.3
Queue Delay	0.3	0.0	0.0	0.0	0.0	0.0

23: US 17 Bus. (Market St.) & US 132 NB Ramps  
2012 Base Year PM Peak



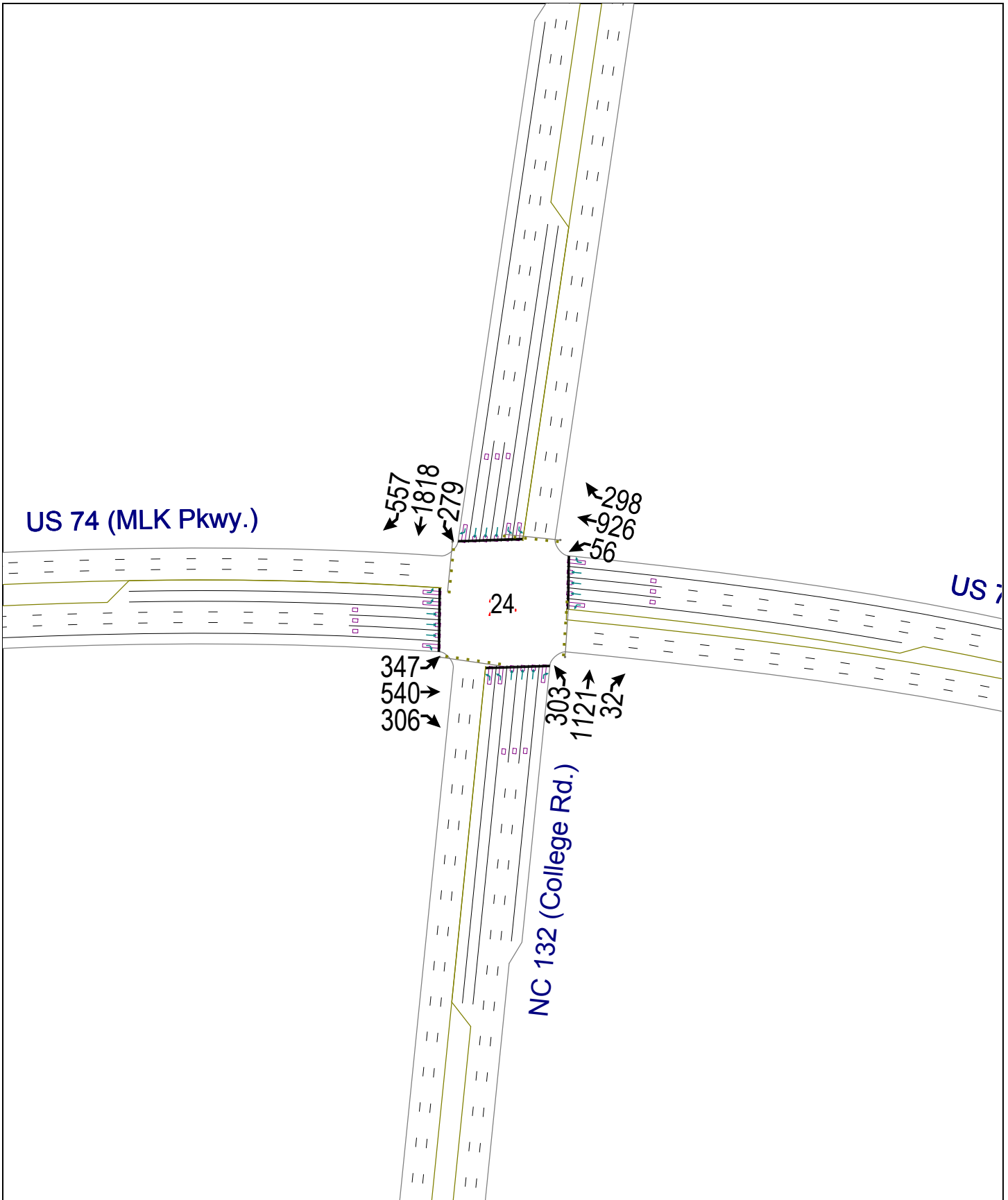
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Delay	7.3	2.9	49.7	4.9	55.4	43.3
LOS	A	A	D	A	E	D
Approach Delay	6.6			6.0	44.5	
Approach LOS	A			A	D	
Queue Length 50th (ft)	84	18	33	201	32	156
Queue Length 95th (ft)	m84	m19	68	243	70	205
Internal Link Dist (ft)	501			964	902	
Turn Bay Length (ft)			225		750	425
Base Capacity (vph)	2348	1051	263	2892	161	782
Starvation Cap Reductn	265	0	0	0	0	0
Spillback Cap Reductn	0	0	0	91	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.25	0.17	0.64	0.27	0.52

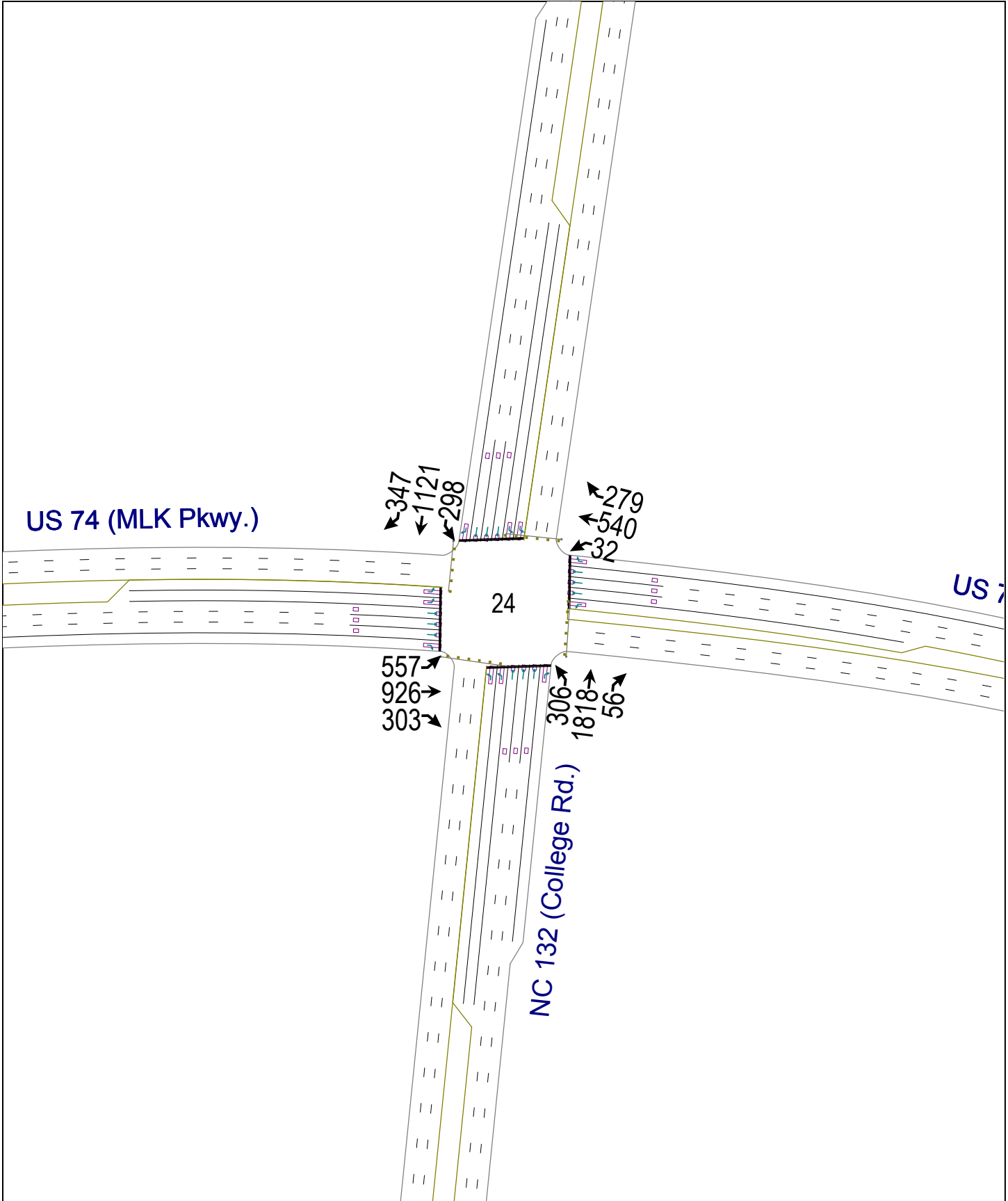
**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 10.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 58.8%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: US 17 Bus. (Market St.) & US 132 NB Ramps












































U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			  		 	  		 	  	
Volume (vph)	347	540	306	56	926	298	303	1121	32	279	1818	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		525	375		675	375		300	350		575
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3335	4940	1538	1719	4940	1538	3335	4940	1538	3335	4940	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	4940	1538	1719	4940	1538	3335	4940	1538	3335	4940	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1054			1097			837			1153	
Travel Time (s)		13.1			13.6			10.4			14.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	386	600	340	62	1029	331	337	1246	36	310	2020	619
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0
Total Split (s)	19.0	32.0	16.0	15.0	28.0	25.0	16.0	48.0	15.0	25.0	57.0	19.0
Total Split (%)	15.8%	26.7%	13.3%	12.5%	23.3%	20.8%	13.3%	40.0%	12.5%	20.8%	47.5%	15.8%
Maximum Green (s)	12.0	25.0	9.0	8.0	21.0	18.0	9.0	41.0	8.0	18.0	50.0	12.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	14.0	27.1	43.1	12.7	23.0	43.0	11.0	43.0	59.7	20.0	52.0	66.0
Actuated g/C Ratio	0.12	0.23	0.36	0.11	0.19	0.36	0.09	0.36	0.50	0.17	0.43	0.55
v/c Ratio	0.99	0.54	0.61	0.34	1.09	0.60	1.10	0.70	0.05	0.56	0.94	0.73
Control Delay	76.5	18.0	15.1	55.6	101.2	23.7	131.4	35.7	15.5	50.3	43.0	18.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)  
2012 Base Year AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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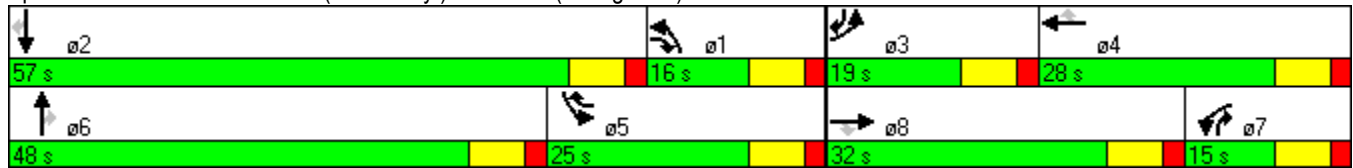


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	76.5	18.0	15.1	55.6	101.2	23.7	131.4	35.7	15.5	50.3	43.0	18.3
LOS	E	B	B	E	F	C	F	D	B	D	D	B
Approach Delay	34.3			81.2			55.2			38.6		
Approach LOS	C			F			E			D		
Queue Length 50th (ft)	110	76	69	44	~328	138	~153	301	13	114	539	196
Queue Length 95th (ft)	#246	86	83	93	#420	205	#248	355	33	162	#656	338
Internal Link Dist (ft)	974			1017			757			1073		
Turn Bay Length (ft)	350		525	375		675	375		300	350		575
Base Capacity (vph)	389	1235	553	184	947	551	306	1770	767	556	2141	846
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.49	0.61	0.34	1.09	0.60	1.10	0.70	0.05	0.56	0.94	0.73

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.10  
 Intersection Signal Delay: 49.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 88.2%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

























Splits and Phases: 24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)



24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)  
2012 Base Year AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	557	926	303	32	540	279	306	1818	56	298	1121	347
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		525	375		675	375		300	350		575
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3335	4940	1538	1719	4940	1538	3335	4940	1538	3335	4940	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	4940	1538	1719	4940	1538	3335	4940	1538	3335	4940	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1054			1097			837			1153	
Travel Time (s)		13.1			13.6			10.4			14.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	619	1029	337	36	600	310	340	2020	62	331	1246	386
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0
Total Split (s)	27.0	34.0	23.0	14.0	21.0	17.0	23.0	55.0	14.0	17.0	49.0	27.0
Total Split (%)	22.5%	28.3%	19.2%	11.7%	17.5%	14.2%	19.2%	45.8%	11.7%	14.2%	40.8%	22.5%
Maximum Green (s)	20.0	27.0	16.0	7.0	14.0	10.0	16.0	48.0	7.0	10.0	42.0	20.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	22.0	31.8	54.8	9.0	16.0	28.0	18.0	50.0	59.0	12.0	44.0	71.0
Actuated g/C Ratio	0.18	0.26	0.46	0.08	0.13	0.23	0.15	0.42	0.49	0.10	0.37	0.59
v/c Ratio	1.01	0.79	0.48	0.28	0.91	0.86	0.68	0.98	0.08	0.99	0.69	0.42
Control Delay	62.6	21.0	8.0	58.4	70.4	50.2	55.9	50.7	9.0	101.2	34.6	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)  
2012 Base Year PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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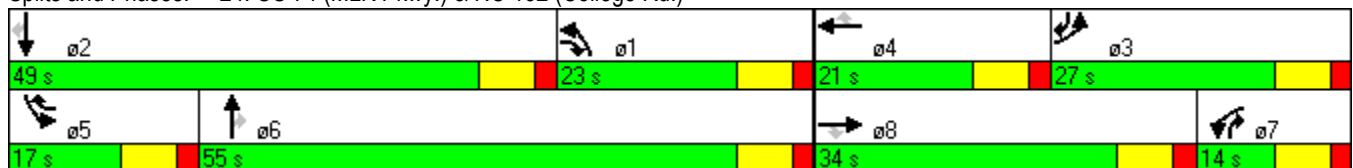


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	62.6	21.0	8.0	58.4	70.4	50.2	55.9	50.7	9.0	101.2	34.6	15.2
LOS	E	C	A	E	E	D	E	D	A	F	C	B
Approach Delay	31.7			63.3			50.4			42.0		
Approach LOS	C			E			D			D		
Queue Length 50th (ft)	~257	220	46	27	170	146	129	556	15	134	296	154
Queue Length 95th (ft)	m#326	m246	m55	62	#241	#262	181	#681	30	#231	350	226
Internal Link Dist (ft)	974			1017			757			1073		
Turn Bay Length (ft)	350		525	375		675	375		300	350		575
Base Capacity (vph)	611	1309	702	129	659	359	500	2058	756	334	1811	910
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.79	0.48	0.28	0.91	0.86	0.68	0.98	0.08	0.99	0.69	0.42

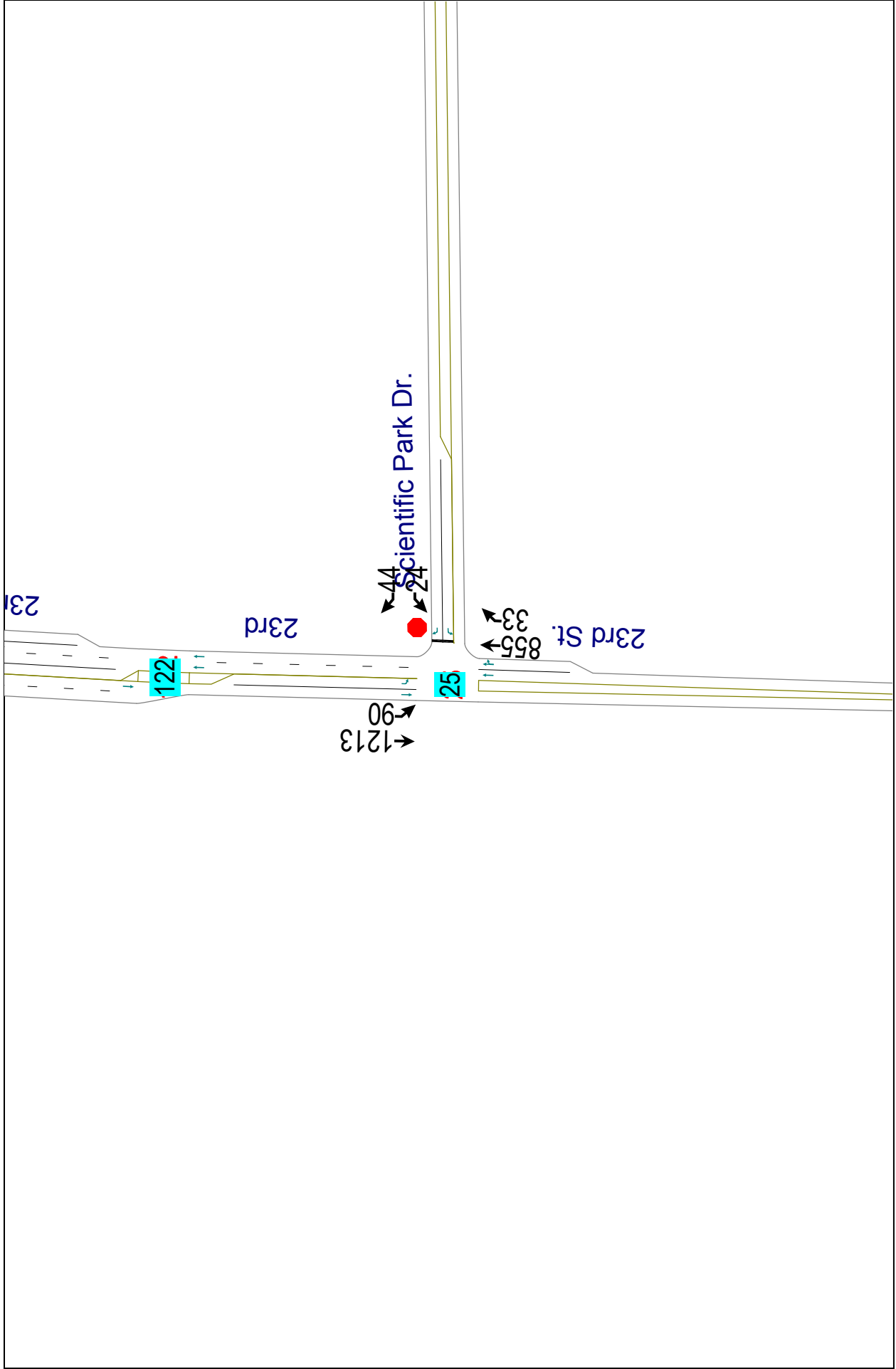
Intersection Summary

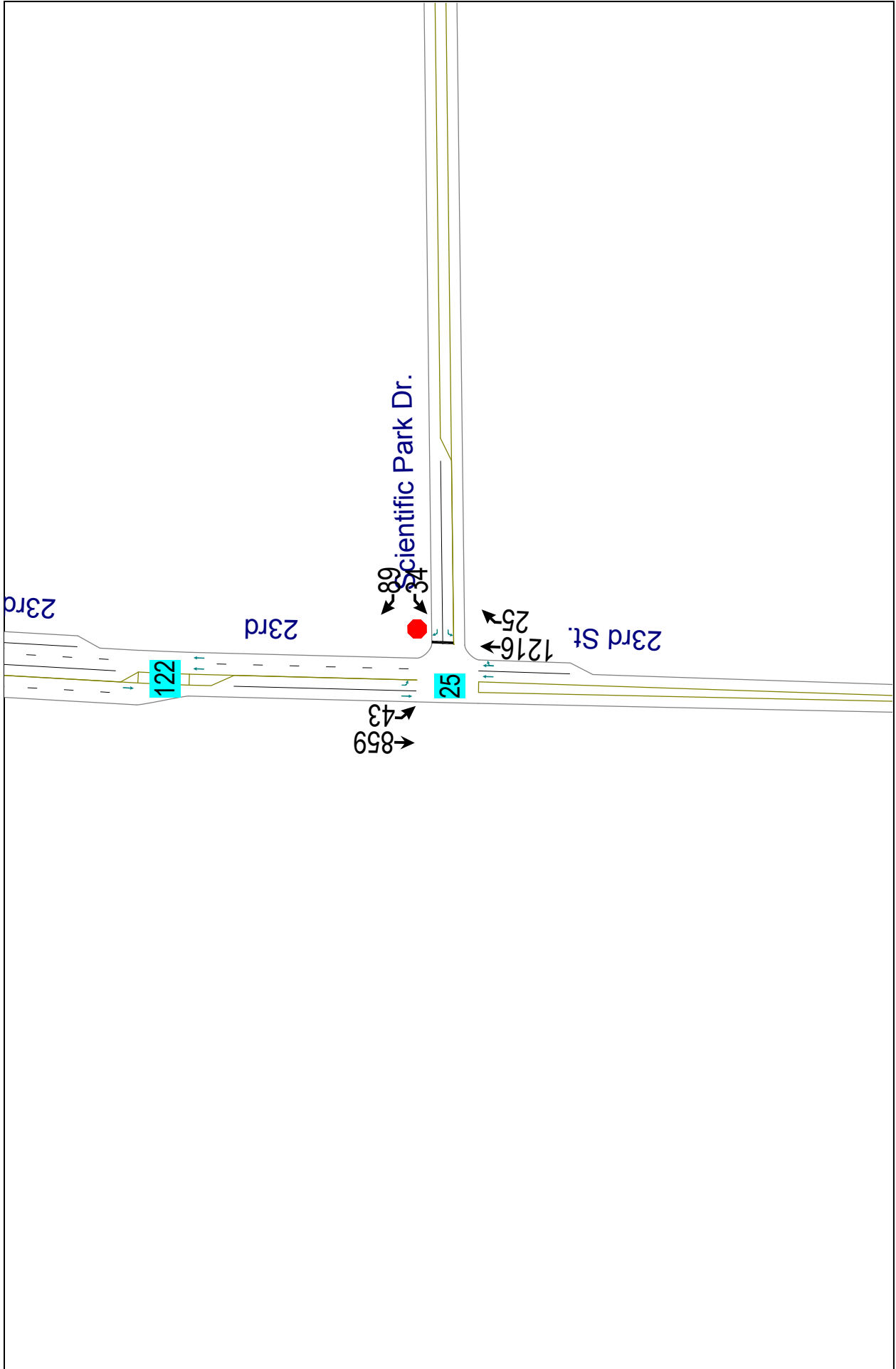
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.01  
 Intersection Signal Delay: 44.8      Intersection LOS: D  
 Intersection Capacity Utilization 87.9%      ICU Level of Service E  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
   Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
   Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)



24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)  
 2012 Base Year PM Peak





U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	24	44	855	33	90	1213
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0		100	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25	25		25	25	
Satd. Flow (prot)	1752	1568	3484	0	1752	1845
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1752	1568	3484	0	1752	1845
Link Speed (mph)	35		45			45
Link Distance (ft)	1155		1029			313
Travel Time (s)	22.5		15.6			4.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	49	987	0	100	1348
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	73.8%
	ICU Level of Service D
Analysis Period (min)	15

25: Scientific Park Dr. & 23rd St.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/11/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↕↔		↙	↕
Volume (veh/h)	24	44	855	33	90	1213
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	27	49	950	37	100	1348
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						666
pX, platoon unblocked	0.27					
vC, conflicting volume	2516	493			987	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	5322	493			987	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	91			86	
cM capacity (veh/h)	0	519			690	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	27	49	633	353	100	1348
Volume Left	27	0	0	0	100	0
Volume Right	0	49	0	37	0	0
cSH	0	519	1700	1700	690	1700
Volume to Capacity	556.47	0.09	0.37	0.21	0.14	0.79
Queue Length 95th (ft)	Err	8	0	0	13	0
Control Delay (s)	Err	12.7	0.0	0.0	11.1	0.0
Lane LOS	F	B			B	
Approach Delay (s)	3537.3		0.0		0.8	
Approach LOS	F					

Intersection Summary						
Average Delay			106.9			
Intersection Capacity Utilization			73.8%	ICU Level of Service		D
Analysis Period (min)			15			

25: Scientific Park Dr. & 23rd St.  
 2012 Base Year AM Peak



U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	34	89	1216	25	43	859
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0		100	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25	25		25	25	
Satd. Flow (prot)	1752	1568	3494	0	1752	1845
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1752	1568	3494	0	1752	1845
Link Speed (mph)	35		45			45
Link Distance (ft)	1155		1029			313
Travel Time (s)	22.5		15.6			4.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	99	1379	0	48	954
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.2%
	ICU Level of Service B
Analysis Period (min)	15

25: Scientific Park Dr. & 23rd St.  
 2012 Base Year PM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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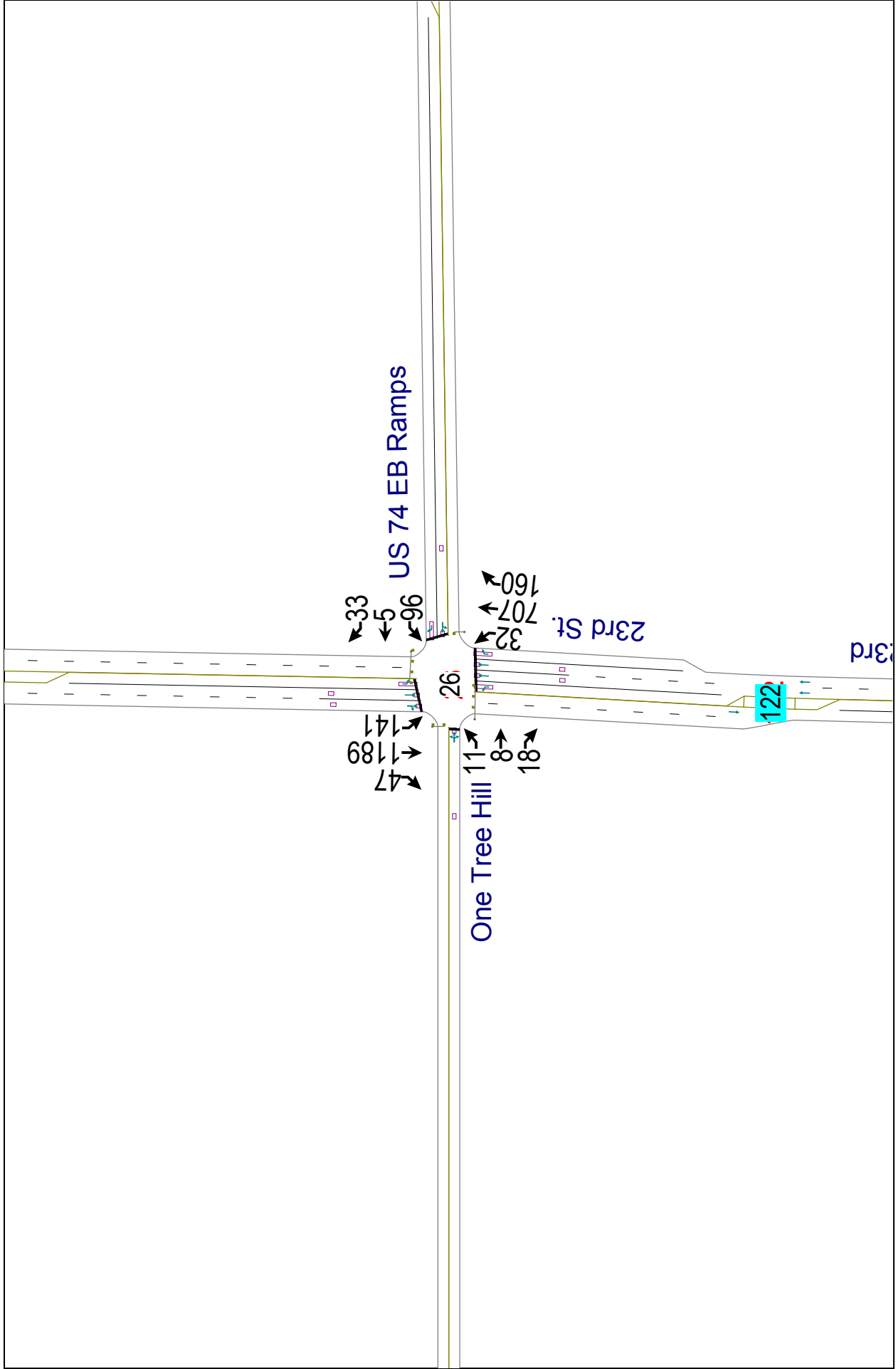


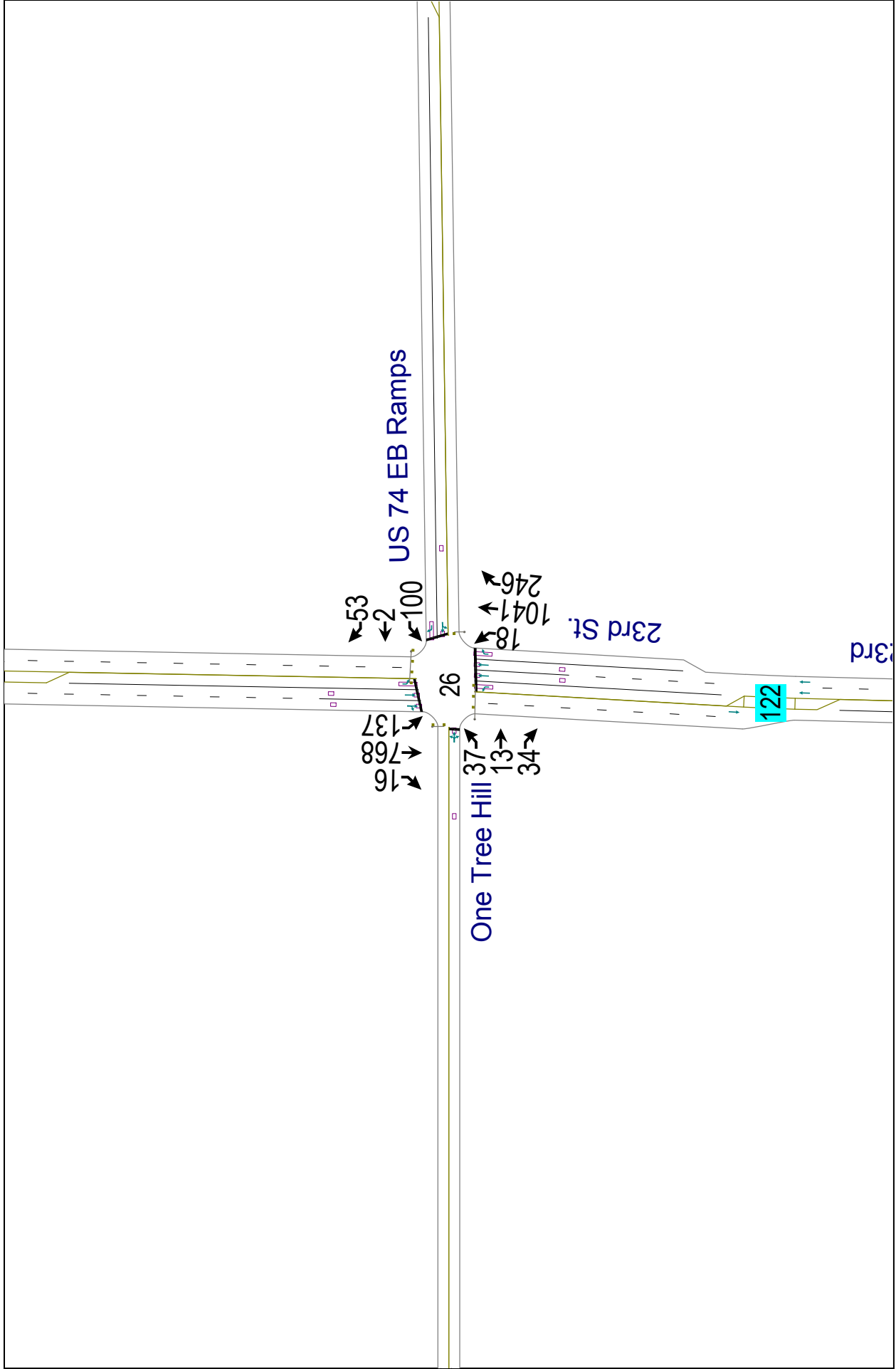
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↰	↕↰		↰	↕
Volume (veh/h)	34	89	1216	25	43	859
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	38	99	1351	28	48	954
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						666
pX, platoon unblocked	0.83					
vC, conflicting volume	2415	689			1379	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2596	689			1379	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	74			90	
cM capacity (veh/h)	15	386			488	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	38	99	901	478	48	954
Volume Left	38	0	0	0	48	0
Volume Right	0	99	0	28	0	0
cSH	15	386	1700	1700	488	1700
Volume to Capacity	2.51	0.26	0.53	0.28	0.10	0.56
Queue Length 95th (ft)	136	25	0	0	8	0
Control Delay (s)	1202.2	17.5	0.0	0.0	13.2	0.0
Lane LOS	F	C			B	
Approach Delay (s)	345.0		0.0		0.6	
Approach LOS	F					

Intersection Summary						
Average Delay			19.0			
Intersection Capacity Utilization			55.2%		ICU Level of Service	B
Analysis Period (min)			15			

25: Scientific Park Dr. & 23rd St.  
2012 Base Year PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↗	↗	↕	↗	↕	↕
Volume (vph)	11	8	18	96	5	33	32	707	160	141	1189	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	675		0	275		225	375		0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1682	0	0	1762	1568	1752	3505	1568	1752	3484	0
Flt Permitted		0.896			0.707		0.197			0.950		
Satd. Flow (perm)	0	1529	0	0	1304	1568	363	3505	1568	1752	3484	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		994			1050			353			1120	
Travel Time (s)		19.4			28.6			5.3			17.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	41	0	0	113	37	36	786	178	157	1373	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm		pm+ov	Perm		Perm		Prot	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6		6			
Detector Phase	8	8		4	4	5	6	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	19.0	19.0	19.0	14.0	19.0	
Total Split (s)	27.0	27.0	0.0	27.0	27.0	26.0	47.0	47.0	47.0	26.0	73.0	0.0
Total Split (%)	27.0%	27.0%	0.0%	27.0%	27.0%	26.0%	47.0%	47.0%	47.0%	26.0%	73.0%	0.0%
Maximum Green (s)	20.0	20.0		20.0	20.0	19.0	40.0	40.0	40.0	19.0	66.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag						Lead	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		15.9			15.9	37.0	53.0	53.0	53.0	16.1	74.1	
Actuated g/C Ratio		0.16			0.16	0.37	0.53	0.53	0.53	0.16	0.74	
v/c Ratio		0.17			0.55	0.06	0.19	0.42	0.21	0.56	0.53	
Control Delay		35.8			47.6	17.4	19.2	16.6	15.5	49.4	3.0	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	

26: One Tree Hill & 23rd St.  
2012 Base Year AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		35.8			47.6	17.4	19.2	16.6	15.5	49.4	3.0	
LOS		D			D	B	B	B	B	D	A	
Approach Delay		35.8			40.2			16.5			7.8	
Approach LOS		D			D			B			A	
Queue Length 50th (ft)		23			67	15	11	152	57	84	52	
Queue Length 95th (ft)		50			115	29	41	250	123	m119	76	
Internal Link Dist (ft)		914			970			273			1040	
Turn Bay Length (ft)							275		225	375		
Base Capacity (vph)		336			287	657	192	1859	832	368	2582	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.12			0.39	0.06	0.19	0.42	0.21	0.43	0.53	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 100  
 Offset: 72 (72%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.56  
 Intersection Signal Delay: 13.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 69.1%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: One Tree Hill & 23rd St.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Volume (vph)	37	13	34	100	2	53	18	1041	246	137	768	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	675		0	275		225	375		0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1688	0	0	1758	1568	1752	3505	1568	1752	3494	0
Flt Permitted		0.790			0.685		0.326			0.950		
Satd. Flow (perm)	0	1364	0	0	1264	1568	601	3505	1568	1752	3494	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		994			1050			353			1120	
Travel Time (s)		19.4			28.6			5.3			17.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	93	0	0	113	59	20	1157	273	152	871	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm		pm+ov	Perm		Perm		Prot	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6		6			
Detector Phase	8	8		4	4	5	6	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	19.0	19.0	19.0	14.0	19.0	
Total Split (s)	20.0	20.0	0.0	20.0	20.0	20.0	50.0	50.0	50.0	20.0	70.0	0.0
Total Split (%)	22.2%	22.2%	0.0%	22.2%	22.2%	22.2%	55.6%	55.6%	55.6%	22.2%	77.8%	0.0%
Maximum Green (s)	13.0	13.0		13.0	13.0	13.0	43.0	43.0	43.0	13.0	63.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag						Lead	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		13.4			13.4	29.2	50.8	50.8	50.8	13.6	70.4	
Actuated g/C Ratio		0.15			0.15	0.32	0.56	0.56	0.56	0.15	0.78	
v/c Ratio		0.46			0.60	0.12	0.06	0.58	0.31	0.57	0.32	
Control Delay		42.2			49.1	18.6	12.3	16.0	13.5	35.2	2.8	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	

26: One Tree Hill & 23rd St.  
2012 Base Year PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		42.2			49.1	18.6	12.3	16.0	13.5	35.2	2.8	
LOS		D			D	B	B	B	B	D	A	
Approach Delay		42.2			38.6			15.5				7.6
Approach LOS		D			D			B				A
Queue Length 50th (ft)		48			59	21	6	246	90	54	80	
Queue Length 95th (ft)		96			115	46	18	316	146	96	12	
Internal Link Dist (ft)		914			970			273			1040	
Turn Bay Length (ft)							275		225	375		
Base Capacity (vph)		227			211	532	340	1980	886	292	2734	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.41			0.54	0.11	0.06	0.58	0.31	0.52	0.32	

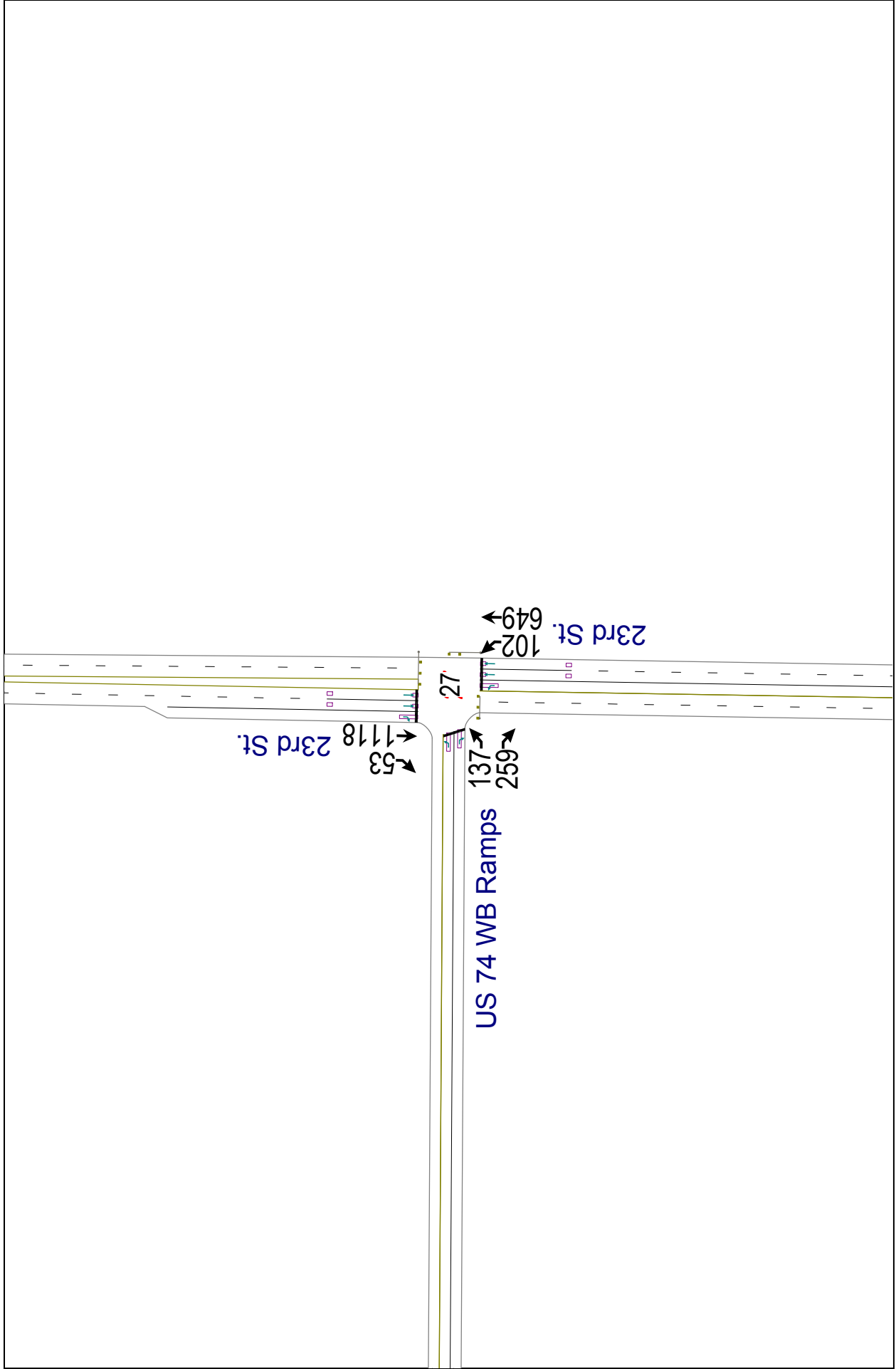
**Intersection Summary**

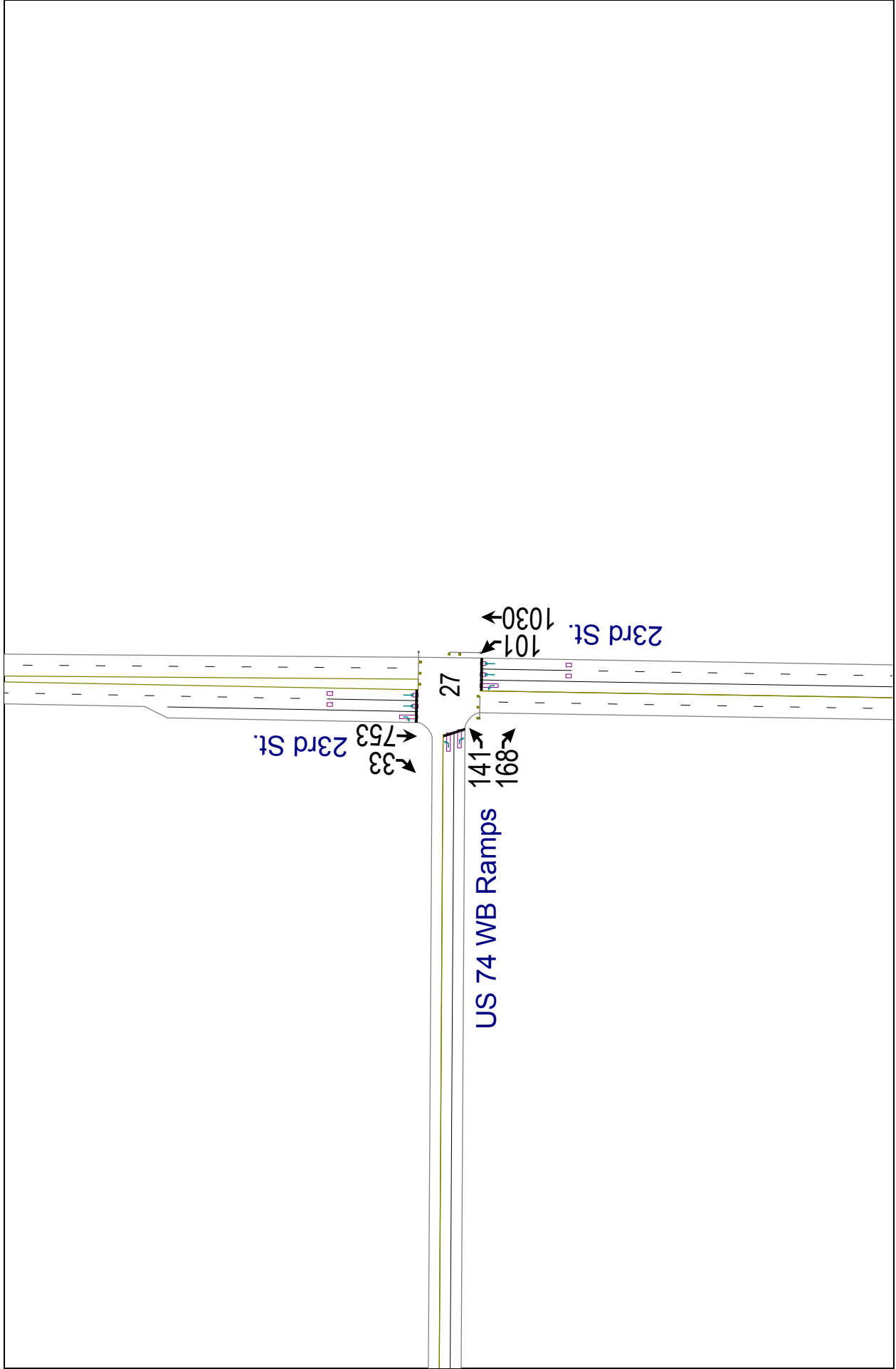
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 46 (51%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.60  
 Intersection Signal Delay: 14.9  
 Intersection Capacity Utilization 60.3%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 26: One Tree Hill & 23rd St.









U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	137	259	102	649	1118	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	975	0	700			275
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Satd. Flow (prot)	1752	1568	1752	3505	3505	1568
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1752	1568	1752	3505	3505	1568
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	25			45	45	
Link Distance (ft)	1174			1083	1057	
Travel Time (s)	32.0			16.4	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	152	288	113	721	1242	59
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8				2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	22.0	21.0	21.0	78.0	57.0	22.0
Total Split (%)	22.0%	21.0%	21.0%	78.0%	57.0%	22.0%
Maximum Green (s)	15.0	14.0	14.0	71.0	50.0	15.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	14.8	33.1	13.3	75.2	56.9	76.7
Actuated g/C Ratio	0.15	0.33	0.13	0.75	0.57	0.77
v/c Ratio	0.58	0.55	0.49	0.27	0.62	0.05
Control Delay	48.8	31.0	49.4	0.8	17.0	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

27: US 74 WB Ramps & 23rd St.  
2012 Base Year AM Peak



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	48.8	31.0	49.4	0.8	17.0	3.4
LOS	D	C	D	A	B	A
Approach Delay	37.2			7.4	16.4	
Approach LOS	D			A	B	
Queue Length 50th (ft)	90	146	35	2	271	8
Queue Length 95th (ft)	154	216	111	3	371	18
Internal Link Dist (ft)	1094			1003	977	
Turn Bay Length (ft)	975		700			275
Base Capacity (vph)	298	562	280	2634	1994	1237
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.51	0.40	0.27	0.62	0.05

**Intersection Summary**

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	16 (16%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	17.0
Intersection LOS:	B
Intersection Capacity Utilization	56.8%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 27: US 74 WB Ramps & 23rd St.



27: US 74 WB Ramps & 23rd St.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	141	168	101	1030	753	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	975	0	700			275
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Satd. Flow (prot)	1752	1568	1752	3505	3505	1568
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1752	1568	1752	3505	3505	1568
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	25			45	45	
Link Distance (ft)	1174			1083	1057	
Travel Time (s)	32.0			16.4	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	157	187	112	1144	837	37
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8				2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	24.0	21.0	21.0	66.0	45.0	24.0
Total Split (%)	26.7%	23.3%	23.3%	73.3%	50.0%	26.7%
Maximum Green (s)	17.0	14.0	14.0	59.0	38.0	17.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	15.0	36.0	16.0	65.0	44.0	64.0
Actuated g/C Ratio	0.17	0.40	0.18	0.72	0.49	0.71
v/c Ratio	0.54	0.30	0.36	0.45	0.49	0.03
Control Delay	40.6	19.1	33.4	1.7	17.3	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

27: US 74 WB Ramps & 23rd St.  
2012 Base Year PM Peak

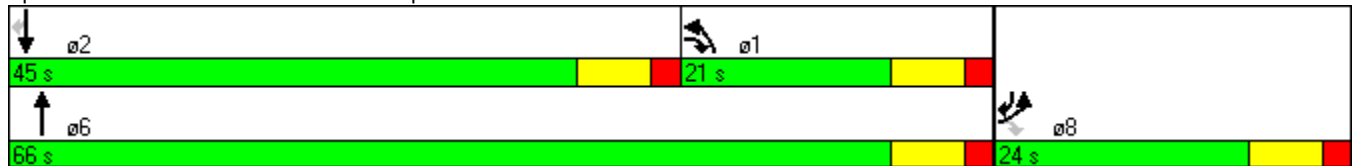


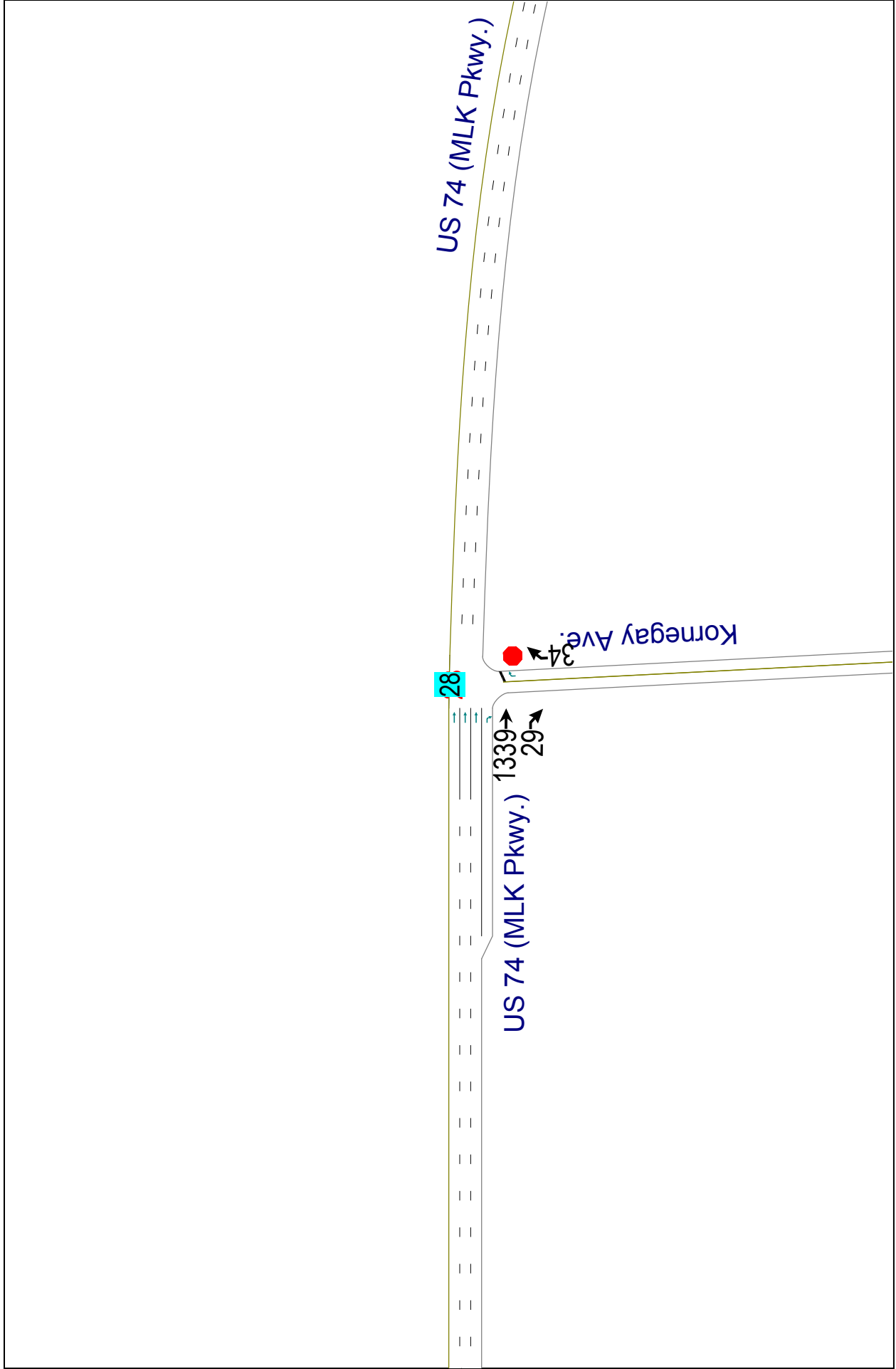
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	40.6	19.1	33.4	1.7	17.3	4.0
LOS	D	B	C	A	B	A
Approach Delay	28.9			4.5	16.7	
Approach LOS	C			A	B	
Queue Length 50th (ft)	82	70	65	4	162	5
Queue Length 95th (ft)	137	112	m112	5	232	13
Internal Link Dist (ft)	1094			1003	977	
Turn Bay Length (ft)	975		700			275
Base Capacity (vph)	370	628	311	2531	1713	1099
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.30	0.36	0.45	0.49	0.03

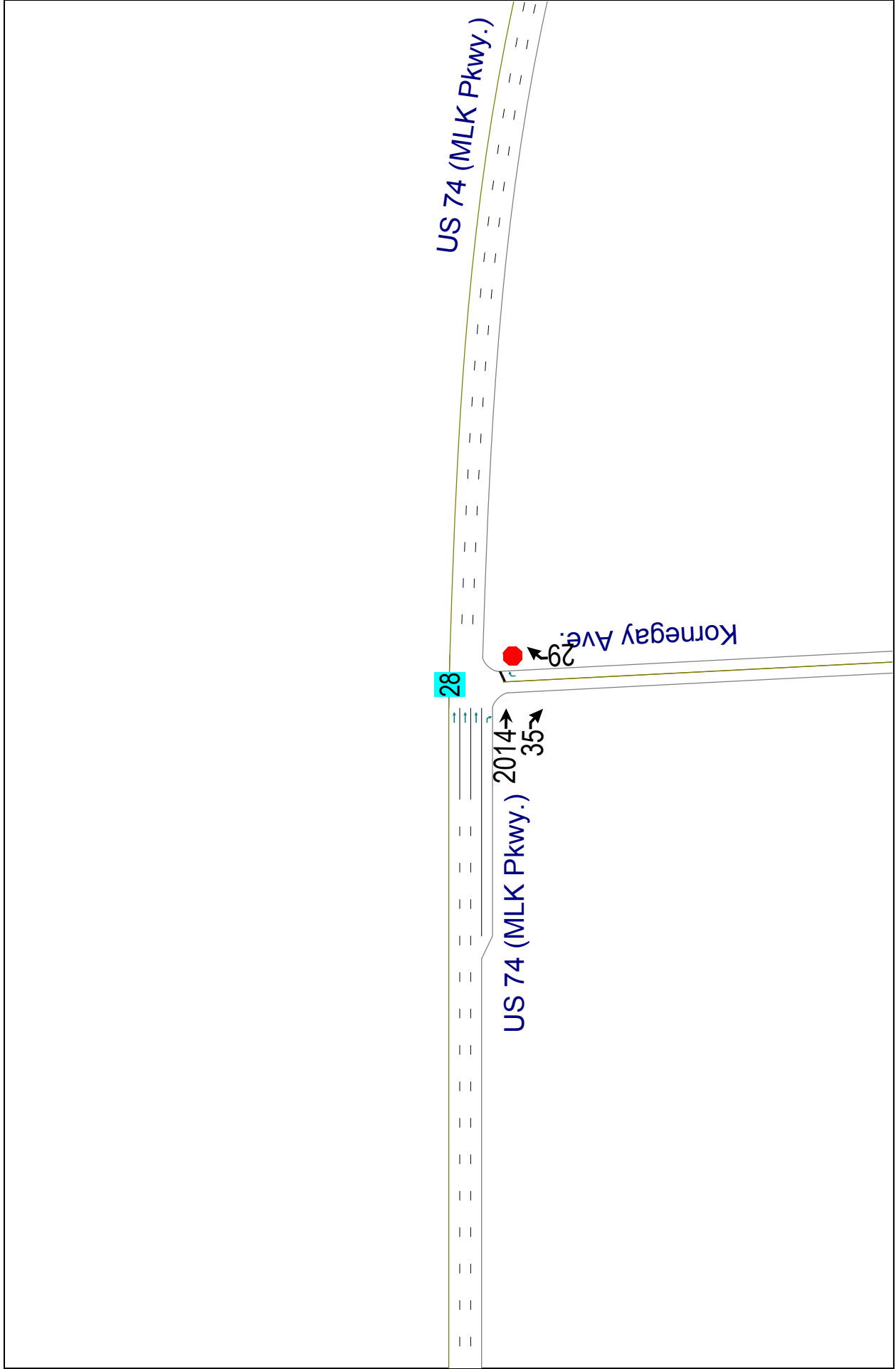
**Intersection Summary**

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 80 (89%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.54  
 Intersection Signal Delay: 12.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 47.0%  
 ICU Level of Service A  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 27: US 74 WB Ramps & 23rd St.









U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 9/11/2012



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑				↑
Volume (vph)	1339	29	0	0	0	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	0		0	0
Storage Lanes		1	0		0	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	4940	1538	0	0	0	1565
Flt Permitted						
Satd. Flow (perm)	4940	1538	0	0	0	1565
Link Speed (mph)	55			55	25	
Link Distance (ft)	1036			1067	820	
Travel Time (s)	12.8			13.2	22.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	0%	0%	5%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1488	32	0	0	0	38
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.9%
	ICU Level of Service A
Analysis Period (min)	15

28: US 74 (MLK Pkwy.) & Kornegay Ave.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/11/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑	↑				↑
Volume (veh/h)	1339	29	0	0	0	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1488	32	0	0	0	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1520		1488	496
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1520		1488	496
tC, single (s)			4.1		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	93
cM capacity (veh/h)			445		112	511

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	NB 1
Volume Total	496	496	496	32	38
Volume Left	0	0	0	0	0
Volume Right	0	0	0	32	38
cSH	1700	1700	1700	1700	511
Volume to Capacity	0.29	0.29	0.29	0.02	0.07
Queue Length 95th (ft)	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	12.6
Lane LOS					B
Approach Delay (s)	0.0				12.6
Approach LOS					B

Intersection Summary					
Average Delay			0.3		
Intersection Capacity Utilization			35.9%	ICU Level of Service	A
Analysis Period (min)			15		

28: US 74 (MLK Pkwy.) & Kornegay Ave.  
 2012 Base Year AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 9/11/2012



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑				↑
Volume (vph)	2014	35	0	0	0	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	0		0	0
Storage Lanes		1	0		0	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	4940	1538	0	0	0	1565
Flt Permitted						
Satd. Flow (perm)	4940	1538	0	0	0	1565
Link Speed (mph)	55			55	25	
Link Distance (ft)	1036			1067	820	
Travel Time (s)	12.8			13.2	22.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	0%	0%	5%	5%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2238	39	0	0	0	32
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.9%
ICU Level of Service	A
Analysis Period (min)	15

28: US 74 (MLK Pkwy.) & Kornegay Ave.  
 2012 Base Year PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/11/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑				↑
Volume (veh/h)	2014	35	0	0	0	29
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2238	39	0	0	0	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			2277		2238	746
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2277		2238	746
tC, single (s)			4.1		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	91
cM capacity (veh/h)			227		34	349

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	NB 1
Volume Total	746	746	746	39	32
Volume Left	0	0	0	0	0
Volume Right	0	0	0	39	32
cSH	1700	1700	1700	1700	349
Volume to Capacity	0.44	0.44	0.44	0.02	0.09
Queue Length 95th (ft)	0	0	0	0	8
Control Delay (s)	0.0	0.0	0.0	0.0	16.3
Lane LOS					C
Approach Delay (s)	0.0				16.3
Approach LOS					C

Intersection Summary					
Average Delay			0.2		
Intersection Capacity Utilization			48.9%	ICU Level of Service	A
Analysis Period (min)			15		

28: US 74 (MLK Pkwy.) & Kornegay Ave.  
 2012 Base Year PM Peak

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information			Site Information					
Analyst		URS	Date Performed		2012			
Agency or Company			Analysis Year		2012 Base Year			
Project Description			U-4434 Independence Boulevard Extension					
<b>35</b>			<b>36</b>			<b>37</b>		
US 74 WB - from 23rd St.			US 74 EB - to 23rd St.			US 74 WB - to 23rd St.		
Merge/Diverge	Merge		Merge/Diverge	Diverge		Merge/Diverge	Diverge	
No. of lanes on Freeway	2		No. of lanes on Freeway	2		No. of lanes on Freeway	2	
Freeway FFS	60 mph		Freeway FFS	60 mph		Freeway FFS	60 mph	
Freeway Volume (AM/PM)	1621	1050	Freeway Volume (AM/PM)	1184	1776	Freeway Volume (AM/PM)	2028	1352
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	50 mph		Ramp FFS	30 mph		Ramp FFS	30 mph	
Ramp Volume (AM/PM)	155	134	Ramp Volume (AM/PM)	134	155	Ramp Volume (AM/PM)	396	309
No. Lanes on Ramp	1		No. Lanes on Ramp	1		No. Lanes on Ramp	1	
Accel/Decel Distance 1	480	ft	Accel/Decel Distance 1	730	ft	Accel/Decel Distance 1	730	ft
Accel/Decel Distance 2	N/A		Accel/Decel Distance 2	N/A		Accel/Decel Distance 2	N/A	
Adjacent Upstream	Yes		Adjacent Upstream	No		Adjacent Upstream	No	
Off/On	Off		Off/On	N/A		Off/On	N/A	
Distance	1160	ft	Distance	N/A		Distance	N/A	
Truck %	3%		Truck %	N/A		Truck %	N/A	
Ramp Volume (AM/PM)	396	309	Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	N/A	N/A
Adjacent Downstream	No		Adjacent Downstream	Yes		Adjacent Downstream	Yes	
Off/On	N/A		Off/On	On - N/A		Off/On	On - N/A	
Distance	N/A		Distance	N/A	ft	Distance	N/A	
Truck %	N/A		Truck %	N/A		Truck %	N/A	
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	N/A	N/A
Peak Hour Factor	0.90		Peak Hour Factor	0.90		Peak Hour Factor	0.90	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	1.00		Population Adj. Factor	1.00	
Freeway Truck %	5%		Freeway Truck %	5%		Freeway Truck %	5%	
Ramp Truck %	3%		Ramp Truck %	3%		Ramp Truck %	3%	
<b>38</b>								
US 74 EB - from 23rd St.								
Merge/Diverge	Merge		Merge/Diverge	Diverge		Merge/Diverge	Diverge	
No. of lanes on Freeway	2		No. of lanes on Freeway	0		No. of lanes on Freeway	0	
Freeway FFS	60 mph		Freeway FFS	0 mph		Freeway FFS	0 mph	
Freeway Volume (AM/PM)	1043	1632	Freeway Volume (AM/PM)	0	0	Freeway Volume (AM/PM)	0	0
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	50 mph		Ramp FFS	0 mph		Ramp FFS	0 mph	
Ramp Volume (AM/PM)	309	396	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
No. Lanes on Ramp	1		No. Lanes on Ramp	0		No. Lanes on Ramp	0	
Accel/Decel Distance 1	480	ft	Accel/Decel Distance 1	0	ft	Accel/Decel Distance 1	0	ft
Accel/Decel Distance 2	N/A		Accel/Decel Distance 2	0	ft	Accel/Decel Distance 2	0	ft
Adjacent Upstream	Yes		Adjacent Upstream	Yes		Adjacent Upstream	Yes	
Off/On	Off		Off/On	On		Off/On	On	
Distance	1780	ft	Distance	0	ft	Distance	0	
Truck %	3%		Truck %	0		Truck %	0	
Ramp Volume (AM/PM)	134	155	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Adjacent Downstream	No		Adjacent Downstream	Yes		Adjacent Downstream	Yes	
Off/On	N/A		Off/On	On		Off/On	On	
Distance	N/A		Distance	0	ft	Distance	0	
Truck %	N/A		Truck %	0		Truck %	0	
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Peak Hour Factor	0.90		Peak Hour Factor	0.00		Peak Hour Factor	0.00	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	0.00		Population Adj. Factor	0.00	
Freeway Truck %	5%		Freeway Truck %	0%		Freeway Truck %	0%	
Ramp Truck %	3%		Ramp Truck %	0%		Ramp Truck %	0%	

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - MULTI LANE SEGMENTS

<b>General Information</b>		<b>Site Information</b>	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2012 Base Year
Project Description		U-4434 Independence Boulevard Extension	

	<b>51</b>			<b>52</b>	
	US 74 WB - East of 23rd St.			US 74 EB - East of 23rd St.	
Base FFS (est.)	60	mph	Base FFS (est.)	60	mph
Median Type	Divided		Median Type	Divided	
Lane Width	12	ft	Lane Width	12	ft
Right Edge	10	ft	Right Edge	10	ft
Left Edge	4	ft	Left Edge	4	ft
Access Points per mi.	0		Access Points per mi.	1	
	<u>Direction 1</u>	<u>Direction 2</u>		<u>Direction 1</u>	<u>Direction 2</u>
Volume (AM/PM)	2028/1352	N/A	Volume (AM/PM)	1352/2028	N/A
PHF	0.9	N/A	PHF	0.9	N/A
No. of Lanes	3	N/A	No. of Lanes	3	N/A
Terrain	Level	N/A	Terrain	Level	N/A
Grade	N/A	N/A	Grade	N/A	N/A
Length	N/A	N/A	Length	N/A	N/A
Trucks and Bus	5%	N/A	Trucks and Bus	5%	N/A
Rec. Vehicles	0%	N/A	Rec. Vehicles	0%	N/A
Driv. Pop. Fac.	1	N/A	Driv. Pop. Fac.	1	N/A

Base FFS (est.)		mph	Base FFS (est.)		mph
Median Type			Median Type		
Lane Width		ft	Lane Width		ft
Right Edge		ft	Right Edge		ft
Left Edge		ft	Left Edge		ft
Access Points per mi.			Access Points per mi.		
	<u>Direction 1</u>	<u>Direction 2</u>		<u>Direction 1</u>	<u>Direction 2</u>
Volume (AM/PM)			Volume (AM/PM)		
PHF			PHF		
No. of Lanes			No. of Lanes		
Terrain			Terrain		
Grade			Grade		
Length			Length		
Trucks and Bus			Trucks and Bus		
Rec. Vehicles			Rec. Vehicles		
Driv. Pop. Fac.			Driv. Pop. Fac.		

Base FFS (est.)		mph	Base FFS (est.)		mph
Median Type			Median Type		
Lane Width		ft	Lane Width		ft
Right Edge		ft	Right Edge		ft
Left Edge		ft	Left Edge		ft
Access Points per mi.			Access Points per mi.		
	<u>Direction 1</u>	<u>Direction 2</u>		<u>Direction 1</u>	<u>Direction 2</u>
Volume (AM/PM)			Volume (AM/PM)		
PHF			PHF		
No. of Lanes			No. of Lanes		
Terrain			Terrain		
Grade			Grade		
Length			Length		
Trucks and Bus			Trucks and Bus		
Rec. Vehicles			Rec. Vehicles		
Driv. Pop. Fac.			Driv. Pop. Fac.		

**HIGHWAY CAPACITY SOFTWARE 2010  
NETWORK DATA SUMMARY - ANALYSIS NOTES**

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2012 Base Year
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV %	Freeway Truck%			
	FR = DS ramp HV %	Freeway Truck%			
	RF = US ramp HV %	Freeway Truck%			
	RR = DS ramp HV %	Freeway Truck%			

Level of Service Standards - Freeways	Level of Service Standards - Signalized Intersections
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004	LOS D or better for overall intersection required
	LOS D or better for individual movements recommended
	If not LOS D for individual movement - v/c ratio must be less than 0.85

**Assumed Improvements**

TIP No.	Description
	NONE

**General Analysis Notes**

- ▶ Interchange Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

**Design Specific Analysis Notes**

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

**Locations where LOS D or better not achieved**

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**

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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	US 74 WB
Agency or Company		Junction	from 23rd St.
Date Performed	2012	Jurisdiction	Segment #35
Analysis Time Period	AM Peak	Analysis Year	2012 Base Year
Project Description U-4434 Independence Boulevard Extension			

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	480	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 1160 ft	Freeway Volume, $V_F$	1621	$L_{down} =$ ft
$V_u =$ 396 veh/h	Ramp Volume, $V_R$	155	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	50.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1621	0.90	Level	5	0	0.976	1.00	1846
Ramp	155	0.90	Level	3	0	0.985	1.00	175
UpStream	396	0.90	Level	3	0	0.985	1.00	447
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
$L_{EQ} =$ (Equation 13-6 or 13-7)	$L_{EQ} =$ (Equation 13-12 or 13-13)
$P_{FM} =$ 1.000 using Equation (Exhibit 13-6)	$P_{FD} =$ using Equation (Exhibit 13-7)
$V_{12} =$ 1846 pc/h	$V_{12} =$ pc/h
$V_3$ or $V_{av34}$ 0 pc/h (Equation 13-14 or 13-17)	$V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	$V_{12} = V_R + (V_F - V_R)P_{FD}$
$L_{EQ} =$ (Equation 13-6 or 13-7)	$L_{EQ} =$ (Equation 13-12 or 13-13)
$P_{FM} =$ 1.000 using Equation (Exhibit 13-6)	$P_{FD} =$ using Equation (Exhibit 13-7)
$V_{12} =$ 1846 pc/h	$V_{12} =$ pc/h
$V_3$ or $V_{av34}$ 0 pc/h (Equation 13-14 or 13-17)	$V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$	2021	Exhibit 13-8	No

### Capacity Checks

	Actual	Capacity	LOS F?
$V_F$		Exhibit 13-8	
$V_{FO} = V_F - V_R$		Exhibit 13-8	
$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2021	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ 18.1 (pc/mi/ln)	$D_R =$ (pc/mi/ln)
LOS = B (Exhibit 13-2)	LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ 18.1 (pc/mi/ln)	$D_R =$ (pc/mi/ln)
LOS = B (Exhibit 13-2)	LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.302 (Exhibit 13-11)	$D_s =$ (Exhibit 13-12)
$S_R =$ 54.6 mph (Exhibit 13-11)	$S_R =$ mph (Exhibit 13-12)
$S_0 =$ N/A mph (Exhibit 13-11)	$S_0 =$ mph (Exhibit 13-12)
$S =$ 54.6 mph (Exhibit 13-13)	$S =$ mph (Exhibit 13-13)

### Speed Determination

$M_S =$ 0.302 (Exhibit 13-11)	$D_s =$ (Exhibit 13-12)
$S_R =$ 54.6 mph (Exhibit 13-11)	$S_R =$ mph (Exhibit 13-12)
$S_0 =$ N/A mph (Exhibit 13-11)	$S_0 =$ mph (Exhibit 13-12)
$S =$ 54.6 mph (Exhibit 13-13)	$S =$ mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	US 74 WB
Agency or Company		Junction	from 23rd St.
Date Performed	2012	Jurisdiction	Segment #35
Analysis Time Period	PM Peak	Analysis Year	2012 Base Year

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	480	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 1160 ft	Freeway Volume, $V_F$	1050	$L_{down} =$ ft
$V_u =$ 309 veh/h	Ramp Volume, $V_R$	134	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	50.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1050	0.90	Level	5	0	0.976	1.00	1196
Ramp	134	0.90	Level	3	0	0.985	1.00	151
UpStream	309	0.90	Level	3	0	0.985	1.00	348
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
(Equation 13-6 or 13-7)

$L_{EQ} =$  1.000 using Equation (Exhibit 13-6)

$P_{FM} =$  1.000 using Equation (Exhibit 13-6)

$V_{12} =$  1196 pc/h

$V_3$  or  $V_{av34} =$  0 pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
(Equation 13-12 or 13-13)

$L_{EQ} =$  using Equation (Exhibit 13-7)

$P_{FD} =$  pc/h

$V_{12} =$  pc/h (Equation 13-14 or 13-17)

$V_3$  or  $V_{av34} =$  pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	1347	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	1347	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$  12.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$  (pc/mi/ln)

LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$  0.288 (Exhibit 13-11)

$S_R =$  54.8 mph (Exhibit 13-11)

$S_0 =$  N/A mph (Exhibit 13-11)

$S =$  54.8 mph (Exhibit 13-13)

### Speed Determination

$D_s =$  (Exhibit 13-12)

$S_R =$  mph (Exhibit 13-12)

$S_0 =$  mph (Exhibit 13-12)

$S =$  mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	US 74 EB
Agency or Company		Junction	to 23rd St.
Date Performed	2012	Jurisdiction	Segment #36
Analysis Time Period	AM Peak	Analysis Year	2012 Base Year

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> =      ft  V <sub>u</sub> =      veh/h	Number of Lanes, N      2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 730 Freeway Volume, V <sub>F</sub> 1184 Ramp Volume, V <sub>R</sub> 134 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> =      ft  V <sub>D</sub> =      veh/h
--	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1184	0.90	Level	5	0	0.976	1.00	1348
Ramp	134	0.90	Level	3	0	0.985	1.00	151
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 L<sub>EQ</sub> = (Equation 13-6 or 13-7)  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 L<sub>EQ</sub> = (Equation 13-12 or 13-13)  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 1348 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	1348	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	1197	Exhibit 13-8	4600 No
V <sub>R</sub>	151	Exhibit 13-10	2000 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	1348	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 9.3 (pc/mi/ln)  
 LOS = A (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.507 (Exhibit 13-12)  
 S<sub>R</sub> = 50.9 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 50.9 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	US 74 EB
Agency or Company		Junction	to 23rd St.
Date Performed	2012	Jurisdiction	Segment #36
Analysis Time Period	PM Peak	Analysis Year	2012 Base Year

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> =      ft  V <sub>u</sub> =      veh/h	Number of Lanes, N      2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 730 Freeway Volume, V <sub>F</sub> 1776 Ramp Volume, V <sub>R</sub> 155 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> =      ft  V <sub>D</sub> =      veh/h
--	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1776	0.90	Level	5	0	0.976	1.00	2023
Ramp	155	0.90	Level	3	0	0.985	1.00	175
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 2023 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2023	Exhibit 13-8 4600	No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	1848	Exhibit 13-8 4600	No
V <sub>R</sub>	175	Exhibit 13-10 2000	No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2023	Exhibit 13-8 4400:All	No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 15.1 (pc/mi/ln)  
 LOS = B (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.509 (Exhibit 13-12)  
 S<sub>R</sub> = 50.8 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 50.8 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	URS				Freeway/Dir of Travel	US 74 WB				
Agency or Company					Junction	to 23rd St.				
Date Performed	2012				Jurisdiction	Segment #37				
Analysis Time Period	AM Peak				Analysis Year	2012 Base Year				
Project Description U-4434 Independence Boulevard Extension										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = ft V <sub>u</sub> = veh/h		Number of Lanes, N Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> Ramp Volume, V <sub>R</sub> Freeway Free-Flow Speed, S <sub>FF</sub> Ramp Free-Flow Speed, S <sub>FR</sub>			2  730 2028 396 60.0 30.0			Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h		
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>		
Freeway	2028	0.90	Level	5	0	0.976	1.00	2310		
Ramp	396	0.90	Level	3	0	0.985	1.00	447		
UpStream										
DownStream										
Merge Areas					Diverge Areas					
Estimation of v <sub>12</sub>					Estimation of v <sub>12</sub>					
$V_{12} = V_F (P_{FM})$ L <sub>EQ</sub> = (Equation 13-6 or 13-7) P <sub>FM</sub> = using Equation (Exhibit 13-6) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L <sub>EQ</sub> = (Equation 13-12 or 13-13) P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7) V <sub>12</sub> = 2310 pc/h V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V <sub>FO</sub>		Exhibit 13-8			V <sub>F</sub>	2310	Exhibit 13-8	4600	No	
			V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	1863	Exhibit 13-8	4600	No			
			V <sub>R</sub>	447	Exhibit 13-10	2000	No			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>	2310	Exhibit 13-8	4400:All	No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D <sub>R</sub> = 5.475 + 0.00734 v <sub>R</sub> + 0.0078 V <sub>12</sub> - 0.00627 L <sub>A</sub>					D <sub>R</sub> = 4.252 + 0.0086 V <sub>12</sub> - 0.009 L <sub>D</sub>					
D <sub>R</sub> = (pc/mi/ln)					D <sub>R</sub> = 17.5 (pc/mi/ln)					
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M <sub>S</sub> = (Exhibit 13-11)					D <sub>S</sub> = 0.533 (Exhibit 13-12)					
S <sub>R</sub> = mph (Exhibit 13-11)					S <sub>R</sub> = 50.4 mph (Exhibit 13-12)					
S <sub>0</sub> = mph (Exhibit 13-11)					S <sub>0</sub> = N/A mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 50.4 mph (Exhibit 13-13)					

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	US 74 WB
Agency or Company		Junction	to 23rd St.
Date Performed	2012	Jurisdiction	Segment #37
Analysis Time Period	PM Peak	Analysis Year	2012 Base Year

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> =      ft  V <sub>u</sub> =      veh/h	Number of Lanes, N      2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 730 Freeway Volume, V <sub>F</sub> 1352 Ramp Volume, V <sub>R</sub> 396 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 30.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> =      ft  V <sub>D</sub> =      veh/h
--	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1352	0.90	Level	5	0	0.976	1.00	1540
Ramp	396	0.90	Level	3	0	0.985	1.00	447
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 L<sub>EQ</sub> = (Equation 13-6 or 13-7)  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 L<sub>EQ</sub> = (Equation 13-12 or 13-13)  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 1540 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	1540	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	1093	Exhibit 13-8	4600 No
V <sub>R</sub>	447	Exhibit 13-10	2000 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	1540	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 10.9 (pc/mi/ln)  
 LOS = B (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.533 (Exhibit 13-12)  
 S<sub>R</sub> = 50.4 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 50.4 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information				Site Information					
Analyst	URS	Freeway/Dir of Travel	US 74 EB						
Agency or Company		Junction	from 23rd St.						
Date Performed	2012	Jurisdiction	Segment #38						
Analysis Time Period	AM Peak	Analysis Year	2012 Base Year						
Project Description U-4434 Independence Boulevard Extension									
<b>Inputs</b>									
Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 1780 ft V <sub>u</sub> = 134 veh/h	Number of Lanes, N Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> Ramp Volume, V <sub>R</sub> Freeway Free-Flow Speed, S <sub>FF</sub> Ramp Free-Flow Speed, S <sub>FR</sub>	2 480  1043 309 60.0 50.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h						
<b>Conversion to pc/h Under Base Conditions</b>									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	1043	0.90	Level	5	0	0.976	1.00	1188	
Ramp	309	0.90	Level	3	0	0.985	1.00	348	
UpStream	134	0.90	Level	3	0	0.985	1.00	151	
DownStream									
<b>Merge Areas</b>				<b>Diverge Areas</b>					
<b>Estimation of v<sub>12</sub></b>				<b>Estimation of v<sub>12</sub></b>					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 1188 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> = pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					
<b>Capacity Checks</b>				<b>Capacity Checks</b>					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V <sub>FO</sub>	1536	Exhibit 13-8		No	V <sub>F</sub>		Exhibit 13-8		
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8		
					V <sub>R</sub>		Exhibit 13-10		
<b>Flow Entering Merge Influence Area</b>				<b>Flow Entering Diverge Influence Area</b>					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V <sub>R12</sub>	1536	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-8		
<b>Level of Service Determination (if not F)</b>				<b>Level of Service Determination (if not F)</b>					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 14.3 (pc/mi/ln) LOS = B (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)					
<b>Speed Determination</b>				<b>Speed Determination</b>					
M <sub>S</sub> =	0.291 (Exhibit 13-11)			D <sub>S</sub> =	(Exhibit 13-12)				
S <sub>R</sub> =	54.8 mph (Exhibit 13-11)			S <sub>R</sub> =	mph (Exhibit 13-12)				
S <sub>0</sub> =	N/A mph (Exhibit 13-11)			S <sub>0</sub> =	mph (Exhibit 13-12)				
S =	54.8 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)				

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	US 74 EB
Agency or Company		Junction	from 23rd St.
Date Performed	2012	Jurisdiction	Segment #38
Analysis Time Period	AM Peak	Analysis Year	2012 Base Year

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Acceleration Lane Length, $L_A$	480	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 1780 ft	Freeway Volume, $V_F$	1632	$L_{down} =$ ft
$V_u =$ 155 veh/h	Ramp Volume, $V_R$	396	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	50.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1632	0.90	Level	5	0	0.976	1.00	1859
Ramp	396	0.90	Level	3	0	0.985	1.00	447
UpStream	155	0.90	Level	3	0	0.985	1.00	175
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$

$L_{EQ} =$  (Equation 13-6 or 13-7)

$P_{FM} =$  1.000 using Equation (Exhibit 13-6)

$V_{12} =$  1859 pc/h

$V_3$  or  $V_{av34} =$  0 pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$

$L_{EQ} =$  (Equation 13-12 or 13-13)

$P_{FD} =$  using Equation (Exhibit 13-7)

$V_{12} =$  pc/h

$V_3$  or  $V_{av34} =$  pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2306	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2306	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$  20.2 (pc/mi/ln)

LOS = C (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$  (pc/mi/ln)

LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$  0.312 (Exhibit 13-11)

$S_R =$  54.4 mph (Exhibit 13-11)

$S_0 =$  N/A mph (Exhibit 13-11)

$S =$  54.4 mph (Exhibit 13-13)

### Speed Determination

$D_s =$  (Exhibit 13-12)

$S_R =$  mph (Exhibit 13-12)

$S_0 =$  mph (Exhibit 13-12)

$S =$  mph (Exhibit 13-13)



## MULTILANE HIGHWAYS WORKSHEET(Direction 1)



General Information		Site Information	
Analyst	URS	Highway/Direction to Travel	US 74 WB
Agency or Company		From/To	East of 23rd St.
Date Performed	2012	Jurisdiction	Segment #51
Analysis Time Period	AM Peak	Analysis Year	2012 Base Year
Project Description U-4434 Independence Boulevard Extension			

 Oper.(LOS)

 Des. (N)

 Plan. (vp)

### Flow Inputs

Volume, V (veh/h)	2028	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P <sub>T</sub>	5
Peak-Hour Prop of AADT (veh/d)		%RVs, P <sub>R</sub>	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	3

### Calculate Flow Adjustments

f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub>	0.976

### Speed Inputs

Lane Width, LW (ft)	12.0	f <sub>LW</sub> (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f <sub>LC</sub> (mi/h)	0.4
Access Points, A (A/mi)	0	f <sub>A</sub> (mi/h)	0.0
Median Type, M	Divided	f <sub>M</sub> (mi/h)	0.0
FFS (measured)		FFS (mi/h)	59.6
Base Free-Flow Speed, BFFS	60.0		

### Calc Speed Adj and FFS

### Operations

<u>Operational (LOS)</u>		<u>Design (N)</u>	
Flow Rate, v <sub>p</sub> (pc/h/ln)	769	Required Number of Lanes, N	
Speed, S (mi/h)	60.0	Flow Rate, v <sub>p</sub> (pc/h)	
D (pc/mi/ln)	12.8	Max Service Flow Rate (pc/h/ln)	
LOS	B	Design LOS	

### Bicycle Level of Service

Directional demand flow rate in outside lane, v <sub>OL</sub> (Eq. 15-24) veh/h	751.1
Effective width, W <sub>v</sub> (Eq. 15-29) ft	24.00
Effective speed factor, S <sub>f</sub> (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.53
Bicycle level of service (Exhibit 15-4)	D

## MULTILANE HIGHWAYS WORKSHEET(Direction 1)



General Information		Site Information	
Analyst	URS	Highway/Direction to Travel	US 74 WB
Agency or Company		From/To	East of 23rd St.
Date Performed	2012	Jurisdiction	Segment #51
Analysis Time Period	PM Peak	Analysis Year	2012 Base Year
Project Description U-4434 Independence Boulevard Extension			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			

Flow Inputs			
Volume, V (veh/h)	1352	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P <sub>T</sub>	5
Peak-Hour Prop of AADT (veh/d)		%RVs, P <sub>R</sub>	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	3

Calculate Flow Adjustments			
f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub>	0.976

Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f <sub>LW</sub> (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f <sub>LC</sub> (mi/h)	0.4
Access Points, A (A/mi)	0	f <sub>A</sub> (mi/h)	0.0
Median Type, M	Divided	f <sub>M</sub> (mi/h)	0.0
FFS (measured)		FFS (mi/h)	59.6
Base Free-Flow Speed, BFFS	60.0		

Operations		Design	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
Flow Rate, v <sub>p</sub> (pc/h/ln)	513	Required Number of Lanes, N	
Speed, S (mi/h)	60.0	Flow Rate, v <sub>p</sub> (pc/h)	
D (pc/mi/ln)	8.6	Max Service Flow Rate (pc/h/ln)	
LOS	A	Design LOS	

Bicycle Level of Service	
Directional demand flow rate in outside lane, v <sub>OL</sub> (Eq. 15-24) veh/h	500.7
Effective width, W <sub>v</sub> (Eq. 15-29) ft	24.00
Effective speed factor, S <sub>f</sub> (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.32
Bicycle level of service (Exhibit 15-4)	C

## MULTILANE HIGHWAYS WORKSHEET(Direction 1)



General Information		Site Information	
Analyst	URS	Highway/Direction to Travel	US 74 EB
Agency or Company		From/To	East of 23rd St.
Date Performed	2012	Jurisdiction	Segment #52
Analysis Time Period	AM Peak	Analysis Year	2012 Base Year
Project Description U-4434 Independence Boulevard Extension			

Oper.(LOS)
  Des. (N)
 Plan. (vp)

Flow Inputs			
Volume, V (veh/h)	1352	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P <sub>T</sub>	5
Peak-Hour Prop of AADT (veh/d)		%RVs, P <sub>R</sub>	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	3

Calculate Flow Adjustments			
f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub>	0.976

Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f <sub>LW</sub> (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f <sub>LC</sub> (mi/h)	0.4
Access Points, A (A/mi)	1	f <sub>A</sub> (mi/h)	0.3
Median Type, M	Divided	f <sub>M</sub> (mi/h)	0.0
FFS (measured)		FFS (mi/h)	59.3
Base Free-Flow Speed, BFFS	60.0		

Operations		Design	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
Flow Rate, v <sub>p</sub> (pc/h/ln)	513	Required Number of Lanes, N	
Speed, S (mi/h)	60.0	Flow Rate, v <sub>p</sub> (pc/h)	
D (pc/mi/ln)	8.6	Max Service Flow Rate (pc/h/ln)	
LOS	A	Design LOS	

Bicycle Level of Service	
Directional demand flow rate in outside lane, v <sub>OL</sub> (Eq. 15-24) veh/h	500.7
Effective width, W <sub>v</sub> (Eq. 15-29) ft	24.00
Effective speed factor, S <sub>f</sub> (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.32
Bicycle level of service (Exhibit 15-4)	C

## MULTILANE HIGHWAYS WORKSHEET(Direction 1)



General Information		Site Information	
Analyst	URS	Highway/Direction to Travel	US 74 EB
Agency or Company		From/To	East of 23rd St.
Date Performed	2012	Jurisdiction	Segment #52
Analysis Time Period	PM Peak	Analysis Year	2012 Base Year
Project Description U-4434 Independence Boulevard Extension			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			

Flow Inputs			
Volume, V (veh/h)	2028	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P <sub>T</sub>	5
Peak-Hour Prop of AADT (veh/d)		%RVs, P <sub>R</sub>	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	3

Calculate Flow Adjustments			
f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub>	0.976

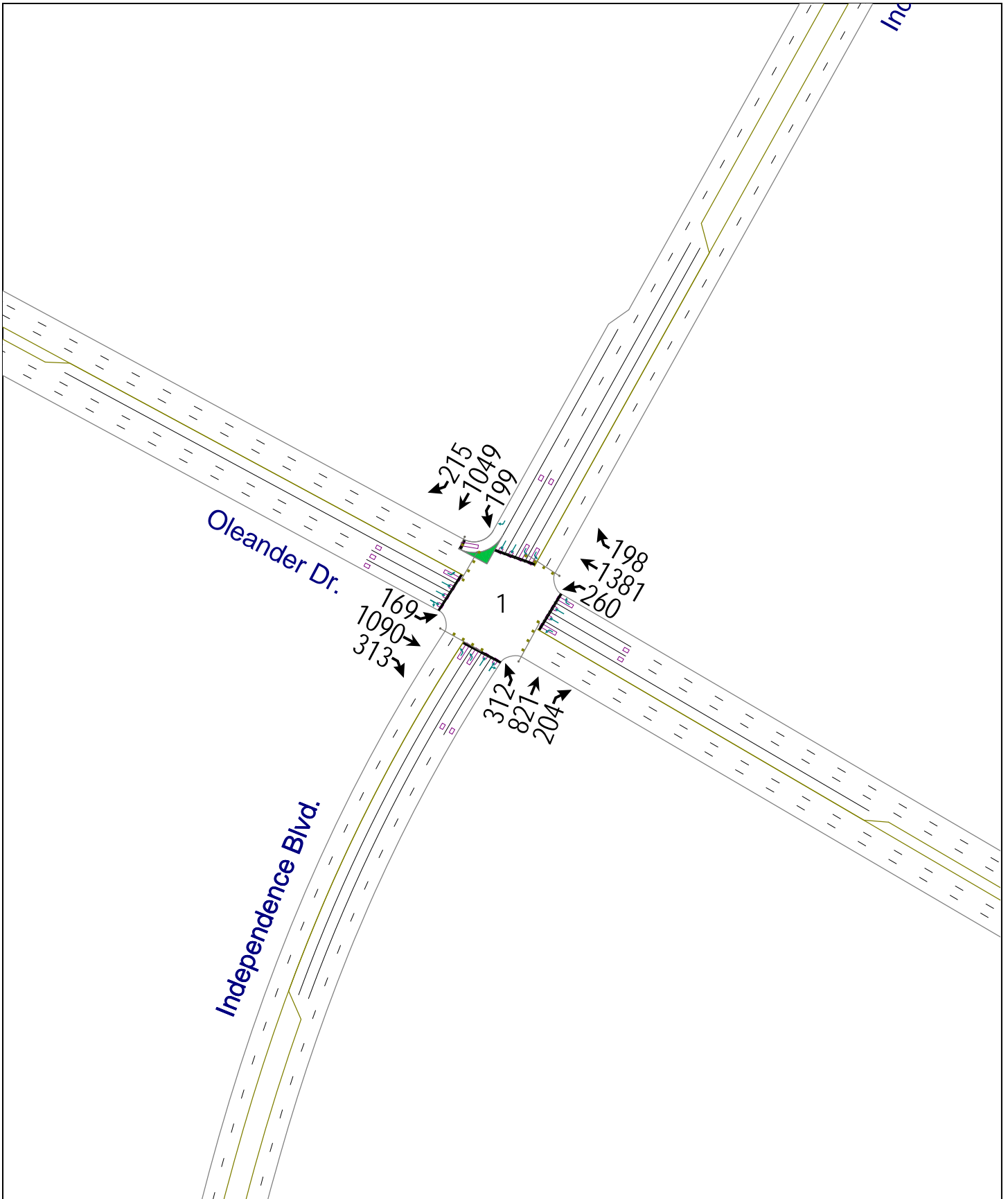
Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f <sub>LW</sub> (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f <sub>LC</sub> (mi/h)	0.4
Access Points, A (A/mi)	1	f <sub>A</sub> (mi/h)	0.3
Median Type, M	Divided	f <sub>M</sub> (mi/h)	0.0
FFS (measured)		FFS (mi/h)	59.3
Base Free-Flow Speed, BFFS	60.0		

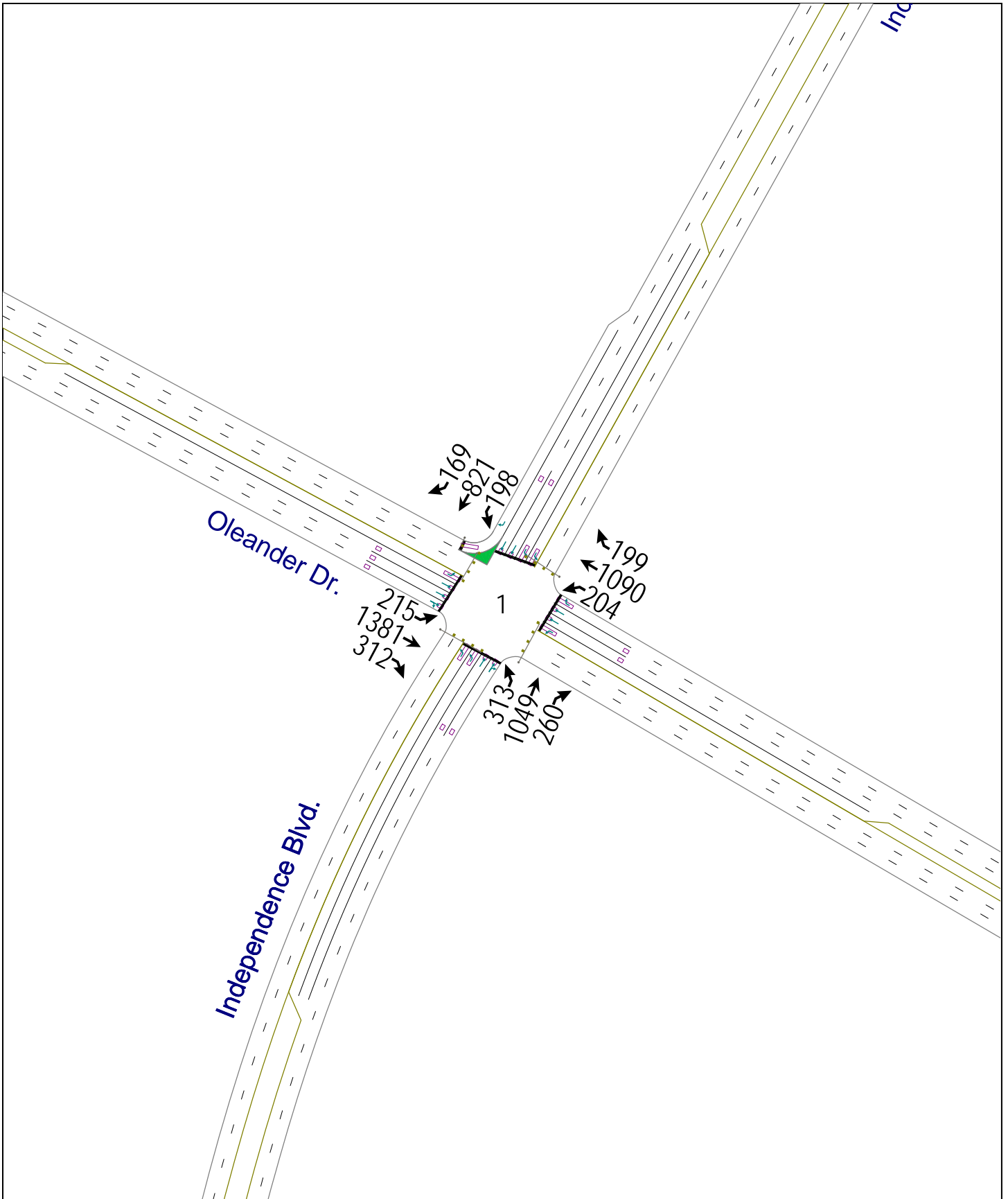
Operations		Design	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
Flow Rate, v <sub>p</sub> (pc/h/ln)	769	Required Number of Lanes, N	
Speed, S (mi/h)	60.0	Flow Rate, v <sub>p</sub> (pc/h)	
D (pc/mi/ln)	12.8	Max Service Flow Rate (pc/h/ln)	
LOS	B	Design LOS	

Bicycle Level of Service	
Directional demand flow rate in outside lane, v <sub>OL</sub> (Eq. 15-24) veh/h	751.1
Effective width, W <sub>v</sub> (Eq. 15-29) ft	24.00
Effective speed factor, S <sub>f</sub> (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.53
Bicycle level of service (Exhibit 15-4)	D

**Appendix H: 2040 No Build Traffic Capacity Analysis**

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U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	1090	313	260	1381	198	312	821	204	199	1049	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	425		0	440		0	400		275
Storage Lanes	1		0	1		1	2		0	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	4823	0	1736	3471	1553	3400	3400	0	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	4823	0	1736	3471	1553	3400	3400	0	3400	3505	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			45			45	
Link Distance (ft)		949			990			888			1128	
Travel Time (s)		16.2			16.9			13.5			17.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	188	1559	0	289	1534	220	347	1139	0	221	1166	239
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		pm+ov	Prot			Prot		pm+ov
Protected Phases	3	8		7	4	5	1	6		5	2	3
Permitted Phases						4						2
Detector Phase	3	8		7	4	5	1	6		5	2	3
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	14.0	14.0	19.0		14.0	19.0	14.0
Total Split (s)	18.0	51.0	0.0	28.0	61.0	14.0	17.0	57.0	0.0	14.0	54.0	18.0
Total Split (%)	12.0%	34.0%	0.0%	18.7%	40.7%	9.3%	11.3%	38.0%	0.0%	9.3%	36.0%	12.0%
Maximum Green (s)	11.0	44.0		21.0	54.0	7.0	10.0	50.0		7.0	47.0	11.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	None
Act Effct Green (s)	13.0	46.0		23.0	56.0	65.0	12.0	52.0		9.0	49.0	62.0
Actuated g/C Ratio	0.09	0.31		0.15	0.37	0.43	0.08	0.35		0.06	0.33	0.41
v/c Ratio	1.25	1.05		1.09	1.18	0.33	1.28	0.97		1.08	1.02	0.37
Control Delay	209.8	88.5		137.6	132.2	21.0	201.8	67.2		109.4	46.3	9.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0

1: Oleander Dr. & Independence Blvd.  
2040 No Build AM Peak

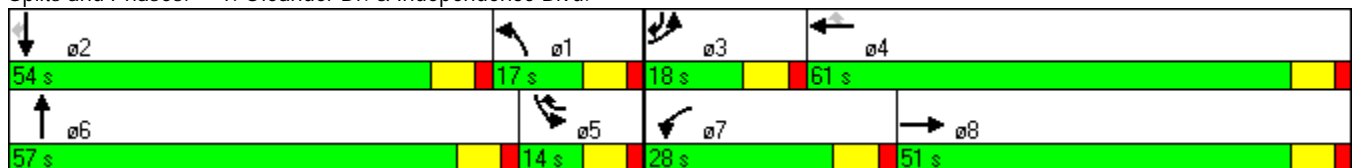


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	209.8	88.5		137.6	132.2	21.0	201.8	67.2		109.4	46.3	9.5
LOS	F	F		F	F	C	F	E		F	D	A
Approach Delay		101.6			121.0			98.6			49.5	
Approach LOS		F			F			F			D	
Queue Length 50th (ft)	~229	~608		~316	~945	100	~220	575		~125	~552	53
Queue Length 95th (ft)	#391	#705		#507	#1085	148	#325	#726		m#137	m#530	m57
Internal Link Dist (ft)		869			910			808			1048	
Turn Bay Length (ft)	500			425			440			400		275
Base Capacity (vph)	150	1479		266	1296	673	272	1179		204	1145	648
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.25	1.05		1.09	1.18	0.33	1.28	0.97		1.08	1.02	0.37

**Intersection Summary**

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 48 (32%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 170  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.28  
 Intersection Signal Delay: 94.4      Intersection LOS: F  
 Intersection Capacity Utilization 102.1%      ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Oleander Dr. & Independence Blvd.



1: Oleander Dr. & Independence Blvd.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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12/18/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	215	1381	312	204	1090	199	313	1049	260	198	821	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	425		0	440		0	400		275
Storage Lanes	1		0	1		1	2		0	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	4848	0	1736	3471	1553	3400	3400	0	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	4848	0	1736	3471	1553	3400	3400	0	3400	3505	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			45			45	
Link Distance (ft)		949			990			888			1128	
Travel Time (s)		16.2			16.9			13.5			17.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	239	1881	0	227	1211	221	348	1455	0	220	912	188
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		pm+ov	Prot			Prot		pm+ov
Protected Phases	3	8		7	4	5	1	6		5	2	3
Permitted Phases						4						2
Detector Phase	3	8		7	4	5	1	6		5	2	3
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	14.0	14.0	19.0		14.0	19.0	14.0
Total Split (s)	22.0	54.0	0.0	21.0	53.0	14.0	23.0	61.0	0.0	14.0	52.0	22.0
Total Split (%)	14.7%	36.0%	0.0%	14.0%	35.3%	9.3%	15.3%	40.7%	0.0%	9.3%	34.7%	14.7%
Maximum Green (s)	15.0	47.0		14.0	46.0	7.0	16.0	54.0		7.0	45.0	15.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	None
Act Effct Green (s)	17.0	49.0		16.0	48.0	57.0	18.0	56.0		9.0	47.0	69.0
Actuated g/C Ratio	0.11	0.33		0.11	0.32	0.38	0.12	0.37		0.06	0.31	0.46
v/c Ratio	1.21	1.19		1.23	1.09	0.37	0.85	1.15		1.08	0.83	0.26
Control Delay	186.8	134.8		193.5	102.2	21.9	84.3	118.0		121.3	42.4	14.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0

1: Oleander Dr. & Independence Blvd.  
2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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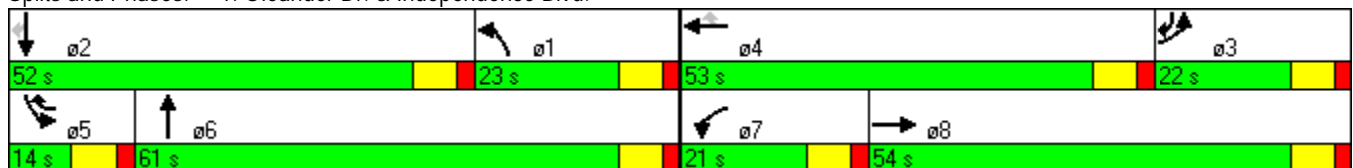


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	186.8	134.8		193.5	102.2	21.9	84.3	118.0		121.3	42.4	14.7
LOS	F	F		F	F	C	F	F		F	D	B
Approach Delay		140.7			104.0			111.5			51.6	
Approach LOS		F			F			F			D	
Queue Length 50th (ft)	~285	~809		~273	~700	107	174	~875		~124	448	93
Queue Length 95th (ft)	#466	#903		#447	#840	159	#255	#1015		m#170	m506	m116
Internal Link Dist (ft)		869			910			808			1048	
Turn Bay Length (ft)	500			425			440			400		275
Base Capacity (vph)	197	1584		185	1111	590	408	1269		204	1098	721
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.21	1.19		1.23	1.09	0.37	0.85	1.15		1.08	0.83	0.26

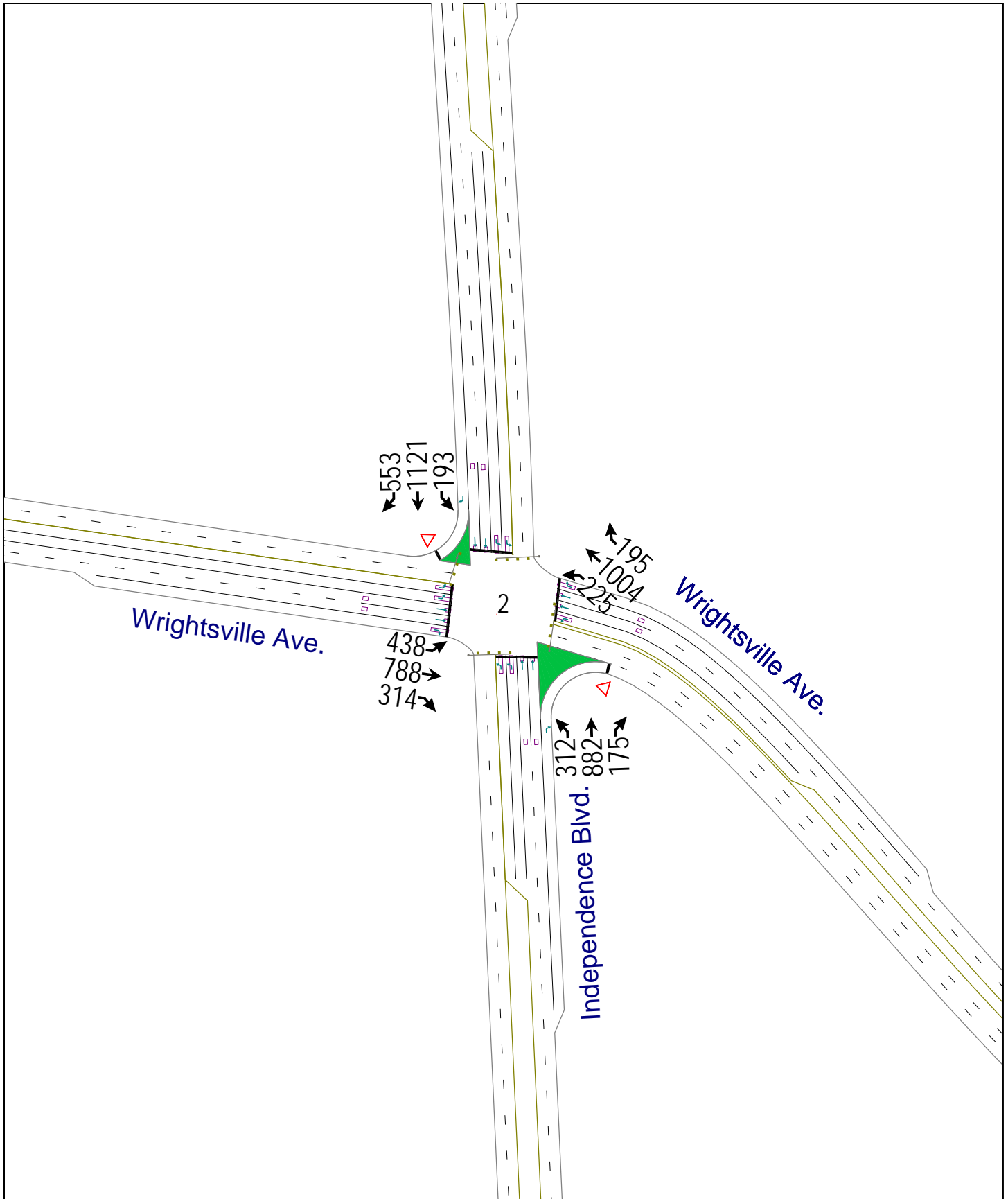
Intersection Summary

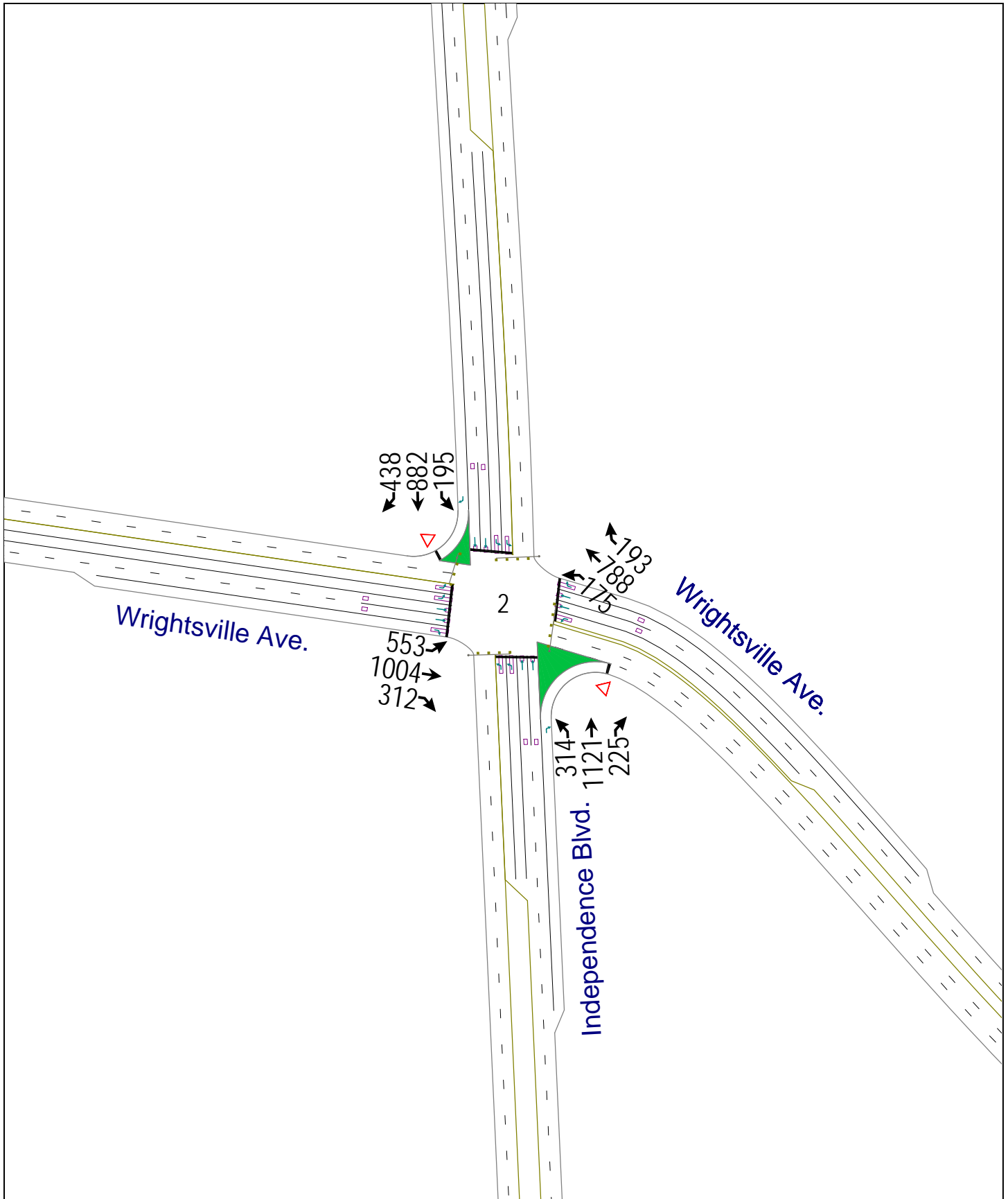
Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 88 (59%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.23  
 Intersection Signal Delay: 107.2  
 Intersection LOS: F  
 Intersection Capacity Utilization 104.7%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Oleander Dr. & Independence Blvd.



1: Oleander Dr. & Independence Blvd.  
 2040 No Build PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
12/18/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	438	788	314	225	1004	195	312	882	175	193	1121	553
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	575		400	325		500	250		400	450		950
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	3400	3505	1568	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	3400	3505	1568	3400	3505	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1010			973			1006			1461	
Travel Time (s)		19.7			19.0			15.2			22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	487	876	349	250	1116	217	347	980	194	214	1246	614
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	7.0	10.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	17.0	14.0	14.0	17.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	26.0	48.0	19.0	28.0	50.0	17.0	19.0	57.0	28.0	17.0	55.0	26.0
Total Split (%)	17.3%	32.0%	12.7%	18.7%	33.3%	11.3%	12.7%	38.0%	18.7%	11.3%	36.7%	17.3%
Maximum Green (s)	19.0	41.0	12.0	21.0	43.0	10.0	12.0	50.0	21.0	10.0	48.0	19.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	21.0	42.0	56.0	24.0	45.0	62.0	14.0	52.0	81.0	12.0	50.0	71.0
Actuated g/C Ratio	0.14	0.28	0.37	0.16	0.30	0.41	0.09	0.35	0.54	0.08	0.33	0.47
v/c Ratio	1.01	0.88	0.59	0.88	1.05	0.33	1.09	0.81	0.23	0.79	1.07	0.83
Control Delay	106.9	63.0	24.9	92.2	91.9	31.7	115.4	35.8	8.2	77.5	85.8	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2: Wrightsville Ave. & Independence Blvd.  
2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 12/18/2012

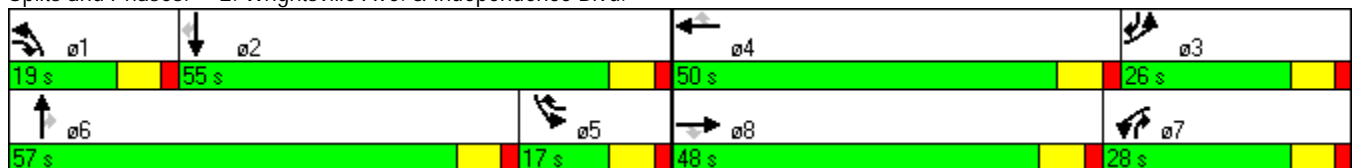


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	106.9	63.0	24.9	92.2	91.9	31.7	115.4	35.8	8.2	77.5	85.8	29.7
LOS	F	E	C	F	F	C	F	D	A	E	F	C
Approach Delay	67.7			83.7			50.4			68.3		
Approach LOS	E			F			D			E		
Queue Length 50th (ft)	~254	430	168	245	-624	143	~194	460	45	111	~716	372
Queue Length 95th (ft)	#375	517	236	#412	#764	213	m#220	m475	m55	m134	m#785	m409
Internal Link Dist (ft)	930			893			926			1381		
Turn Bay Length (ft)	575		400	325		500	250		400	450		950
Base Capacity (vph)	481	1015	592	283	1062	654	317	1215	846	272	1168	742
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.86	0.59	0.88	1.05	0.33	1.09	0.81	0.23	0.79	1.07	0.83

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 67.8  
 Intersection LOS: E  
 Intersection Capacity Utilization 96.8%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Wrightsville Ave. & Independence Blvd.



2: Wrightsville Ave. & Independence Blvd.  
 2040 No Build AM Peak



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
12/18/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	553	1004	312	175	788	193	314	1121	225	195	882	438
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	575		400	325		500	250		400	450		950
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	3400	3505	1568	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	3400	3505	1568	3400	3505	1568
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1010			973			1006			1461	
Travel Time (s)		19.7			19.0			15.2			22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	614	1116	347	194	876	214	349	1246	250	217	980	487
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	7.0	10.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	17.0	14.0	14.0	17.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	32.0	53.0	21.0	22.0	43.0	15.0	21.0	60.0	22.0	15.0	54.0	32.0
Total Split (%)	21.3%	35.3%	14.0%	14.7%	28.7%	10.0%	14.0%	40.0%	14.7%	10.0%	36.0%	21.3%
Maximum Green (s)	25.0	46.0	14.0	15.0	36.0	8.0	14.0	53.0	15.0	8.0	47.0	25.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	27.0	48.0	64.0	17.0	38.0	48.0	16.0	55.0	72.0	10.0	49.0	76.0
Actuated g/C Ratio	0.18	0.32	0.43	0.11	0.25	0.32	0.11	0.37	0.48	0.07	0.33	0.51
v/c Ratio	0.99	0.99	0.51	0.97	0.98	0.42	0.96	0.97	0.33	0.96	0.86	0.61
Control Delay	95.3	73.8	23.2	120.0	80.0	27.4	69.9	33.9	8.4	108.2	45.9	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2: Wrightsville Ave. & Independence Blvd.  
2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 12/18/2012

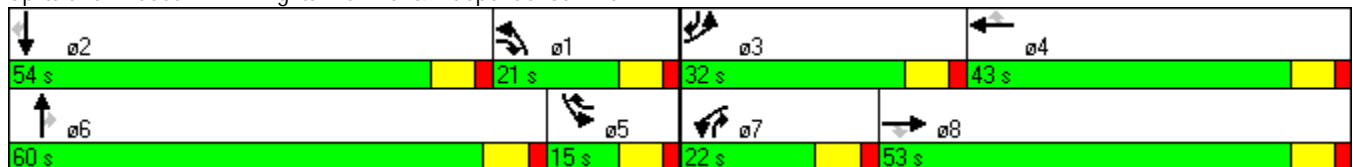


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	95.3	73.8	23.2	120.0	80.0	27.4	69.9	33.9	8.4	108.2	45.9	24.7
LOS	F	E	C	F	F	C	E	C	A	F	D	C
Approach Delay	71.7			77.3			37.3			47.8		
Approach LOS	E			E			D			D		
Queue Length 50th (ft)	312	572	164	192	451	101	178	512	58	114	378	267
Queue Length 95th (ft)	#443	#726	230	#354	#593	151	m173	m413	m57	m#174	502	m321
Internal Link Dist (ft)	930			893			926			1381		
Turn Bay Length (ft)	575		400	325		500	250		400	450		950
Base Capacity (vph)	618	1132	675	201	897	507	363	1285	753	227	1145	794
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.99	0.51	0.97	0.98	0.42	0.96	0.97	0.33	0.96	0.86	0.61

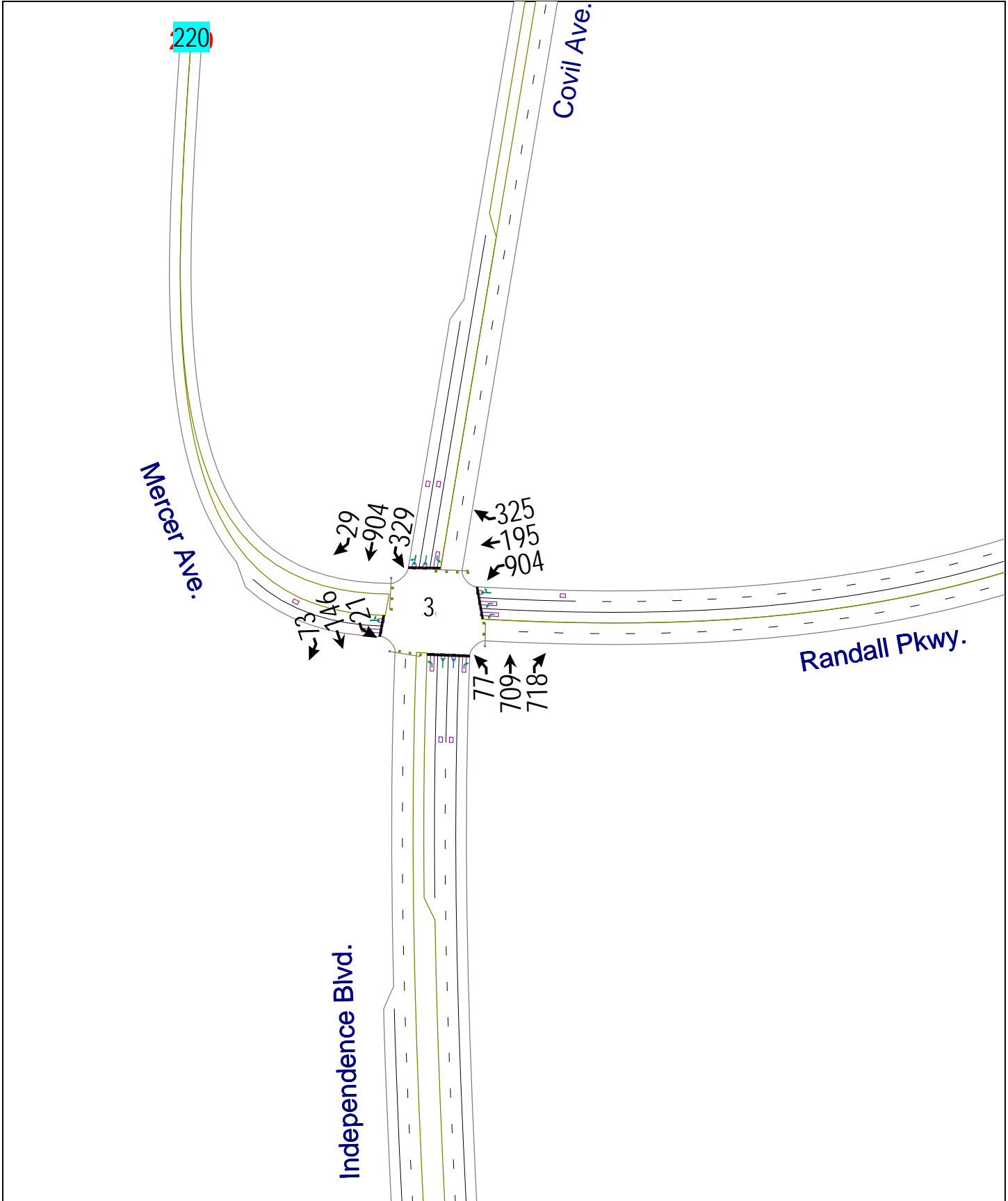
Intersection Summary

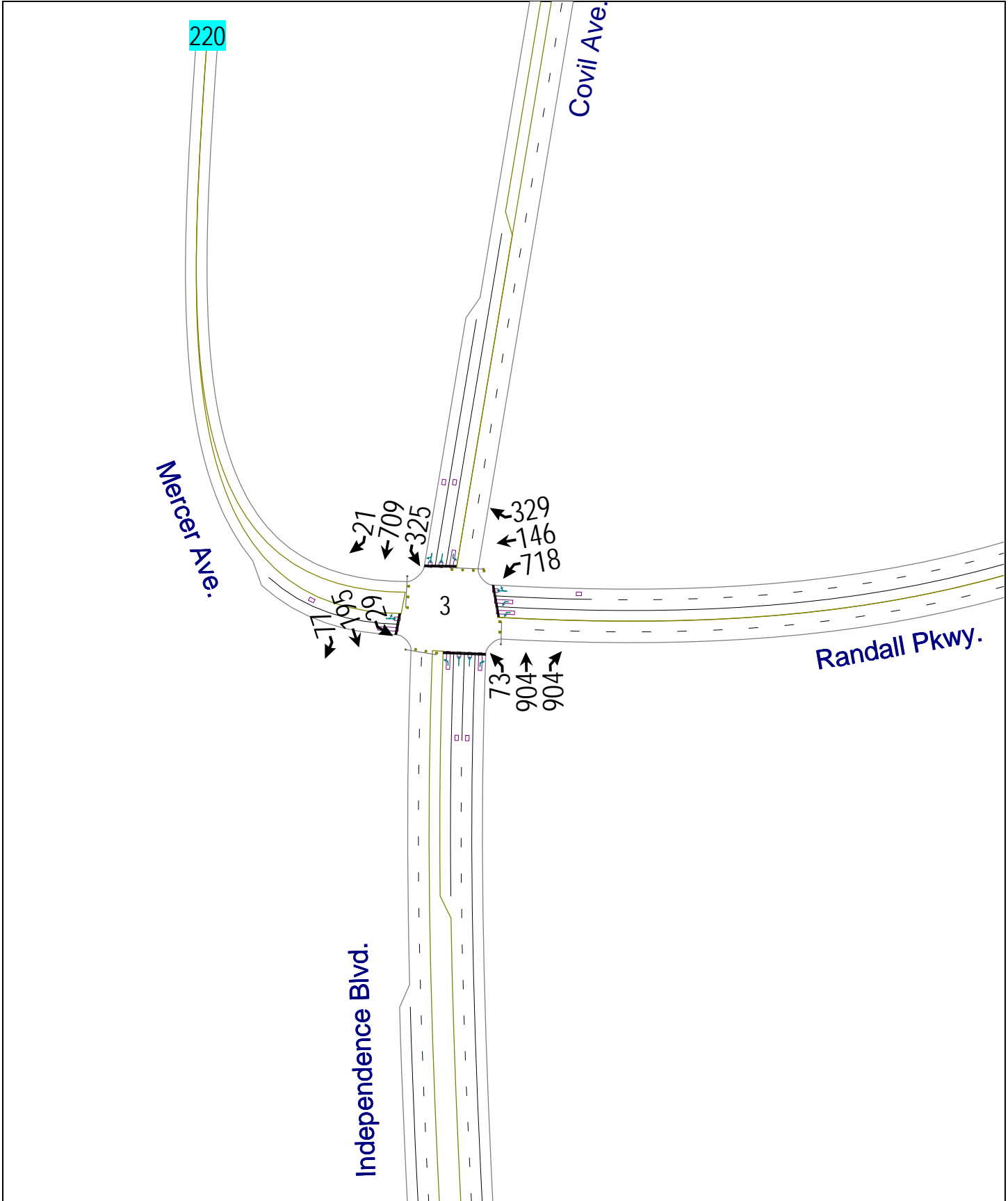
Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 136 (91%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 57.7  
 Intersection LOS: E  
 Intersection Capacity Utilization 91.0%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Wrightsville Ave. & Independence Blvd.



2: Wrightsville Ave. & Independence Blvd.  
 2040 No Build PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖↗	↖		↖	↖↗	↗	↖	↖↗	
Volume (vph)	21	146	73	904	195	325	77	709	718	329	904	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	600		0	275		750	375		275
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1852	1583	3400	1671	0	1752	3505	1568	1752	3487	0
Flt Permitted		0.861		0.950			0.277			0.950		
Satd. Flow (perm)	0	1604	1583	3400	1671	0	511	3505	1568	1752	3487	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45				35
Link Distance (ft)		801			965			1461				786
Travel Time (s)		21.8			18.8			22.1				15.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	185	81	1004	578	0	86	788	798	366	1036	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm		Perm	Prot			Perm		pm+ov	Prot		
Protected Phases		8		7	4			6	7	5	2	
Permitted Phases	8		8				6		6			
Detector Phase	8	8	8	7	4		6	6	7	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	7.0	7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	14.0	14.0	17.0	
Total Split (s)	23.0	23.0	23.0	49.0	72.0	0.0	42.0	42.0	49.0	36.0	78.0	0.0
Total Split (%)	15.3%	15.3%	15.3%	32.7%	48.0%	0.0%	28.0%	28.0%	32.7%	24.0%	52.0%	0.0%
Maximum Green (s)	16.0	16.0	16.0	42.0	65.0		35.0	35.0	42.0	29.0	71.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	None	None	C-Max	
Act Effect Green (s)		18.0	18.0	44.0	67.0		37.0	37.0	86.0	31.0	73.0	
Actuated g/C Ratio		0.12	0.12	0.29	0.45		0.25	0.25	0.57	0.21	0.49	
v/c Ratio		0.96	0.43	1.01	0.77		0.68	0.91	0.89	1.01	0.61	
Control Delay		120.5	68.9	82.3	43.7		46.1	42.1	44.3	108.1	30.1	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	

3: Mercer Ave. & Covil Ave.  
2040 No Build AM Peak

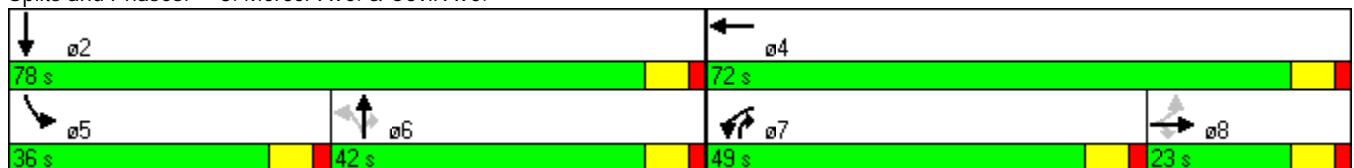


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		120.5	68.9	82.3	43.7		46.1	42.1	44.3	108.1	30.1	
LOS		F	E	F	D		D	D	D	F	C	
Approach Delay		104.8			68.2			43.4			50.4	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)		183	75	~514	473		71	408	819	~368	382	
Queue Length 95th (ft)		#344	133	#663	637		m87	m#433	m914	#582	454	
Internal Link Dist (ft)		721			885			1381			706	
Turn Bay Length (ft)			150	600			275		750	375		
Base Capacity (vph)		192	190	997	746		126	865	899	362	1697	
Starvation Cap Reductn		0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0		0	0	0	0	0	
Storage Cap Reductn		0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio		0.96	0.43	1.01	0.77		0.68	0.91	0.89	1.01	0.61	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 16 (11%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.01  
 Intersection Signal Delay: 56.7  
 Intersection LOS: E  
 Intersection Capacity Utilization 93.5%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Mercer Ave. & Covil Ave.



U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 12/18/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↖		↖	↕	↗	↖	↕	↗
Volume (vph)	29	195	77	718	146	329	73	904	904	325	709	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	600		0	275		750	375		275
Storage Lanes	0		1	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1852	1583	3400	1653	0	1752	3505	1568	1752	3491	0
Flt Permitted		0.865		0.950			0.346			0.950		
Satd. Flow (perm)	0	1611	1583	3400	1653	0	638	3505	1568	1752	3491	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45				35
Link Distance (ft)		801			965			1461				786
Travel Time (s)		21.8			18.8			22.1				15.3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	249	86	798	528	0	81	1004	1004	361	811	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm		Perm	Prot			Perm		pm+ov	Prot		
Protected Phases		8		7	4			6	7	5	2	
Permitted Phases	8		8				6		6			
Detector Phase	8	8	8	7	4		6	6	7	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		12.0	12.0	7.0	7.0	10.0	
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0		19.0	19.0	14.0	14.0	17.0	
Total Split (s)	27.0	27.0	27.0	46.0	73.0	0.0	45.0	45.0	46.0	32.0	77.0	0.0
Total Split (%)	18.0%	18.0%	18.0%	30.7%	48.7%	0.0%	30.0%	30.0%	30.7%	21.3%	51.3%	0.0%
Maximum Green (s)	20.0	20.0	20.0	39.0	66.0		38.0	38.0	39.0	25.0	70.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag	Lag	Lead			Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		C-Max	C-Max	None	None	C-Max	
Act Effect Green (s)		22.0	22.0	41.0	68.0		40.0	40.0	86.0	27.0	72.0	
Actuated g/C Ratio		0.15	0.15	0.27	0.45		0.27	0.27	0.57	0.18	0.48	
v/c Ratio		1.06	0.37	0.86	0.70		0.48	1.07	1.12	1.15	0.48	
Control Delay		133.3	63.0	62.2	39.2		40.3	83.6	78.3	149.4	27.6	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	

3: Mercer Ave. & Covil Ave.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 12/18/2012

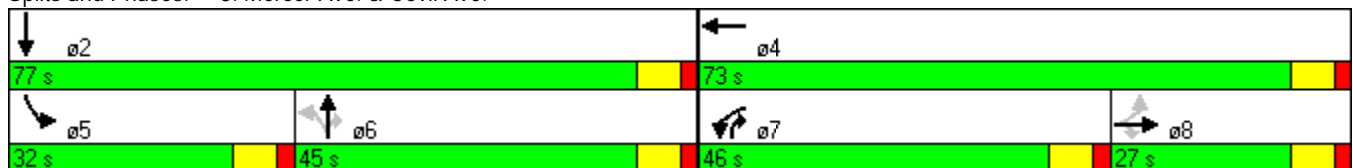


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		133.3	63.0	62.2	39.2		40.3	83.6	78.3	149.4	27.6	
LOS		F	E	E	D		D	F	E	F	C	
Approach Delay		115.2			53.0			79.4			65.1	
Approach LOS		F			D			E			E	
Queue Length 50th (ft)		-265	77	384	409		0	-573	-1109	-412	278	
Queue Length 95th (ft)		#446	135	467	554		m0	m#601	m#1180	#619	336	
Internal Link Dist (ft)		721			885			1381			706	
Turn Bay Length (ft)			150	600			275		750	375		
Base Capacity (vph)		236	232	929	749		170	935	899	315	1676	
Starvation Cap Reductn		0	0	0	0		0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0		0	0	0	0	0	
Storage Cap Reductn		0	0	0	0		0	0	0	0	0	
Reduced v/c Ratio		1.06	0.37	0.86	0.70		0.48	1.07	1.12	1.15	0.48	

Intersection Summary

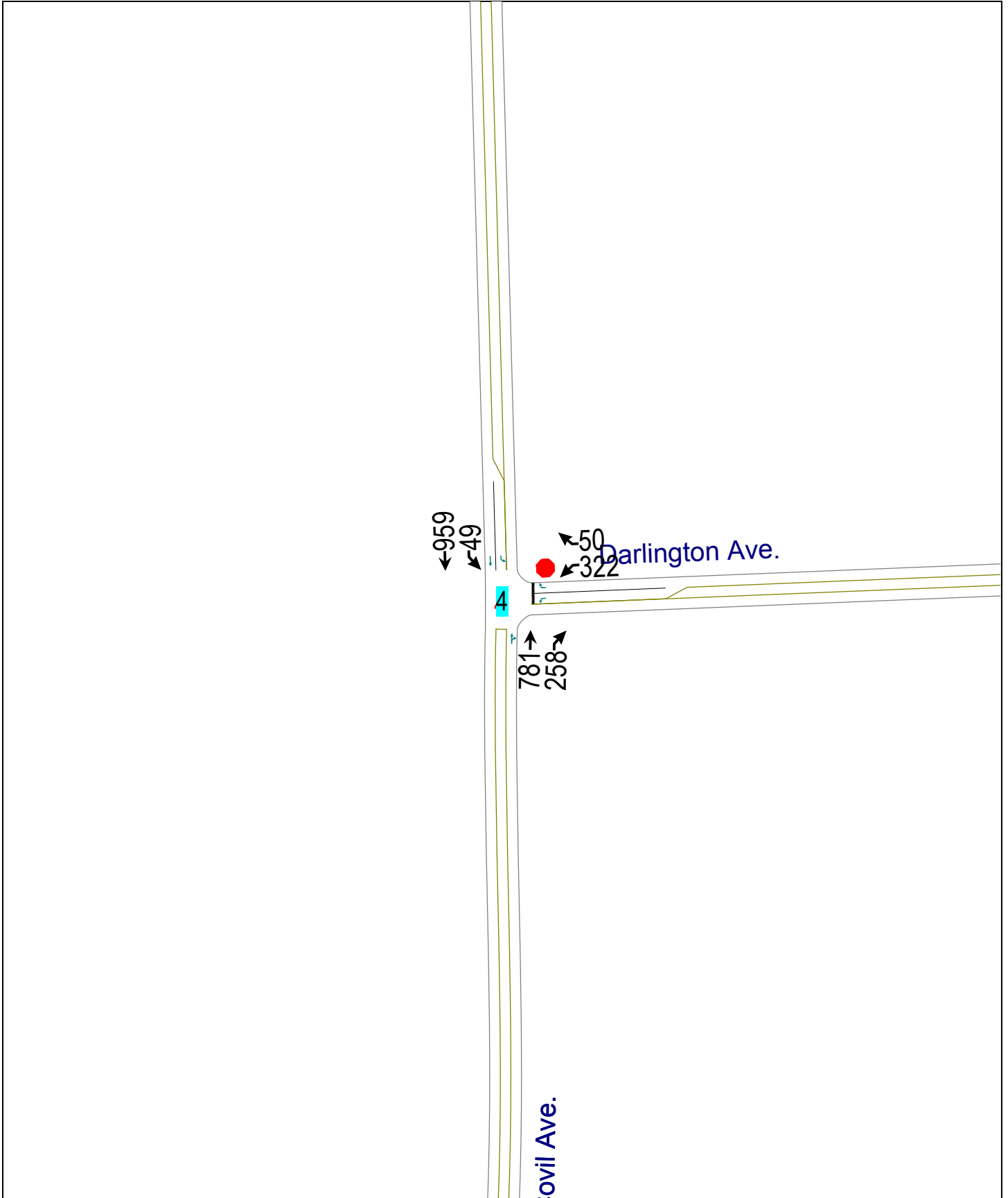
Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Offset: 23 (15%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.15  
 Intersection Signal Delay: 71.3  
 Intersection LOS: E  
 Intersection Capacity Utilization 99.4%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

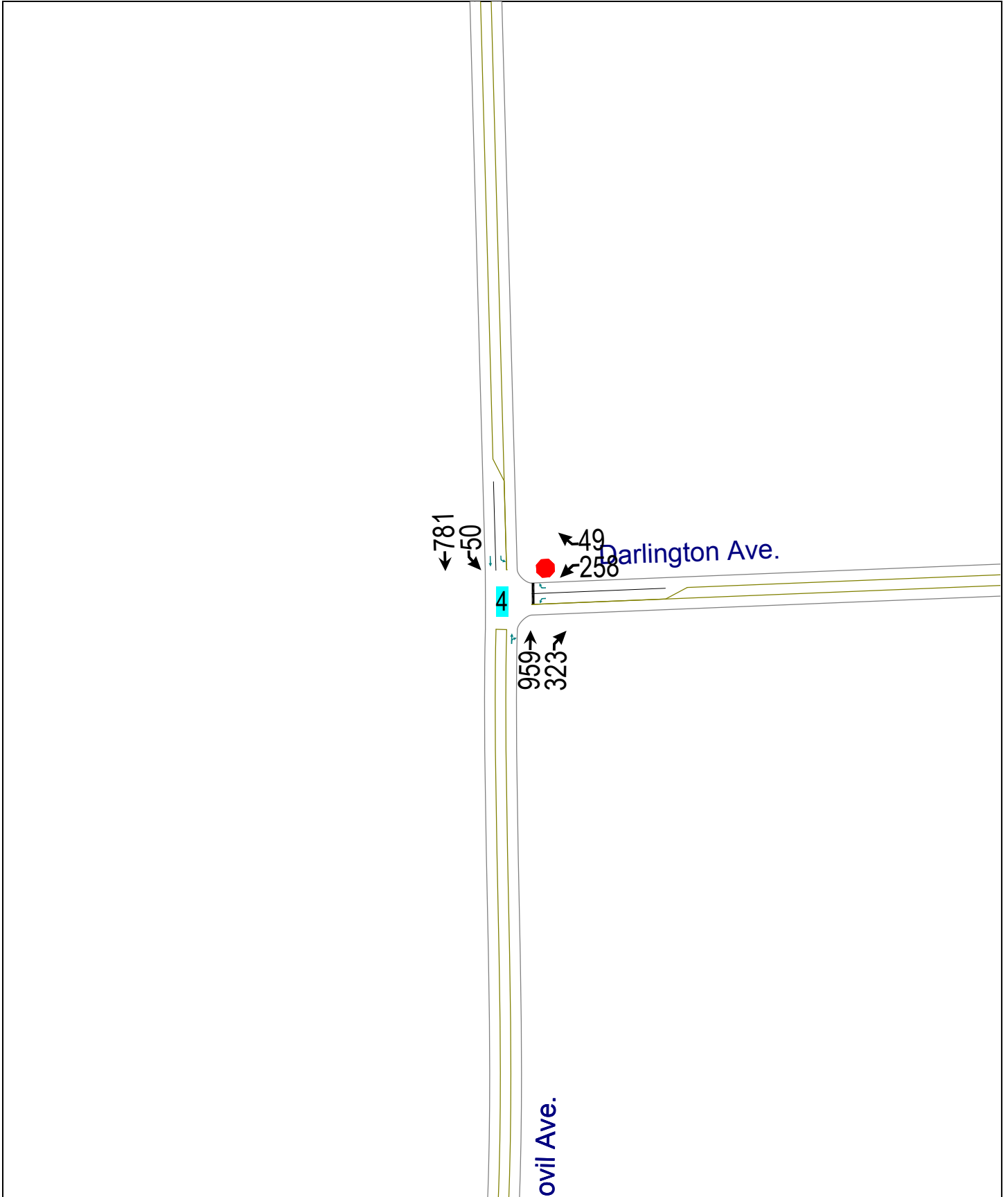
Splits and Phases: 3: Mercer Ave. & Covil Ave.



3: Mercer Ave. & Covil Ave.  
 2040 No Build PM Peak







U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	322	50	781	258	49	959
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0		0	100	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25	25		25	25	
Satd. Flow (prot)	1770	1583	1782	0	1752	1845
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1782	0	1752	1845
Link Speed (mph)	25		35			35
Link Distance (ft)	991		906			1149
Travel Time (s)	27.0		17.6			22.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	358	56	1155	0	54	1066
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	81.3%
	ICU Level of Service D
Analysis Period (min)	15

4: Darlington Ave. & Covil Ave.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	322	50	781	258	49	959
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	358	56	868	287	54	1066
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2186	1011			1154	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2186	1011			1154	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	81			91	
cM capacity (veh/h)	46	291			602	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	358	56	1154	54	1066
Volume Left	358	0	0	54	0
Volume Right	0	56	287	0	0
cSH	46	291	1700	602	1700
Volume to Capacity	7.82	0.19	0.68	0.09	0.63
Queue Length 95th (ft)	Err	17	0	7	0
Control Delay (s)	Err	20.3	0.0	11.6	0.0
Lane LOS	F	C		B	
Approach Delay (s)	8657.8		0.0	0.6	
Approach LOS	F				

Intersection Summary					
Average Delay			1331.6		
Intersection Capacity Utilization			81.3%	ICU Level of Service	D
Analysis Period (min)			15		

4: Darlington Ave. & Covil Ave.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	258	49	959	323	50	781
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150	0		0	100	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25	25		25	25	
Satd. Flow (prot)	1770	1583	1782	0	1752	1845
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1782	0	1752	1845
Link Speed (mph)	25		35			35
Link Distance (ft)	991		906			1149
Travel Time (s)	27.0		17.6			22.4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	287	54	1425	0	56	868
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	91.1%
	ICU Level of Service F
Analysis Period (min)	15

4: Darlington Ave. & Covil Ave.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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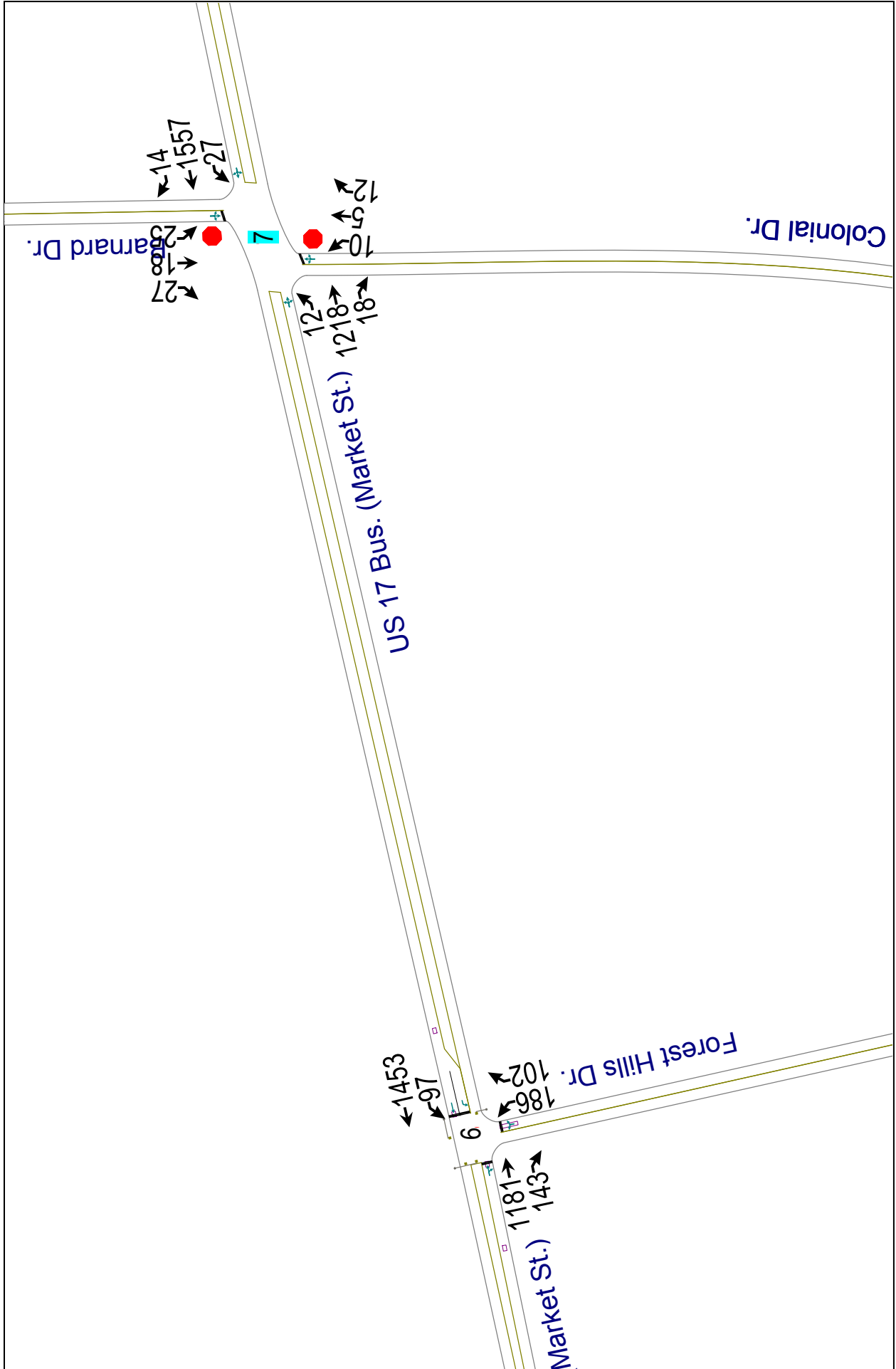


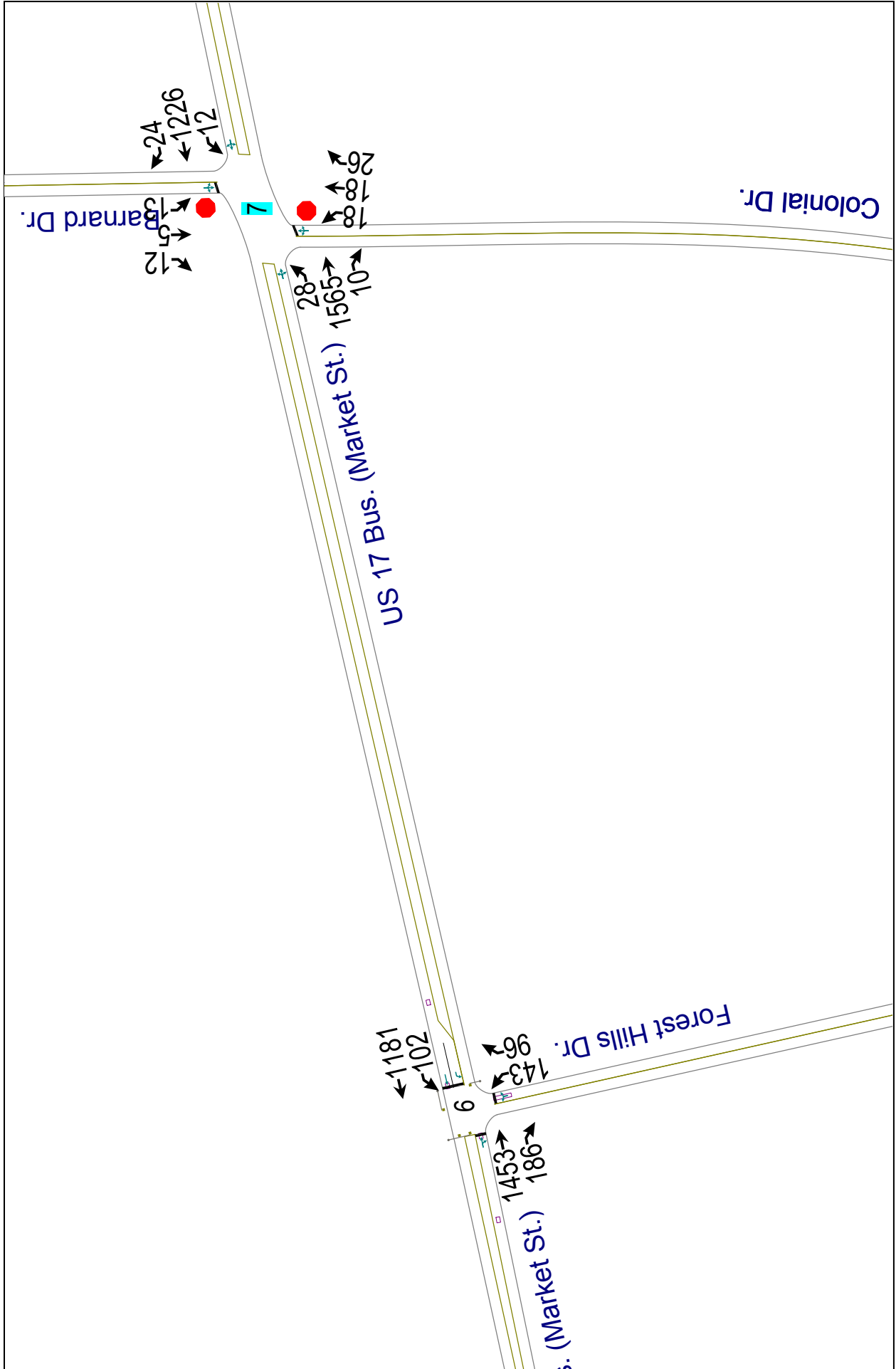
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	258	49	959	323	50	781
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	287	54	1066	359	56	868
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2224	1245			1424	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2224	1245			1424	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	74			88	
cM capacity (veh/h)	42	212			475	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	287	54	1424	56	868
Volume Left	287	0	0	56	0
Volume Right	0	54	359	0	0
cSH	42	212	1700	475	1700
Volume to Capacity	6.83	0.26	0.84	0.12	0.51
Queue Length 95th (ft)	Err	25	0	10	0
Control Delay (s)	Err	27.7	0.0	13.6	0.0
Lane LOS	F	D		B	
Approach Delay (s)	8407.5		0.0	0.8	
Approach LOS	F				

Intersection Summary					
Average Delay			1066.9		
Intersection Capacity Utilization			91.1%	ICU Level of Service	F
Analysis Period (min)			15		

4: Darlington Ave. & Covil Ave.  
 2040 No Build PM Peak







U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1181	143	97	1453	186	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	50		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	1835	0	1770	1863	1718	0
Flt Permitted			0.043		0.969	
Satd. Flow (perm)	1835	0	80	1863	1718	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	25	
Link Distance (ft)	1021			1010	949	
Travel Time (s)	19.9			19.7	25.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1471	0	108	1614	320	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Detector Phase	2		6	6	8	
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	7.0	
Minimum Split (s)	17.0		17.0	17.0	14.0	
Total Split (s)	98.0	0.0	98.0	98.0	22.0	0.0
Total Split (%)	81.7%	0.0%	81.7%	81.7%	18.3%	0.0%
Maximum Green (s)	91.0		91.0	91.0	15.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	2.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Act Effct Green (s)	93.0		93.0	93.0	17.0	
Actuated g/C Ratio	0.78		0.78	0.78	0.14	
v/c Ratio	1.03		1.74	1.12	1.32	
Control Delay	48.4		397.1	74.7	209.3	
Queue Delay	0.0		0.0	0.0	0.0	

6: US 17 Bus. (Market St.) & Forest Hills Dr.  
2040 No Build AM Peak



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Delay	48.4		397.1	74.7	209.3	
LOS	D		F	E	F	
Approach Delay	48.4			94.9	209.3	
Approach LOS	D			F	F	
Queue Length 50th (ft)	~1225		~116	~1451	~320	
Queue Length 95th (ft)	#1489		m#194	m#1536	#502	
Internal Link Dist (ft)	941			930	869	
Turn Bay Length (ft)			50			
Base Capacity (vph)	1422		62	1444	243	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	1.03		1.74	1.12	1.32	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.74  
 Intersection Signal Delay: 85.9  
 Intersection LOS: F  
 Intersection Capacity Utilization 105.5%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: US 17 Bus. (Market St.) & Forest Hills Dr.



6: US 17 Bus. (Market St.) & Forest Hills Dr.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1453	186	102	1181	143	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	50		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	1835	0	1770	1863	1711	0
Flt Permitted			0.042		0.971	
Satd. Flow (perm)	1835	0	78	1863	1711	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	25	
Link Distance (ft)	1021			1010	949	
Travel Time (s)	19.9			19.7	25.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1821	0	113	1312	266	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type			Perm			
Protected Phases	2			6	8	
Permitted Phases			6			
Detector Phase	2		6	6	8	
Switch Phase						
Minimum Initial (s)	10.0		10.0	10.0	7.0	
Minimum Split (s)	17.0		17.0	17.0	14.0	
Total Split (s)	100.0	0.0	100.0	100.0	20.0	0.0
Total Split (%)	83.3%	0.0%	83.3%	83.3%	16.7%	0.0%
Maximum Green (s)	93.0		93.0	93.0	13.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	2.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Act Effct Green (s)	95.0		95.0	95.0	15.0	
Actuated g/C Ratio	0.79		0.79	0.79	0.12	
v/c Ratio	1.25		1.82	0.89	1.24	
Control Delay	137.4		435.1	16.6	185.9	
Queue Delay	0.0		0.0	0.0	0.0	

6: US 17 Bus. (Market St.) & Forest Hills Dr.  
2040 No Build PM Peak



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Delay	137.4		435.1	16.6	185.9	
LOS	F		F	B	F	
Approach Delay	137.4			49.8	185.9	
Approach LOS	F			D	F	
Queue Length 50th (ft)	~1764		~126	839	~256	
Queue Length 95th (ft)	#2029		m#210	m906	#427	
Internal Link Dist (ft)	941			930	869	
Turn Bay Length (ft)			50			
Base Capacity (vph)	1453		62	1475	214	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	1.25		1.82	0.89	1.24	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 54 (45%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.82  
 Intersection Signal Delay: 105.5  
 Intersection LOS: F  
 Intersection Capacity Utilization 109.9%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: US 17 Bus. (Market St.) & Forest Hills Dr.



6: US 17 Bus. (Market St.) & Forest Hills Dr.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	12	1218	18	27	1557	14	10	5	12	25	18	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1859	0	0	1859	0	0	1721	0	0	1734	0
Flt Permitted					0.999			0.982			0.982	
Satd. Flow (perm)	0	1859	0	0	1859	0	0	1721	0	0	1734	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			861			978			871	
Travel Time (s)		19.7			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1386	0	0	1776	0	0	30	0	0	78	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	111.5%
Analysis Period (min)	15
	ICU Level of Service H

7: US 17 Bus. (Market St.) & Barnard Dr.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	12	1218	18	27	1557	14	10	5	12	25	18	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	1353	20	30	1730	16	11	6	13	28	20	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1010										
pX, platoon unblocked				0.25			0.25	0.25	0.25	0.25	0.25	0.25
vC, conflicting volume	1746			1373			3228	3196	1363	3204	3198	1738
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1746			998			8351	8224	958	8257	8232	1738
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			83			0	0	83	0	0	72
cM capacity (veh/h)	359			175			0	0	79	0	0	108

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1387	1776	30	78
Volume Left	13	30	11	28
Volume Right	20	16	13	30
cSH	359	175	0	0
Volume to Capacity	0.04	0.17	Err	Err
Queue Length 95th (ft)	3	15	Err	Err
Control Delay (s)	3.1	0.5	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	3.1	0.5	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		111.5%	ICU Level of Service H
Analysis Period (min)		15	

7: US 17 Bus. (Market St.) & Barnard Dr.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	28	1565	10	12	1226	24	18	18	26	13	5	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1859	0	0	1857	0	0	1732	0	0	1727	0
Flt Permitted		0.999						0.986			0.979	
Satd. Flow (perm)	0	1859	0	0	1857	0	0	1732	0	0	1727	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		1010			861			978			871	
Travel Time (s)		19.7			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1781	0	0	1402	0	0	69	0	0	33	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	111.2%
ICU Level of Service	H
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 2040 No Build PM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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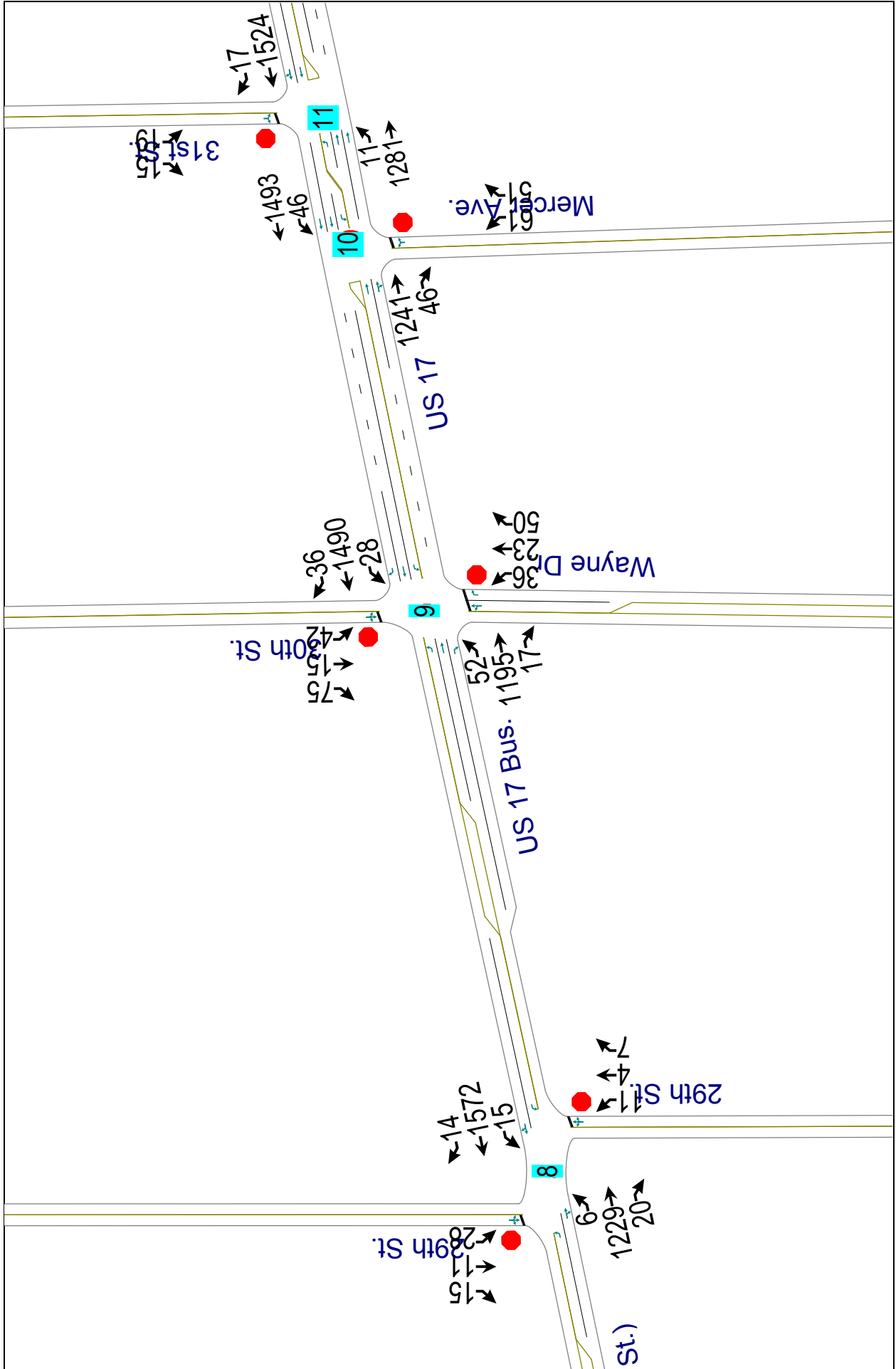
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	28	1565	10	12	1226	24	18	18	26	13	5	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	31	1739	11	13	1362	27	20	20	29	14	6	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1010										
pX, platoon unblocked				0.22			0.22	0.22	0.22	0.22	0.22	
vC, conflicting volume	1389			1750			3225	3222	1744	3248	3214	1376
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1389			2639			9356	9344	2613	9460	9308	1376
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			62			0	0	0	0	0	92
cM capacity (veh/h)	493			35			0	0	7	0	0	178

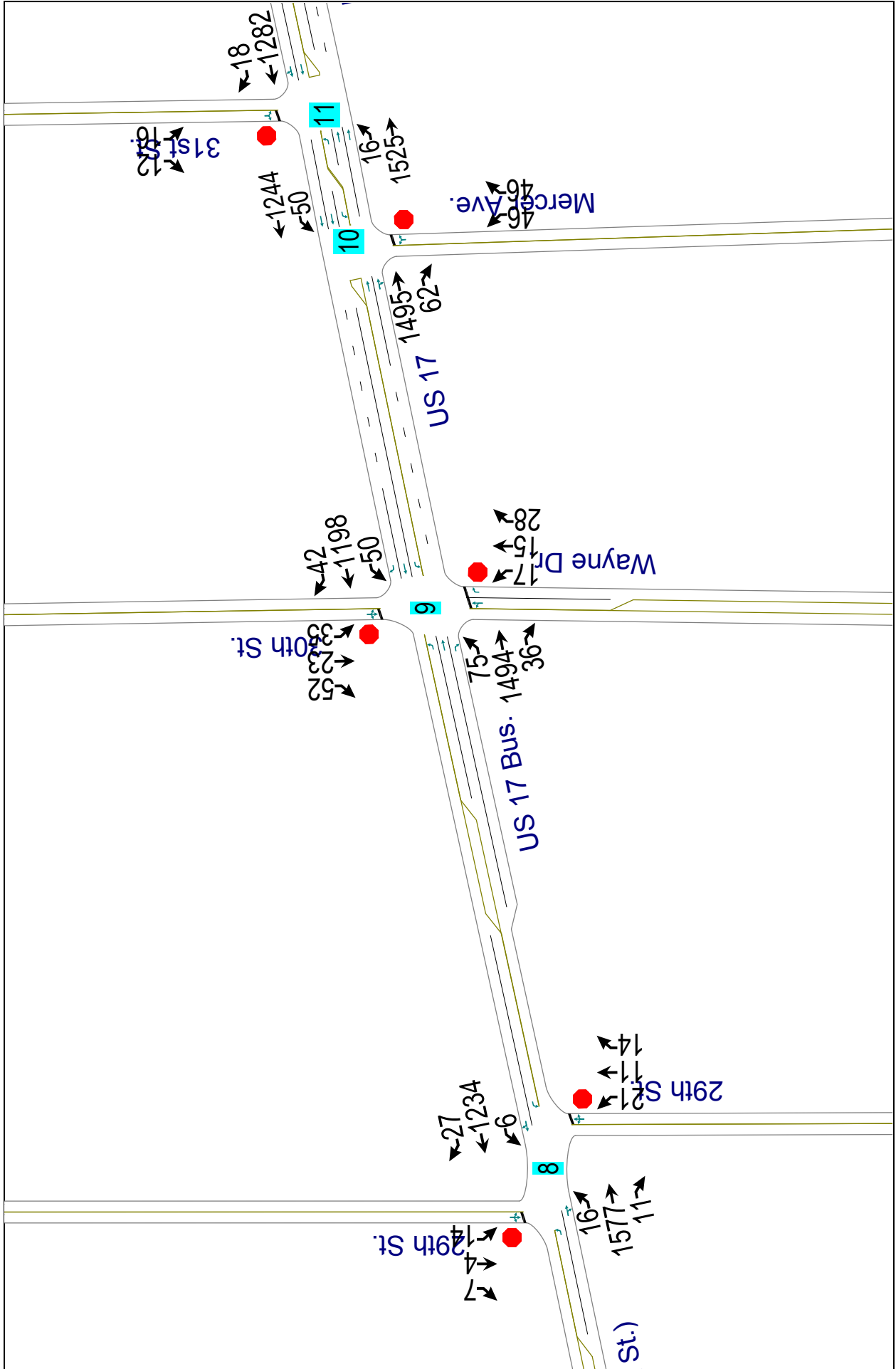
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1781	1402	69	33
Volume Left	31	13	20	14
Volume Right	11	27	29	13
cSH	493	35	0	0
Volume to Capacity	0.06	0.38	Err	Err
Queue Length 95th (ft)	5	31	Err	Err
Control Delay (s)	0.2	159.7	Err	Err
Lane LOS	A	F	F	F
Approach Delay (s)	0.2	159.7	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		111.2%	ICU Level of Service
Analysis Period (min)		15	H

7: US 17 Bus. (Market St.) & Barnard Dr.  
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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	1229	20	15	1572	14	11	4	7	28	11	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	175		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	1859	0	1770	1861	0	0	1736	0	0	1730	0
Flt Permitted	0.950			0.950				0.976			0.975	
Satd. Flow (perm)	1770	1859	0	1770	1861	0	0	1736	0	0	1730	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		861			630			952			799	
Travel Time (s)		14.7			10.7			26.0			21.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1388	0	17	1763	0	0	24	0	0	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			48			48	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	94.1%
ICU Level of Service	F
Analysis Period (min)	15

8: US 17 Bus. (Market St.) & 29th St.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	1229	20	15	1572	14	11	4	7	28	11	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	1366	22	17	1747	16	12	4	8	31	12	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1762			1388			3193	3186	1377	3177	3189	1754
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1762			1388			3193	3186	1377	3177	3189	1754
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			0	54	96	0	0	84
cM capacity (veh/h)	354			493			0	10	177	4	10	105

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	7	1388	17	1762	24	60
Volume Left	7	0	17	0	12	31
Volume Right	0	22	0	16	8	17
cSH	354	1700	493	1700	0	6
Volume to Capacity	0.02	0.82	0.03	1.04	Err	9.99
Queue Length 95th (ft)	1	0	3	0	Err	Err
Control Delay (s)	15.4	0.0	12.6	0.0	Err	Err
Lane LOS	C		B		F	F
Approach Delay (s)	0.1		0.1		Err	Err
Approach LOS					F	F

Intersection Summary						
Average Delay				Err		
Intersection Capacity Utilization			94.1%		ICU Level of Service	F
Analysis Period (min)			15			

8: US 17 Bus. (Market St.) & 29th St.  
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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	1577	11	6	1234	27	21	11	14	14	4	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	175		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	1861	0	1770	1857	0	0	1745	0	0	1723	0
Flt Permitted	0.950			0.950				0.978			0.972	
Satd. Flow (perm)	1770	1861	0	1770	1857	0	0	1745	0	0	1723	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		861			630			952			799	
Travel Time (s)		14.7			10.7			26.0			21.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	1764	0	7	1401	0	0	51	0	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			48			48	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	93.7%
ICU Level of Service	F
Analysis Period (min)	15

8: US 17 Bus. (Market St.) & 29th St.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	1577	11	6	1234	27	21	11	14	14	4	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	1752	12	7	1371	30	23	12	16	16	4	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1401			1764			3188	3208	1758	3209	3199	1386
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1401			1764			3188	3208	1758	3209	3199	1386
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			98			0	0	85	0	53	96
cM capacity (veh/h)	488			353			4	9	105	0	9	174

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	18	1764	7	1401	51	28
Volume Left	18	0	7	0	23	16
Volume Right	0	12	0	30	16	8
cSH	488	1700	353	1700	6	0
Volume to Capacity	0.04	1.04	0.02	0.82	8.09	Err
Queue Length 95th (ft)	3	0	1	0	Err	Err
Control Delay (s)	12.7	0.0	15.4	0.0	Err	Err
Lane LOS	B		C		F	F
Approach Delay (s)	0.1		0.1		Err	Err
Approach LOS					F	F

Intersection Summary

Average Delay		Err				
Intersection Capacity Utilization		93.7%		ICU Level of Service		F
Analysis Period (min)		15				

8: US 17 Bus. (Market St.) & 29th St.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	1195	17	28	1490	36	36	23	50	42	15	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		300	300		0	150		0	0		0
Storage Lanes	1		1	1		1	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	1809	1583	0	1694	0
Flt Permitted	0.950			0.950				0.971			0.984	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	0	1809	1583	0	1694	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			411			873			738	
Travel Time (s)		10.7			7.0			23.8			20.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	1328	19	31	1656	40	0	66	56	0	147	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	99.5%
ICU Level of Service	F
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	52	1195	17	28	1490	36	36	23	50	42	15	75
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	58	1328	19	31	1656	40	40	26	56	47	17	83
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					834							
pX, platoon unblocked	0.40						0.40	0.40		0.40	0.40	0.40
vC, conflicting volume	1696			1347			3253	3201	1328	3229	3180	1656
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1989			1347			5882	5753	1328	5824	5700	1889
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	50			94			0	0	71	0	0	0
cM capacity (veh/h)	116			511			0	0	190	0	0	35

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	58	1328	19	31	1656	40	66	56	147
Volume Left	58	0	0	31	0	0	40	0	47
Volume Right	0	0	19	0	0	40	0	56	83
cSH	116	1700	1700	511	1700	1700	0	190	0
Volume to Capacity	0.50	0.78	0.01	0.06	0.97	0.02	Err	0.29	Err
Queue Length 95th (ft)	57	0	0	5	0	0	Err	29	Err
Control Delay (s)	63.8	0.0	0.0	12.5	0.0	0.0	Err	31.7	Err
Lane LOS	F			B			F	D	F
Approach Delay (s)	2.6			0.2			Err		Err
Approach LOS							F		F

Intersection Summary

Average Delay		Err							
Intersection Capacity Utilization		99.5%		ICU Level of Service				F	
Analysis Period (min)		15							

9: US 17 Bus. (Market St.) & 30th St.  
 2040 No Build AM Peak



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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	1494	36	50	1198	42	17	15	28	35	23	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		300	300		0	150		0	0		0
Storage Lanes	1		1	1		1	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	1814	1583	0	1716	0
Flt Permitted	0.950			0.950				0.974			0.984	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	0	1814	1583	0	1716	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			411			873			738	
Travel Time (s)		10.7			7.0			23.8			20.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	1660	40	56	1331	47	0	36	31	0	123	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	98.3%
ICU Level of Service	F
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	75	1494	36	50	1198	42	17	15	28	35	23	52
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	1660	40	56	1331	47	19	17	31	39	26	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					834							
pX, platoon unblocked	0.69						0.69	0.69		0.69	0.69	0.69
vC, conflicting volume	1378			1700			3339	3316	1660	3308	3309	1331
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1324			1700			4153	4118	1660	4108	4109	1256
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	77			85			0	0	74	0	0	60
cM capacity (veh/h)	362			374			0	1	120	0	1	145

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	83	1660	40	56	1331	47	36	31	122
Volume Left	83	0	0	56	0	0	19	0	39
Volume Right	0	0	40	0	0	47	0	31	58
cSH	362	1700	1700	374	1700	1700	0	120	0
Volume to Capacity	0.23	0.98	0.02	0.15	0.78	0.03	Err	0.26	Err
Queue Length 95th (ft)	22	0	0	13	0	0	Err	24	Err
Control Delay (s)	17.9	0.0	0.0	16.3	0.0	0.0	Err	45.0	Err
Lane LOS	C			C			F	E	F
Approach Delay (s)	0.8			0.6			Err		Err
Approach LOS							F		F

Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization		98.3%	ICU Level of Service
Analysis Period (min)		15	

9: US 17 Bus. (Market St.) & 30th St.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↘	
Volume (vph)	1241	46	46	1493	61	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	40		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3522	0	1770	3539	1702	0
Flt Permitted			0.950		0.974	
Satd. Flow (perm)	3522	0	1770	3539	1702	0
Link Speed (mph)	40			40	25	
Link Distance (ft)	411			142	909	
Travel Time (s)	7.0			2.4	24.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1430	0	51	1659	125	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.4%
ICU Level of Service	A
Analysis Period (min)	15

10: US 17 Bus. (Market St.) & Mercer Ave.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (veh/h)	1241	46	46	1493	61	51
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1379	51	51	1659	68	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	423					
pX, platoon unblocked					0.75	
vC, conflicting volume			1430	2336	715	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1430	2117	715	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			89	0	85	
cM capacity (veh/h)			471	29	373	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	919	511	51	829	829	124
Volume Left	0	0	51	0	0	68
Volume Right	0	51	0	0	0	57
cSH	1700	1700	471	1700	1700	50
Volume to Capacity	0.54	0.30	0.11	0.49	0.49	2.48
Queue Length 95th (ft)	0	0	9	0	0	323
Control Delay (s)	0.0	0.0	13.6	0.0	0.0	847.7
Lane LOS	B			F		
Approach Delay (s)	0.0		0.4			847.7
Approach LOS				F		

Intersection Summary						
Average Delay			32.5			
Intersection Capacity Utilization			54.4%	ICU Level of Service	A	
Analysis Period (min)			15			

10: US 17 Bus. (Market St.) & Mercer Ave.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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 9/11/2012



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (vph)	1495	62	50	1244	46	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	40		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3518	0	1770	3539	1694	0
Flt Permitted			0.950		0.976	
Satd. Flow (perm)	3518	0	1770	3539	1694	0
Link Speed (mph)	40			40	25	
Link Distance (ft)	411			142	909	
Travel Time (s)	7.0			2.4	24.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1730	0	56	1382	102	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.3%
ICU Level of Service	B
Analysis Period (min)	15

10: US 17 Bus. (Market St.) & Mercer Ave.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/11/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (veh/h)	1495	62	50	1244	46	46
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1661	69	56	1382	51	51
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	423					
pX, platoon unblocked					0.83	
vC, conflicting volume			1730	2498	865	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1730	2397	865	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			85	0	83	
cM capacity (veh/h)			361	20	297	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1107	623	56	691	691	102
Volume Left	0	0	56	0	0	51
Volume Right	0	69	0	0	0	51
cSH	1700	1700	361	1700	1700	37
Volume to Capacity	0.65	0.37	0.15	0.41	0.41	2.77
Queue Length 95th (ft)	0	0	13	0	0	288
Control Delay (s)	0.0	0.0	16.8	0.0	0.0	1031.3
Lane LOS	C			F		
Approach Delay (s)	0.0		0.6			1031.3
Approach LOS				F		

Intersection Summary						
Average Delay			32.5			
Intersection Capacity Utilization			55.3%	ICU Level of Service	B	
Analysis Period (min)			15			

10: US 17 Bus. (Market St.) & Mercer Ave.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	11	1281	1524	17	19	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	40			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	1770	3539	3532	0	1704	0
Flt Permitted	0.950				0.973	
Satd. Flow (perm)	1770	3539	3532	0	1704	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		142	281		960	
Travel Time (s)		2.4	4.8		26.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	1423	1712	0	38	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.7%
ICU Level of Service	A
Analysis Period (min)	15

11: US 17 Bus. (Market St.) & 31st St.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	11	1281	1524	17	19	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	1423	1693	19	21	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			281			
pX, platoon unblocked	0.75				0.75	0.75
vC, conflicting volume	1712				2439	856
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1282				2251	139
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				17	97
cM capacity (veh/h)	403				26	662
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	12	712	712	1129	583	38
Volume Left	12	0	0	0	0	21
Volume Right	0	0	0	0	19	17
cSH	403	1700	1700	1700	1700	44
Volume to Capacity	0.03	0.42	0.42	0.66	0.34	0.85
Queue Length 95th (ft)	2	0	0	0	0	84
Control Delay (s)	14.2	0.0	0.0	0.0	0.0	232.5
Lane LOS	B					F
Approach Delay (s)	0.1			0.0		232.5
Approach LOS						F
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			52.7%		ICU Level of Service	A
Analysis Period (min)			15			

11: US 17 Bus. (Market St.) & 31st St.  
 2040 No Build AM Peak



U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	16	1525	1282	18	16	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	40			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	1770	3539	3532	0	1707	0
Flt Permitted	0.950				0.972	
Satd. Flow (perm)	1770	3539	3532	0	1707	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		142	281		960	
Travel Time (s)		2.4	4.8		26.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	1694	1444	0	31	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.2%
	ICU Level of Service A
Analysis Period (min)	15

11: US 17 Bus. (Market St.) & 31st St.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/11/2012

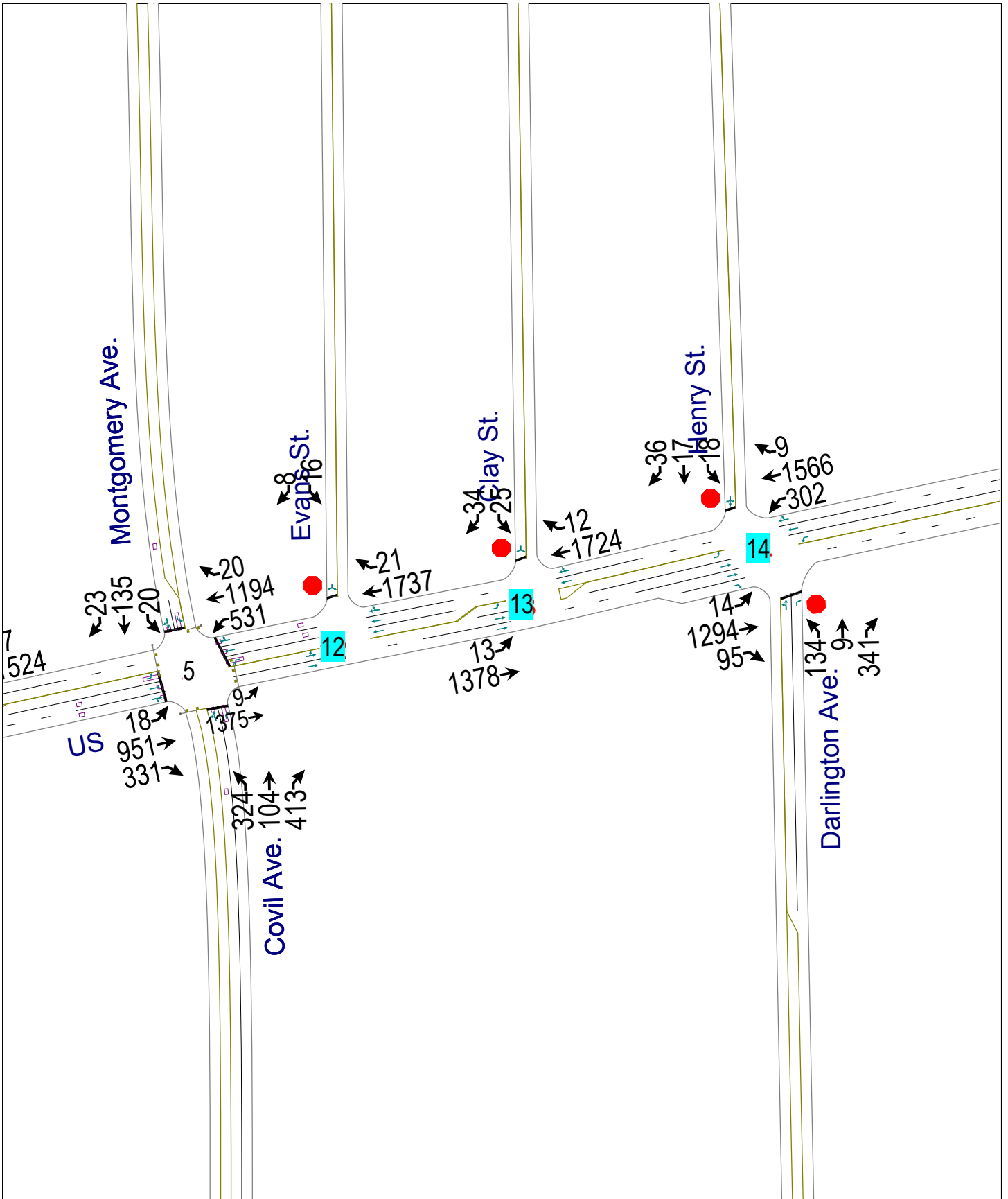


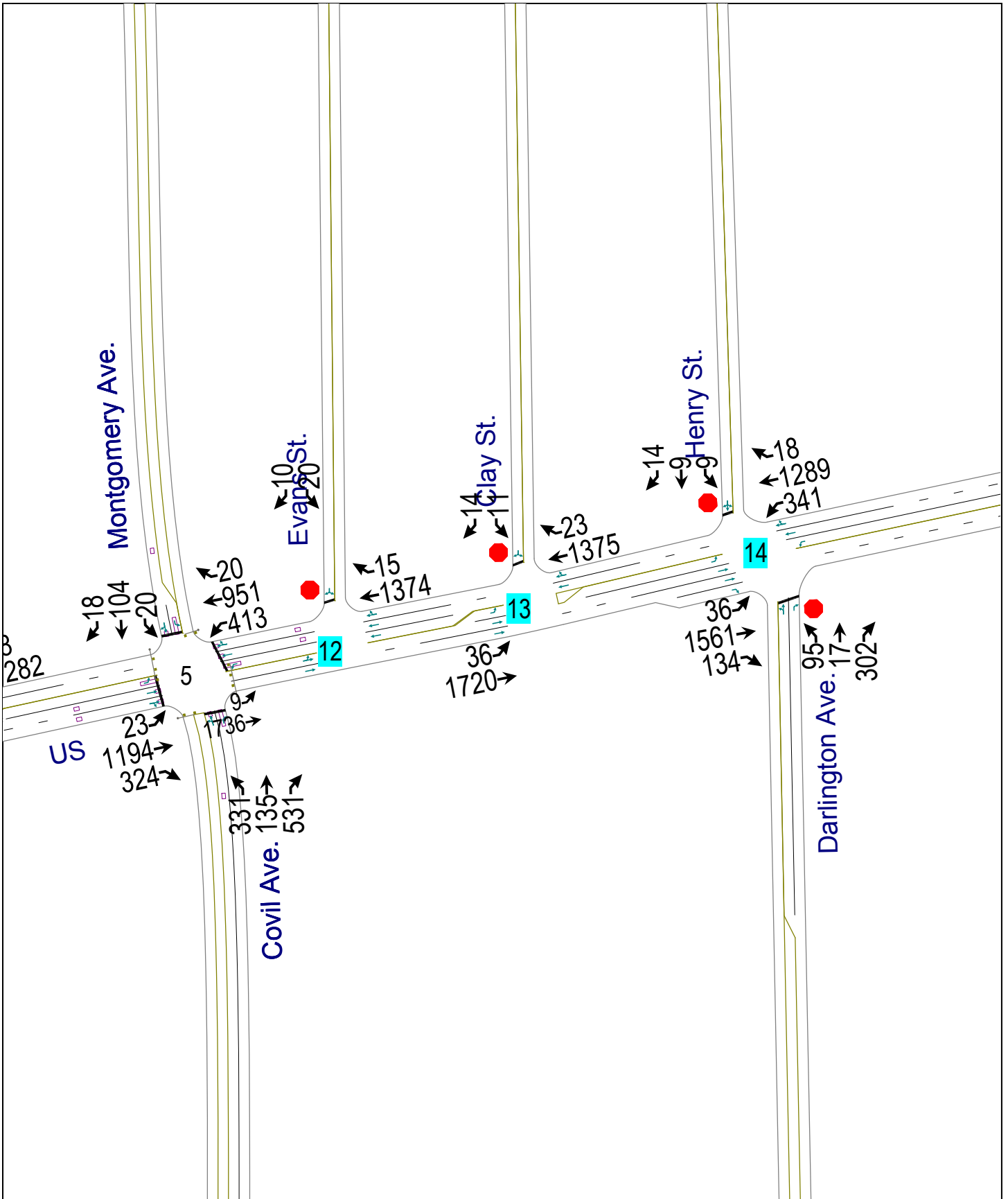
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	1525	1282	18	16	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	1694	1424	20	18	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			281			
pX, platoon unblocked	0.83				0.83	0.83
vC, conflicting volume	1444				2317	722
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1121				2175	249
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				44	98
cM capacity (veh/h)	512				32	622

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	18	847	847	950	495	31
Volume Left	18	0	0	0	0	18
Volume Right	0	0	0	0	20	13
cSH	512	1700	1700	1700	1700	53
Volume to Capacity	0.03	0.50	0.50	0.56	0.29	0.58
Queue Length 95th (ft)	3	0	0	0	0	57
Control Delay (s)	12.3	0.0	0.0	0.0	0.0	141.5
Lane LOS	B					F
Approach Delay (s)	0.1			0.0		141.5
Approach LOS						F

Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			52.2%		ICU Level of Service	A
Analysis Period (min)			15			

11: US 17 Bus. (Market St.) & 31st St.  
 2040 No Build PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	18	951	331	531	1194	20	324	104	413	20	135	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		0	0		650	35		0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3401	0	1752	3498	0	0	1778	1568	1770	1822	0
Flt Permitted	0.202			0.950				0.596		0.161		
Satd. Flow (perm)	376	3401	0	1752	3498	0	0	1099	1568	300	1822	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35				25
Link Distance (ft)		281			164			1137				915
Travel Time (s)		4.8			2.8			22.1				25.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	1425	0	590	1349	0	0	476	459	22	176	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Prot			Perm		pm+ov	Perm		
Protected Phases		2		1	6			8	1			4
Permitted Phases	2						8		8	4		
Detector Phase	2	2		1	6		8	8	1	4		4
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	17.0	17.0		14.0	17.0		14.0	14.0	14.0	14.0		14.0
Total Split (s)	44.0	44.0	0.0	34.0	78.0	0.0	42.0	42.0	34.0	42.0	42.0	0.0
Total Split (%)	36.7%	36.7%	0.0%	28.3%	65.0%	0.0%	35.0%	35.0%	28.3%	35.0%	35.0%	0.0%
Maximum Green (s)	37.0	37.0		27.0	71.0		35.0	35.0	27.0	35.0		35.0
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0		5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag		Lead								Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None		None
Act Effct Green (s)	39.0	39.0		29.0	73.0			37.0	71.0	37.0		37.0
Actuated g/C Ratio	0.32	0.32		0.24	0.61			0.31	0.59	0.31		0.31
v/c Ratio	0.16	1.29		1.39	0.63			1.40	0.49	0.24		0.31
Control Delay	25.4	165.0		227.1	16.7			232.1	16.4	39.1		33.7
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0

5: US 17 Bus. (Market St.) & Montgomery Ave.  
2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
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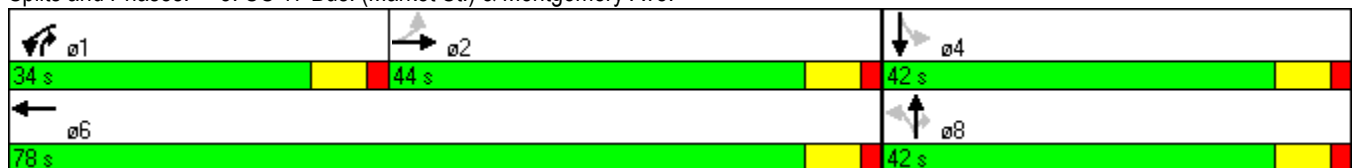


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	25.4	165.0		227.1	16.7			232.1	16.4	39.1	33.7	
LOS	C	F		F	B			F	B	D	C	
Approach Delay		163.0			80.7			126.2				34.3
Approach LOS		F			F			F				C
Queue Length 50th (ft)	10	~745		~610	329			~494	194	13	104	
Queue Length 95th (ft)	m13	m#720		#832	399			#704	280	38	167	
Internal Link Dist (ft)		201			84			1057				835
Turn Bay Length (ft)	175								650	35		
Base Capacity (vph)	122	1105		423	2128			339	928	93	562	
Starvation Cap Reductn	0	0		0	0			0	0	0	0	
Spillback Cap Reductn	0	0		0	0			0	0	0	0	
Storage Cap Reductn	0	0		0	0			0	0	0	0	
Reduced v/c Ratio	0.16	1.29		1.39	0.63			1.40	0.49	0.24	0.31	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 114 (95%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 160  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.40  
 Intersection Signal Delay: 114.4      Intersection LOS: F  
 Intersection Capacity Utilization 114.9%      ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
   Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
   Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: US 17 Bus. (Market St.) & Montgomery Ave.



5: US 17 Bus. (Market St.) & Montgomery Ave.  
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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1194	324	413	951	20	331	135	531	20	104	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		0	0		650	35		0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3426	0	1752	3494	0	0	1782	1568	1770	1822	0
Flt Permitted	0.265			0.950				0.669		0.111		
Satd. Flow (perm)	494	3426	0	1752	3494	0	0	1234	1568	207	1822	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35			25	
Link Distance (ft)		281			164			1137			915	
Travel Time (s)		4.8			2.8			22.1			25.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1687	0	459	1079	0	0	518	590	22	136	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Prot			Perm		pm+ov	Perm		
Protected Phases		2		1	6			8	1		4	
Permitted Phases	2						8		8	4		
Detector Phase	2	2		1	6		8	8	1	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	17.0	17.0		14.0	17.0		14.0	14.0	14.0	14.0	14.0	
Total Split (s)	51.0	51.0	0.0	28.0	79.0	0.0	41.0	41.0	28.0	41.0	41.0	0.0
Total Split (%)	42.5%	42.5%	0.0%	23.3%	65.8%	0.0%	34.2%	34.2%	23.3%	34.2%	34.2%	0.0%
Maximum Green (s)	44.0	44.0		21.0	72.0		34.0	34.0	21.0	34.0	34.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag		Lead					Lead			
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None	None	None	None	
Act Effct Green (s)	46.0	46.0		23.0	74.0			36.0	64.0	36.0	36.0	
Actuated g/C Ratio	0.38	0.38		0.19	0.62			0.30	0.53	0.30	0.30	
v/c Ratio	0.14	1.28		1.37	0.50			1.40	0.71	0.35	0.25	
Control Delay	18.8	157.0		220.5	13.8			229.3	26.7	51.9	33.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	

5: US 17 Bus. (Market St.) & Montgomery Ave.  
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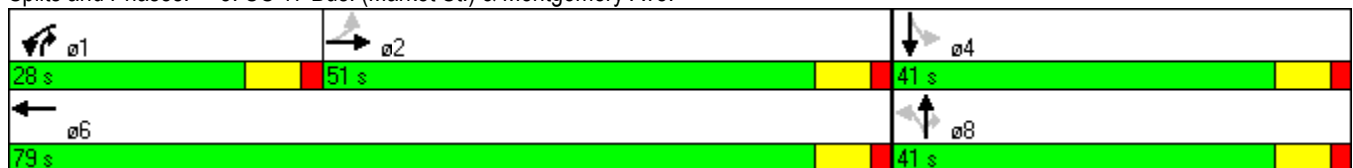


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	18.8	157.0		220.5	13.8			229.3	26.7	51.9	33.3	
LOS	B	F		F	B			F	C	D	C	
Approach Delay		154.9			75.5			121.4				35.9
Approach LOS		F			E			F				D
Queue Length 50th (ft)	12	~875		~469	228			~537	328	13	80	
Queue Length 95th (ft)	m12	m#646		#676	280			#751	472	44	133	
Internal Link Dist (ft)		201			84			1057				835
Turn Bay Length (ft)	175								650	35		
Base Capacity (vph)	189	1313		336	2155			370	836	62	547	
Starvation Cap Reductn	0	0		0	0			0	0	0	0	
Spillback Cap Reductn	0	0		0	0			0	0	0	0	
Storage Cap Reductn	0	0		0	0			0	0	0	0	
Reduced v/c Ratio	0.14	1.28		1.37	0.50			1.40	0.71	0.35	0.25	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 42 (35%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.40  
 Intersection Signal Delay: 115.5  
 Intersection LOS: F  
 Intersection Capacity Utilization 114.9%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: US 17 Bus. (Market St.) & Montgomery Ave.



5: US 17 Bus. (Market St.) & Montgomery Ave.  
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕↕		↕↕	
Volume (vph)	9	1375	1737	21	16	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	5026	0	1689	0
Flt Permitted					0.968	
Satd. Flow (perm)	0	3505	5026	0	1689	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		164	218		894	
Travel Time (s)		2.8	3.7		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1538	1953	0	27	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.3%
ICU Level of Service	A
Analysis Period (min)	15

12: US 17 Bus. (Market St.) & Evans St.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑		↓	
Volume (veh/h)	9	1375	1737	21	16	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1528	1930	23	18	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		164				
pX, platoon unblocked					0.68	
vC, conflicting volume	1953				2726	655
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1953				2597	655
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				0	98
cM capacity (veh/h)	291				13	404

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	519	1019	772	772	409	27
Volume Left	10	0	0	0	0	18
Volume Right	0	0	0	0	23	9
cSH	291	1700	1700	1700	1700	19
Volume to Capacity	0.03	0.60	0.45	0.45	0.24	1.40
Queue Length 95th (ft)	3	0	0	0	0	92
Control Delay (s)	1.2	0.0	0.0	0.0	0.0	637.8
Lane LOS	A					F
Approach Delay (s)	0.4		0.0			637.8
Approach LOS						F

Intersection Summary						
Average Delay			5.0			
Intersection Capacity Utilization			54.3%		ICU Level of Service	A
Analysis Period (min)			15			

12: US 17 Bus. (Market St.) & Evans St.  
 2040 No Build AM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕↕		↕↕	
Volume (vph)	9	1736	1374	15	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	5026	0	1689	0
Flt Permitted					0.968	
Satd. Flow (perm)	0	3505	5026	0	1689	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		164	218		894	
Travel Time (s)		2.8	3.7		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1939	1544	0	33	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other  
 Control Type: Unsignalized  
 Intersection Capacity Utilization 64.3% ICU Level of Service C  
 Analysis Period (min) 15

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕↕		↕↕	
Volume (veh/h)	9	1736	1374	15	20	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1929	1527	17	22	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		164				
pX, platoon unblocked					0.62	
vC, conflicting volume	1543				2519	517
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1543				2226	517
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				0	98
cM capacity (veh/h)	421				22	498
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	653	1286	611	611	322	33
Volume Left	10	0	0	0	0	22
Volume Right	0	0	0	0	17	11
cSH	421	1700	1700	1700	1700	32
Volume to Capacity	0.02	0.76	0.36	0.36	0.19	1.05
Queue Length 95th (ft)	2	0	0	0	0	91
Control Delay (s)	0.7	0.0	0.0	0.0	0.0	362.4
Lane LOS	A					F
Approach Delay (s)	0.2		0.0			362.4
Approach LOS						F
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			64.3%		ICU Level of Service	C
Analysis Period (min)			15			

12: US 17 Bus. (Market St.) & Evans St.  
 2040 No Build PM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	13	1378	1724	12	25	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	35			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	1752	3505	3501	0	1681	0
Flt Permitted	0.950				0.979	
Satd. Flow (perm)	1752	3505	3501	0	1681	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		218	274		819	
Travel Time (s)		3.7	4.7		22.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	1531	1929	0	66	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.2%
ICU Level of Service	B
Analysis Period (min)	15

13: US 17 Bus. (Market St.) & Clay St.  
 2040 No Build AM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↑↑	↑↑		↘	
Volume (veh/h)	13	1378	1724	12	25	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	1531	1916	13	28	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		382				
pX, platoon unblocked					0.69	
vC, conflicting volume	1929				2717	964
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1929				2587	964
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				0	85
cM capacity (veh/h)	298				13	255

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	14	766	766	1277	652	66
Volume Left	14	0	0	0	0	28
Volume Right	0	0	0	0	13	38
cSH	298	1700	1700	1700	1700	30
Volume to Capacity	0.05	0.45	0.45	0.75	0.38	2.21
Queue Length 95th (ft)	4	0	0	0	0	192
Control Delay (s)	17.7	0.0	0.0	0.0	0.0	841.2
Lane LOS	C					F
Approach Delay (s)	0.2			0.0		841.2
Approach LOS						F

Intersection Summary						
Average Delay			15.6			
Intersection Capacity Utilization			58.2%		ICU Level of Service	B
Analysis Period (min)			15			

13: US 17 Bus. (Market St.) & Clay St.  
 2040 No Build AM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	36	1720	1375	23	11	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	35			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	1752	3505	3494	0	1683	0
Flt Permitted	0.950				0.979	
Satd. Flow (perm)	1752	3505	3494	0	1683	0
Link Speed (mph)		40	40		25	
Link Distance (ft)		218	274		819	
Travel Time (s)		3.7	4.7		22.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	1911	1554	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.5%
	ICU Level of Service B
Analysis Period (min)	15

13: US 17 Bus. (Market St.) & Clay St.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↑↑	↑↑		↘	
Volume (veh/h)	36	1720	1375	23	11	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	40	1911	1528	26	12	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		382				
pX, platoon unblocked					0.62	
vC, conflicting volume	1553				2576	777
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1553				2322	777
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				31	95
cM capacity (veh/h)	418				18	340

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	40	956	956	1019	535	28
Volume Left	40	0	0	0	0	12
Volume Right	0	0	0	0	26	16
cSH	418	1700	1700	1700	1700	38
Volume to Capacity	0.10	0.56	0.56	0.60	0.31	0.73
Queue Length 95th (ft)	8	0	0	0	0	66
Control Delay (s)	14.5	0.0	0.0	0.0	0.0	227.3
Lane LOS	B					F
Approach Delay (s)	0.3			0.0		227.3
Approach LOS						F

Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			57.5%		ICU Level of Service	B
Analysis Period (min)			15			

13: US 17 Bus. (Market St.) & Clay St.  
 2040 No Build PM Peak



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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	1294	95	302	1566	9	134	9	341	18	17	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		50	500		0	350		0	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3505	1568	1752	3501	0	0	1779	1583	0	1697	0
Flt Permitted	0.950			0.950				0.955			0.987	
Satd. Flow (perm)	1752	3505	1568	1752	3501	0	0	1779	1583	0	1697	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		274			1024			913			767	
Travel Time (s)		4.7			17.5			24.9			20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1438	106	336	1750	0	0	159	379	0	79	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			24			24	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	77.1%
ICU Level of Service	D
Analysis Period (min)	15

14: US 17 Bus. (Market St.) & Henry St.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	14	1294	95	302	1566	9	134	9	341	18	17	36
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	1438	106	336	1740	10	149	10	379	20	19	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		656										
pX, platoon unblocked				0.70			0.70	0.70	0.70	0.70	0.70	0.70
vC, conflicting volume	1750			1543			3059	3890	719	3550	3991	875
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1750			922			3085	4269	0	3784	4413	875
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			34			0	0	50	0	0	86
cM capacity (veh/h)	350			512			0	0	760	0	0	290

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	16	719	719	106	336	1160	590	159	379	79
Volume Left	16	0	0	0	336	0	0	149	0	20
Volume Right	0	0	0	106	0	0	10	0	379	40
cSH	350	1700	1700	1700	512	1700	1700	0	760	0
Volume to Capacity	0.04	0.42	0.42	0.06	0.66	0.68	0.35	Err	0.50	Err
Queue Length 95th (ft)	3	0	0	0	118	0	0	Err	70	Err
Control Delay (s)	15.8	0.0	0.0	0.0	24.4	0.0	0.0	Err	14.3	Err
Lane LOS	C				C			F	B	F
Approach Delay (s)	0.2				3.9			Err		Err
Approach LOS								F		F

Intersection Summary

Average Delay		Err								
Intersection Capacity Utilization		77.1%		ICU Level of Service					D	
Analysis Period (min)		15								

14: US 17 Bus. (Market St.) & Henry St.  
 2040 No Build AM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	1561	134	341	1289	18	95	17	302	9	9	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		50	500		0	350		0	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3505	1568	1752	3498	0	0	1786	1583	0	1710	0
Flt Permitted	0.950			0.950				0.959			0.986	
Satd. Flow (perm)	1752	3505	1568	1752	3498	0	0	1786	1583	0	1710	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		274			1024			913			767	
Travel Time (s)		4.7			17.5			24.9			20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	1734	149	379	1452	0	0	125	336	0	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			24			24	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	84.9%
ICU Level of Service	E
Analysis Period (min)	15

14: US 17 Bus. (Market St.) & Henry St.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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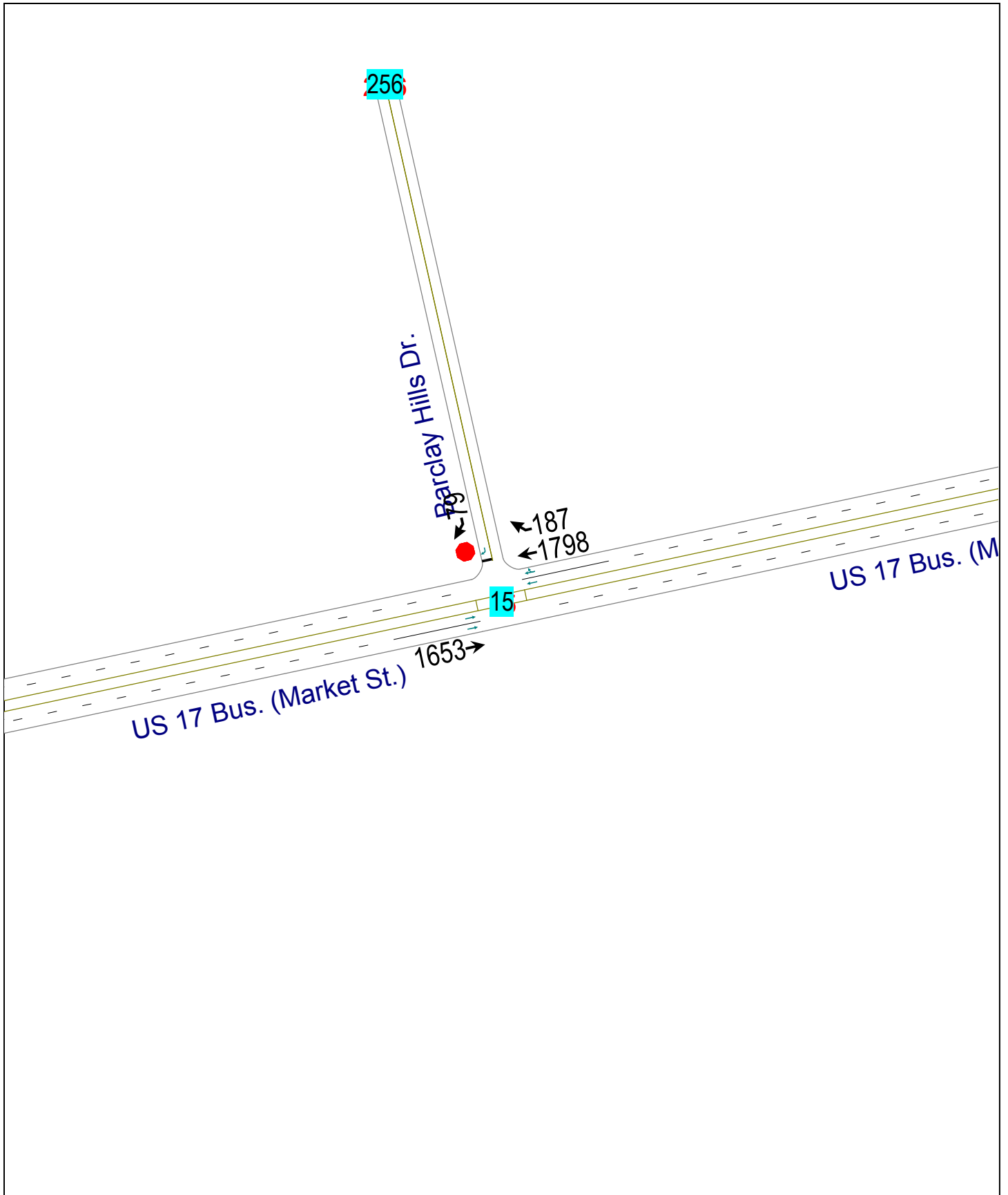
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	36	1561	134	341	1289	18	95	17	302	9	9	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	40	1734	149	379	1432	20	106	19	336	10	10	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		656										
pX, platoon unblocked				0.64			0.64	0.64	0.64	0.64	0.64	
vC, conflicting volume	1452			1883			3309	4024	867	3492	4163	726
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1452			1254			3483	4602	0	3770	4819	726
tC, single (s)	4.2			4.2			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			0			0	0	52	0	0	96
cM capacity (veh/h)	457			349			0	0	693	0	0	365

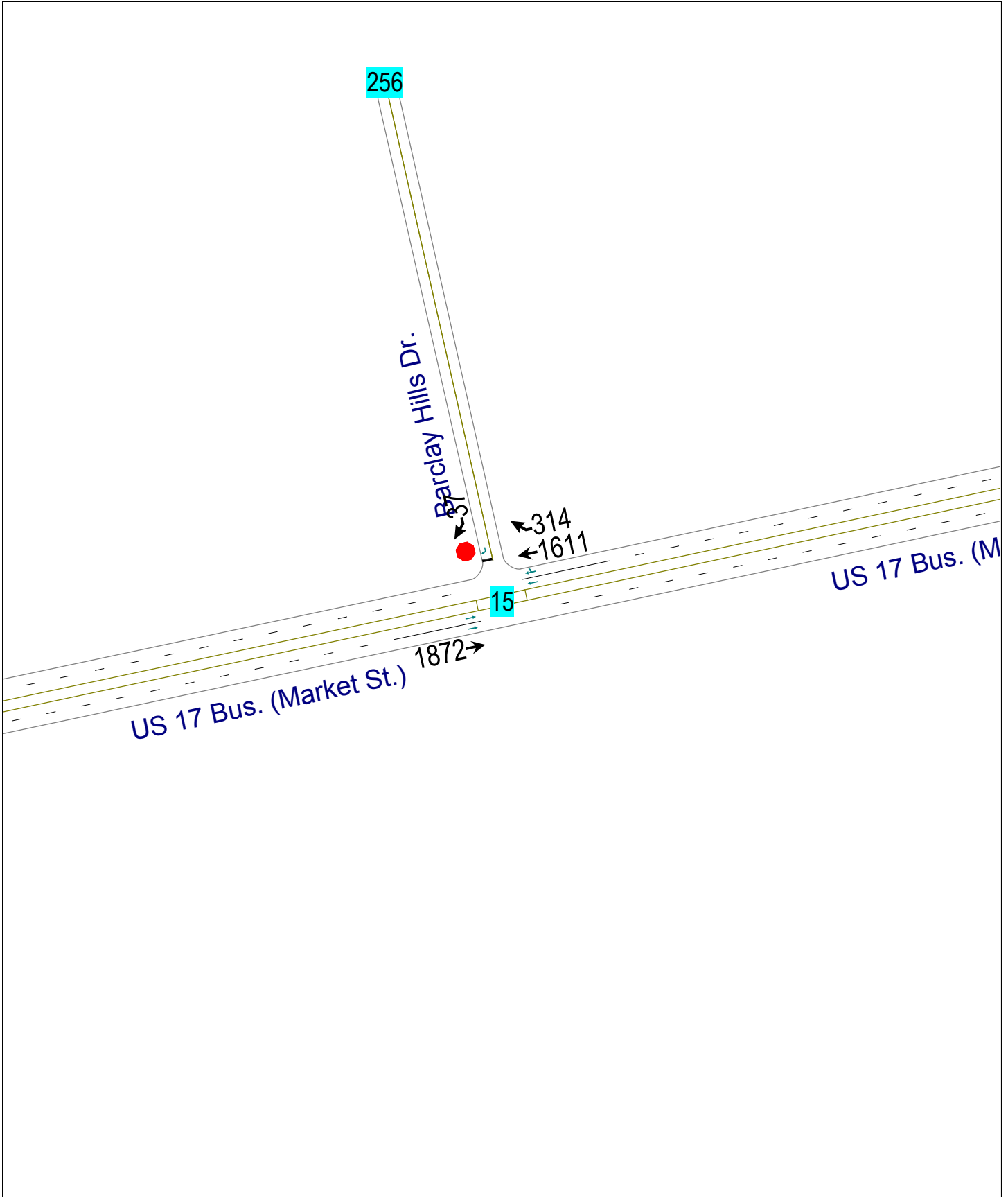
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	40	867	867	149	379	955	497	124	336	36
Volume Left	40	0	0	0	379	0	0	106	0	10
Volume Right	0	0	0	149	0	0	20	0	336	16
cSH	457	1700	1700	1700	349	1700	1700	0	693	0
Volume to Capacity	0.09	0.51	0.51	0.09	1.09	0.56	0.29	Err	0.48	Err
Queue Length 95th (ft)	7	0	0	0	349	0	0	Err	66	Err
Control Delay (s)	13.6	0.0	0.0	0.0	108.6	0.0	0.0	Err	15.0	Err
Lane LOS	B				F			F	B	F
Approach Delay (s)	0.3				22.5			Err		Err
Approach LOS								F		F

Intersection Summary

Average Delay		Err								
Intersection Capacity Utilization		84.9%		ICU Level of Service				E		
Analysis Period (min)		15								

14: US 17 Bus. (Market St.) & Henry St.  
 2040 No Build PM Peak





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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Volume (vph)	0	1653	1798	187	0	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3505	3456	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3505	3456	0	0	1611
Link Speed (mph)		40	40		35	
Link Distance (ft)		923	771		600	
Travel Time (s)		15.7	13.1		11.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1837	2206	0	0	88
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	67.2%
Analysis Period (min)	15
	ICU Level of Service C

15: US 17 Bus. (Market St.) & Barclay Hills Dr.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Volume (veh/h)	0	1653	1798	187	0	79
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1837	1998	208	0	88
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2206				3020	1103
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2206				3020	1103
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	57
cM capacity (veh/h)	231				10	206

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	918	918	1332	874	88
Volume Left	0	0	0	0	0
Volume Right	0	0	0	208	88
cSH	1700	1700	1700	1700	206
Volume to Capacity	0.54	0.54	0.78	0.51	0.43
Queue Length 95th (ft)	0	0	0	0	49
Control Delay (s)	0.0	0.0	0.0	0.0	34.8
Lane LOS					D
Approach Delay (s)	0.0		0.0		34.8
Approach LOS					D

Intersection Summary					
Average Delay			0.7		
Intersection Capacity Utilization			67.2%	ICU Level of Service	C
Analysis Period (min)			15		

15: US 17 Bus. (Market St.) & Barclay Hills Dr.  
 2040 No Build AM Peak



U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Volume (vph)	0	1872	1611	314	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3505	3421	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3505	3421	0	0	1611
Link Speed (mph)		40	40		35	
Link Distance (ft)		923	771		600	
Travel Time (s)		15.7	13.1		11.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2080	2139	0	0	41
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.5%
Analysis Period (min)	15
	ICU Level of Service C

15: US 17 Bus. (Market St.) & Barclay Hills Dr.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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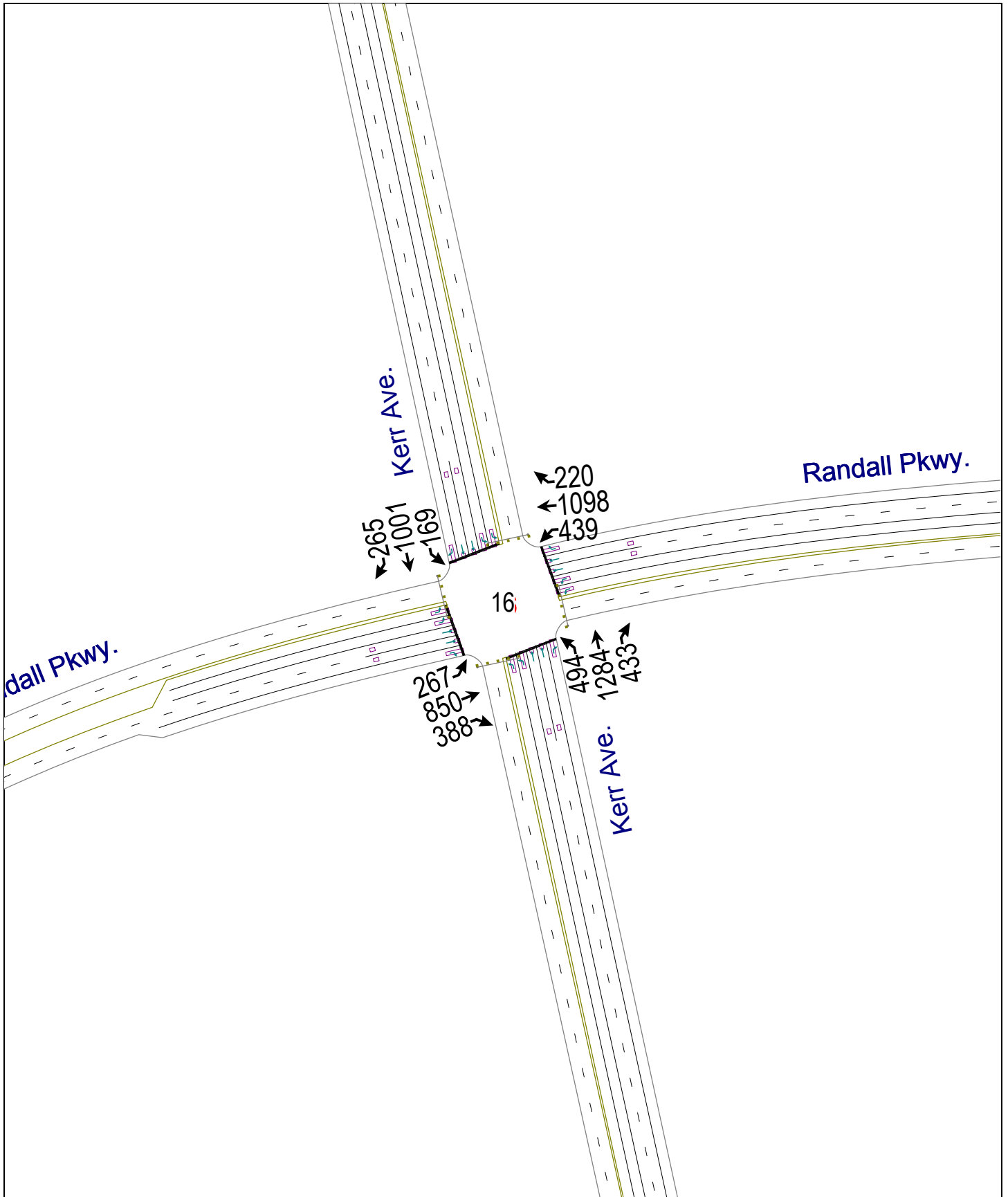


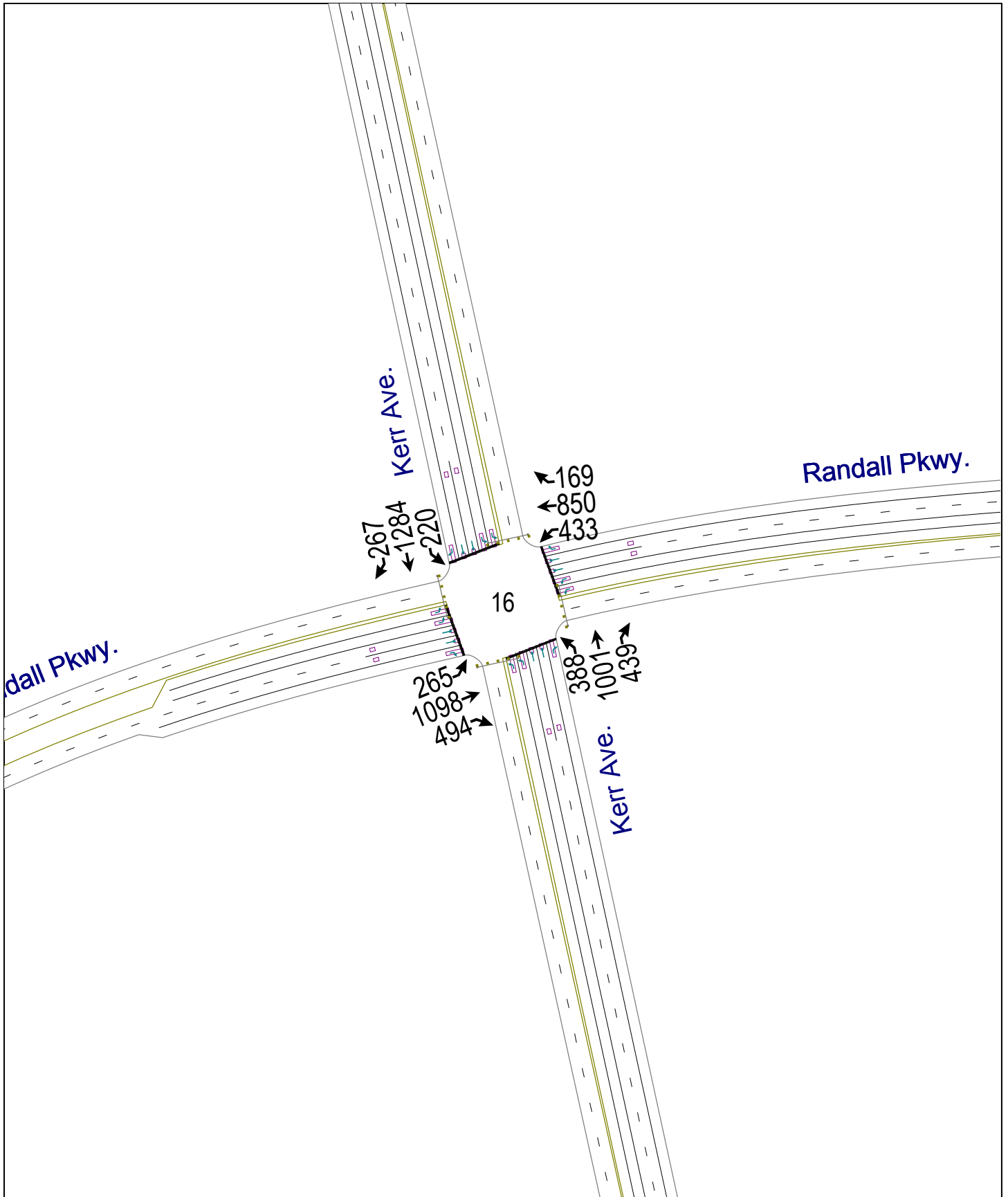
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Volume (veh/h)	0	1872	1611	314	0	37
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2080	1790	349	0	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2139				3004	1069
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2139				3004	1069
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	81
cM capacity (veh/h)	246				11	217

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	1040	1040	1193	946	41
Volume Left	0	0	0	0	0
Volume Right	0	0	0	349	41
cSH	1700	1700	1700	1700	217
Volume to Capacity	0.61	0.61	0.70	0.56	0.19
Queue Length 95th (ft)	0	0	0	0	17
Control Delay (s)	0.0	0.0	0.0	0.0	25.4
Lane LOS					D
Approach Delay (s)	0.0		0.0		25.4
Approach LOS					D

Intersection Summary					
Average Delay			0.2		
Intersection Capacity Utilization			64.5%	ICU Level of Service	C
Analysis Period (min)			15		

15: US 17 Bus. (Market St.) & Barclay Hills Dr.  
 2040 No Build PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	267	850	388	439	1098	220	494	1284	433	169	1001	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		350	775		1000	775		1000	750		1000
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	1568	3400	3505	1568	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	3505	1568	3400	3505	1568	3367	3471	1553	3367	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			35	
Link Distance (ft)		976			1156			1214			1203	
Travel Time (s)		19.0			22.5			18.4			23.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	297	944	431	488	1220	244	549	1427	481	188	1112	294
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		28			28			28			28	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	7.0	10.0	7.0	7.0	12.0	7.0	7.0	10.0	7.0
Minimum Split (s)	14.0	17.0	14.0	14.0	17.0	14.0	14.0	19.0	14.0	14.0	17.0	14.0
Total Split (s)	17.0	45.0	28.0	26.0	54.0	14.0	28.0	65.0	26.0	14.0	51.0	17.0
Total Split (%)	11.3%	30.0%	18.7%	17.3%	36.0%	9.3%	18.7%	43.3%	17.3%	9.3%	34.0%	11.3%
Maximum Green (s)	10.0	38.0	21.0	19.0	47.0	7.0	21.0	58.0	19.0	7.0	44.0	10.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	12.0	40.0	63.0	21.0	49.0	58.0	23.0	60.0	81.0	9.0	46.0	58.0
Actuated g/C Ratio	0.08	0.27	0.42	0.14	0.33	0.39	0.15	0.40	0.54	0.06	0.31	0.39
v/c Ratio	1.09	1.01	0.65	1.03	1.07	0.40	1.06	1.03	0.57	0.93	1.05	0.49
Control Delay	143.0	85.8	24.2	109.8	93.6	23.6	116.6	75.4	18.6	116.4	89.8	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

16: Randall Pkwy. & Kerr Ave.  
2040 No Build AM Peak

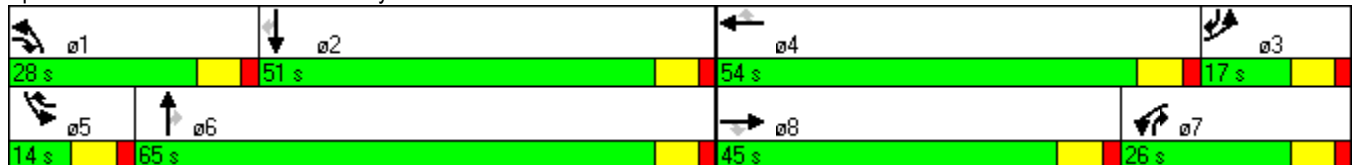


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	143.0	85.8	24.2	109.8	93.6	23.6	116.6	75.4	18.6	116.4	89.8	25.4
LOS	F	F	C	F	F	C	F	E	B	F	F	C
Approach Delay	80.1			88.9			73.5			81.1		
Approach LOS	F			F			E			F		
Queue Length 50th (ft)	~168	~497	206	~261	~691	129	~304	~782	213	96	~618	134
Queue Length 95th (ft)	#267	#646	285	#377	#831	188	#424	#922	293	#174	#758	191
Internal Link Dist (ft)	896			1076			1134			1123		
Turn Bay Length (ft)	325		350	775		1000	775		1000	750		1000
Base Capacity (vph)	272	935	659	476	1145	606	516	1388	839	202	1064	600
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	1.01	0.65	1.03	1.07	0.40	1.06	1.03	0.57	0.93	1.05	0.49

**Intersection Summary**

























Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Natural Cycle: 150  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.09  
 Intersection Signal Delay: 80.4  
 Intersection LOS: F  
 Intersection Capacity Utilization 96.4%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 16: Randall Pkwy. & Kerr Ave.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	265	1098	494	433	850	169	388	1001	439	220	1284	267
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		350	775		1000	775		1000	750		1000
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	1568	3400	3505	1568	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	3505	1568	3400	3505	1568	3367	3471	1553	3367	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			35	
Link Distance (ft)		976			1156			1214			1203	
Travel Time (s)		19.0			22.5			18.4			23.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	294	1220	549	481	944	188	431	1112	488	244	1427	297
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		28			28			28			28	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	7.0	10.0	7.0	7.0	12.0	7.0	7.0	10.0	7.0
Minimum Split (s)	14.0	17.0	14.0	14.0	17.0	14.0	14.0	19.0	14.0	14.0	17.0	14.0
Total Split (s)	21.0	51.0	22.0	24.0	54.0	19.0	22.0	66.0	24.0	19.0	63.0	21.0
Total Split (%)	13.1%	31.9%	13.8%	15.0%	33.8%	11.9%	13.8%	41.3%	15.0%	11.9%	39.4%	13.1%
Maximum Green (s)	14.0	44.0	15.0	17.0	47.0	12.0	15.0	59.0	17.0	12.0	56.0	14.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	17.0	46.0	63.0	19.0	48.0	62.0	17.0	61.0	80.0	14.0	58.0	75.0
Actuated g/C Ratio	0.11	0.29	0.39	0.12	0.30	0.39	0.11	0.38	0.50	0.09	0.36	0.47
v/c Ratio	0.81	1.21	0.89	1.19	0.90	0.31	1.20	0.84	0.63	0.83	1.13	0.41
Control Delay	87.8	151.5	45.4	165.3	65.6	22.0	172.8	52.1	24.8	94.1	116.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

16: Randall Pkwy. & Kerr Ave.  
2040 No Build PM Peak

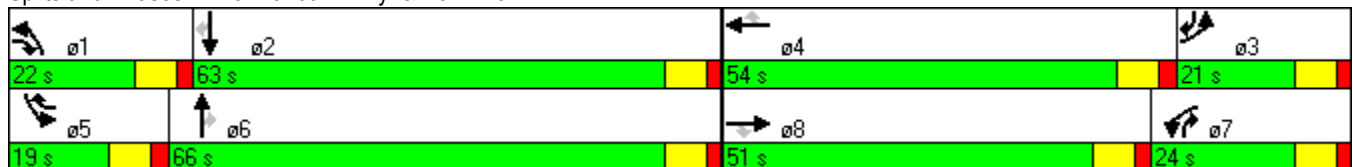


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	87.8	151.5	45.4	165.3	65.6	22.0	172.8	52.1	24.8	94.1	116.5	18.9
LOS	F	F	D	F	E	C	F	D	C	F	F	B
Approach Delay	114.2			90.2			71.2			99.0		
Approach LOS	F			F			E			F		
Queue Length 50th (ft)	158	~816	364	~311	495	96	~281	556	247	131	~910	135
Queue Length 95th (ft)	#240	#958	#573	#430	587	145	#396	651	334	#203	#1050	191
Internal Link Dist (ft)	896			1076			1134			1123		
Turn Bay Length (ft)	325		350	775		1000	775		1000	750		1000
Base Capacity (vph)	361	1008	617	404	1073	607	358	1323	777	295	1258	728
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	1.21	0.89	1.19	0.88	0.31	1.20	0.84	0.63	0.83	1.13	0.41

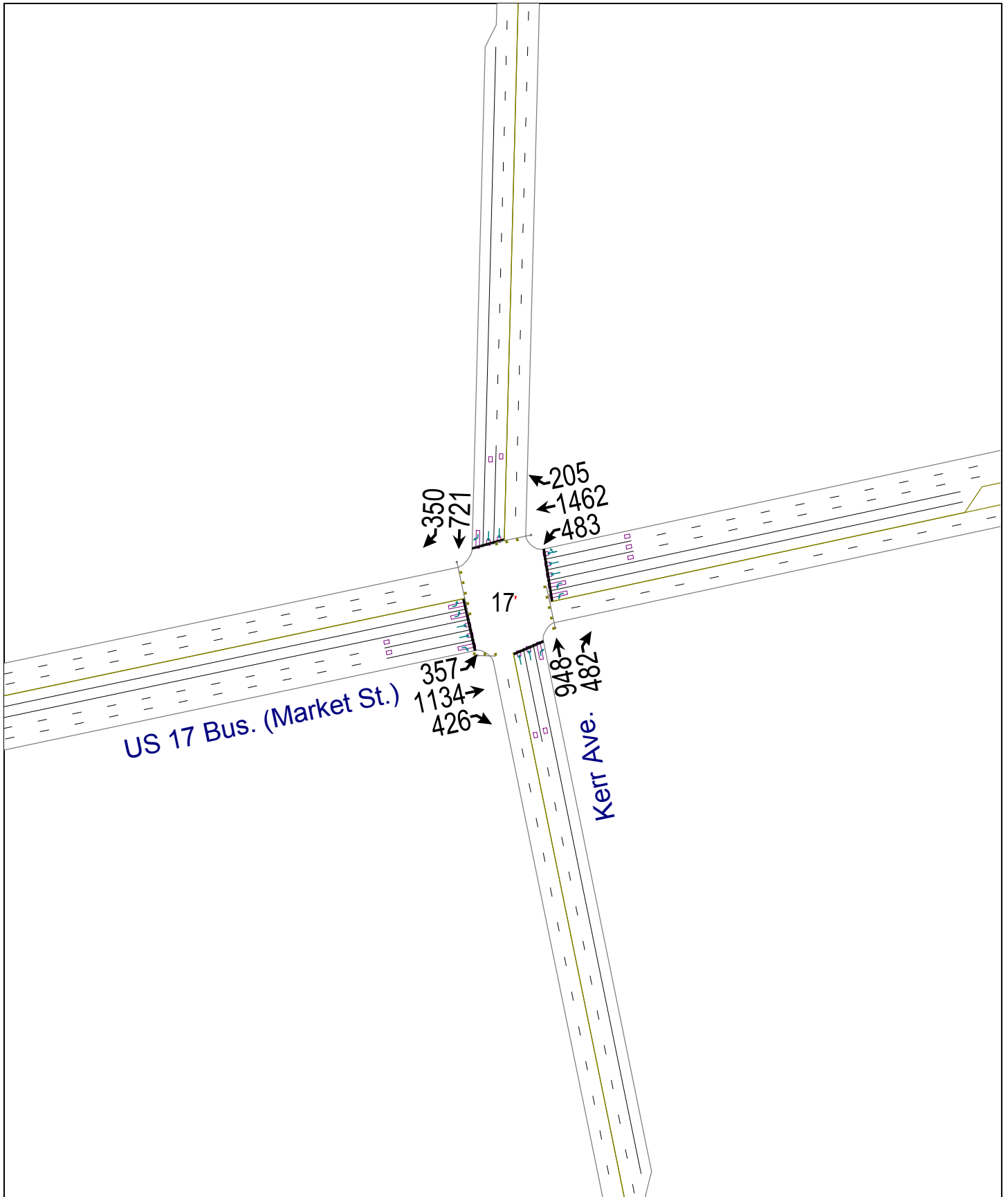
**Intersection Summary**

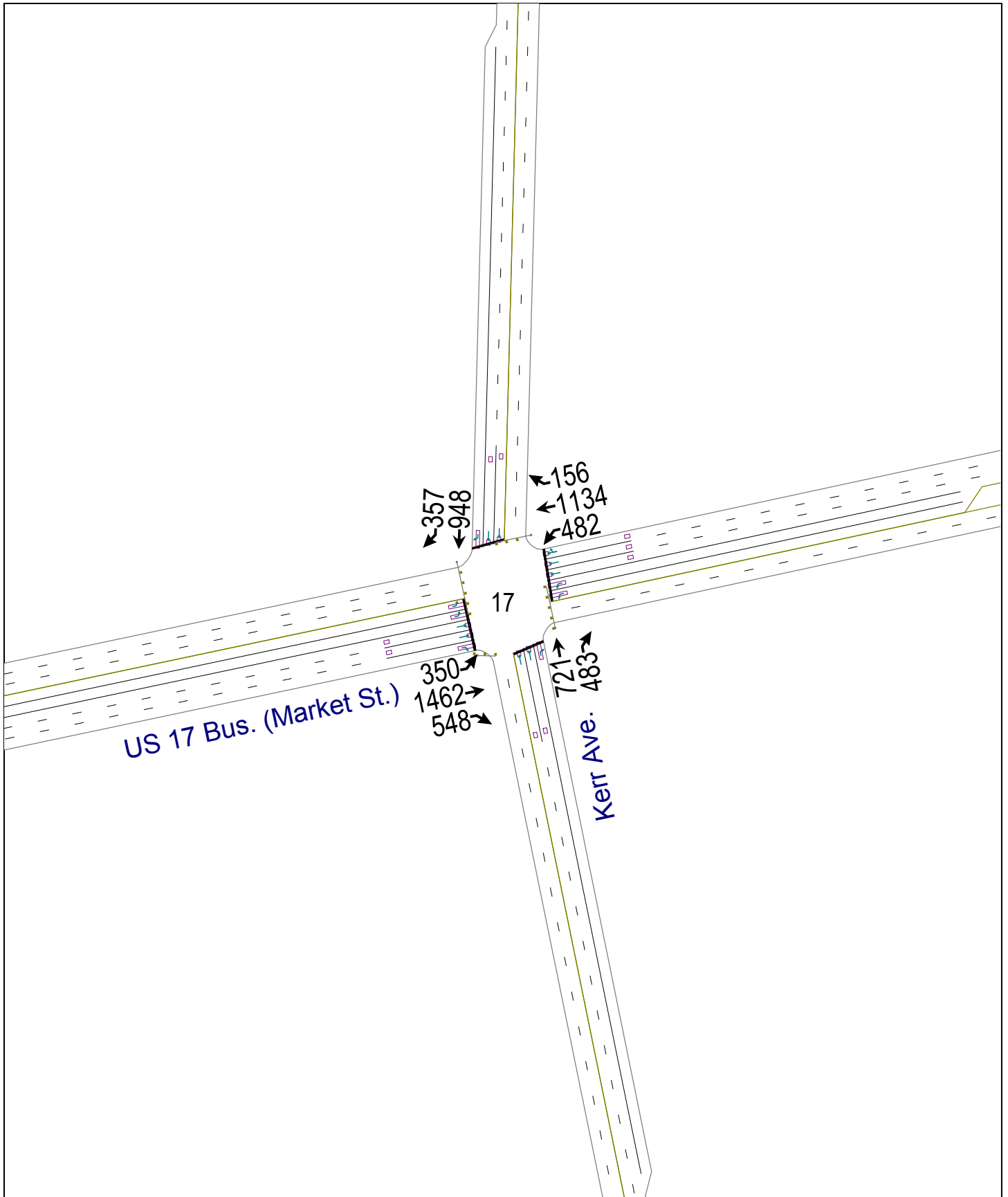
Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Natural Cycle: 160  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.21  
 Intersection Signal Delay: 93.9  
 Intersection LOS: F  
 Intersection Capacity Utilization 105.9%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 16: Randall Pkwy. & Kerr Ave.






























U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	357	1134	426	483	1462	205	0	948	482	0	721	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	550		0	475		0	0		600	0		550
Storage Lanes	2		1	2		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	1568	3400	4945	0	0	3471	1553	0	3471	1553
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	3400	3505	1568	3400	4945	0	0	3471	1553	0	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35				45
Link Distance (ft)		706			982			915				1044
Travel Time (s)		12.0			16.7			17.8				15.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	397	1260	473	537	1852	0	0	1053	536	0	801	389
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		Perm	Prot					pm+ov			pm+ov
Protected Phases	5	2		1	6			8	1		4	5
Permitted Phases			2						8			4
Detector Phase	5	2	2	1	6			8	1		4	5
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0			10.0	7.0		12.0	7.0
Minimum Split (s)	14.0	17.0	17.0	14.0	17.0			17.0	14.0		19.0	14.0
Total Split (s)	21.0	52.0	52.0	25.0	56.0	0.0	0.0	43.0	25.0	0.0	43.0	21.0
Total Split (%)	17.5%	43.3%	43.3%	20.8%	46.7%	0.0%	0.0%	35.8%	20.8%	0.0%	35.8%	17.5%
Maximum Green (s)	14.0	45.0	45.0	18.0	49.0			36.0	18.0		36.0	14.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead				Lead			Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Recall Mode	None	Max	Max	None	Max			None	None		None	None
Act Effct Green (s)	16.0	47.0	47.0	20.0	51.0			38.0	63.0		38.0	59.0
Actuated g/C Ratio	0.13	0.39	0.39	0.17	0.42			0.32	0.52		0.32	0.49
v/c Ratio	0.88	0.92	0.77	0.95	0.88			0.96	0.66		0.73	0.51
Control Delay	71.9	46.3	41.8	76.5	37.8			59.3	25.5		41.1	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0

17: US 17 Bus. (Market St.) & Kerr Ave.  
2040 No Build AM Peak

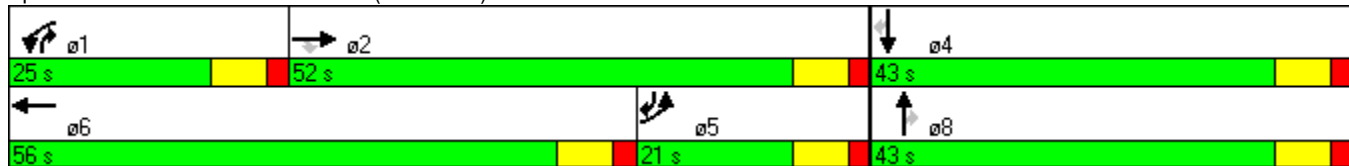


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	71.9	46.3	41.8	76.5	37.8			59.3	25.5		41.1	23.6
LOS	E	D	D	E	D			E	C		D	C
Approach Delay		50.1			46.5			47.9			35.4	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	157	482	316	214	474			420	290		289	198
Queue Length 95th (ft)	#242	#624	455	#322	545			#561	419		363	290
Internal Link Dist (ft)		626			902			835			964	
Turn Bay Length (ft)	550			475					600			550
Base Capacity (vph)	453	1373	614	567	2102			1099	815		1099	764
Starvation Cap Reductn	0	0	0	0	0			0	0		0	0
Spillback Cap Reductn	0	0	0	0	0			0	0		0	0
Storage Cap Reductn	0	0	0	0	0			0	0		0	0
Reduced v/c Ratio	0.88	0.92	0.77	0.95	0.88			0.96	0.66		0.73	0.51

**Intersection Summary**

































Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 46.1  
 Intersection LOS: D  
 Intersection Capacity Utilization 83.8%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 17: US 17 Bus. (Market St.) & Kerr Ave.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 	 	  	  			 	 		 	 
Volume (vph)	350	1462	548	482	1134	156	0	721	483	0	948	357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	550		0	475		0	0		600	0		550
Storage Lanes	2		1	2		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	1568	3400	4945	0	0	3471	1553	0	3471	1553
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	3400	3505	1568	3400	4945	0	0	3471	1553	0	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35				45
Link Distance (ft)		706			982			915				1044
Travel Time (s)		12.0			16.7			17.8				15.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	389	1624	609	536	1433	0	0	801	537	0	1053	397
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		Perm	Prot					pm+ov			pm+ov
Protected Phases	5	2		1	6			8	1		4	5
Permitted Phases			2						8			4
Detector Phase	5	2	2	1	6			8	1		4	5
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0			10.0	7.0		12.0	7.0
Minimum Split (s)	14.0	17.0	17.0	14.0	17.0			17.0	14.0		19.0	14.0
Total Split (s)	25.0	58.0	58.0	23.0	56.0	0.0	0.0	39.0	23.0	0.0	39.0	25.0
Total Split (%)	20.8%	48.3%	48.3%	19.2%	46.7%	0.0%	0.0%	32.5%	19.2%	0.0%	32.5%	20.8%
Maximum Green (s)	18.0	51.0	51.0	16.0	49.0			32.0	16.0		32.0	18.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead				Lead			Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Recall Mode	None	Max	Max	None	Max			None	None		None	None
Act Effct Green (s)	20.0	53.0	53.0	18.0	51.0			34.0	57.0		34.0	59.0
Actuated g/C Ratio	0.17	0.44	0.44	0.15	0.42			0.28	0.48		0.28	0.49
v/c Ratio	0.69	1.05	0.88	1.05	0.68			0.81	0.73		1.07	0.52
Control Delay	54.1	70.2	46.4	103.0	30.0			47.9	32.4		91.1	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0

17: US 17 Bus. (Market St.) & Kerr Ave.  
2040 No Build PM Peak

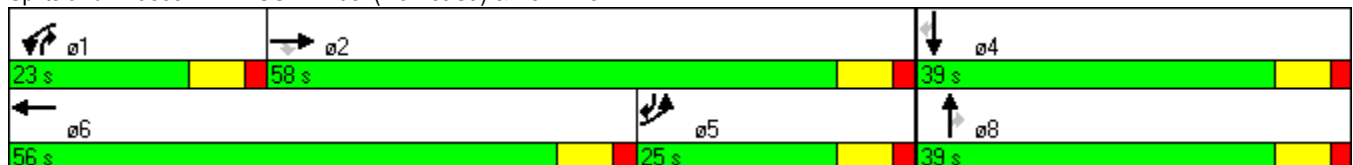


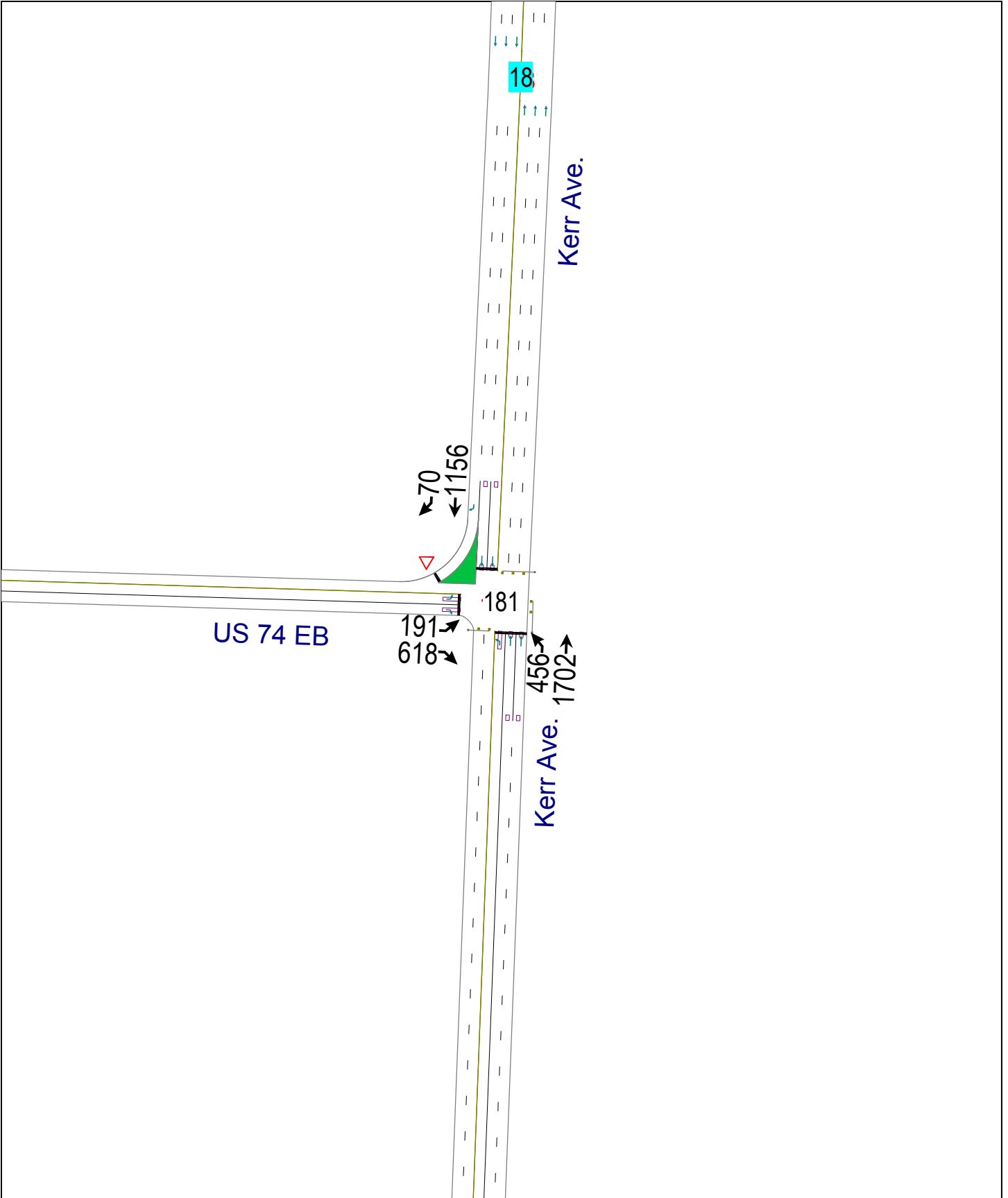
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	54.1	70.2	46.4	103.0	30.0			47.9	32.4		91.1	23.9
LOS	D	E	D	F	C			D	C		F	C
Approach Delay		62.3			49.9			41.7			72.7	
Approach LOS		E			D			D			E	
Queue Length 50th (ft)	147	~721	422	~233	323			304	325		~476	204
Queue Length 95th (ft)	202	#860	#648	#345	378			382	468		#610	298
Internal Link Dist (ft)		626			902			835			964	
Turn Bay Length (ft)	550			475					600			550
Base Capacity (vph)	567	1548	693	510	2102			983	738		983	764
Starvation Cap Reductn	0	0	0	0	0			0	0		0	0
Spillback Cap Reductn	0	0	0	0	0			0	0		0	0
Storage Cap Reductn	0	0	0	0	0			0	0		0	0
Reduced v/c Ratio	0.69	1.05	0.88	1.05	0.68			0.81	0.73		1.07	0.52

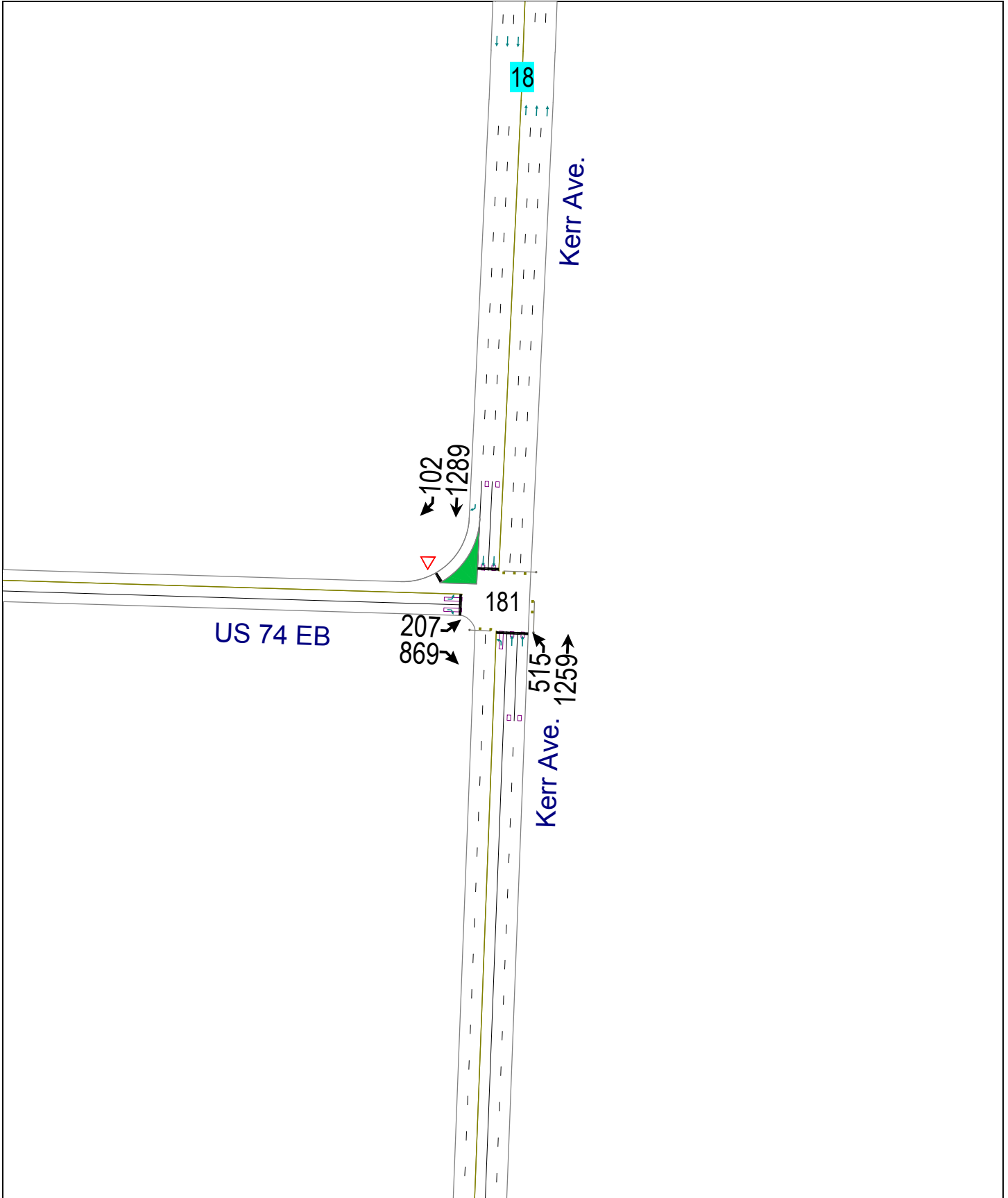
**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.07  
 Intersection Signal Delay: 57.3      Intersection LOS: E  
 Intersection Capacity Utilization 92.9%      ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 17: US 17 Bus. (Market St.) & Kerr Ave.









U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	191	618	456	1702	1156	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	690	650			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Satd. Flow (prot)	1736	1553	1736	3471	3471	1553
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1736	3471	3471	1553
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	45			45	45	
Link Distance (ft)	798			1079	591	
Travel Time (s)	12.1			16.3	9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	212	687	507	1891	1284	78
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	R NA	Right	Left	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	6	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	22.0	44.0	44.0	98.0	54.0	22.0
Total Split (%)	18.3%	36.7%	36.7%	81.7%	45.0%	18.3%
Maximum Green (s)	15.0	37.0	37.0	91.0	47.0	15.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	16.9	60.0	38.1	93.1	50.0	71.9
Actuated g/C Ratio	0.14	0.50	0.32	0.78	0.42	0.60
v/c Ratio	0.87	0.88	0.92	0.70	0.89	0.08
Control Delay	82.4	41.6	62.8	8.4	25.4	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

181: US 74 EB & Kerr Ave.  
2040 No Build AM Peak



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	82.4	41.6	62.8	8.4	25.4	6.1
LOS	F	D	E	A	C	A
Approach Delay	51.2			19.9	24.3	
Approach LOS	D			B	C	
Queue Length 50th (ft)	163	454	373	319	238	12
Queue Length 95th (ft)	#300	#703	#575	387	m256	m19
Internal Link Dist (ft)	718			999	511	
Turn Bay Length (ft)		690	650			
Base Capacity (vph)	246	788	564	2692	1445	931
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.87	0.90	0.70	0.89	0.08

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 118 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 27.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 80.3%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 181: US 74 EB & Kerr Ave.



181: US 74 EB & Kerr Ave.  
 2040 No Build AM Peak

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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	207	869	515	1259	1289	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	690	650			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Satd. Flow (prot)	1736	1553	1736	3471	3471	1553
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1736	3471	3471	1553
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	45			45	45	
Link Distance (ft)	798			1079	591	
Travel Time (s)	12.1			16.3	9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	230	966	572	1399	1432	113
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	R NA	Right	Left	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	6	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	20.0	50.0	50.0	100.0	50.0	20.0
Total Split (%)	16.7%	41.7%	41.7%	83.3%	41.7%	16.7%
Maximum Green (s)	13.0	43.0	43.0	93.0	43.0	13.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	15.0	65.0	45.0	95.0	45.0	65.0
Actuated g/C Ratio	0.12	0.54	0.38	0.79	0.38	0.54
v/c Ratio	1.06	1.15	0.88	0.51	1.10	0.13
Control Delay	128.0	108.3	51.4	5.1	78.7	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

181: US 74 EB & Kerr Ave.  
2040 No Build PM Peak

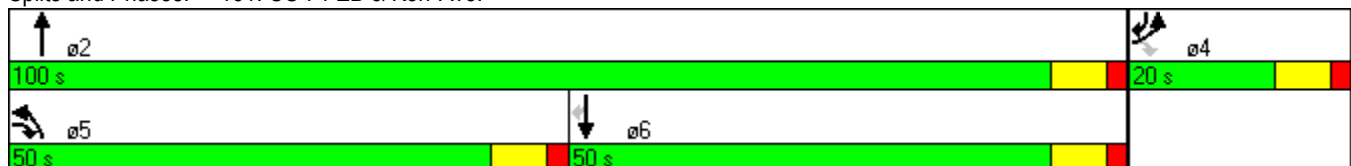


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	128.0	108.3	51.4	5.1	78.7	8.8
LOS	F	F	D	A	E	A
Approach Delay	112.1			18.5	73.6	
Approach LOS	F			B	E	
Queue Length 50th (ft)	~196	~879	409	162	~642	21
Queue Length 95th (ft)	#357	#1129	#617	197	#783	m31
Internal Link Dist (ft)	718			999	511	
Turn Bay Length (ft)		690	650			
Base Capacity (vph)	217	841	651	2748	1302	841
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.06	1.15	0.88	0.51	1.10	0.13

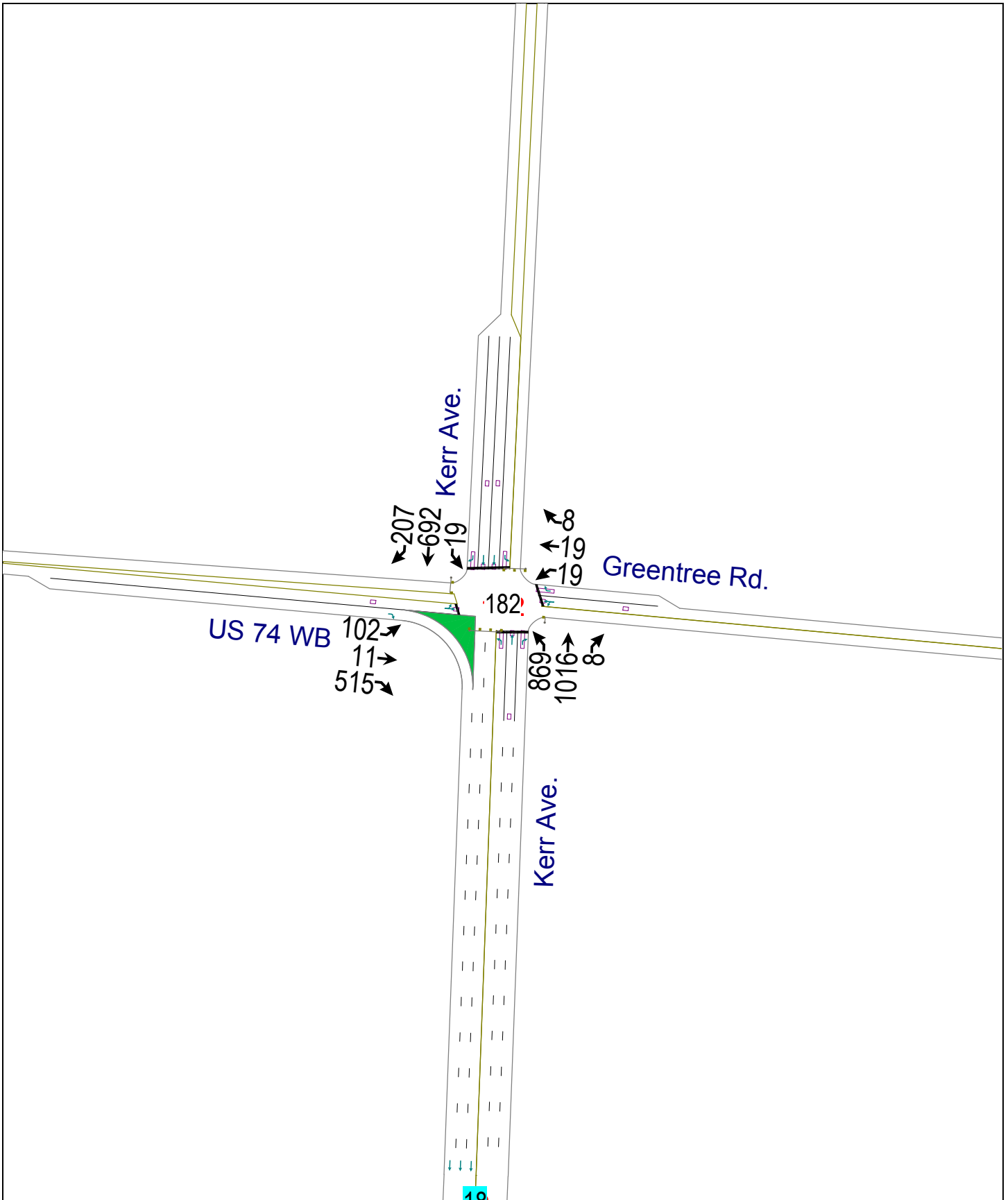
**Intersection Summary**

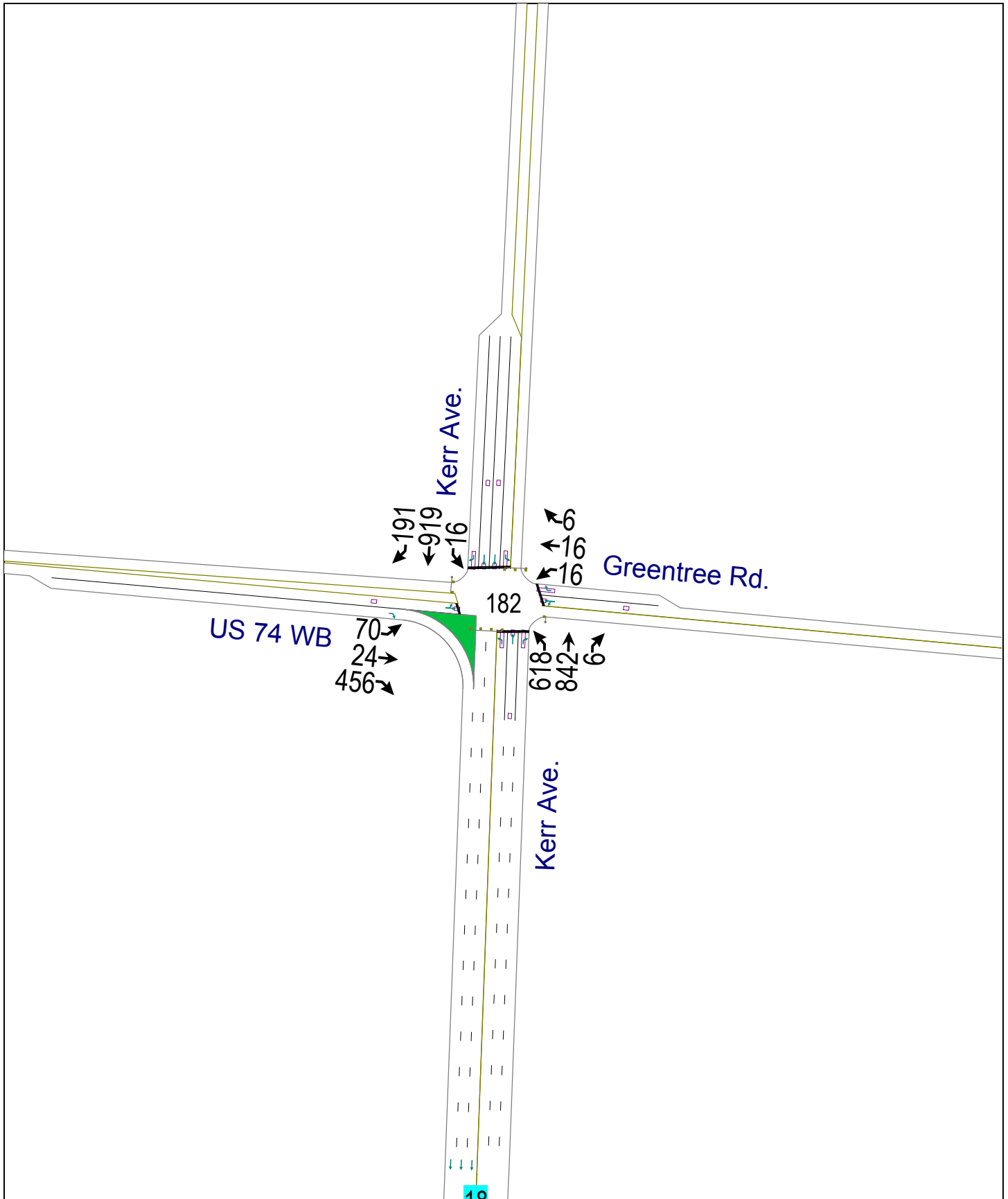
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.15  
 Intersection Signal Delay: 60.3  
 Intersection LOS: E  
 Intersection Capacity Utilization 97.8%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 181: US 74 EB & Kerr Ave.



181: US 74 EB & Kerr Ave.  
 2040 No Build PM Peak





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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗	↗	↖	↖↗	↖↗
Volume (vph)	102	11	515	19	19	8	869	1016	8	19	692	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		125	0		0	260		260
Storage Lanes	0		1	0		1	1		1	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1748	1553	0	1818	1583	1736	1827	1553	1736	3471	1553
Flt Permitted		0.716			0.556		0.950			0.950		
Satd. Flow (perm)	0	1308	1553	0	1036	1583	1736	1827	1553	1736	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45				45
Link Distance (ft)		670			656			674				989
Travel Time (s)		18.3			17.9			10.2				15.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	125	572	0	42	9	966	1129	9	21	769	230
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm		pm+ov	Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	4	4	5	8	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	7.0	12.0	12.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	19.0	14.0	19.0	19.0
Total Split (s)	16.0	16.0	72.0	16.0	16.0	14.0	72.0	90.0	90.0	14.0	32.0	32.0
Total Split (%)	13.3%	13.3%	60.0%	13.3%	13.3%	11.7%	60.0%	75.0%	75.0%	11.7%	26.7%	26.7%
Maximum Green (s)	9.0	9.0	65.0	9.0	9.0	7.0	65.0	83.0	83.0	7.0	25.0	25.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead			Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)		11.0	83.0		11.0	25.0	67.0	90.6	90.6	9.0	27.0	27.0
Actuated g/C Ratio		0.09	0.69		0.09	0.21	0.56	0.76	0.76	0.08	0.22	0.22
v/c Ratio		1.04	0.53		0.44	0.03	1.00	0.82	0.01	0.16	0.98	0.66
Control Delay		146.7	11.3		67.0	38.2	50.2	12.0	4.6	55.2	75.2	52.5
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

182: US 74 WB & Kerr Ave.  
 2040 No Build AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		146.7	11.3		67.0	38.2	50.2	12.0	4.6	55.2	75.2	52.5
LOS		F	B		E	D	D	B	A	E	E	D
Approach Delay		35.6			61.9			29.5			69.7	
Approach LOS		D			E			C			E	
Queue Length 50th (ft)		~105	195		31	6	563	364	2	16	314	163
Queue Length 95th (ft)		#231	281		71	20	#1017	424	m2	42	#446	253
Internal Link Dist (ft)		590			576			594			909	
Turn Bay Length (ft)			450			125				260		260
Base Capacity (vph)		120	1074		95	330	969	1379	1172	130	781	349
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		1.04	0.53		0.44	0.03	1.00	0.82	0.01	0.16	0.98	0.66

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.04  
 Intersection Signal Delay: 41.6  
 Intersection LOS: D  
 Intersection Capacity Utilization 92.7%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 182: US 74 WB & Kerr Ave.





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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗	↘		↗	↘	↘	↗	↘	↘	↗↗	↘
Volume (vph)	70	24	456	16	16	6	618	842	6	16	919	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		125	0		0	260		260
Storage Lanes	0		1	0		1	1		1	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1761	1553	0	1818	1583	1736	1827	1553	1736	3471	1553
Flt Permitted		0.758			0.696		0.950			0.950		
Satd. Flow (perm)	0	1385	1553	0	1296	1583	1736	1827	1553	1736	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		670			656			674			989	
Travel Time (s)		18.3			17.9			10.2			15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	105	507	0	36	7	687	936	7	18	1021	212
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm		pm+ov	Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	4	4	5	8	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	7.0	12.0	12.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	19.0	14.0	19.0	19.0
Total Split (s)	17.0	17.0	58.0	17.0	17.0	14.0	58.0	89.0	89.0	14.0	45.0	45.0
Total Split (%)	14.2%	14.2%	48.3%	14.2%	14.2%	11.7%	48.3%	74.2%	74.2%	11.7%	37.5%	37.5%
Maximum Green (s)	10.0	10.0	51.0	10.0	10.0	7.0	51.0	82.0	82.0	7.0	38.0	38.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead			Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?			Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)		11.8	68.3		11.8	25.8	51.5	89.8	89.8	9.0	41.7	41.7
Actuated g/C Ratio		0.10	0.57		0.10	0.22	0.43	0.75	0.75	0.08	0.35	0.35
v/c Ratio		0.77	0.57		0.28	0.02	0.92	0.68	0.01	0.14	0.85	0.39
Control Delay		86.4	19.4		56.2	37.3	43.7	9.3	4.7	54.6	44.6	33.0
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

182: US 74 WB & Kerr Ave.  
2040 No Build PM Peak

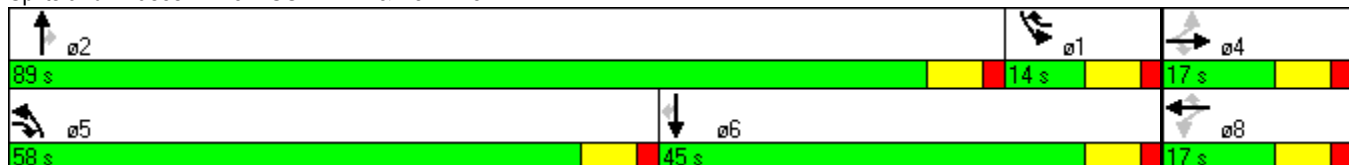


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		86.4	19.4		56.2	37.3	43.7	9.3	4.7	54.6	44.6	33.0
LOS		F	B		E	D	D	A	A	D	D	C
Approach Delay		30.9			53.1			23.8			42.7	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)		81	230		26	4	366	258	1	13	391	126
Queue Length 95th (ft)		#174	332		61	17	m#662	m340	m2	38	#508	198
Internal Link Dist (ft)		590			576			594			909	
Turn Bay Length (ft)			450			125				260		260
Base Capacity (vph)		139	904		130	341	767	1367	1162	130	1206	540
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.76	0.56		0.28	0.02	0.90	0.68	0.01	0.14	0.85	0.39

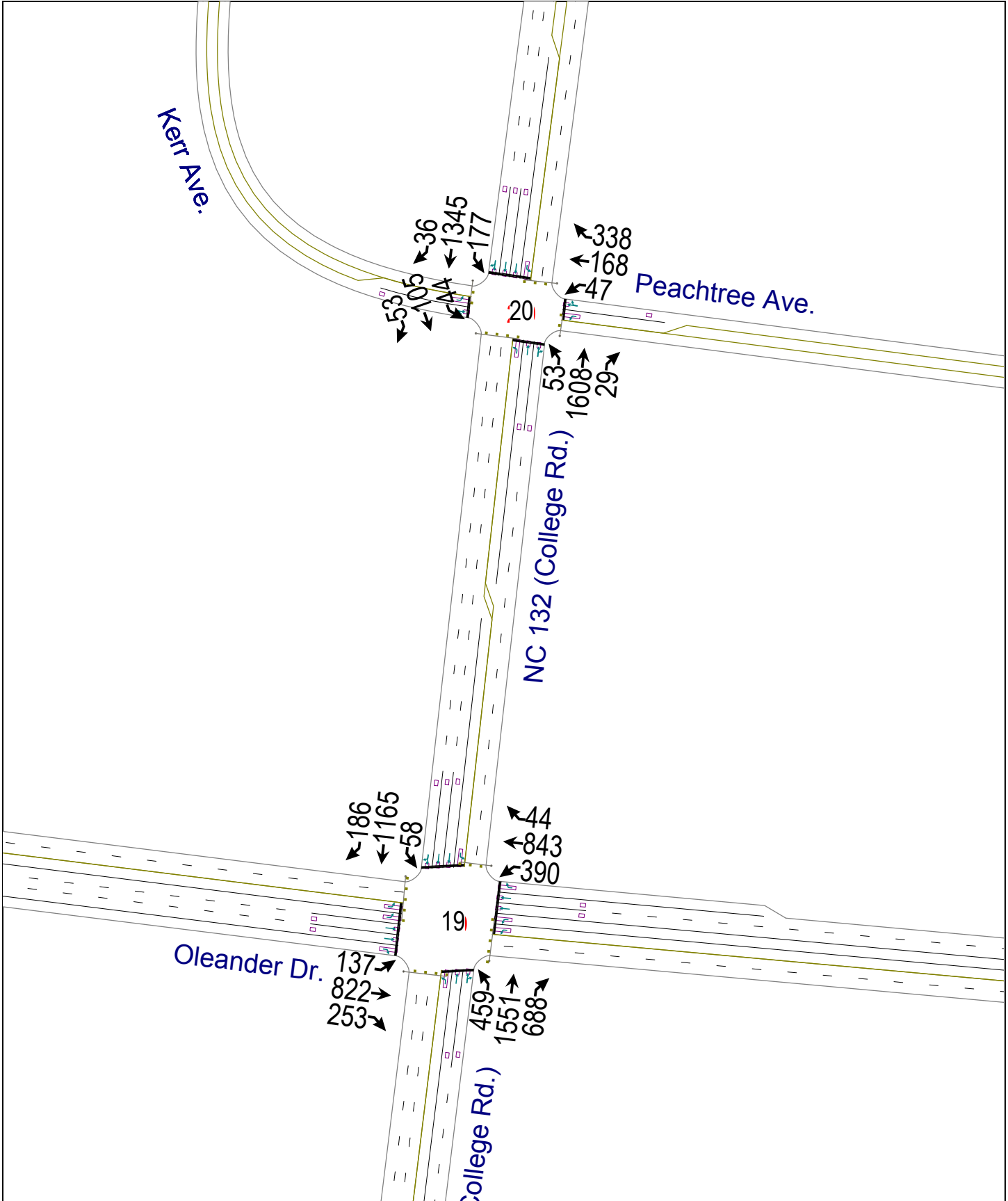
**Intersection Summary**

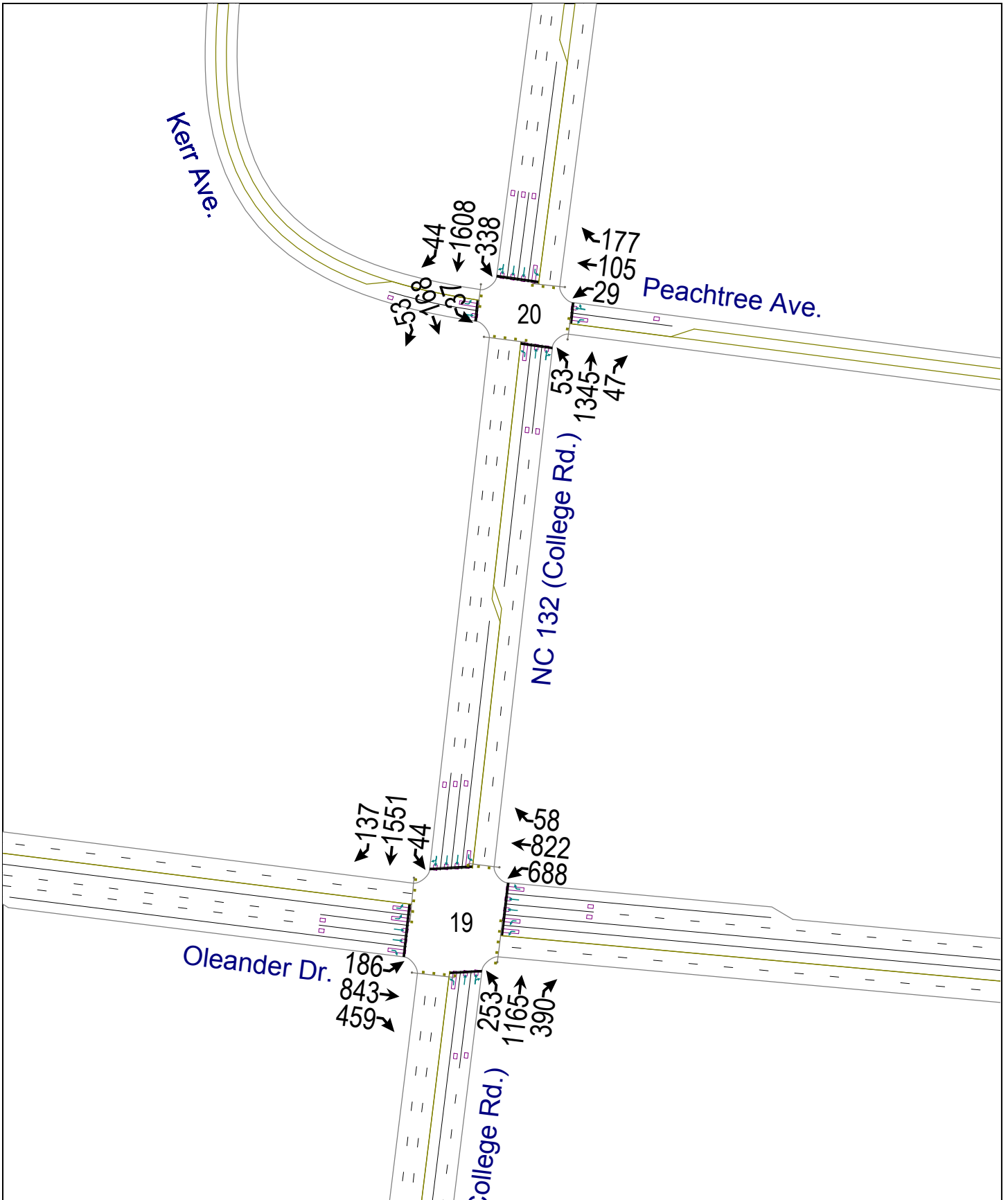
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 32.1 Intersection LOS: C  
 Intersection Capacity Utilization 83.9% ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 182: US 74 WB & Kerr Ave.



182: US 74 WB & Kerr Ave.  
 2040 No Build PM Peak





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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	137	822	253	390	843	44	459	1551	688	58	1165	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)			450	775		300	500		0	275		0
Storage Lanes	1		1	2		1	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	1719	3280	0	1719	4836	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	1719	3280	0	1719	4836	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			45			45			45	
Link Distance (ft)		967			928			1037			690	
Travel Time (s)		16.5			14.1			15.7			10.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	152	913	281	433	937	49	510	2487	0	64	1501	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Prot		Prot	
Protected Phases	3	8	1	7	4	5	1	6		5	2	
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	7.0	12.0	7.0	7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	17.0	14.0	14.0	19.0	14.0	14.0	19.0		14.0	19.0	
Total Split (s)	14.0	31.0	43.0	18.0	35.0	14.0	43.0	77.0	0.0	14.0	48.0	0.0
Total Split (%)	10.0%	22.1%	30.7%	12.9%	25.0%	10.0%	30.7%	55.0%	0.0%	10.0%	34.3%	0.0%
Maximum Green (s)	7.0	24.0	36.0	11.0	28.0	7.0	36.0	70.0		7.0	41.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)	9.0	26.0	64.0	13.0	30.0	39.0	38.0	74.8		9.0	43.0	
Actuated g/C Ratio	0.06	0.19	0.46	0.09	0.21	0.28	0.27	0.53		0.06	0.31	
v/c Ratio	0.70	1.42	0.40	1.38	1.26	0.11	1.09	1.42		0.58	1.01	
Control Delay	81.8	236.9	16.5	236.4	172.0	27.0	116.1	220.6		95.6	53.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	

19: Oleander Dr. & NC 132 (College Rd.)  
2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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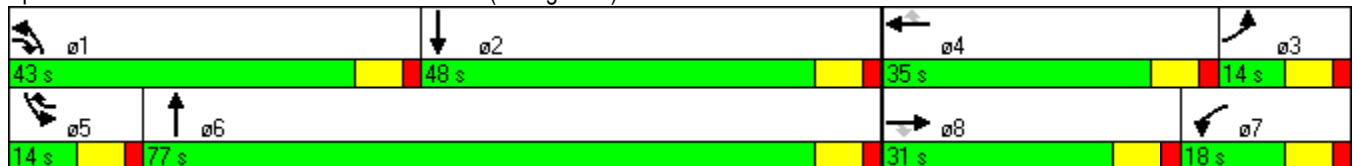


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	81.8	236.9	16.5	236.4	172.0	27.0	116.1	220.6		95.6	53.6	
LOS	F	F	B	F	F	C	F	F		F	D	
Approach Delay		173.4			186.6			202.8			55.3	
Approach LOS		F			F			F			E	
Queue Length 50th (ft)	71	~587	112	~269	~562	27	~523	~1634		62	~514	
Queue Length 95th (ft)	#118	#722	164	#379	#697	54	#746	#1760		m107	#624	
Internal Link Dist (ft)		887			848			957			610	
Turn Bay Length (ft)	550		450	775		300	500			275		
Base Capacity (vph)	216	645	710	313	744	433	467	1753		111	1485	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.70	1.42	0.40	1.38	1.26	0.11	1.09	1.42		0.58	1.01	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 20 (14%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 180  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.42  
 Intersection Signal Delay: 162.7  
 Intersection LOS: F  
 Intersection Capacity Utilization 121.2%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Oleander Dr. & NC 132 (College Rd.)



19: Oleander Dr. & NC 132 (College Rd.)  
 2040 No Build AM Peak

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	186	843	459	688	822	58	253	1165	390	44	1551	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)			450	775		300	500		0	275		0
Storage Lanes	1		1	2		1	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	1719	3307	0	1719	4881	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	1719	3307	0	1719	4881	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			45			45			45	
Link Distance (ft)		967			928			1037			690	
Travel Time (s)		16.5			14.1			15.7			10.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	207	937	510	764	913	64	281	1727	0	49	1875	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Prot		Prot	
Protected Phases	3	8	1	7	4	5	1	6		5	2	
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	7.0	12.0	7.0	7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	17.0	14.0	14.0	19.0	14.0	14.0	19.0		14.0	19.0	
Total Split (s)	15.0	31.0	21.0	27.0	43.0	14.0	21.0	58.0	0.0	14.0	51.0	0.0
Total Split (%)	11.5%	23.8%	16.2%	20.8%	33.1%	10.8%	16.2%	44.6%	0.0%	10.8%	39.2%	0.0%
Maximum Green (s)	8.0	24.0	14.0	20.0	36.0	7.0	14.0	51.0		7.0	44.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)	10.5	26.0	42.0	22.0	37.5	51.5	16.0	55.8		9.0	46.0	
Actuated g/C Ratio	0.08	0.20	0.32	0.17	0.29	0.40	0.12	0.43		0.07	0.35	
v/c Ratio	0.76	1.35	1.02	1.34	0.91	0.10	1.33	1.22		0.41	1.09	
Control Delay	76.8	207.0	76.1	206.1	58.7	25.1	218.8	138.0		62.4	77.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	

19: Oleander Dr. & NC 132 (College Rd.)  
2040 No Build PM Peak

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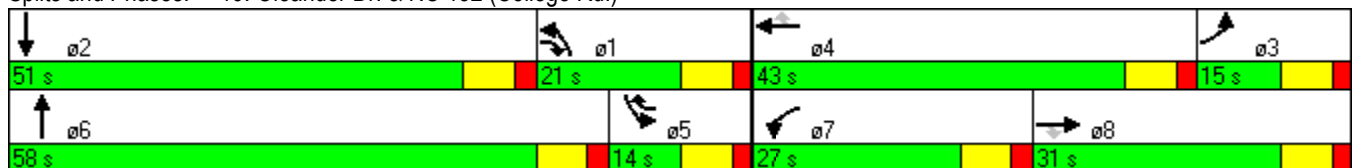


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	76.8	207.0	76.1	206.1	58.7	25.1	218.8	138.0		62.4	77.4	
LOS	E	F	E	F	E	C	F	F		E	E	
Approach Delay		150.4			122.2			149.3			77.0	
Approach LOS		F			F			F			E	
Queue Length 50th (ft)	90	~543	~274	~432	389	33	~307	~970		43	~651	
Queue Length 95th (ft)	#153	#677	#555	#557	#507	65	#485	#1109		m76	#748	
Internal Link Dist (ft)		887			848			957			610	
Turn Bay Length (ft)	550		450	775		300	500			275		
Base Capacity (vph)	272	694	502	570	1015	615	212	1419		119	1727	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.76	1.35	1.02	1.34	0.90	0.10	1.33	1.22		0.41	1.09	

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 128 (98%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 180  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.35  
 Intersection Signal Delay: 124.1  
 Intersection LOS: F  
 Intersection Capacity Utilization 110.1%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Oleander Dr. & NC 132 (College Rd.)



19: Oleander Dr. & NC 132 (College Rd.)  
 2040 No Build PM Peak



U-4434 Independence Blvd.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	105	53	47	168	338	53	1608	29	177	1345	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	115		0	275		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	1736	0	1736	1644	0	1719	3428	0	1719	4920	0
Flt Permitted	0.093			0.563			0.950			0.950		
Satd. Flow (perm)	170	1736	0	1029	1644	0	1719	3428	0	1719	4920	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		912			981			690			868	
Travel Time (s)		17.8			19.1			10.5			13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	176	0	52	563	0	59	1819	0	197	1534	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0		14.0	19.0	
Total Split (s)	48.0	48.0	0.0	48.0	48.0	0.0	15.0	73.0	0.0	19.0	77.0	0.0
Total Split (%)	34.3%	34.3%	0.0%	34.3%	34.3%	0.0%	10.7%	52.1%	0.0%	13.6%	55.0%	0.0%
Maximum Green (s)	41.0	41.0		41.0	41.0		8.0	66.0		12.0	70.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag							Lag	Lead		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	43.0	43.0		43.0	43.0		9.8	68.0		14.0	75.0	
Actuated g/C Ratio	0.31	0.31		0.31	0.31		0.07	0.49		0.10	0.54	
v/c Ratio	0.94	0.33		0.16	1.11		0.49	1.09		1.15	0.58	
Control Delay	158.7	39.6		37.3	119.8		48.9	59.3		167.2	23.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	50.4		0.0	0.0	

20: Kerr Ave. & NC 132 (College Rd.)  
2040 No Build AM Peak

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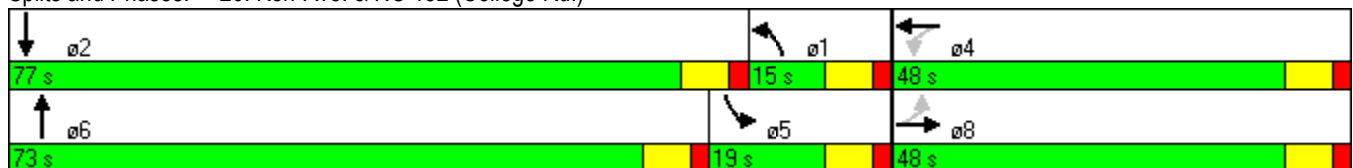


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	158.7	39.6		37.3	119.8		48.9	109.7		167.2	23.7	
LOS	F	D		D	F		D	F		F	C	
Approach Delay		65.5			112.8			107.8			40.0	
Approach LOS		E			F			F			D	
Queue Length 50th (ft)	44	124		35	~587		57	~963		~210	351	
Queue Length 95th (ft)	#132	192		71	#817		m45	m176		#372	401	
Internal Link Dist (ft)		832			901			610			788	
Turn Bay Length (ft)	100			115			275			250		
Base Capacity (vph)	52	533		316	505		123	1665		172	2635	
Starvation Cap Reductn	0	0		0	0		0	159		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.94	0.33		0.16	1.11		0.48	1.21		1.15	0.58	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.15  
 Intersection Signal Delay: 80.0  
 Intersection LOS: E  
 Intersection Capacity Utilization 106.7%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: Kerr Ave. & NC 132 (College Rd.)



20: Kerr Ave. & NC 132 (College Rd.)  
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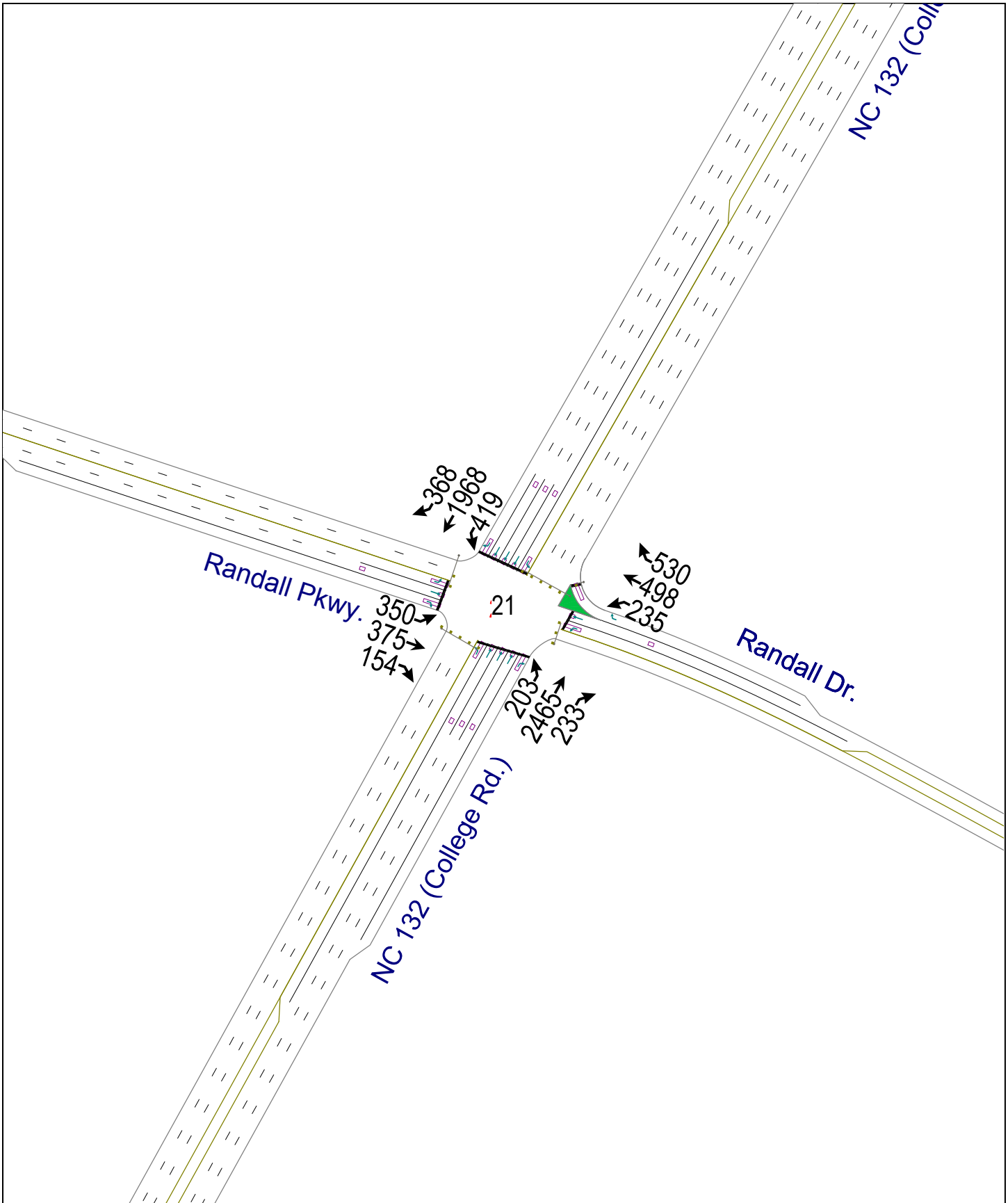
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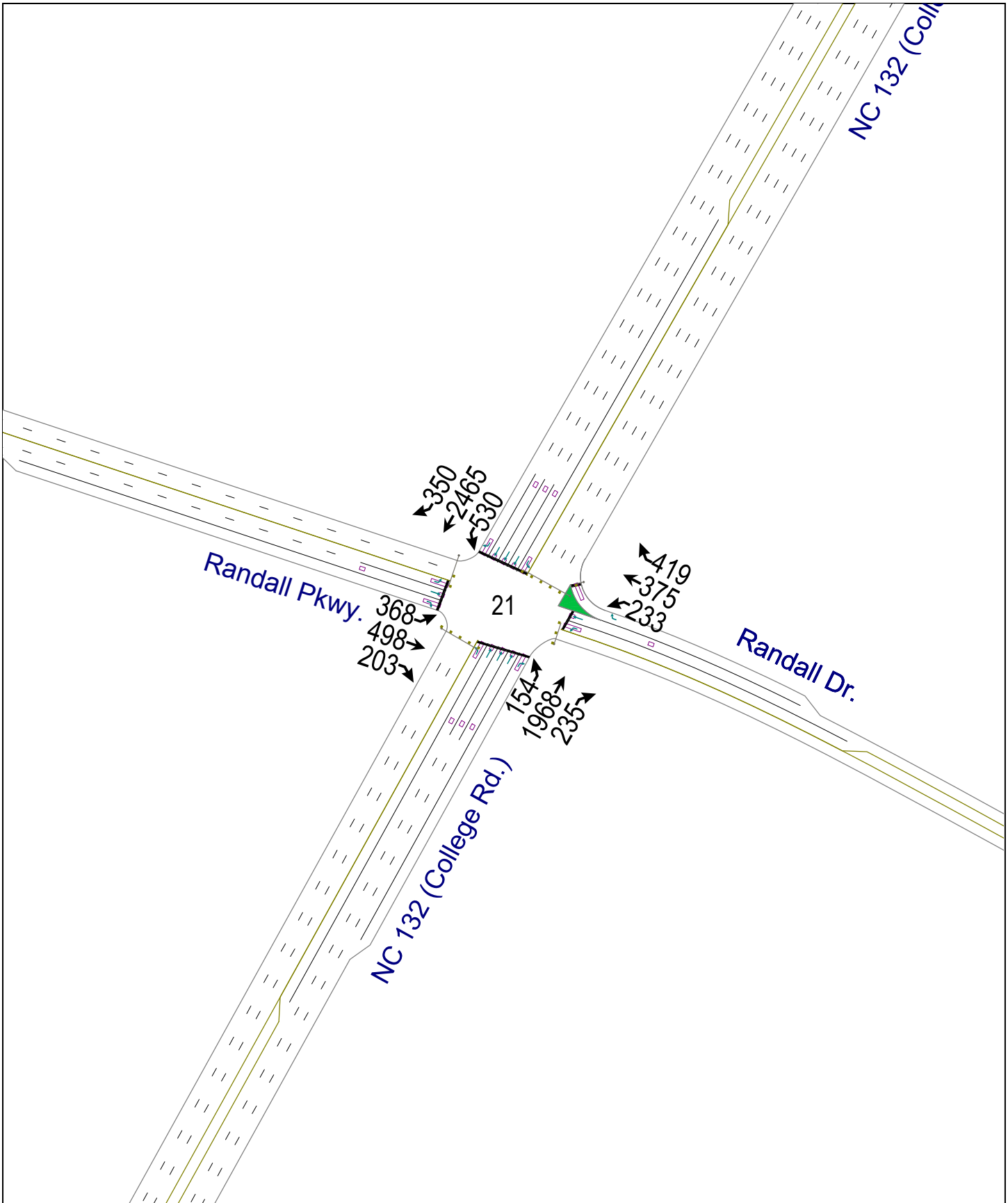


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	168	53	29	105	177	53	1345	47	338	1608	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	115		0	275		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	1761	0	1736	1655	0	1719	3421	0	1719	4920	0
Flt Permitted	0.178			0.324			0.950			0.950		
Satd. Flow (perm)	325	1761	0	592	1655	0	1719	3421	0	1719	4920	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		912			981			690			868	
Travel Time (s)		17.8			19.1			10.5			13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	41	246	0	32	314	0	59	1546	0	376	1836	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0		14.0	19.0	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	15.0	66.0	0.0	34.0	85.0	0.0
Total Split (%)	23.1%	23.1%	0.0%	23.1%	23.1%	0.0%	11.5%	50.8%	0.0%	26.2%	65.4%	0.0%
Maximum Green (s)	23.0	23.0		23.0	23.0		8.0	59.0		27.0	78.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	25.0	25.0		25.0	25.0		9.8	61.0		29.0	83.0	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.08	0.47		0.22	0.64	
v/c Ratio	0.65	0.73		0.28	0.99		0.46	0.96		0.98	0.58	
Control Delay	93.5	62.8		52.5	99.7		30.5	10.3		91.9	15.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	9.6		0.0	0.0	

20: Kerr Ave. & NC 132 (College Rd.)  
2040 No Build PM Peak







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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	350	375	154	235	498	530	203	2465	233	419	1968	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	340		275	450		350	450		0
Storage Lanes	0		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1719	4940	1538	1719	4940	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1719	4940	1538	1719	4940	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		1005			988			1040			1025	
Travel Time (s)		19.6			26.9			15.8			15.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	389	417	171	261	553	589	226	2739	259	466	2187	409
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	28.0	38.0	21.0	25.0	35.0	33.0	21.0	64.0	25.0	33.0	76.0	28.0
Total Split (%)	17.5%	23.8%	13.1%	15.6%	21.9%	20.6%	13.1%	40.0%	15.6%	20.6%	47.5%	17.5%
Maximum Green (s)	21.0	31.0	14.0	18.0	28.0	26.0	14.0	57.0	18.0	26.0	69.0	21.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	23.0	33.0	49.0	20.0	30.0	58.0	16.0	59.0	79.0	28.0	71.0	94.0
Actuated g/C Ratio	0.14	0.21	0.31	0.12	0.19	0.36	0.10	0.37	0.49	0.18	0.44	0.59
v/c Ratio	1.54	1.09	0.36	1.19	1.60	1.04	1.31	1.50	0.34	1.55	1.00	0.45
Control Delay	305.9	131.0	28.6	179.1	322.0	80.9	228.5	265.1	13.8	303.8	62.6	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

21: Randall Pkwy. & NC 132 (College Rd.)  
2040 No Build AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	305.9	131.0	28.6	179.1	322.0	80.9	228.5	265.1	13.8	303.8	62.6	11.5
LOS	F	F	C	F	F	F	F	F	B	F	E	B
Approach Delay	182.7			194.2			242.4			92.5		
Approach LOS	F			F			F			F		
Queue Length 50th (ft)	~570	~491	100	~328	~824	~447	~304	~1451	80	~684	829	132
Queue Length 95th (ft)	#787	#710	152	#517	#1060	#594	#483	#1525	115	#912	#953	180
Internal Link Dist (ft)	925			908			960			945		
Turn Bay Length (ft)			500	340			275	450			350	450
Base Capacity (vph)	252	381	480	219	346	568	172	1822	759	301	2192	904
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.54	1.09	0.36	1.19	1.60	1.04	1.31	1.50	0.34	1.55	1.00	0.45

**Intersection Summary**

Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Natural Cycle: 160  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.60  
 Intersection Signal Delay: 174.9  
 Intersection LOS: F  
 Intersection Capacity Utilization 133.1%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 21: Randall Pkwy. & NC 132 (College Rd.)





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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	368	498	203	233	375	419	154	1968	235	530	2465	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	340		275	450		350	450		0
Storage Lanes	0		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1719	4940	1538	1719	4940	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1719	4940	1538	1719	4940	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		1005			988			1040			1025	
Travel Time (s)		19.6			26.9			15.8			15.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	409	553	226	259	417	466	171	2187	261	589	2739	389
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	35.0	44.0	19.0	25.0	34.0	48.0	19.0	63.0	25.0	48.0	92.0	35.0
Total Split (%)	19.4%	24.4%	10.6%	13.9%	18.9%	26.7%	10.6%	35.0%	13.9%	26.7%	51.1%	19.4%
Maximum Green (s)	28.0	37.0	12.0	18.0	27.0	41.0	12.0	56.0	18.0	41.0	85.0	28.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	30.0	39.0	53.0	20.0	29.0	72.0	14.0	58.0	78.0	43.0	87.0	117.0
Actuated g/C Ratio	0.17	0.22	0.29	0.11	0.16	0.40	0.08	0.32	0.43	0.24	0.48	0.65
v/c Ratio	1.40	1.38	0.49	1.33	1.40	0.74	1.28	1.37	0.39	1.43	1.15	0.39
Control Delay	250.2	236.0	41.7	234.6	251.5	32.9	229.9	216.5	19.4	254.5	113.6	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

21: Randall Pkwy. & NC 132 (College Rd.)  
2040 No Build PM Peak

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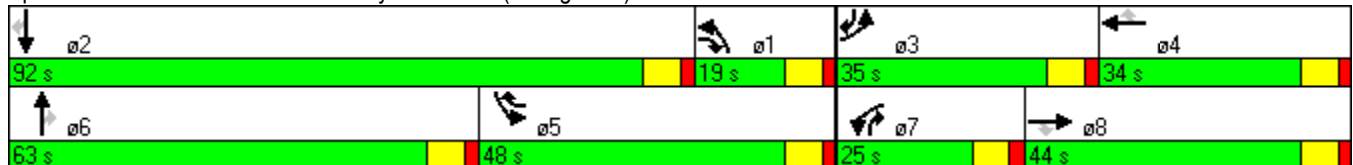


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	250.2	236.0	41.7	234.6	251.5	32.9	229.9	216.5	19.4	254.5	113.6	9.1
LOS	F	F	D	F	F	C	F	F	B	F	F	A
Approach Delay	203.9			158.4			197.7			125.0		
Approach LOS	F			F			F			F		
Queue Length 50th (ft)	~643	~864	167	~395	~656	286	~255	~1246	103	~938	~1383	120
Queue Length 95th (ft)	#870	#1108	238	#591	#884	378	#423	#1327	144	#1188	#1449	160
Internal Link Dist (ft)	925			908			960			945		
Turn Bay Length (ft)			500	340			275	450			350	450
Base Capacity (vph)	292	400	462	195	297	627	134	1592	666	411	2388	1000
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.40	1.38	0.49	1.33	1.40	0.74	1.28	1.37	0.39	1.43	1.15	0.39

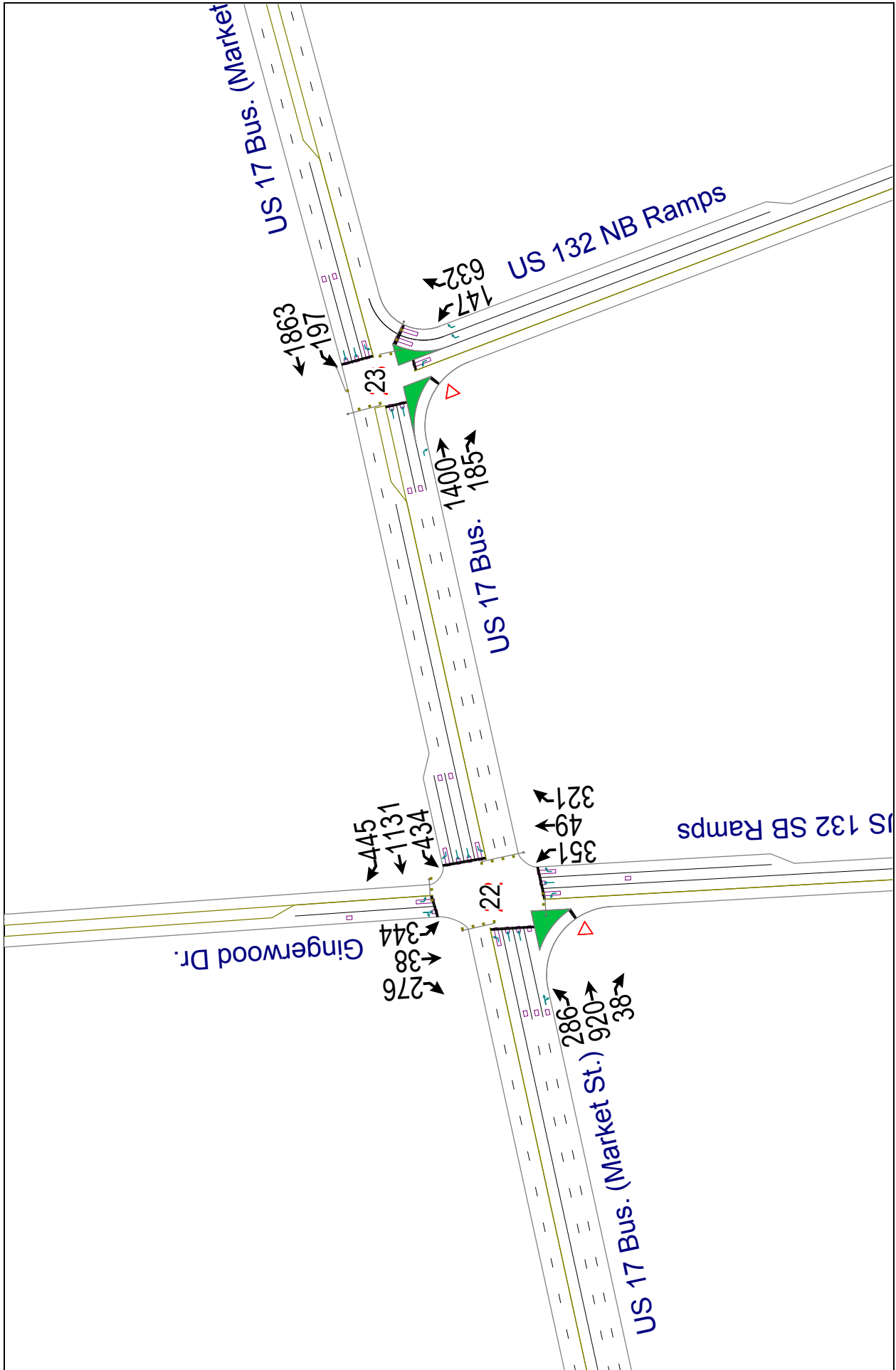
Intersection Summary

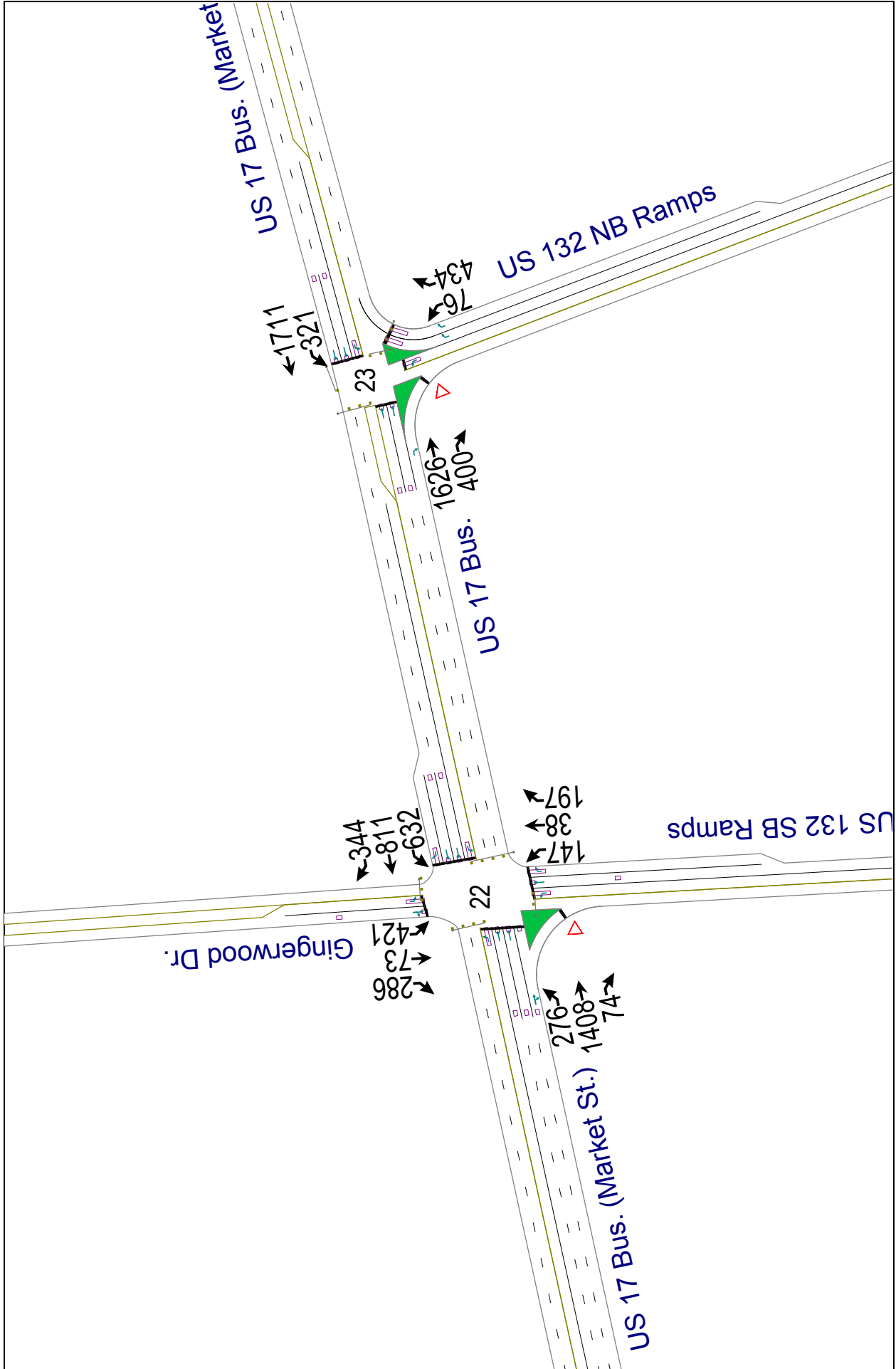
Area Type:	Other
Cycle Length:	180
Actuated Cycle Length:	180
Natural Cycle:	180
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.43
Intersection Signal Delay:	162.2
Intersection LOS:	F
Intersection Capacity Utilization	124.2%
ICU Level of Service	H
Analysis Period (min)	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 21: Randall Pkwy. & NC 132 (College Rd.)



21: Randall Pkwy. & NC 132 (College Rd.)  
2040 No Build PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	286	920	38	434	1131	445	351	49	321	344	38	276
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	750		0	400		100	400		250	150		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	5006	0	1752	3505	1568	1752	1845	1568	1770	1617	0
Flt Permitted	0.950			0.950			0.416			0.722		
Satd. Flow (perm)	1752	5006	0	1752	3505	1568	767	1845	1568	1345	1617	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25				35
Link Distance (ft)		1082			581			996				905
Travel Time (s)		18.4			9.9			27.2				17.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	318	1064	0	482	1257	494	390	54	357	382	349	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1			4
Permitted Phases						6	8		8	4		
Detector Phase	5	2		1	6	6	8	8	1	4		4
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	14.0	17.0		14.0	17.0	17.0	14.0	14.0	14.0	14.0		14.0
Total Split (s)	23.0	34.0	0.0	32.0	43.0	43.0	54.0	54.0	32.0	54.0		54.0
Total Split (%)	19.2%	28.3%	0.0%	26.7%	35.8%	35.8%	45.0%	45.0%	26.7%	45.0%		45.0%
Maximum Green (s)	16.0	27.0		25.0	36.0	36.0	47.0	47.0	25.0	47.0		47.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lead		Lag	Lead	Lead				Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes				Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None		None
Act Effct Green (s)	18.0	29.0		27.0	38.0	38.0	49.0	49.0	81.0	49.0		49.0
Actuated g/C Ratio	0.15	0.24		0.22	0.32	0.32	0.41	0.41	0.68	0.41		0.41
v/c Ratio	1.21	0.88		1.22	1.13	0.99	1.25	0.07	0.34	0.70		0.53
Control Delay	167.7	53.4		151.4	101.0	66.7	167.2	22.1	9.3	37.4		30.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0

22: US 17 Bus. (Market St.) & Gingerwood Dr.  
2040 No Build AM Peak

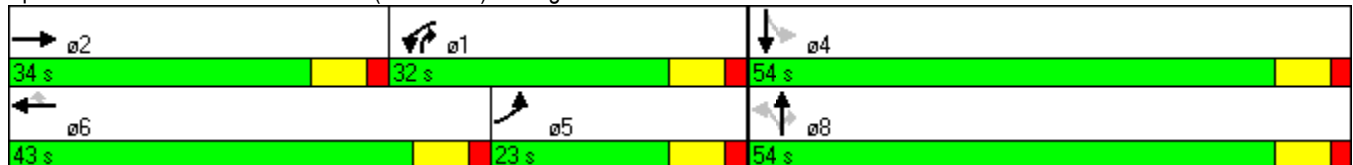


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	167.7	53.4		151.4	101.0	66.7	167.2	22.1	9.3	37.4	30.4	
LOS	F	D		F	F	E	F	C	A	D	C	
Approach Delay		79.7			104.3			87.0				34.1
Approach LOS		E			F			F				C
Queue Length 50th (ft)	~301	292		~463	~599	384	~376	25	106	241	201	
Queue Length 95th (ft)	#483	#354		#676	#728	#605	#571	52	156	362	295	
Internal Link Dist (ft)		1002			501			916				825
Turn Bay Length (ft)	750			400		100	400		250	150		
Base Capacity (vph)	263	1210		394	1110	497	313	753	1058	549	660	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.88		1.22	1.13	0.99	1.25	0.07	0.34	0.70	0.53	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 16 (13%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.25  
 Intersection Signal Delay: 85.0  
 Intersection LOS: F  
 Intersection Capacity Utilization 102.3%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.
























Splits and Phases: 22: US 17 Bus. (Market St.) & Gingerwood Dr.



22: US 17 Bus. (Market St.) & Gingerwood Dr.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	276	1408	74	632	811	344	147	38	197	421	73	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	750		0	400		100	400		250	150		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	5001	0	1752	3505	1568	1752	1845	1568	1770	1639	0
Flt Permitted	0.950			0.950			0.233			0.730		
Satd. Flow (perm)	1752	5001	0	1752	3505	1568	430	1845	1568	1360	1639	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25				35
Link Distance (ft)		1082			581			996				905
Travel Time (s)		18.4			9.9			27.2				17.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	307	1646	0	702	901	382	163	42	219	468	399	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1			4
Permitted Phases						6	8		8	4		
Detector Phase	5	2		1	6	6	8	8	1	4		4
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	14.0	17.0		14.0	17.0	17.0	14.0	14.0	14.0	14.0		14.0
Total Split (s)	33.0	42.0	0.0	45.0	54.0	54.0	43.0	43.0	45.0	43.0	43.0	0.0
Total Split (%)	25.4%	32.3%	0.0%	34.6%	41.5%	41.5%	33.1%	33.1%	34.6%	33.1%	33.1%	0.0%
Maximum Green (s)	26.0	35.0		38.0	47.0	47.0	36.0	36.0	38.0	36.0		36.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lead		Lag	Lead	Lead				Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes				Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None		None
Act Effct Green (s)	28.0	37.0		40.0	49.0	49.0	38.0	38.0	83.0	38.0		38.0
Actuated g/C Ratio	0.22	0.28		0.31	0.38	0.38	0.29	0.29	0.64	0.29		0.29
v/c Ratio	0.81	1.16		1.30	0.68	0.65	1.29	0.08	0.22	1.18		0.83
Control Delay	66.5	120.6		182.7	33.6	35.4	216.9	34.0	10.6	143.4		59.3
Queue Delay	0.0	0.0		0.0	0.4	0.0	0.0	0.0	0.0	0.0		0.0

22: US 17 Bus. (Market St.) & Gingerwood Dr.  
2040 No Build PM Peak

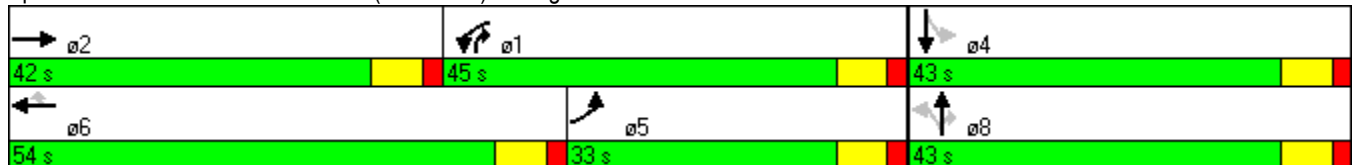


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	66.5	120.6		182.7	34.1	35.4	216.9	34.0	10.6	143.4	59.3	
LOS	E	F		F	C	D	F	C	B	F	E	
Approach Delay		112.1			86.9			92.2			104.7	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	248	~599		~762	337	268	~175	26	72	~471	315	
Queue Length 95th (ft)	#393	#695		#1005	413	382	#322	55	111	#685	#482	
Internal Link Dist (ft)		1002			501			916			825	
Turn Bay Length (ft)	750			400		100	400		250	150		
Base Capacity (vph)	377	1423		539	1321	591	126	539	1001	398	479	
Starvation Cap Reductn	0	0		0	114	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.81	1.16		1.30	0.75	0.65	1.29	0.08	0.22	1.18	0.83	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 24 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.30  
 Intersection Signal Delay: 99.7  
 Intersection LOS: F  
 Intersection Capacity Utilization 110.1%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 22: US 17 Bus. (Market St.) & Gingerwood Dr.



22: US 17 Bus. (Market St.) & Gingerwood Dr.  
 2040 No Build PM Peak



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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓↓
Volume (vph)	1400	185	197	1863	147	632
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	225		750	425
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3505	1568	1752	3505	1752	2760
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3505	1568	1752	3505	1752	2760
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	40			40	45	
Link Distance (ft)	581			1044	982	
Travel Time (s)	9.9			17.8	14.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1556	206	219	2070	163	702
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type		Perm	Prot			pm+ov
Protected Phases	2		1	6	8	1
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	1
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	17.0	17.0	14.0	17.0	14.0	14.0
Total Split (s)	71.0	71.0	27.0	98.0	22.0	27.0
Total Split (%)	59.2%	59.2%	22.5%	81.7%	18.3%	22.5%
Maximum Green (s)	64.0	64.0	20.0	91.0	15.0	20.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag			Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	None	Max	None
Act Effct Green (s)	66.0	66.0	22.0	93.0	17.0	44.0
Actuated g/C Ratio	0.55	0.55	0.18	0.78	0.14	0.37
v/c Ratio	0.81	0.24	0.68	0.76	0.66	0.69
Control Delay	15.5	7.7	57.7	9.8	62.3	36.7
Queue Delay	0.4	0.0	0.0	0.0	0.0	0.0

23: US 17 Bus. (Market St.) & US 132 NB Ramps  
2040 No Build AM Peak



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Delay	15.9	7.7	57.7	9.8	62.3	36.7
LOS	B	A	E	A	E	D
Approach Delay	15.0			14.4	41.5	
Approach LOS	B			B	D	
Queue Length 50th (ft)	249	46	160	388	121	260
Queue Length 95th (ft)	295	m52	247	472	#198	337
Internal Link Dist (ft)	501			964	902	
Turn Bay Length (ft)			225		750	425
Base Capacity (vph)	1928	862	321	2716	248	1012
Starvation Cap Reductn	90	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.24	0.68	0.76	0.66	0.69

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 112 (93%), Referenced to phase 2:EBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 19.4 Intersection LOS: B  
 Intersection Capacity Utilization 70.3% ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: US 17 Bus. (Market St.) & US 132 NB Ramps



23: US 17 Bus. (Market St.) & US 132 NB Ramps  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙	↑↑	↙	↗↗
Volume (vph)	1626	400	321	1711	76	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	225		750	425
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3505	1568	1752	3505	1752	2760
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3505	1568	1752	3505	1752	2760
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	40			40	45	
Link Distance (ft)	581			1044	982	
Travel Time (s)	9.9			17.8	14.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1807	444	357	1901	84	482
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type		Perm	Prot			pm+ov
Protected Phases	2		1	6	8	1
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	1
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	17.0	17.0	14.0	17.0	14.0	14.0
Total Split (s)	80.0	80.0	36.0	116.0	14.0	36.0
Total Split (%)	61.5%	61.5%	27.7%	89.2%	10.8%	27.7%
Maximum Green (s)	73.0	73.0	29.0	109.0	7.0	29.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag			Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	None	Max	None
Act Effct Green (s)	75.0	75.0	29.9	109.9	10.1	45.0
Actuated g/C Ratio	0.58	0.58	0.23	0.85	0.08	0.35
v/c Ratio	0.89	0.49	0.88	0.64	0.62	0.50
Control Delay	14.6	3.7	72.1	4.5	78.8	35.9
Queue Delay	2.0	0.5	0.0	0.1	0.0	0.0

23: US 17 Bus. (Market St.) & US 132 NB Ramps  
2040 No Build PM Peak

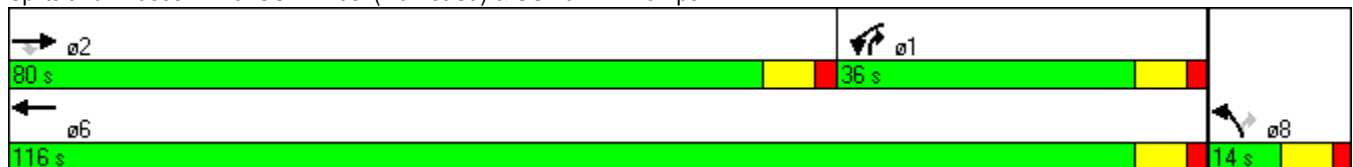


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Delay	16.7	4.2	72.1	4.6	78.8	35.9
LOS	B	A	E	A	E	D
Approach Delay	14.2			15.3	42.3	
Approach LOS	B			B	D	
Queue Length 50th (ft)	250	46	290	197	70	182
Queue Length 95th (ft)	m106	m40	#455	234	#151	241
Internal Link Dist (ft)	501			964	902	
Turn Bay Length (ft)			225		750	425
Base Capacity (vph)	2022	905	418	2993	135	955
Starvation Cap Reductn	111	163	0	0	0	0
Spillback Cap Reductn	0	0	0	220	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.60	0.85	0.69	0.62	0.50

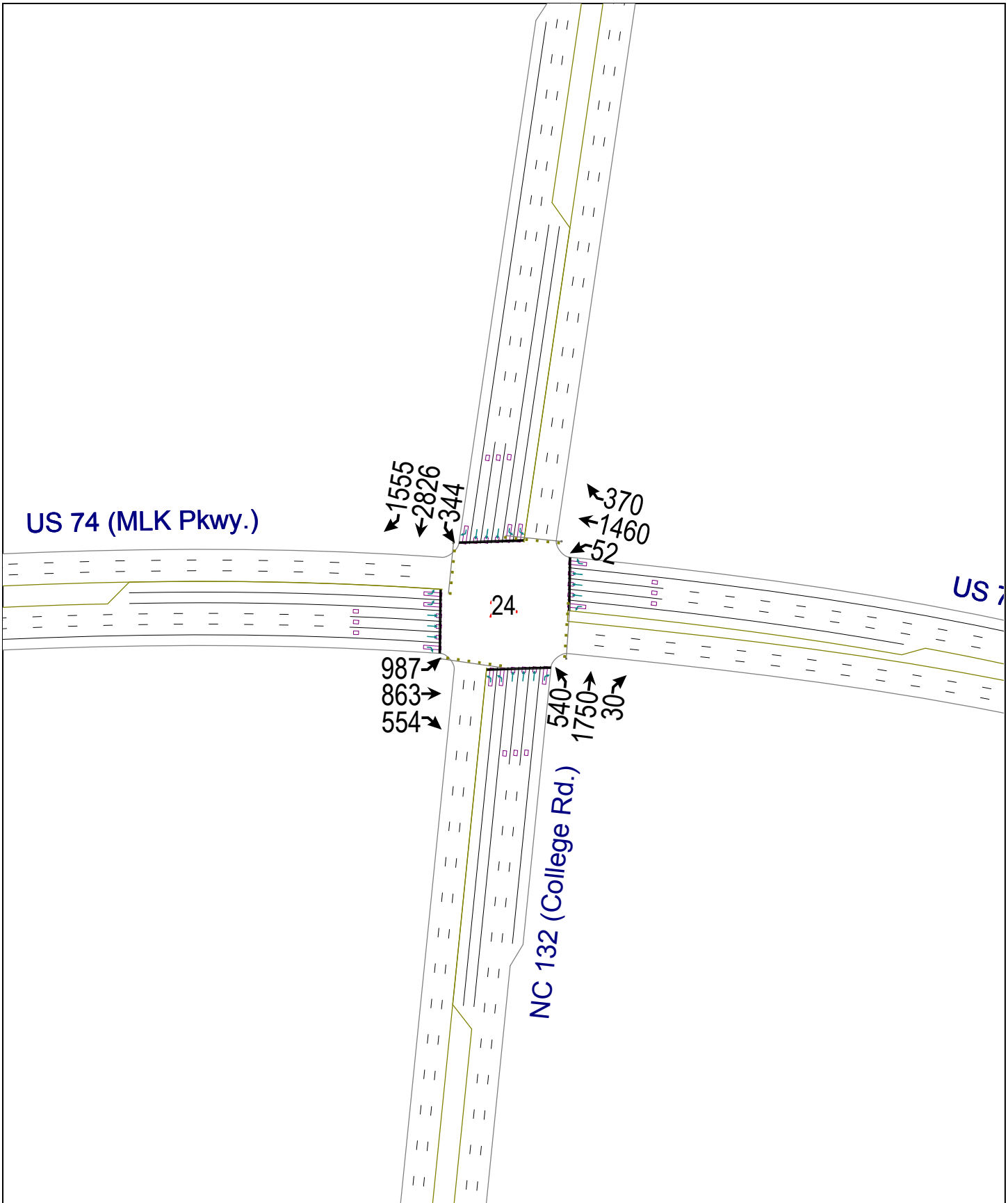
**Intersection Summary**

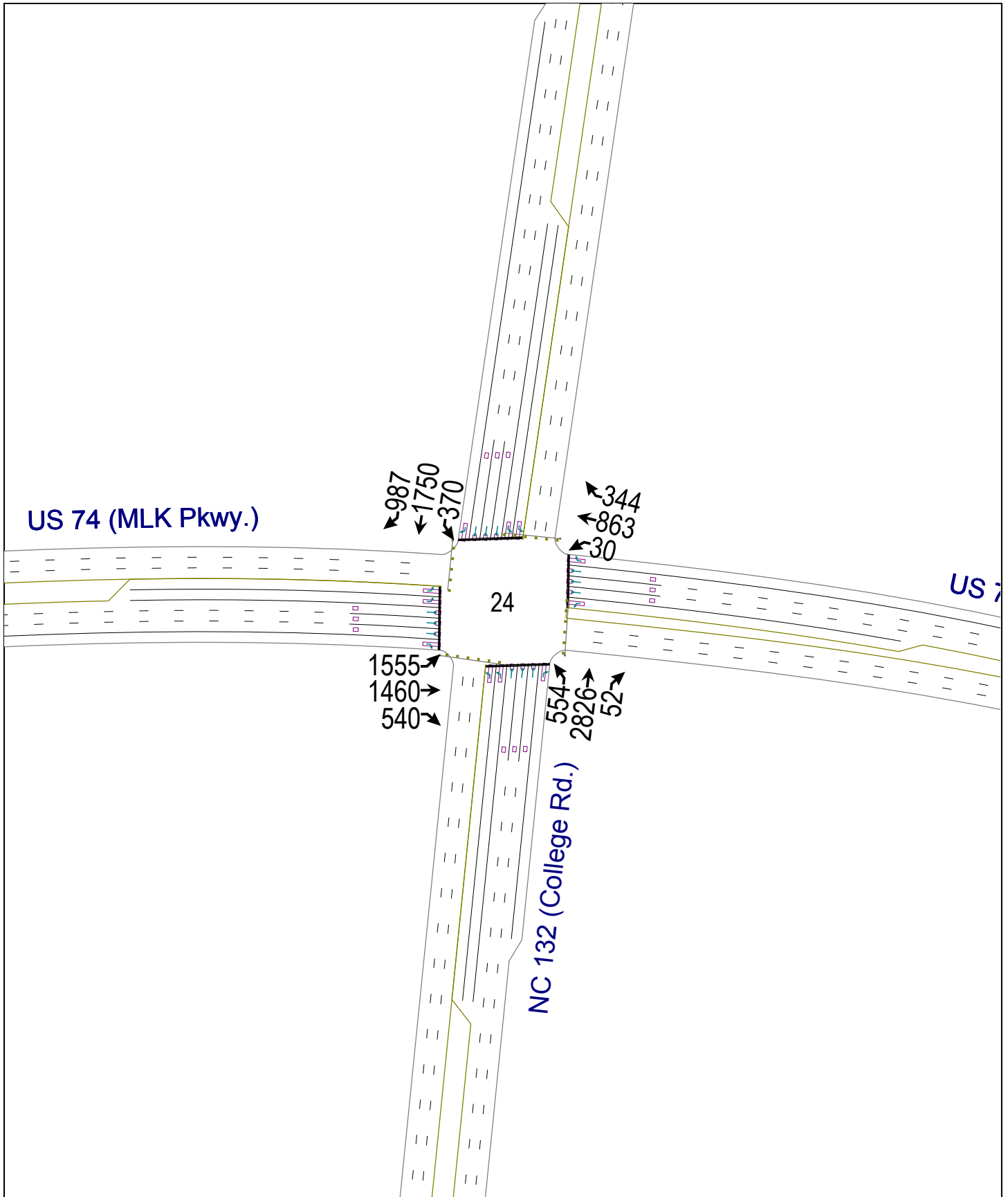
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 17.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 81.1%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: US 17 Bus. (Market St.) & US 132 NB Ramps



























23: US 17 Bus. (Market St.) & US 132 NB Ramps  
 2040 No Build PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	987	863	554	52	1460	370	540	1750	30	344	2826	1555
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		525	375		675	375		300	350		575
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3335	4940	1538	1719	4940	1538	3335	4940	1538	3335	4940	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	4940	1538	1719	4940	1538	3335	4940	1538	3335	4940	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1054			1097			837			1153	
Travel Time (s)		13.1			13.6			10.4			14.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1097	959	616	58	1622	411	600	1944	33	382	3140	1728
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0
Total Split (s)	47.0	70.0	24.0	17.0	40.0	18.0	24.0	75.0	17.0	18.0	69.0	47.0
Total Split (%)	26.1%	38.9%	13.3%	9.4%	22.2%	10.0%	13.3%	41.7%	9.4%	10.0%	38.3%	26.1%
Maximum Green (s)	40.0	63.0	17.0	10.0	33.0	11.0	17.0	68.0	10.0	11.0	62.0	40.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	42.0	68.5	88.5	11.3	35.0	48.0	19.0	70.0	81.3	13.0	64.0	106.0
Actuated g/C Ratio	0.23	0.38	0.49	0.06	0.19	0.27	0.11	0.39	0.45	0.07	0.36	0.59
v/c Ratio	1.41	0.51	0.81	0.54	1.69	1.00	1.70	1.01	0.05	1.59	1.79	1.91
Control Delay	239.2	44.8	45.9	99.7	354.0	95.0	371.2	77.1	17.8	329.4	389.9	432.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)  
2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 9/11/2012

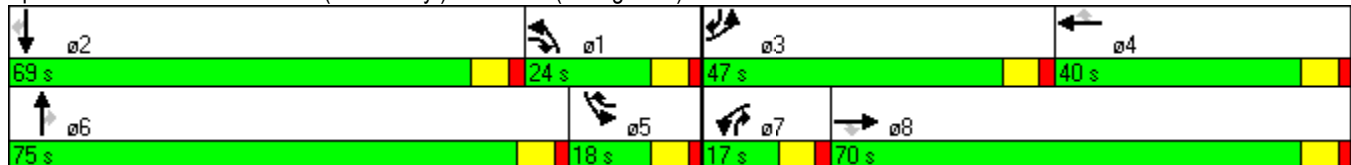


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	239.2	44.8	45.9	99.7	354.0	95.0	371.2	77.1	17.8	329.4	389.9	432.7
LOS	F	D	D	F	F	F	F	E	B	F	F	F
Approach Delay		124.9			296.0			144.8			399.6	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	~892	330	485	68	~1022	~334	~534	~880	16	~329	~2025	~3118
Queue Length 95th (ft)	#1030	378	#641	123	#1115	#581	#662	#967	34	#444	#2076	#3370
Internal Link Dist (ft)		974			1017			757			1073	
Turn Bay Length (ft)	350		525	375		675	375		300	350		575
Base Capacity (vph)	778	1879	756	115	961	410	352	1921	701	241	1756	906
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.41	0.51	0.81	0.50	1.69	1.00	1.70	1.01	0.05	1.59	1.79	1.91

**Intersection Summary**

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Natural Cycle: 180  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.91  
 Intersection Signal Delay: 271.9      Intersection LOS: F  
 Intersection Capacity Utilization 152.4%      ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)



24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)  
 2040 No Build AM Peak



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1555	1460	540	30	863	344	554	2826	52	370	1750	987
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		525	375		675	375		300	350		575
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3335	4940	1538	1719	4940	1538	3335	4940	1538	3335	4940	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	4940	1538	1719	4940	1538	3335	4940	1538	3335	4940	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1054			1097			837			1153	
Travel Time (s)		13.1			13.6			10.4			14.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1728	1622	600	33	959	382	616	3140	58	411	1944	1097
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0
Total Split (s)	57.0	72.0	26.0	14.0	29.0	20.0	26.0	74.0	14.0	20.0	68.0	57.0
Total Split (%)	31.7%	40.0%	14.4%	7.8%	16.1%	11.1%	14.4%	41.1%	7.8%	11.1%	37.8%	31.7%
Maximum Green (s)	50.0	65.0	19.0	7.0	22.0	13.0	19.0	67.0	7.0	13.0	61.0	50.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	52.0	69.8	91.8	9.0	24.0	39.0	21.0	69.0	78.0	15.0	63.0	115.0
Actuated g/C Ratio	0.29	0.39	0.51	0.05	0.13	0.22	0.12	0.38	0.43	0.08	0.35	0.64
v/c Ratio	1.79	0.85	0.77	0.38	1.46	1.15	1.58	1.66	0.09	1.48	1.12	1.12
Control Delay	396.3	56.0	33.4	96.0	263.0	132.4	320.3	333.0	19.2	284.6	116.2	86.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)  
2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 9/11/2012

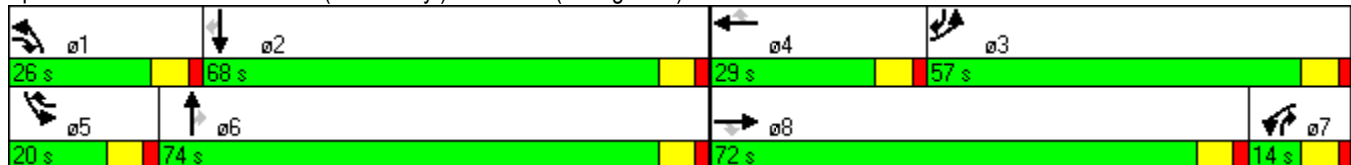


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	396.3	56.0	33.4	96.0	263.0	132.4	320.3	333.0	19.2	284.6	116.2	86.4
LOS	F	E	C	F	F	F	F	F	B	F	F	F
Approach Delay	201.4			222.7			326.1			126.8		
Approach LOS	F			F			F			F		
Queue Length 50th (ft)	~1570	657	458	39	~564	~364	~531	~1964	30	~342	~967	~1158
Queue Length 95th (ft)	#1700	721	601	81	#661	#583	#660	#2015	54	#460	#1053	#1750
Internal Link Dist (ft)	974			1017			757			1073		
Turn Bay Length (ft)	350		525	375		675	375		300	350		575
Base Capacity (vph)	963	1916	784	86	659	333	389	1894	666	278	1729	983
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.79	0.85	0.77	0.38	1.46	1.15	1.58	1.66	0.09	1.48	1.12	1.12

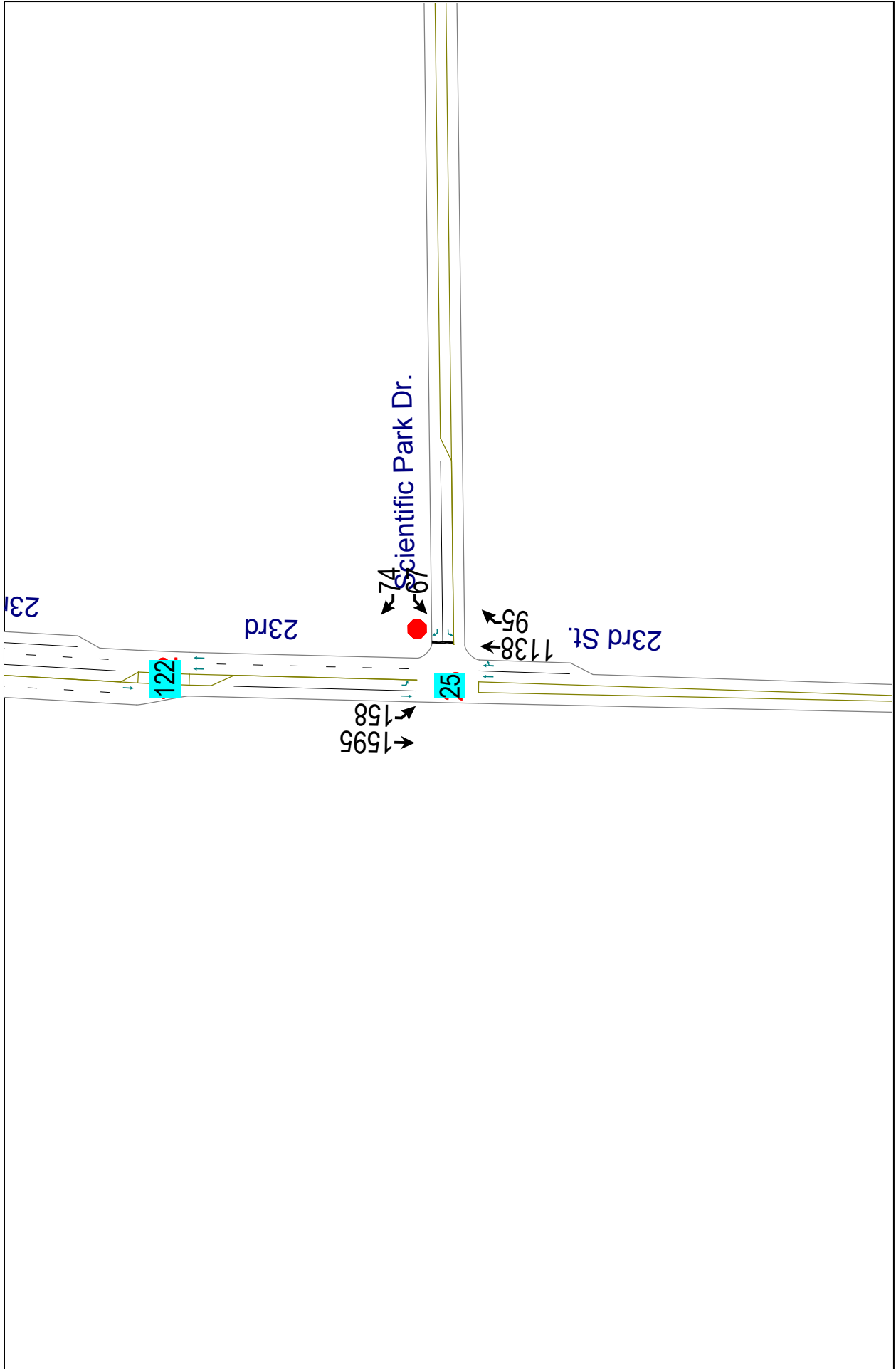
**Intersection Summary**

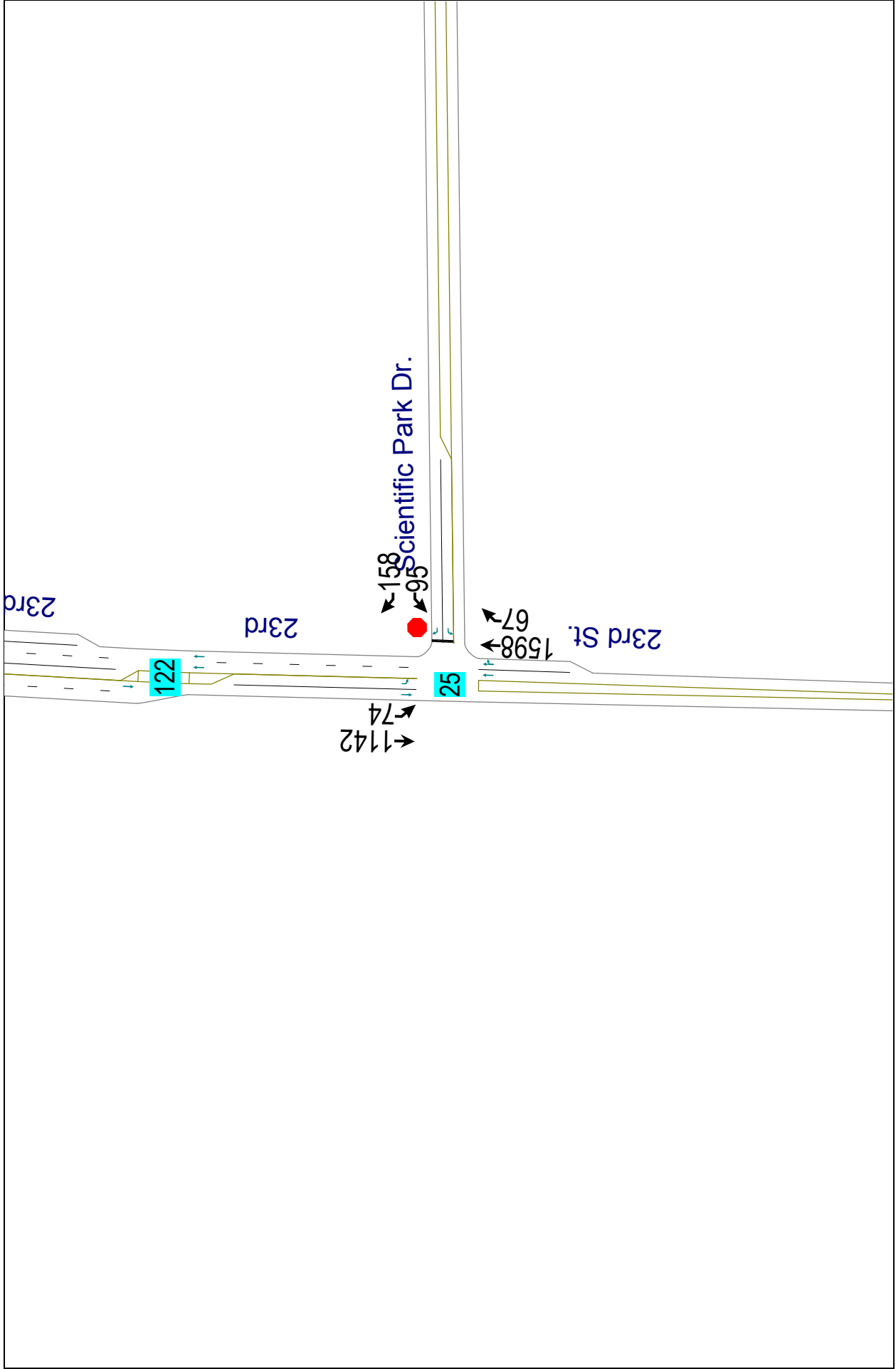
Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Natural Cycle: 180  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.79  
 Intersection Signal Delay: 221.1      Intersection LOS: F  
 Intersection Capacity Utilization 142.9%      ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)



24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)  
 2040 No Build PM Peak





U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	67	74	1138	95	158	1595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0		100	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25	25		25	25	
Satd. Flow (prot)	1752	1568	3463	0	1752	1845
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1752	1568	3463	0	1752	1845
Link Speed (mph)	35		45			45
Link Distance (ft)	1155		1029			313
Travel Time (s)	22.5		15.6			4.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	74	82	1370	0	176	1772
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	94.3%
ICU Level of Service	F
Analysis Period (min)	15

25: Scientific Park Dr. & 23rd St.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/11/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	67	74	1138	95	158	1595
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	74	82	1264	106	176	1772
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						666
pX, platoon unblocked	0.27					
vC, conflicting volume	3441	685			1370	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	8764	685			1370	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	79			64	
cM capacity (veh/h)	0	388			492	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	74	82	843	527	176	1772
Volume Left	74	0	0	0	176	0
Volume Right	0	82	0	106	0	0
cSH	0	388	1700	1700	492	1700
Volume to Capacity	Err	0.21	0.50	0.31	0.36	1.04
Queue Length 95th (ft)	Err	20	0	0	40	0
Control Delay (s)	Err	16.7	0.0	0.0	16.3	0.0
Lane LOS	F	C			C	
Approach Delay (s)	4760.1		0.0		1.5	
Approach LOS	F					

Intersection Summary						
Average Delay			215.5			
Intersection Capacity Utilization			94.3%		ICU Level of Service	F
Analysis Period (min)			15			

25: Scientific Park Dr. & 23rd St.  
 2040 No Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 9/11/2012



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	95	158	1598	67	74	1142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0		100	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25	25		25	25	
Satd. Flow (prot)	1752	1568	3484	0	1752	1845
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1752	1568	3484	0	1752	1845
Link Speed (mph)	35		45			45
Link Distance (ft)	1155		1029			313
Travel Time (s)	22.5		15.6			4.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	106	176	1850	0	82	1269
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	72.0%
	ICU Level of Service C
Analysis Period (min)	15

25: Scientific Park Dr. & 23rd St.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/11/2012



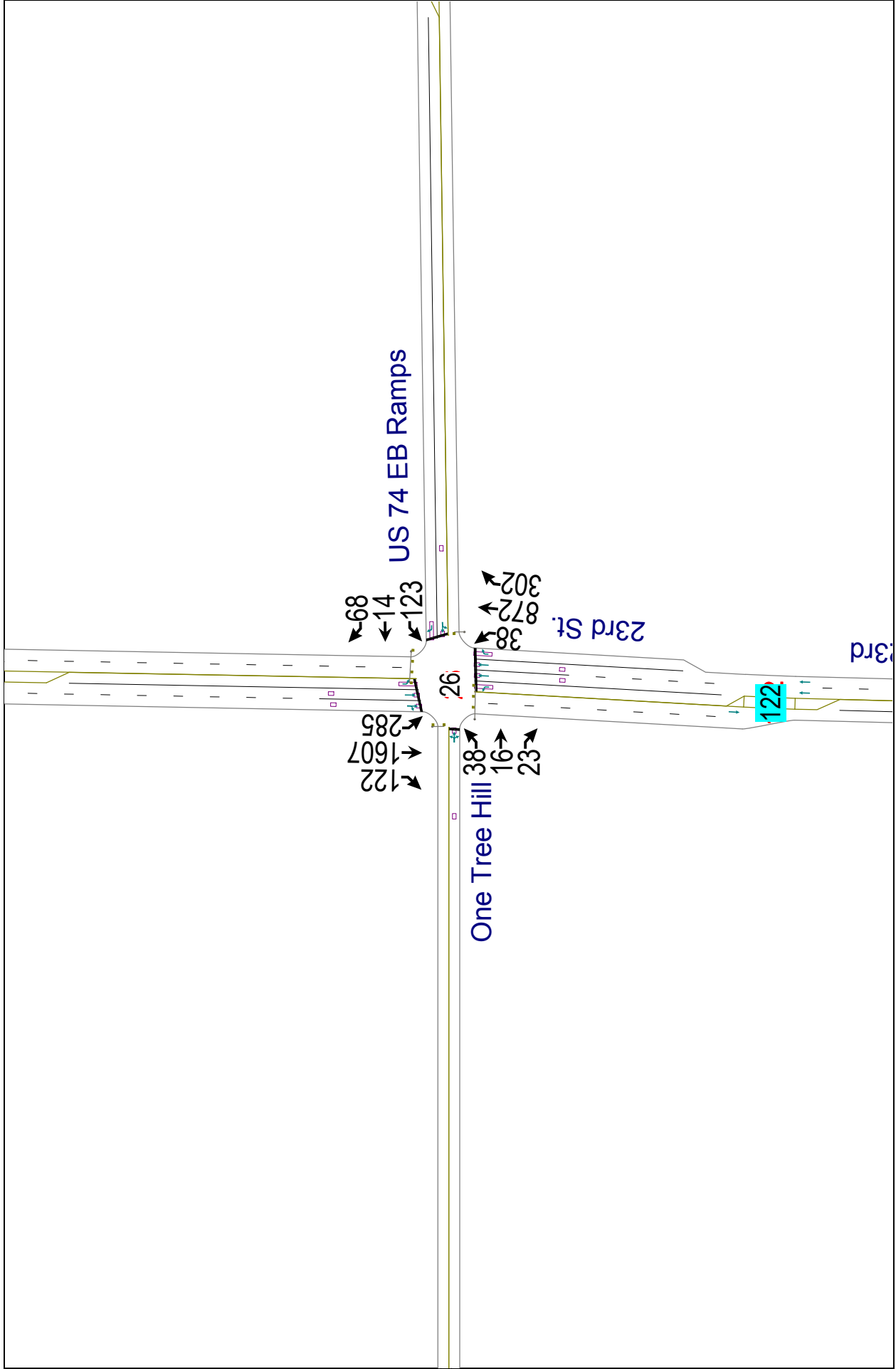
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↕	↗	↙	↕
Volume (veh/h)	95	158	1598	67	74	1142
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	106	176	1776	74	82	1269
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						666
pX, platoon unblocked	0.31					
vC, conflicting volume	3246	925			1850	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	7081	925			1850	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	35			74	
cM capacity (veh/h)	0	269			320	

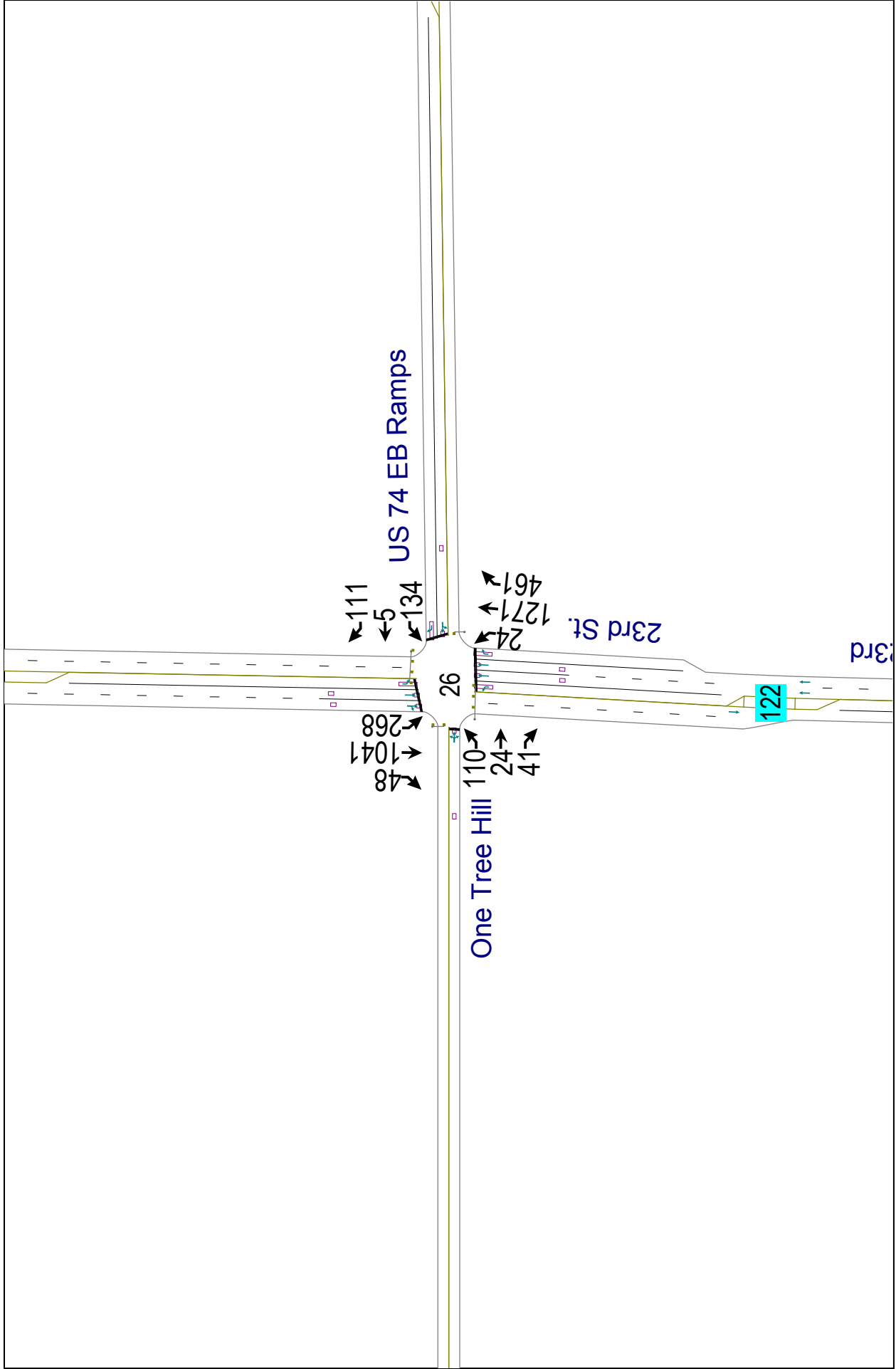
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	106	176	1184	666	82	1269
Volume Left	106	0	0	0	82	0
Volume Right	0	176	0	74	0	0
cSH	0	269	1700	1700	320	1700
Volume to Capacity	Err	0.65	0.70	0.39	0.26	0.75
Queue Length 95th (ft)	Err	104	0	0	25	0
Control Delay (s)	Err	40.4	0.0	0.0	20.1	0.0
Lane LOS	F	E			C	
Approach Delay (s)	3779.8		0.0		1.2	
Approach LOS	F					

Intersection Summary						
Average Delay			305.6			
Intersection Capacity Utilization			72.0%		ICU Level of Service	C
Analysis Period (min)			15			

25: Scientific Park Dr. & 23rd St.  
 2040 No Build PM Peak







U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↗	↗	↖	↕	↕
Volume (vph)	38	16	23	123	14	68	38	872	302	285	1607	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	675		0	275		225	375		0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1710	0	0	1765	1568	1752	3505	1568	1752	3466	0
Flt Permitted		0.664			0.723		0.111			0.950		
Satd. Flow (perm)	0	1163	0	0	1334	1568	205	3505	1568	1752	3466	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		994			1050			353			1120	
Travel Time (s)		19.4			28.6			5.3			17.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	153	76	42	969	336	317	1922	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm		pm+ov	Perm		Perm		Prot	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6		6			
Detector Phase	8	8		4	4	5	6	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	19.0	19.0	19.0	14.0	19.0	
Total Split (s)	20.0	20.0	0.0	20.0	20.0	27.0	43.0	43.0	43.0	27.0	70.0	0.0
Total Split (%)	22.2%	22.2%	0.0%	22.2%	22.2%	30.0%	47.8%	47.8%	47.8%	30.0%	77.8%	0.0%
Maximum Green (s)	13.0	13.0		13.0	13.0	20.0	36.0	36.0	36.0	20.0	63.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag						Lead	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		14.3			14.3	39.9	40.1	40.1	40.1	20.6	65.7	
Actuated g/C Ratio		0.16			0.16	0.44	0.45	0.45	0.45	0.23	0.73	
v/c Ratio		0.46			0.73	0.11	0.46	0.62	0.48	0.79	0.76	
Control Delay		43.1			56.4	14.2	39.4	21.9	21.3	48.5	3.4	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	

26: One Tree Hill & 23rd St.  
2040 No Build AM Peak

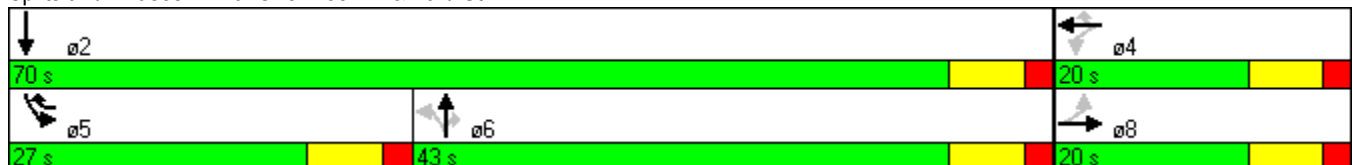


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		43.1			56.4	14.2	39.4	21.9	21.3	48.5	3.4	
LOS		D			E	B	D	C	C	D	A	
Approach Delay		43.1			42.4			22.3				9.8
Approach LOS		D			D			C				A
Queue Length 50th (ft)		44			83	23	17	225	137	182	113	
Queue Length 95th (ft)		92			#171	48	#65	293	217	m195	m117	
Internal Link Dist (ft)		914			970			273				1040
Turn Bay Length (ft)							275		225	375		
Base Capacity (vph)		194			222	719	92	1561	698	428	2531	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	0
Spillback Cap Reductn		0			0	0	0	0	0	0	0	0
Storage Cap Reductn		0			0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.44			0.69	0.11	0.46	0.62	0.48	0.74	0.76	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 40 (44%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 16.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 83.5%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: One Tree Hill & 23rd St.



U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 9/11/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↗	↗	↕↕	↗	↕↕	
Volume (vph)	110	24	41	134	5	111	24	1271	461	268	1041	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	675		0	275		225	375		0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1715	0	0	1760	1568	1752	3505	1568	1752	3480	0
Flt Permitted		0.641			0.623		0.232			0.950		
Satd. Flow (perm)	0	1134	0	0	1149	1568	428	3505	1568	1752	3480	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		994			1050			353			1120	
Travel Time (s)		19.4			28.6			5.3			17.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	195	0	0	155	123	27	1412	512	298	1210	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm		pm+ov	Perm		Perm	Prot		
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6		6			
Detector Phase	8	8		4	4	5	6	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	19.0	19.0	19.0	14.0	19.0	
Total Split (s)	22.0	22.0	0.0	22.0	22.0	22.0	46.0	46.0	46.0	22.0	68.0	0.0
Total Split (%)	24.4%	24.4%	0.0%	24.4%	24.4%	24.4%	51.1%	51.1%	51.1%	24.4%	75.6%	0.0%
Maximum Green (s)	15.0	15.0		15.0	15.0	15.0	39.0	39.0	39.0	15.0	61.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag						Lead	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		17.0			17.0	39.0	41.0	41.0	41.0	17.0	63.0	
Actuated g/C Ratio		0.19			0.19	0.43	0.46	0.46	0.46	0.19	0.70	
v/c Ratio		0.91			0.71	0.18	0.14	0.88	0.72	0.90	0.50	
Control Delay		80.5			54.3	16.6	16.6	30.6	26.8	56.1	3.5	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	

26: One Tree Hill & 23rd St.  
 2040 No Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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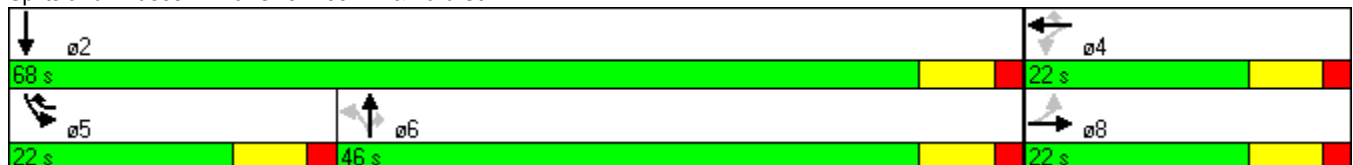


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		80.5			54.3	16.6	16.6	30.6	26.8	56.1	3.5	
LOS		F			D	B	B	C	C	E	A	
Approach Delay		80.5			37.6			29.4			13.9	
Approach LOS		F			D			C			B	
Queue Length 50th (ft)		110			83	42	9	372	227	125	20	
Queue Length 95th (ft)		#238			#177	78	26	#490	351	m#290	27	
Internal Link Dist (ft)		914			970			273			1040	
Turn Bay Length (ft)							275		225	375		
Base Capacity (vph)		214			217	679	195	1597	714	331	2436	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.91			0.71	0.18	0.14	0.88	0.72	0.90	0.50	

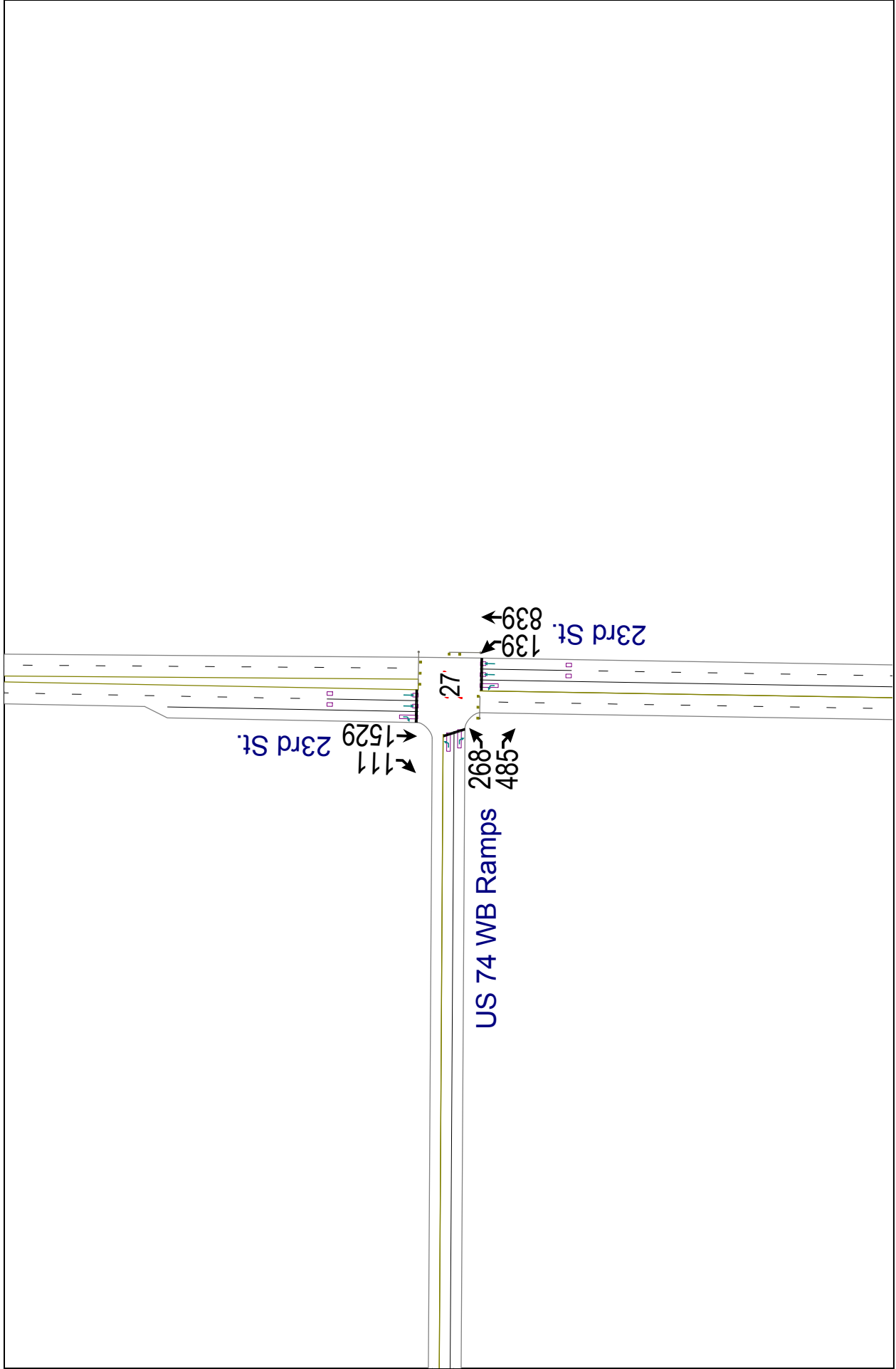
Intersection Summary

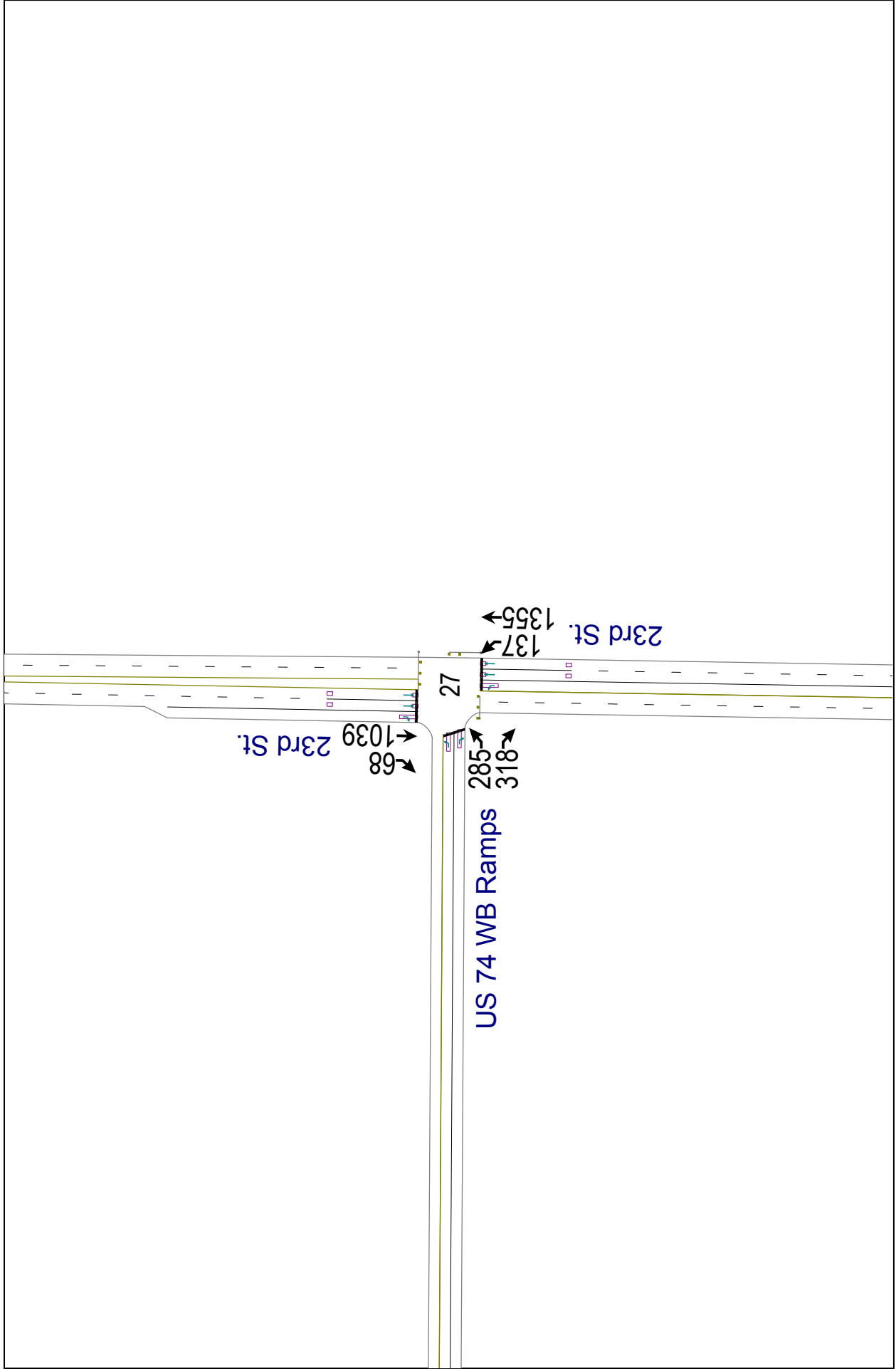
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 56 (62%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 26.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 79.0%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: One Tree Hill & 23rd St.



26: One Tree Hill & 23rd St.  
 2040 No Build PM Peak







U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	268	485	139	839	1529	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	975	0	700			275
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Satd. Flow (prot)	1752	1568	1752	3505	3505	1568
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1752	1568	1752	3505	3505	1568
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	25			45	45	
Link Distance (ft)	1174			1083	1057	
Travel Time (s)	32.0			16.4	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	298	539	154	932	1699	123
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8				2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	20.0	18.0	18.0	70.0	52.0	20.0
Total Split (%)	22.2%	20.0%	20.0%	77.8%	57.8%	22.2%
Maximum Green (s)	13.0	11.0	11.0	63.0	45.0	13.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	15.0	33.0	13.0	65.0	47.0	67.0
Actuated g/C Ratio	0.17	0.37	0.14	0.72	0.52	0.74
v/c Ratio	1.02	0.94	0.61	0.37	0.93	0.11
Control Delay	97.4	54.3	51.5	1.0	30.6	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

27: US 74 WB Ramps & 23rd St.  
2040 No Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	97.4	54.3	51.5	1.0	30.6	3.4
LOS	F	D	D	A	C	A
Approach Delay	69.6			8.2	28.8	
Approach LOS	E			A	C	
Queue Length 50th (ft)	~176	291	63	4	446	16
Queue Length 95th (ft)	#339	#497	m113	5	#628	29
Internal Link Dist (ft)	1094			1003	977	
Turn Bay Length (ft)	975		700			275
Base Capacity (vph)	292	575	253	2531	1830	1167
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.94	0.61	0.37	0.93	0.11

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	88 (98%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.02
Intersection Signal Delay:	31.9
Intersection LOS:	C
Intersection Capacity Utilization:	80.6%
ICU Level of Service:	D
Analysis Period (min):	15
~	Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 27: US 74 WB Ramps & 23rd St.



27: US 74 WB Ramps & 23rd St.  
2040 No Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/11/2012



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	285	318	137	1355	1039	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	975	0	700			275
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Satd. Flow (prot)	1752	1568	1752	3505	3505	1568
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1752	1568	1752	3505	3505	1568
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	25			45	45	
Link Distance (ft)	1174			1083	1057	
Travel Time (s)	32.0			16.4	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	317	353	152	1506	1154	76
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8				2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	28.0	18.0	18.0	62.0	44.0	28.0
Total Split (%)	31.1%	20.0%	20.0%	68.9%	48.9%	31.1%
Maximum Green (s)	21.0	11.0	11.0	55.0	37.0	21.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	21.2	39.2	13.0	58.8	40.8	67.0
Actuated g/C Ratio	0.24	0.44	0.14	0.65	0.45	0.74
v/c Ratio	0.77	0.52	0.60	0.66	0.73	0.07
Control Delay	45.3	21.3	33.0	2.1	23.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

27: US 74 WB Ramps & 23rd St.  
2040 No Build PM Peak

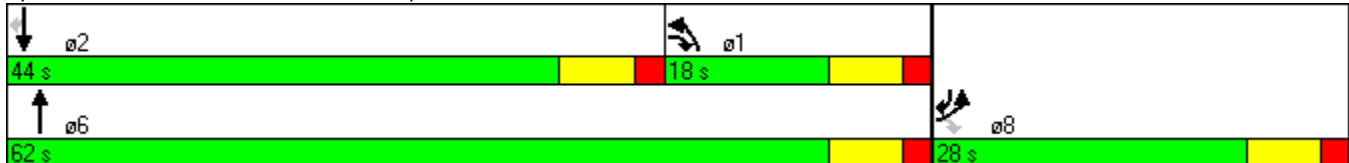


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	45.3	21.3	33.0	2.1	23.8	3.2
LOS	D	C	C	A	C	A
Approach Delay	32.7			4.9	22.5	
Approach LOS	C			A	C	
Queue Length 50th (ft)	164	136	86	25	283	9
Queue Length 95th (ft)	#262	215	m100	m31	363	20
Internal Link Dist (ft)	1094			1003	977	
Turn Bay Length (ft)	975		700			275
Base Capacity (vph)	448	682	253	2292	1591	1158
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.52	0.60	0.66	0.73	0.07

**Intersection Summary**

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 88 (98%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 16.2      Intersection LOS: B  
 Intersection Capacity Utilization 64.6%      ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 27: US 74 WB Ramps & 23rd St.



27: US 74 WB Ramps & 23rd St.  
2040 No Build PM Peak

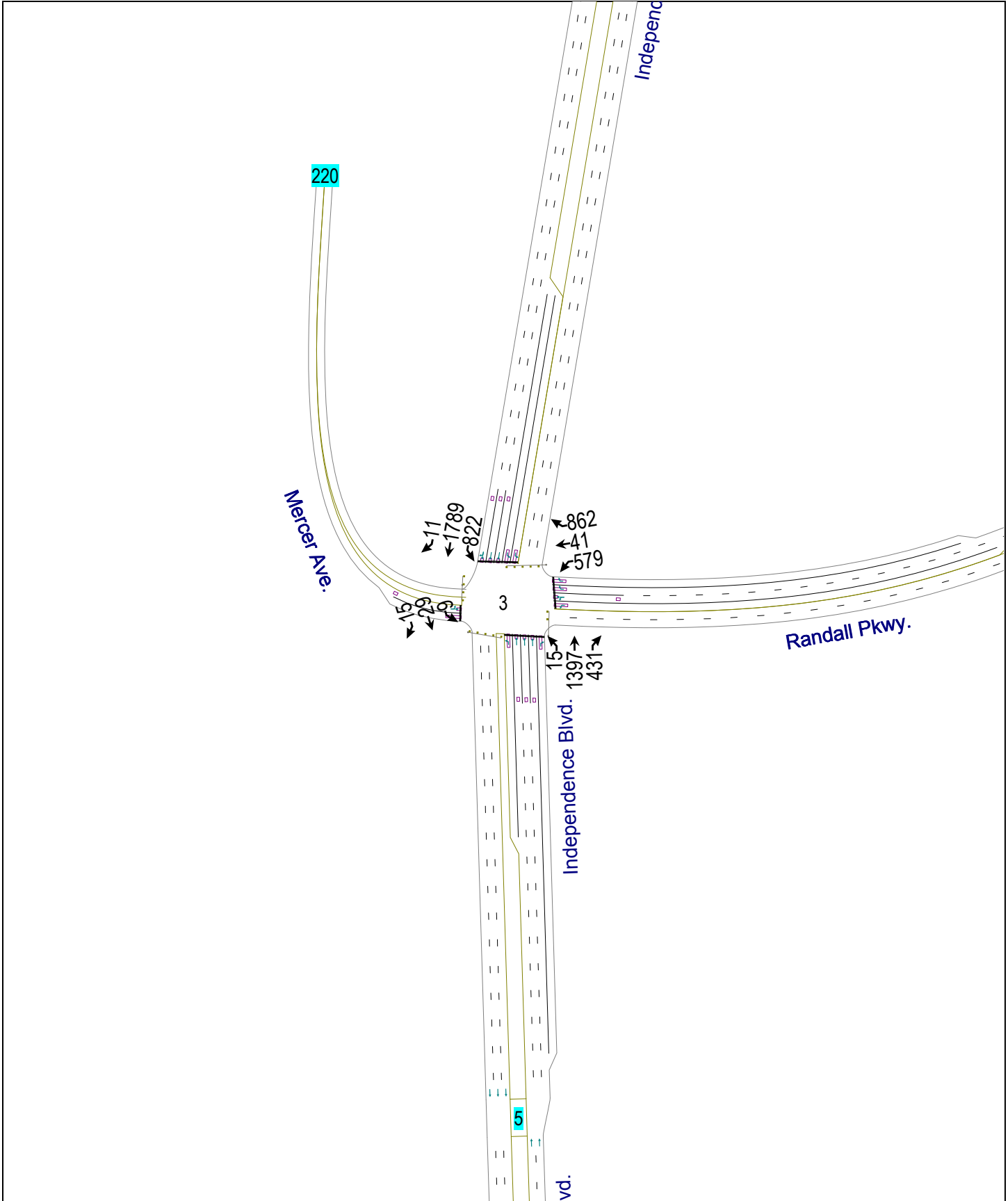
## Appendix I: 2040 Build Traffic Capacity Analysis

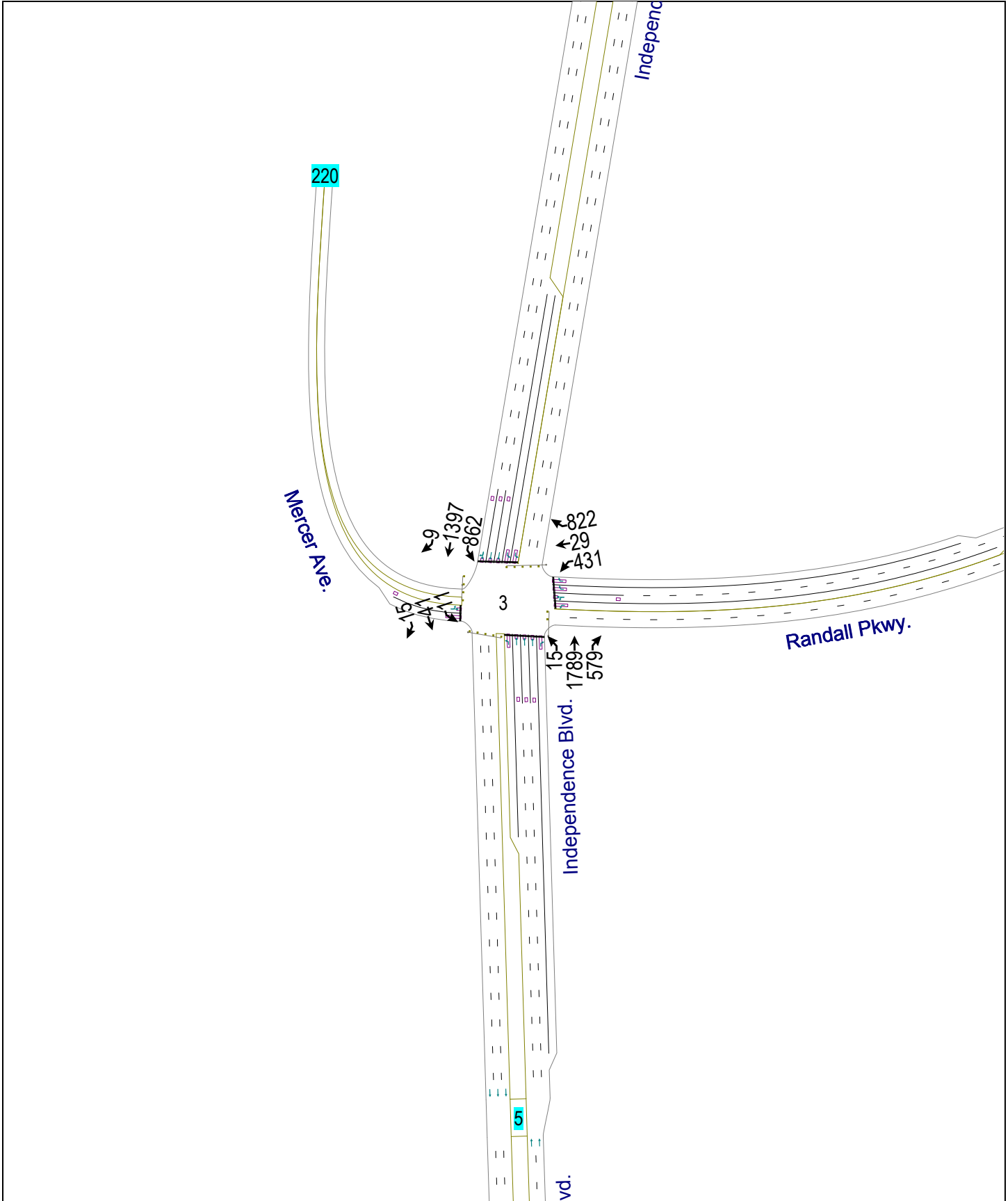
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## Common to All Build Alternatives

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U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↕	↗↗	↖	↕↕↕	↗	↖↖	↕↕↕	
Volume (vph)	9	29	15	579	41	862	15	1397	431	822	1789	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	675		625	300		625	400		0
Storage Lanes	0		1	1		1	1		1	2		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1840	1583	1665	1679	2760	1736	4988	1553	3367	4983	0
Flt Permitted		0.988		0.950	0.958		0.950			0.950		
Satd. Flow (perm)	0	1840	1583	1665	1679	2760	1736	4988	1553	3367	4983	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			55	
Link Distance (ft)		801			965			772			1157	
Travel Time (s)		21.8			18.8			11.7			14.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	42	17	341	348	958	17	1552	479	913	2000	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split		pm+ov	Split		pm+ov	Prot		pm+ov	Prot		
Protected Phases	8	8	1	4	4	5	1	6	4	5	2	
Permitted Phases			8			4			6			
Detector Phase	8	8	1	4	4	5	1	6	4	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	14.0	
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0	14.0	19.0	19.0	14.0	21.0	
Total Split (s)	14.0	14.0	14.0	45.0	45.0	56.0	14.0	65.0	45.0	56.0	107.0	0.0
Total Split (%)	7.8%	7.8%	7.8%	25.0%	25.0%	31.1%	7.8%	36.1%	25.0%	31.1%	59.4%	0.0%
Maximum Green (s)	7.0	7.0	7.0	38.0	38.0	49.0	7.0	58.0	38.0	49.0	100.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag			Lag			Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	
Act Effct Green (s)		9.0	16.2	39.7	39.7	95.7	9.0	63.1	103.8	51.0	110.7	
Actuated g/C Ratio		0.05	0.09	0.22	0.22	0.53	0.05	0.35	0.58	0.28	0.62	
v/c Ratio		0.46	0.12	0.93	0.94	0.65	0.20	0.89	0.53	0.96	0.65	
Control Delay		99.3	44.3	99.5	101.4	32.8	82.6	38.3	11.6	83.2	25.1	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

3: Mercer Ave. & Independence Blvd.  
2040 Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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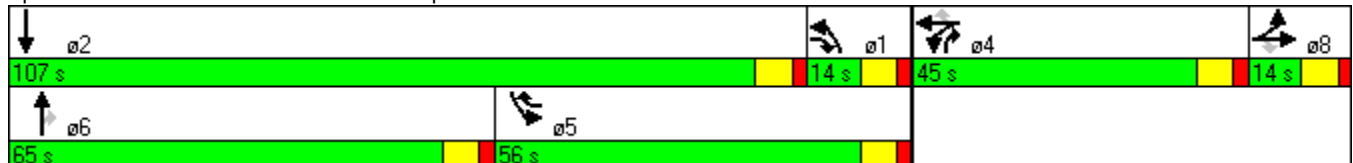


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		99.3	44.3	99.5	101.4	32.8	82.6	38.3	11.6	83.2	25.1	
LOS		F	D	F	F	C	F	D	B	F	C	
Approach Delay		83.4			61.1			32.4				43.3
Approach LOS		F			E			C				D
Queue Length 50th (ft)		49	13	420	430	451	20	578	128	551	611	
Queue Length 95th (ft)		97	32	#628	#644	535	m23	m653	m161	#687	663	
Internal Link Dist (ft)		721			885			692				1077
Turn Bay Length (ft)			100	675		625	300		625	400		
Base Capacity (vph)		92	142	370	373	1468	87	1748	889	954	3064	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.46	0.12	0.92	0.93	0.65	0.20	0.89	0.54	0.96	0.65	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 179 (99%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 130  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 44.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 86.7%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Mercer Ave. & Independence Blvd.



3: Mercer Ave. & Independence Blvd.  
 2040 Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗	↖	↖	↗	↖↗	↖	↖↖↖	↖	↖↖	↖↖↖	
Volume (vph)	11	41	15	431	29	822	15	1789	579	862	1397	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	675		625	300		625	400		0
Storage Lanes	0		1	1		1	1		1	2		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1844	1583	1665	1679	2760	1736	4988	1553	3367	4983	0
Flt Permitted		0.990		0.950	0.958		0.950			0.950		
Satd. Flow (perm)	0	1844	1583	1665	1679	2760	1736	4988	1553	3367	4983	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			55	
Link Distance (ft)		801			965			812			1157	
Travel Time (s)		21.8			18.8			12.3			14.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)				47%								
Lane Group Flow (vph)	0	58	17	254	257	913	17	1988	643	958	1562	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split		pm+ov	Split		pm+ov	Prot		pm+ov	Prot		
Protected Phases	8	8	1	4	4	5	1	6	4	5	2	
Permitted Phases			8			4			6			
Detector Phase	8	8	1	4	4	5	1	6	4	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0	7.0	12.0	12.0	7.0	14.0	
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0	14.0	19.0	19.0	14.0	21.0	
Total Split (s)	14.0	14.0	14.0	37.0	37.0	63.0	14.0	86.0	37.0	63.0	135.0	0.0
Total Split (%)	7.0%	7.0%	7.0%	18.5%	18.5%	31.5%	7.0%	43.0%	18.5%	31.5%	67.5%	0.0%
Maximum Green (s)	7.0	7.0	7.0	30.0	30.0	56.0	7.0	79.0	30.0	56.0	128.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag			Lag			Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	
Act Effct Green (s)		9.0	18.0	32.0	32.0	95.0	9.0	81.0	113.0	58.0	132.8	
Actuated g/C Ratio		0.04	0.09	0.16	0.16	0.48	0.04	0.40	0.56	0.29	0.66	
v/c Ratio		0.70	0.12	0.95	0.96	0.70	0.22	0.98	0.73	0.98	0.47	
Control Delay		131.7	56.1	125.5	125.3	44.7	99.0	74.6	31.2	93.8	17.4	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

3: Mercer Ave. & Independence Blvd.  
2040 Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		131.7	56.1	125.5	125.3	44.7	99.0	74.6	31.2	93.8	17.4	
LOS		F	E	F	F	D	F	E	C	F	B	
Approach Delay		114.6			73.7			64.2			46.4	
Approach LOS		F			E			E			D	
Queue Length 50th (ft)		77	16	354	358	533	22	950	473	651	370	
Queue Length 95th (ft)		#159	39	#561	#566	624	54	#1056	606	#798	402	
Internal Link Dist (ft)		721			885			732			1077	
Turn Bay Length (ft)			100	675		625	300		625	400		
Base Capacity (vph)		83	142	266	269	1311	78	2020	877	976	3309	
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn		0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio		0.70	0.12	0.95	0.96	0.70	0.22	0.98	0.73	0.98	0.47	

Intersection Summary

Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 170  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 60.1  
 Intersection LOS: E  
 Intersection Capacity Utilization 91.0%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Mercer Ave. & Independence Blvd.



3: Mercer Ave. & Independence Blvd.  
 2040 Build PM Peak

Intersection: 3: Mercer Ave. & Independence Blvd.

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	LT	R	L	LT	R	R	L	T	T	T	R	L
Maximum Queue (ft)	136	51	668	682	628	618	66	625	639	603	408	412
Average Queue (ft)	54	18	424	448	205	219	21	443	440	436	221	371
95th Queue (ft)	115	48	621	632	358	372	52	588	578	578	368	453
Link Distance (ft)	733			862	862			734	734	734		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		100	675			625	300				625	400
Storage Blk Time (%)	6		0	0	0	0		25				3
Queuing Penalty (veh)	1		0	0	0	0		4				19

Intersection: 3: Mercer Ave. & Independence Blvd.

Movement	SB	SB	SB	SB
Directions Served	L	T	T	TR
Maximum Queue (ft)	425	1068	1032	469
Average Queue (ft)	386	405	317	305
95th Queue (ft)	463	799	617	423
Link Distance (ft)		1063	1063	1063
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)	400			
Storage Blk Time (%)	10			
Queuing Penalty (veh)	58			

Intersection: 3: Mercer Ave. & Independence Blvd.

Movement	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	NB	B4
Directions Served	LT	R	L	LT	R	R	L	T	T	T	R	T
Maximum Queue (ft)	198	125	423	436	484	483	66	806	726	806	650	142
Average Queue (ft)	97	24	295	311	289	308	18	516	510	510	320	5
95th Queue (ft)	171	83	403	411	444	458	47	782	759	756	608	47
Link Distance (ft)	734			862	862			735	735	735		620
Upstream Blk Time (%)								1	0	1		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (ft)		100	675			625	300					625
Storage Blk Time (%)	32	0						29		3	0	
Queuing Penalty (veh)	5	0						4		17	0	

Intersection: 3: Mercer Ave. & Independence Blvd.

Movement	B4	SB	SB	SB	SB	SB	B218	B218
Directions Served	T	L	L	T	T	TR	T	T
Maximum Queue (ft)	326	412	424	1171	1142	362	1027	797
Average Queue (ft)	17	379	398	830	322	182	253	92
95th Queue (ft)	125	464	487	1429	880	316	810	445
Link Distance (ft)	620			1063	1063	1063	1014	1014
Upstream Blk Time (%)				18	0		0	
Queuing Penalty (veh)				0	0		0	
Storage Bay Dist (ft)		400	400					
Storage Blk Time (%)		6	34					
Queuing Penalty (veh)		28	159					

Network Summary

Network wide Queuing Penalty: 213



# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - BASIC FREEWAY SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - All Alternatives
Project Description	U-4434 Independence Boulevard Extension		

	33		34		
Independence Blvd SB - from US 74 to US 17 Bus.		Independence Blvd NB - from US 17 Bus. To US 74			
AM Peak Volume	2877	AM Peak Volume	2354	AM Peak Volume	0
PM Peak Volume	2354	PM Peak Volume	2877	PM Peak Volume	0
Peak Hour Factor	0.90	Peak Hour Factor	0.90	Peak Hour Factor	0.00
Number of Lanes	2	Number of Lanes	2	Number of Lanes	0
Terrain	Level	Terrain	Level	Terrain	Level
Truck Percentage	4%	Truck Percentage	4%	Truck Percentage	0%
Driver Pop. Adj.	1.00	Driver Pop. Adj.	1.00	Driver Pop. Adj.	0.00
Measured FFS	60 mph	Measured FFS	60 mph	Measured FFS	0 mph
Lane Width	12 ft	Lane Width	12 ft	Lane Width	12 ft
Right Side Clearance	6 ft	Right Side Clearance	6 ft	Right Side Clearance	6 ft
Total Ramp Density	2.6 ramp/mi	Total Ramp Density	2.6 ramp/mi	Total Ramp Density	0.0 ramp/mi
AM Peak Volume	0	AM Peak Volume	0	AM Peak Volume	0
PM Peak Volume	0	PM Peak Volume	0	PM Peak Volume	0
Peak Hour Factor	0.00	Peak Hour Factor	0.00	Peak Hour Factor	0.00
Number of Lanes	0	Number of Lanes	0	Number of Lanes	0
Terrain	Level	Terrain	Level	Terrain	Level
Truck Percentage	0%	Truck Percentage	0%	Truck Percentage	0%
Driver Pop. Adj.	0.00	Driver Pop. Adj.	0.00	Driver Pop. Adj.	0.00
Measured FFS	0 mph	Measured FFS	0 mph	Measured FFS	0 mph
Lane Width	12 ft	Lane Width	12 ft	Lane Width	12 ft
Right Side Clearance	6 ft	Right Side Clearance	6 ft	Right Side Clearance	6 ft
Total Ramp Density	0.0 ramp/mi	Total Ramp Density	0.0 ramp/mi	Total Ramp Density	0.0 ramp/mi
AM Peak Volume	0	AM Peak Volume	0	AM Peak Volume	0
PM Peak Volume	0	PM Peak Volume	0	PM Peak Volume	0
Peak Hour Factor	0.00	Peak Hour Factor	0.00	Peak Hour Factor	0.00
Number of Lanes	0	Number of Lanes	0	Number of Lanes	0
Terrain	Level	Terrain	Level	Terrain	Level
Truck Percentage	0%	Truck Percentage	0%	Truck Percentage	0%
Driver Pop. Adj.	0.00	Driver Pop. Adj.	0.00	Driver Pop. Adj.	0.00
Measured FFS	0 mph	Measured FFS	0 mph	Measured FFS	0 mph
Lane Width	12 ft	Lane Width	12 ft	Lane Width	12 ft
Right Side Clearance	6 ft	Right Side Clearance	6 ft	Right Side Clearance	6 ft
Total Ramp Density	0.0 ramp/mi	Total Ramp Density	0.0 ramp/mi	Total Ramp Density	0.0 ramp/mi
AM Peak Volume	0	AM Peak Volume	0	AM Peak Volume	0
PM Peak Volume	0	PM Peak Volume	0	PM Peak Volume	0
Peak Hour Factor	0.00	Peak Hour Factor	0.00	Peak Hour Factor	0.00
Number of Lanes	0	Number of Lanes	0	Number of Lanes	0
Terrain	Level	Terrain	Level	Terrain	Level
Truck Percentage	0%	Truck Percentage	0%	Truck Percentage	0%
Driver Pop. Adj.	0.00	Driver Pop. Adj.	0.00	Driver Pop. Adj.	0.00
Measured FFS	0 mph	Measured FFS	0 mph	Measured FFS	0 mph
Lane Width	12 ft	Lane Width	12 ft	Lane Width	12 ft
Right Side Clearance	6 ft	Right Side Clearance	6 ft	Right Side Clearance	6 ft
Total Ramp Density	0.0 ramp/mi	Total Ramp Density	0.0 ramp/mi	Total Ramp Density	0.0 ramp/mi

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - BASIC FREEWAY SEGMENTS

<b>General Information</b>		<b>Site Information</b>	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - All Alternatives
Project Description		U-4434 Independence Boulevard Extension	

<div style="border: 1px solid black; width: 60px; margin: 0 auto; padding: 2px;"><b>33</b></div> <p>Independence Blvd SB - from US 74 to US 17 Bus.</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><u>Interchange</u></td> <td style="text-align: center;"><u>Ramps</u></td> </tr> <tr> <td>Kerr Ave.</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Independence Blvd.</td> <td style="text-align: center;">2</td> </tr> <tr> <td>23rd St.</td> <td style="text-align: center;">2</td> </tr> <tr> <td>NC 133</td> <td style="text-align: center;">2</td> </tr> <tr> <td>3rd St.</td> <td style="text-align: center;">1</td> </tr> </table> <p>Note: freeway only 3.5 miles long</p> <p>Ramp Density                      2.57   r/mi</p>	<u>Interchange</u>	<u>Ramps</u>	Kerr Ave.	2	Independence Blvd.	2	23rd St.	2	NC 133	2	3rd St.	1	<div style="border: 1px solid black; width: 60px; margin: 0 auto; padding: 2px;"><b>34</b></div> <p>Independence Blvd NB - from US 17 Bus. To US 74</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><u>Interchange</u></td> <td style="text-align: center;"><u>Ramps</u></td> </tr> <tr> <td>3rd St.</td> <td style="text-align: center;">1</td> </tr> <tr> <td>NC 133</td> <td style="text-align: center;">2</td> </tr> <tr> <td>23rd St.</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Independence Blvd.</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Kerr Ave.</td> <td style="text-align: center;">2</td> </tr> </table> <p>Note: freeway only 3.5 miles long</p> <p>Ramp Density                      2.57   r/mi</p>	<u>Interchange</u>	<u>Ramps</u>	3rd St.	1	NC 133	2	23rd St.	2	Independence Blvd.	2	Kerr Ave.	2	<div style="border: 1px solid black; width: 60px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><u>Interchange</u></td> <td style="text-align: center;"><u>Ramps</u></td> </tr> </table> <p>Note: freeway only 1.0 mile long</p> <p>Ramp Density                      0.00   r/mi</p>	<u>Interchange</u>	<u>Ramps</u>
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23rd St.	2																											
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# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information			Site Information					
Analyst		URS	Date Performed		2012			
Agency or Company			Analysis Year		2040 Build - All Alternatives			
Project Description			U-4434 Independence Boulevard Extension					
<b>39</b>			<b>40</b>					
Independence Blvd. SB - to US 74 EB			Independence Blvd. NB - to US 74 EB					
Merge/Diverge	Merge		Merge/Diverge	Diverge		Merge/Diverge	Diverge	
No. of lanes on Freeway	2		No. of lanes on Freeway	2		No. of lanes on Freeway	0	
Freeway FFS	60 mph		Freeway FFS	60 mph		Freeway FFS	0 mph	
Freeway Volume (AM/PM)	1628	1103	Freeway Volume (AM/PM)	2413	2807	Freeway Volume (AM/PM)	0	0
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	50 mph		Ramp FFS	50 mph		Ramp FFS	0 mph	
Ramp Volume (AM/PM)	1179	1310	Ramp Volume (AM/PM)	1103	1628	Ramp Volume (AM/PM)	0	0
No. Lanes on Ramp	2		No. Lanes on Ramp	2		No. Lanes on Ramp	0	
Accel/Decel Distance 1	930	ft	Accel/Decel Distance 1	560	ft	Accel/Decel Distance 1	0	ft
Accel/Decel Distance 2	1930	ft	Accel/Decel Distance 2	560	ft	Accel/Decel Distance 2	0	ft
Adjacent Upstream	N/A		Adjacent Upstream	N/A		Adjacent Upstream	Yes	
Off/On	N/A		Off/On	N/A		Off/On	On	
Distance	N/A ft		Distance	N/A ft		Distance	0 ft	
Truck %	N/A		Truck %	N/A		Truck %	0	
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0
Adjacent Downstream	N/A		Adjacent Downstream	N/A		Adjacent Downstream	Yes	
Off/On	N/A		Off/On	N/A		Off/On	On	
Distance	N/A ft		Distance	N/A ft		Distance	0 ft	
Truck %	N/A		Truck %	N/A		Truck %	0	
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0
Peak Hour Factor	0.90		Peak Hour Factor	0.90		Peak Hour Factor	0.00	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	1.00		Population Adj. Factor	0.00	
Freeway Truck %	4%		Freeway Truck %	4%		Freeway Truck %	0%	
Ramp Truck %	4%		Ramp Truck %	4%		Ramp Truck %	0%	
Merge/Diverge	Diverge		Merge/Diverge	Diverge		Merge/Diverge	Diverge	
No. of lanes on Freeway	0		No. of lanes on Freeway	0		No. of lanes on Freeway	0	
Freeway FFS	0 mph		Freeway FFS	0 mph		Freeway FFS	0 mph	
Freeway Volume (AM/PM)	0	0	Freeway Volume (AM/PM)	0	0	Freeway Volume (AM/PM)	0	0
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	0 mph		Ramp FFS	0 mph		Ramp FFS	0 mph	
Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
No. Lanes on Ramp	0		No. Lanes on Ramp	0		No. Lanes on Ramp	0	
Accel/Decel Distance 1	0	ft	Accel/Decel Distance 1	0	ft	Accel/Decel Distance 1	0	ft
Accel/Decel Distance 2	0	ft	Accel/Decel Distance 2	0	ft	Accel/Decel Distance 2	0	ft
Adjacent Upstream	Yes		Adjacent Upstream	Yes		Adjacent Upstream	Yes	
Off/On	On		Off/On	On		Off/On	On	
Distance	0 ft		Distance	0 ft		Distance	0 ft	
Truck %	0		Truck %	0		Truck %	0	
Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Adjacent Downstream	Yes		Adjacent Downstream	Yes		Adjacent Downstream	Yes	
Off/On	On		Off/On	On		Off/On	On	
Distance	0 ft		Distance	0 ft		Distance	0 ft	
Truck %	0		Truck %	0		Truck %	0	
Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Peak Hour Factor	0.00		Peak Hour Factor	0.00		Peak Hour Factor	0.00	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	0.00		Population Adj. Factor	0.00		Population Adj. Factor	0.00	
Freeway Truck %	0%		Freeway Truck %	0%		Freeway Truck %	0%	
Ramp Truck %	0%		Ramp Truck %	0%		Ramp Truck %	0%	

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - MULTI LANE SEGMENTS

<b>General Information</b>		<b>Site Information</b>	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - All Alternatives
Project Description		U-4434 Independence Boulevard Extension	

	<b>55</b>			<b>56</b>	
Independence Blvd. SB - South of US 17 Bus.			Independence Blvd. NB - South of Darlington		
Base FFS (est.)	60	mph	Base FFS (est.)	60	mph
Median Type	Divided		Median Type	Divided	
Lane Width	12	ft	Lane Width	12	ft
Right Edge	10	ft	Right Edge	10	ft
Left Edge	4	ft	Left Edge	4	ft
Access Points per mi.	0		Access Points per mi.	1	
	<u>Direction 1</u>	<u>Direction 2</u>		<u>Direction 1</u>	<u>Direction 2</u>
Volume (AM/PM)	2684/2196	N/A	Volume (AM/PM)	2196/2684	N/A
PHF	0.9	N/A	PHF	0.9	N/A
No. of Lanes	2	N/A	No. of Lanes	2	N/A
Terrain	Level	N/A	Terrain	Level	N/A
Grade	N/A	N/A	Grade	N/A	N/A
Length	N/A	N/A	Length	N/A	N/A
Trucks and Bus	4%	N/A	Trucks and Bus	4%	N/A
Rec. Vehicles	0	N/A	Rec. Vehicles	0%	N/A
Driv. Pop. Fac.	1	N/A	Driv. Pop. Fac.	1	N/A

Base FFS (est.)		mph	Base FFS (est.)		mph
Median Type			Median Type		
Lane Width		ft	Lane Width		ft
Right Edge		ft	Right Edge		ft
Left Edge		ft	Left Edge		ft
Access Points per mi.			Access Points per mi.		
	<u>Direction 1</u>	<u>Direction 2</u>		<u>Direction 1</u>	<u>Direction 2</u>
Volume (AM/PM)			Volume (AM/PM)		
PHF			PHF		
No. of Lanes			No. of Lanes		
Terrain			Terrain		
Grade			Grade		
Length			Length		
Trucks and Bus			Trucks and Bus		
Rec. Vehicles			Rec. Vehicles		
Driv. Pop. Fac.			Driv. Pop. Fac.		

Base FFS (est.)		mph	Base FFS (est.)		mph
Median Type			Median Type		
Lane Width		ft	Lane Width		ft
Right Edge		ft	Right Edge		ft
Left Edge		ft	Left Edge		ft
Access Points per mi.			Access Points per mi.		
	<u>Direction 1</u>	<u>Direction 2</u>		<u>Direction 1</u>	<u>Direction 2</u>
Volume (AM/PM)			Volume (AM/PM)		
PHF			PHF		
No. of Lanes			No. of Lanes		
Terrain			Terrain		
Grade			Grade		
Length			Length		
Trucks and Bus			Trucks and Bus		
Rec. Vehicles			Rec. Vehicles		
Driv. Pop. Fac.			Driv. Pop. Fac.		

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - ANALYSIS NOTES

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - All Alternatives
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV %	Freeway Truck%			
	FR = DS ramp HV %	Off Ramp Truck %			
	RF = US ramp HV %	On Ramp Truck %			
	RR = DS ramp HV %	Off Ramp Truck %			

Level of Service Standards - Freeways	Level of Service Standards - Signalized Intersections
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004	LOS D or better for overall intersection required
	LOS D or better for individual movements recommended
	If not LOS D for individual movement - v/c ratio must be less than 0.85

### Assumed Improvements

TIP No.	Description
U-3338	SR 1175 (Kerr Avenue) - widening, including new interchange at US 74

### General Analysis Notes

- ▶ Interchange/Ramp Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

### Design Specific Analysis Notes

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

### Locations where LOS D or better not achieved

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**

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## BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	URS	Highway/Direction of Travel	Independence Blvd SB
Agency or Company		From/To	US 74 to US 17 Business
Date Performed	2013	Jurisdiction	Segment #33
Analysis Time Period	AM Peak	Analysis Year	2040 Build - All Alternatives
Project Description U-4434 Independence Boulevard Extension			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	2877	veh/h	Peak-Hour Factor, PHF 0.90
AADT		veh/day	%Trucks and Buses, P <sub>T</sub> 4
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub> 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f <sub>LW</sub>	mph
Number of Lanes, N	2	f <sub>LC</sub>	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	60.0	FFS	60.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	1630	pc/h/ln	
x f <sub>p</sub> )			v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )
S	60.0	mph	x f <sub>p</sub> )
D = v <sub>p</sub> / S	27.2	pc/mi/ln	S
LOS	D		D = v <sub>p</sub> / S
			Required Number of Lanes, N
Glossary		Factor Location	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

## BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	URS	Highway/Direction of Travel	Independence Blvd SB
Agency or Company		From/To	US 74 to US 17 Business
Date Performed	2013	Jurisdiction	Segment #33
Analysis Time Period	PM Peak	Analysis Year	2040 Build - All Alternatives
Project Description U-4434 Independence Boulevard Extension			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	2354	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
			Up/Down %
			0.90
			4
			0
			Level
			mi
Calculate Flow Adjustments			
f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f <sub>LW</sub>	mph
Number of Lanes, N	2	f <sub>LC</sub>	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	60.0	FFS	60.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	1334	Design LOS	
x f <sub>p</sub> )		v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	pc/h/ln
S	60.0	x f <sub>p</sub> )	
D = v <sub>p</sub> / S	22.2	S	mph
LOS	C	D = v <sub>p</sub> / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			





## BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	URS	Highway/Direction of Travel	Independence Blvd NB
Agency or Company		From/To	US 17 Business to US 74
Date Performed	2013	Jurisdiction	Segment #34
Analysis Time Period	PM Peak	Analysis Year	2040 Build - All Alternatives
Project Description U-4434 Independence Boulevard Extension			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	2877	veh/h	Peak-Hour Factor, PHF 0.90
AADT		veh/day	%Trucks and Buses, P <sub>T</sub> 4
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub> 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f <sub>LW</sub>	mph
Number of Lanes, N	2	f <sub>LC</sub>	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	60.0	FFS	60.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v <sub>p</sub> = (V or DDHV) / (PHF x N x f <sub>HV</sub> )	1630	pc/h/ln	
x f <sub>p</sub> )			
S	60.0	mph	
D = v <sub>p</sub> / S	27.2	pc/mi/ln	
LOS	D		
			Required Number of Lanes, N
Glossary		Factor Location	
N - Number of lanes	S - Speed	E <sub>R</sub> - Exhibits 11-10, 11-12	f <sub>LW</sub> - Exhibit 11-8
V - Hourly volume	D - Density	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow speed	f <sub>p</sub> - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

## MULTILANE HIGHWAYS WORKSHEET(Direction 1)



General Information		Site Information	
Analyst	URS	Highway/Direction to Travel	Independence Blvd SB
Agency or Company		From/To	South of US 17 Business
Date Performed	2012	Jurisdiction	Segment #55
Analysis Time Period	AM Peak	Analysis Year	2040 Build - All Alternatives
Project Description U-4434 Independence Boulevard Extension			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			

Flow Inputs			
Volume, V (veh/h)	2684	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P <sub>T</sub>	4
Peak-Hour Prop of AADT (veh/d)		%RVs, P <sub>R</sub>	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments			
f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub>	0.980

Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f <sub>LW</sub> (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f <sub>LC</sub> (mi/h)	0.4
Access Points, A (A/mi)	0	f <sub>A</sub> (mi/h)	0.0
Median Type, M	Divided	f <sub>M</sub> (mi/h)	0.0
FFS (measured)		FFS (mi/h)	59.6
Base Free-Flow Speed, BFFS	60.0		

Operations		Design	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
Flow Rate, v <sub>p</sub> (pc/h/ln)	1520	Required Number of Lanes, N	
Speed, S (mi/h)	59.6	Flow Rate, v <sub>p</sub> (pc/h)	
D (pc/mi/ln)	25.5	Max Service Flow Rate (pc/h/ln)	
LOS	C	Design LOS	

Bicycle Level of Service	
Directional demand flow rate in outside lane, v <sub>OL</sub> (Eq. 15-24) veh/h	1491.1
Effective width, W <sub>v</sub> (Eq. 15-29) ft	24.00
Effective speed factor, S <sub>f</sub> (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.59
Bicycle level of service (Exhibit 15-4)	D

## MULTILANE HIGHWAYS WORKSHEET(Direction 1)



General Information		Site Information	
Analyst	URS	Highway/Direction to Travel	Independence Blvd SB
Agency or Company		From/To	South of US 17 Business
Date Performed	2012	Jurisdiction	Segment #55
Analysis Time Period	PM Peak	Analysis Year	2040 Build - All Alternatives
Project Description U-4434 Independence Boulevard Extension			

Oper.(LOS)
  Des. (N)
 Plan. (vp)

Flow Inputs			
Volume, V (veh/h)	2196	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P <sub>T</sub>	4
Peak-Hour Prop of AADT (veh/d)		%RVs, P <sub>R</sub>	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments			
f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub>	0.980

Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f <sub>LW</sub> (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f <sub>LC</sub> (mi/h)	0.4
Access Points, A (A/mi)	0	f <sub>A</sub> (mi/h)	0.0
Median Type, M	Divided	f <sub>M</sub> (mi/h)	0.0
FFS (measured)		FFS (mi/h)	59.6
Base Free-Flow Speed, BFFS	60.0		

Operations		Design	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
Flow Rate, v <sub>p</sub> (pc/h/ln)	1244	Required Number of Lanes, N	
Speed, S (mi/h)	60.0	Flow Rate, v <sub>p</sub> (pc/h)	
D (pc/mi/ln)	20.7	Max Service Flow Rate (pc/h/ln)	
LOS	C	Design LOS	

Bicycle Level of Service	
Directional demand flow rate in outside lane, v <sub>OL</sub> (Eq. 15-24) veh/h	1220.0
Effective width, W <sub>v</sub> (Eq. 15-29) ft	24.00
Effective speed factor, S <sub>f</sub> (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.48
Bicycle level of service (Exhibit 15-4)	C

## MULTILANE HIGHWAYS WORKSHEET(Direction 1)



General Information		Site Information	
Analyst	URS	Highway/Direction to Travel	Independence Blvd NB
Agency or Company		From/To	South of Darlington Ave
Date Performed	2012	Jurisdiction	Segment #56
Analysis Time Period	AM Peak	Analysis Year	2040 Build - All Alternatives
Project Description U-4434 Independence Boulevard Extension			

 Oper.(LOS)

 Des. (N)

 Plan. (vp)

### Flow Inputs

Volume, V (veh/h)	2196	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P <sub>T</sub>	4
Peak-Hour Prop of AADT (veh/d)		%RVs, P <sub>R</sub>	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

### Calculate Flow Adjustments

f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub>	0.980

### Speed Inputs

### Calc Speed Adj and FFS

Lane Width, LW (ft)	12.0	f <sub>LW</sub> (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f <sub>LC</sub> (mi/h)	0.4
Access Points, A (A/mi)	1	f <sub>A</sub> (mi/h)	0.3
Median Type, M	Divided	f <sub>M</sub> (mi/h)	0.0
FFS (measured)		FFS (mi/h)	59.3
Base Free-Flow Speed, BFFS	60.0		

### Operations

### Design

<u>Operational (LOS)</u>		<u>Design (N)</u>	
Flow Rate, v <sub>p</sub> (pc/h/ln)	1244	Required Number of Lanes, N	
Speed, S (mi/h)	60.0	Flow Rate, v <sub>p</sub> (pc/h)	
D (pc/mi/ln)	20.7	Max Service Flow Rate (pc/h/ln)	
LOS	C	Design LOS	

### Bicycle Level of Service

Directional demand flow rate in outside lane, v <sub>OL</sub> (Eq. 15-24) veh/h	1220.0
Effective width, W <sub>v</sub> (Eq. 15-29) ft	24.00
Effective speed factor, S <sub>f</sub> (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.48
Bicycle level of service (Exhibit 15-4)	C

## MULTILANE HIGHWAYS WORKSHEET(Direction 1)



General Information		Site Information	
Analyst	URS	Highway/Direction to Travel	Independence Blvd NB
Agency or Company		From/To	South of Darlington Ave
Date Performed	2012	Jurisdiction	Segment #56
Analysis Time Period	PM Peak	Analysis Year	2040 Build - All Alternatives
Project Description U-4434 Independence Boulevard Extension			
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des. (N)	
<input type="checkbox"/> Plan. (vp)			

Flow Inputs			
Volume, V (veh/h)	2684	Peak-Hour Factor, PHF	0.90
AADT(veh/h)		%Trucks and Buses, P <sub>T</sub>	4
Peak-Hour Prop of AADT (veh/d)		%RVs, P <sub>R</sub>	0
Peak-Hour Direction Prop, D		General Terrain:	Level
DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2

Calculate Flow Adjustments			
f <sub>p</sub>	1.00	E <sub>R</sub>	1.2
E <sub>T</sub>	1.5	f <sub>HV</sub>	0.980

Speed Inputs		Calc Speed Adj and FFS	
Lane Width, LW (ft)	12.0	f <sub>LW</sub> (mi/h)	0.0
Total Lateral Clearance, LC (ft)	10.0	f <sub>LC</sub> (mi/h)	0.4
Access Points, A (A/mi)	1	f <sub>A</sub> (mi/h)	0.3
Median Type, M	Divided	f <sub>M</sub> (mi/h)	0.0
FFS (measured)		FFS (mi/h)	59.3
Base Free-Flow Speed, BFFS	60.0		

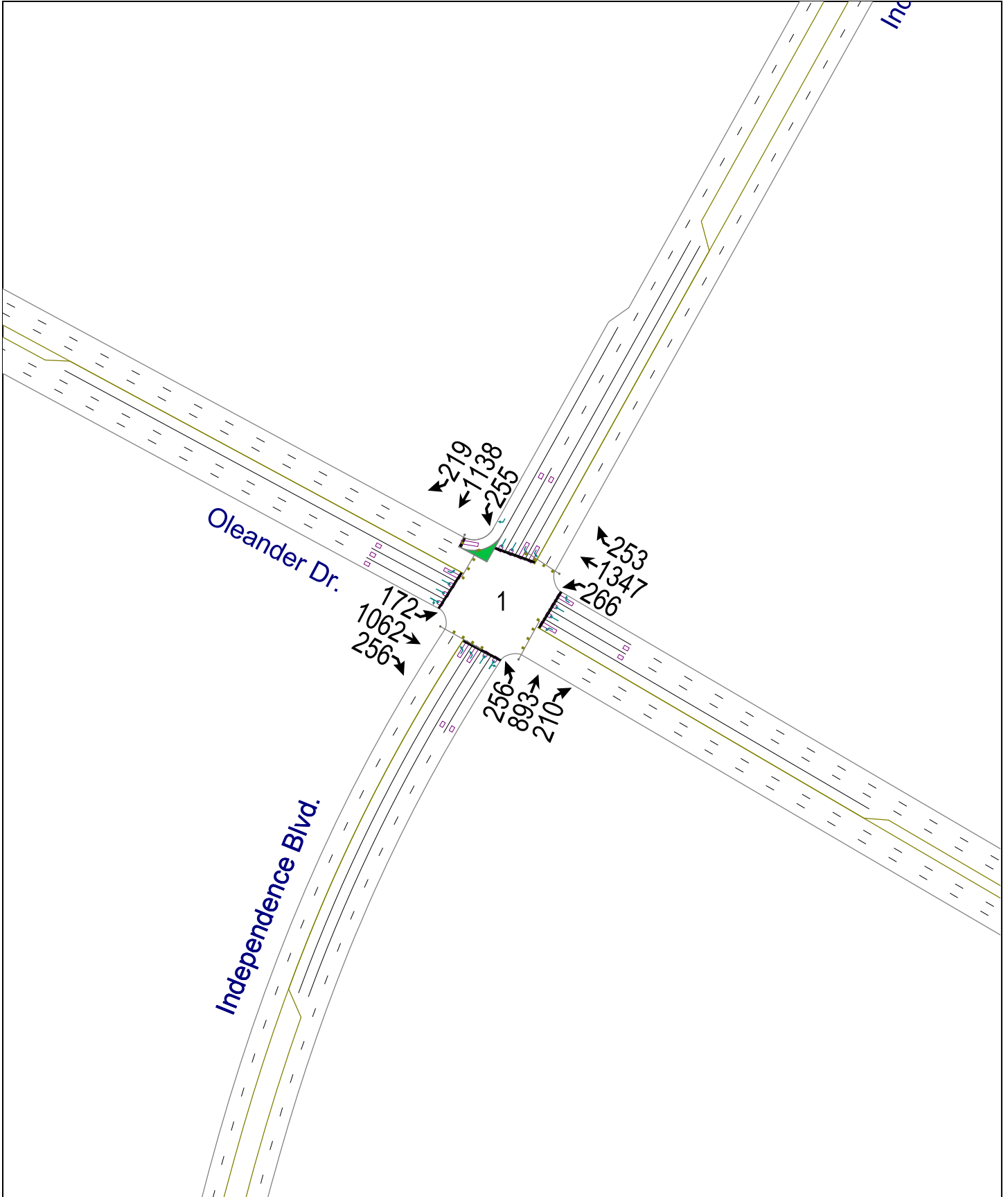
Operations		Design	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
Flow Rate, v <sub>p</sub> (pc/h/ln)	1520	Required Number of Lanes, N	
Speed, S (mi/h)	59.6	Flow Rate, v <sub>p</sub> (pc/h)	
D (pc/mi/ln)	25.5	Max Service Flow Rate (pc/h/ln)	
LOS	C	Design LOS	

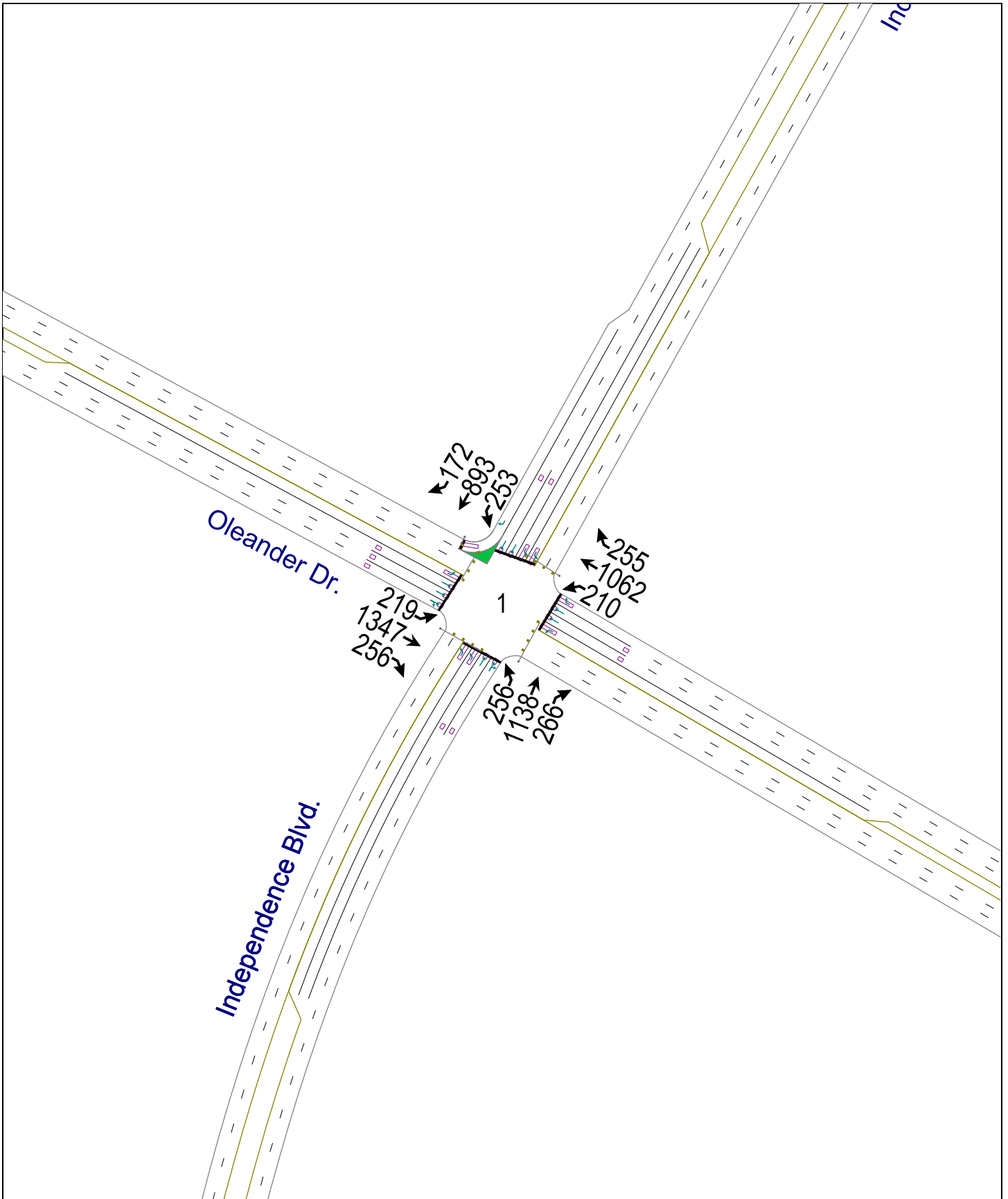
Bicycle Level of Service	
Directional demand flow rate in outside lane, v <sub>OL</sub> (Eq. 15-24) veh/h	1491.1
Effective width, W <sub>v</sub> (Eq. 15-29) ft	24.00
Effective speed factor, S <sub>f</sub> (Eq. 15-30)	4.79
Bicycle level of service score, BLOS (Eq. 15-31)	3.59
Bicycle level of service (Exhibit 15-4)	D

## Adjacent Segments

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U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
11/8/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	1062	256	266	1347	253	256	893	210	255	1138	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	425		0	440		0	400		275
Storage Lanes	1		0	1		1	2		0	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	4843	0	1736	3471	1553	3367	3370	0	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	4843	0	1736	3471	1553	3367	3370	0	3367	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			45			45	
Link Distance (ft)		949			990			888			1128	
Travel Time (s)		16.2			16.9			13.5			17.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	191	1464	0	296	1497	281	284	1225	0	283	1264	243
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		pm+ov	Prot			Prot		pm+ov
Protected Phases	3	8		7	4	5	1	6		5	2	3
Permitted Phases						4						2
Detector Phase	3	8		7	4	5	1	6		5	2	3
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	14.0	14.0	19.0		14.0	19.0	14.0
Total Split (s)	21.0	60.0	0.0	35.0	74.0	17.0	17.0	68.0	0.0	17.0	68.0	21.0
Total Split (%)	11.7%	33.3%	0.0%	19.4%	41.1%	9.4%	9.4%	37.8%	0.0%	9.4%	37.8%	11.7%
Maximum Green (s)	14.0	53.0		28.0	67.0	10.0	10.0	61.0		10.0	61.0	14.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	None
Act Effct Green (s)	16.0	55.0		30.0	69.0	81.0	12.0	63.0		12.0	63.0	79.0
Actuated g/C Ratio	0.09	0.31		0.17	0.38	0.45	0.07	0.35		0.07	0.35	0.44
v/c Ratio	1.24	0.99		1.02	1.12	0.40	1.27	1.04		1.26	1.04	0.36
Control Delay	212.9	82.3		130.0	116.0	26.2	212.5	92.3		179.7	57.7	13.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0

1: Oleander Dr. & Independence Blvd.  
2040 Build AM Peak

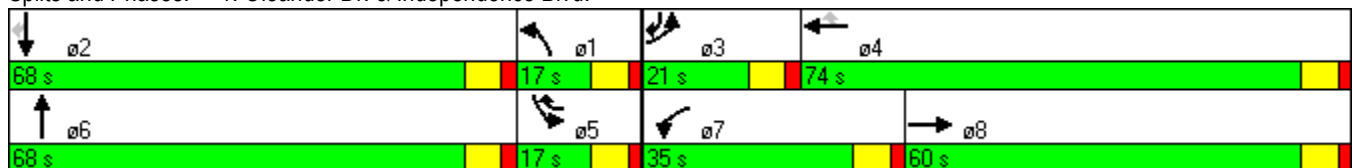


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	212.9	82.3		130.0	116.0	26.2	212.5	92.3		179.7	57.7	13.6
LOS	F	F		F	F	C	F	F		F	E	B
Approach Delay		97.3			105.9			114.9			71.0	
Approach LOS		F			F			F			E	
Queue Length 50th (ft)	~278	635		~370	~1070	160	~216	~817		~217	~835	111
Queue Length 95th (ft)	#457	#744		#578	#1207	221	#321	#957		m#226	m#834	m115
Internal Link Dist (ft)		869			910			808			1048	
Turn Bay Length (ft)	500			425			440			400		275
Base Capacity (vph)	154	1480		289	1331	699	224	1180		224	1215	682
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.24	0.99		1.02	1.12	0.40	1.27	1.04		1.26	1.04	0.36

**Intersection Summary**

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 57 (32%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 170  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.27  
 Intersection Signal Delay: 96.9  
 Intersection LOS: F  
 Intersection Capacity Utilization 102.2%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Oleander Dr. & Independence Blvd.



1: Oleander Dr. & Independence Blvd.  
 2040 Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
11/8/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	219	1347	256	210	1062	255	256	1138	266	253	893	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		0	425		0	440		0	400		275
Storage Lanes	1		0	1		1	2		0	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	4868	0	1736	3471	1553	3367	3374	0	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	4868	0	1736	3471	1553	3367	3374	0	3367	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			45			45	
Link Distance (ft)		949			990			888			1128	
Travel Time (s)		16.2			16.9			13.5			17.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	243	1781	0	233	1180	283	284	1560	0	281	992	191
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		pm+ov	Prot			Prot		pm+ov
Protected Phases	3	8		7	4	5	1	6		5	2	3
Permitted Phases						4						2
Detector Phase	3	8		7	4	5	1	6		5	2	3
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	7.0	7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	14.0	14.0	19.0		14.0	19.0	14.0
Total Split (s)	29.0	67.0	0.0	28.0	66.0	19.0	25.0	86.0	0.0	19.0	80.0	29.0
Total Split (%)	14.5%	33.5%	0.0%	14.0%	33.0%	9.5%	12.5%	43.0%	0.0%	9.5%	40.0%	14.5%
Maximum Green (s)	22.0	60.0		21.0	59.0	12.0	18.0	79.0		12.0	73.0	22.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lag	Lag		Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	None
Act Effct Green (s)	24.0	62.0		23.0	61.0	75.0	20.0	81.0		14.0	75.0	104.0
Actuated g/C Ratio	0.12	0.31		0.12	0.30	0.38	0.10	0.40		0.07	0.38	0.52
v/c Ratio	1.17	1.18		1.17	1.11	0.49	0.84	1.14		1.19	0.76	0.24
Control Delay	185.8	145.6		186.3	125.7	32.1	109.6	125.2		168.0	48.7	14.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0

1: Oleander Dr. & Independence Blvd.  
2040 Build PM Peak

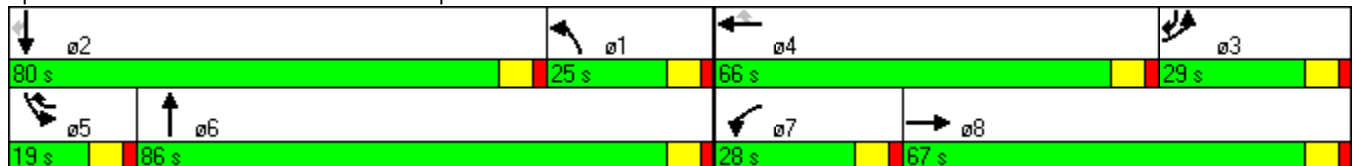


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	185.8	145.6		186.3	125.7	32.1	109.6	125.2		168.0	48.7	14.8
LOS	F	F		F	F	C	F	F		F	D	B
Approach Delay		150.4			118.4			122.8			67.2	
Approach LOS		F			F			F			E	
Queue Length 50th (ft)	~378	~1023		~363	~932	204	193	~1256		~230	627	131
Queue Length 95th (ft)	#580	#1110		#561	#1073	277	#271	#1388		m#320	m728	m157
Internal Link Dist (ft)		869			910			808			1048	
Turn Bay Length (ft)	500			425			440			400		275
Base Capacity (vph)	208	1509		200	1059	582	337	1366		236	1302	808
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.17	1.18		1.17	1.11	0.49	0.84	1.14		1.19	0.76	0.24

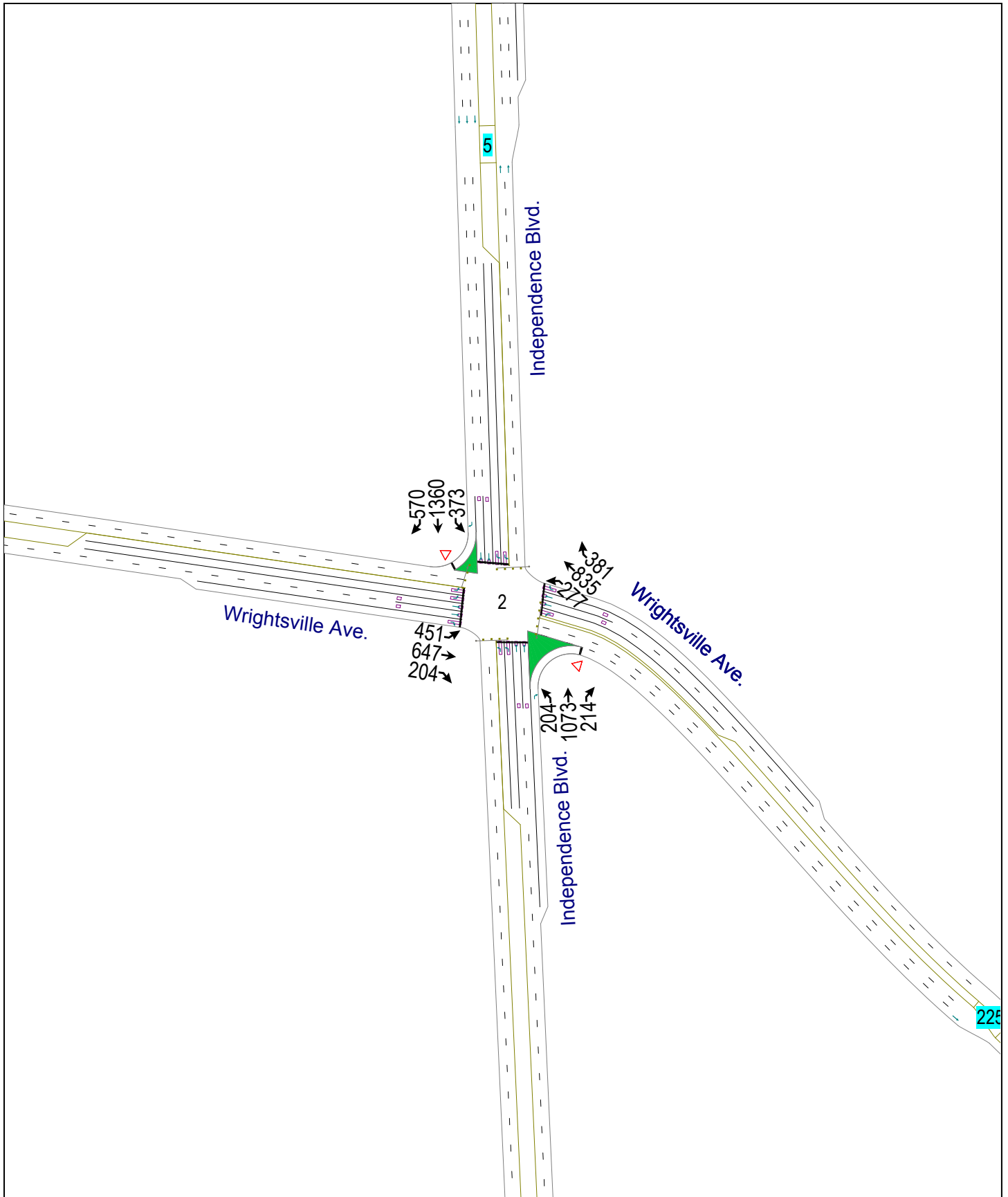
**Intersection Summary**

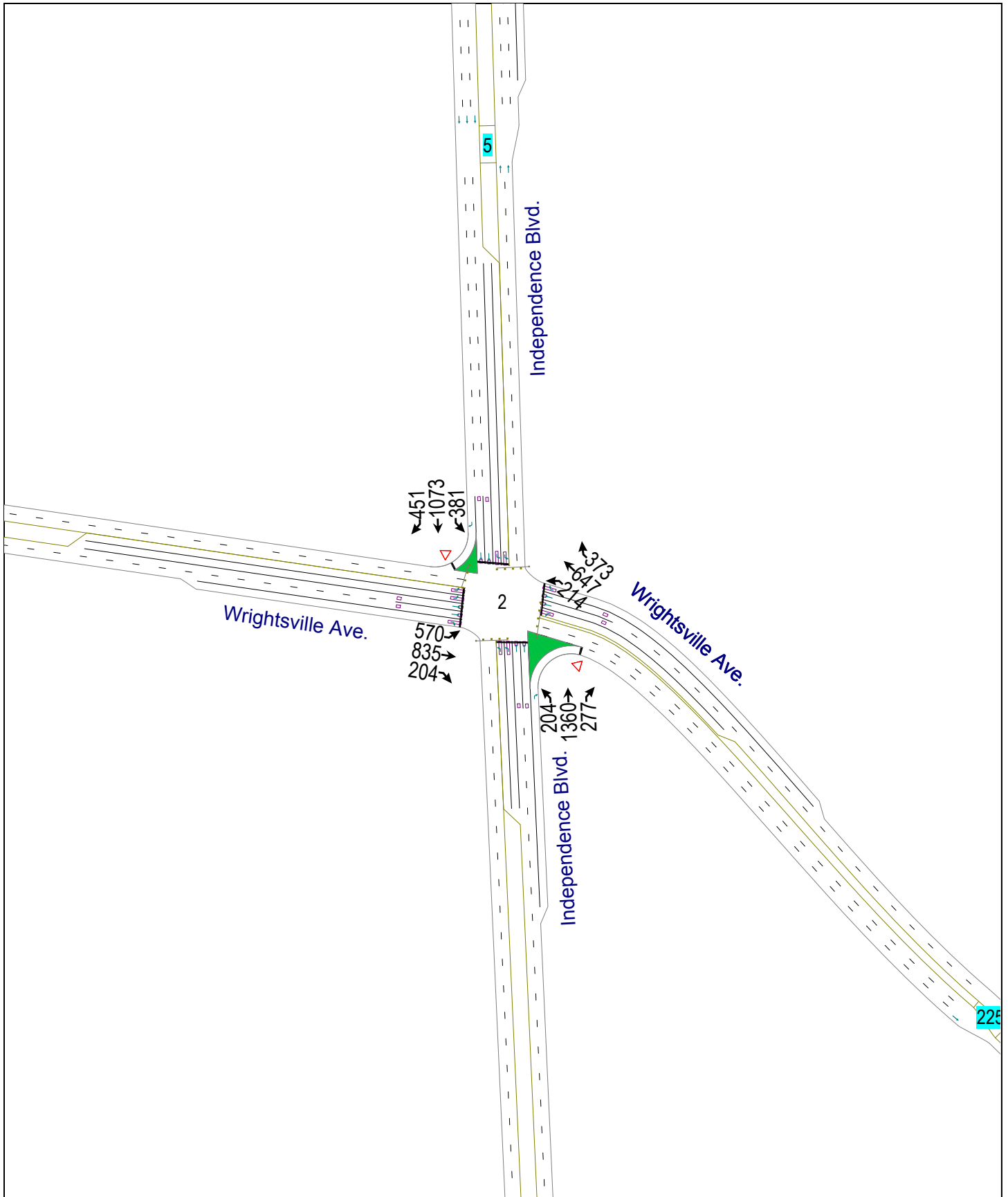
Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 126 (63%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 170  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.19  
 Intersection Signal Delay: 118.1      Intersection LOS: F  
 Intersection Capacity Utilization 107.2%      ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Oleander Dr. & Independence Blvd.



1: Oleander Dr. & Independence Blvd.  
 2040 Build PM Peak







































U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
11/8/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 		 	 		 	 	 
Volume (vph)	451	647	204	277	835	381	204	1073	214	373	1360	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	575		400	325		500	250		400	450		0
Storage Lanes	2		1	1		1	2		1	2		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	3367	3471	1553	3367	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1010			973			1006			688	
Travel Time (s)		19.7			19.0			15.2			10.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	501	719	227	308	928	423	227	1192	238	414	1511	633
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	7.0	10.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	17.0	14.0	14.0	17.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	31.0	44.0	17.0	37.0	50.0	28.0	17.0	71.0	37.0	28.0	82.0	31.0
Total Split (%)	17.2%	24.4%	9.4%	20.6%	27.8%	15.6%	9.4%	39.4%	20.6%	15.6%	45.6%	17.2%
Maximum Green (s)	24.0	37.0	10.0	30.0	43.0	21.0	10.0	64.0	30.0	21.0	75.0	24.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	26.0	38.9	50.9	32.1	45.0	73.0	12.0	66.0	103.1	23.0	77.0	103.0
Actuated g/C Ratio	0.14	0.22	0.28	0.18	0.25	0.41	0.07	0.37	0.57	0.13	0.43	0.57
v/c Ratio	1.01	0.94	0.51	0.97	1.05	0.66	1.01	0.94	0.27	0.96	1.02	0.71
Control Delay	117.2	89.4	34.7	116.4	106.9	49.4	112.4	53.1	8.4	91.3	61.1	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2: Wrightsville Ave. & Independence Blvd.  
2040 Build AM Peak

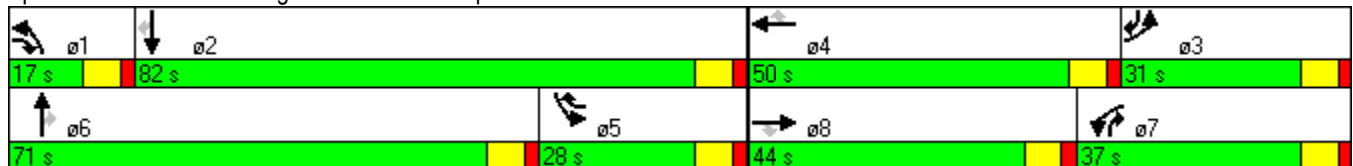


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	117.2	89.4	34.7	116.4	106.9	49.4	112.4	53.1	8.4	91.3	61.1	16.5
LOS	F	F	C	F	F	D	F	D	A	F	E	B
Approach Delay	90.4			94.0			54.8			55.0		
Approach LOS	F			F			D			D		
Queue Length 50th (ft)	~314	445	149	368	~624	405	~146	739	88	241	~830	169
Queue Length 95th (ft)	#442	#566	212	#576	#765	538	m#163	m716	m100	m#346	#1110	m284
Internal Link Dist (ft)	930			893			926			608		
Turn Bay Length (ft)	575		400	325		500	250		400	450		
Base Capacity (vph)	496	767	448	316	885	642	224	1273	890	430	1485	889
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.94	0.51	0.97	1.05	0.66	1.01	0.94	0.27	0.96	1.02	0.71

**Intersection Summary**

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 176 (98%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 70.8  
 Intersection LOS: E  
 Intersection Capacity Utilization 96.0%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

































Splits and Phases: 2: Wrightsville Ave. & Independence Blvd.



2: Wrightsville Ave. & Independence Blvd.  
 2040 Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
11/8/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 		 	 		 	 	 
Volume (vph)	570	835	204	214	647	373	204	1360	277	381	1073	451
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	575		400	325		500	250		400	450		0
Storage Lanes	2		1	1		1	2		1	2		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	3367	3471	1553	3367	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1010			973			1006			688	
Travel Time (s)		19.7			19.0			15.2			10.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	633	928	227	238	719	414	227	1511	308	423	1192	501
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	7.0	10.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	17.0	14.0	14.0	17.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	40.0	54.0	24.0	30.0	44.0	29.0	24.0	87.0	30.0	29.0	92.0	40.0
Total Split (%)	20.0%	27.0%	12.0%	15.0%	22.0%	14.5%	12.0%	43.5%	15.0%	14.5%	46.0%	20.0%
Maximum Green (s)	33.0	47.0	17.0	23.0	37.0	22.0	17.0	80.0	23.0	22.0	85.0	33.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	35.0	49.0	72.3	25.0	39.0	68.0	18.3	82.0	107.0	24.0	87.7	122.7
Actuated g/C Ratio	0.18	0.24	0.36	0.12	0.20	0.34	0.09	0.41	0.54	0.12	0.44	0.61
v/c Ratio	1.05	1.07	0.40	1.08	1.04	0.77	0.73	1.06	0.37	1.05	0.78	0.53
Control Delay	127.3	119.9	50.0	159.5	120.7	70.1	109.8	66.8	9.6	124.8	40.4	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2: Wrightsville Ave. & Independence Blvd.  
2040 Build PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	127.3	119.9	50.0	159.5	120.7	70.1	109.8	66.8	9.6	124.8	40.4	12.8
LOS	F	F	D	F	F	E	F	E	A	F	D	B
Approach Delay		113.7			112.1			62.9			50.7	
Approach LOS		F			F			E			D	
Queue Length 50th (ft)	~467	~708	223	~347	~535	491	144	~1132	84	~311	759	154
Queue Length 95th (ft)	#600	#850	310	#546	#673	640	m142	m826	m81	m#408	m830	m185
Internal Link Dist (ft)		930			893			926			608	
Turn Bay Length (ft)	575		400	325		500	250		400	450		
Base Capacity (vph)	601	867	578	221	690	538	320	1423	831	404	1522	952
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	1.07	0.39	1.08	1.04	0.77	0.71	1.06	0.37	1.05	0.78	0.53

**Intersection Summary**

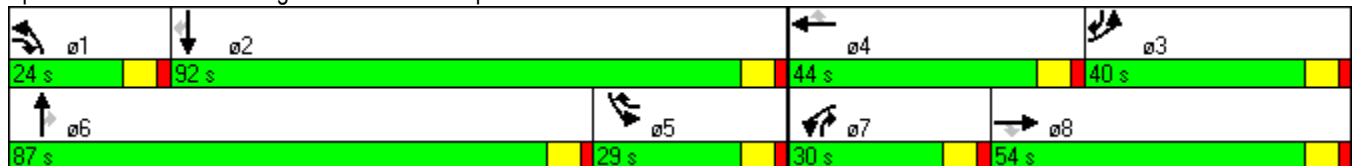
Area Type: Other  
 Cycle Length: 200  
 Actuated Cycle Length: 200  
 Offset: 195 (98%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.08  
 Intersection Signal Delay: 81.0  
 Intersection Capacity Utilization 100.1%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service G

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

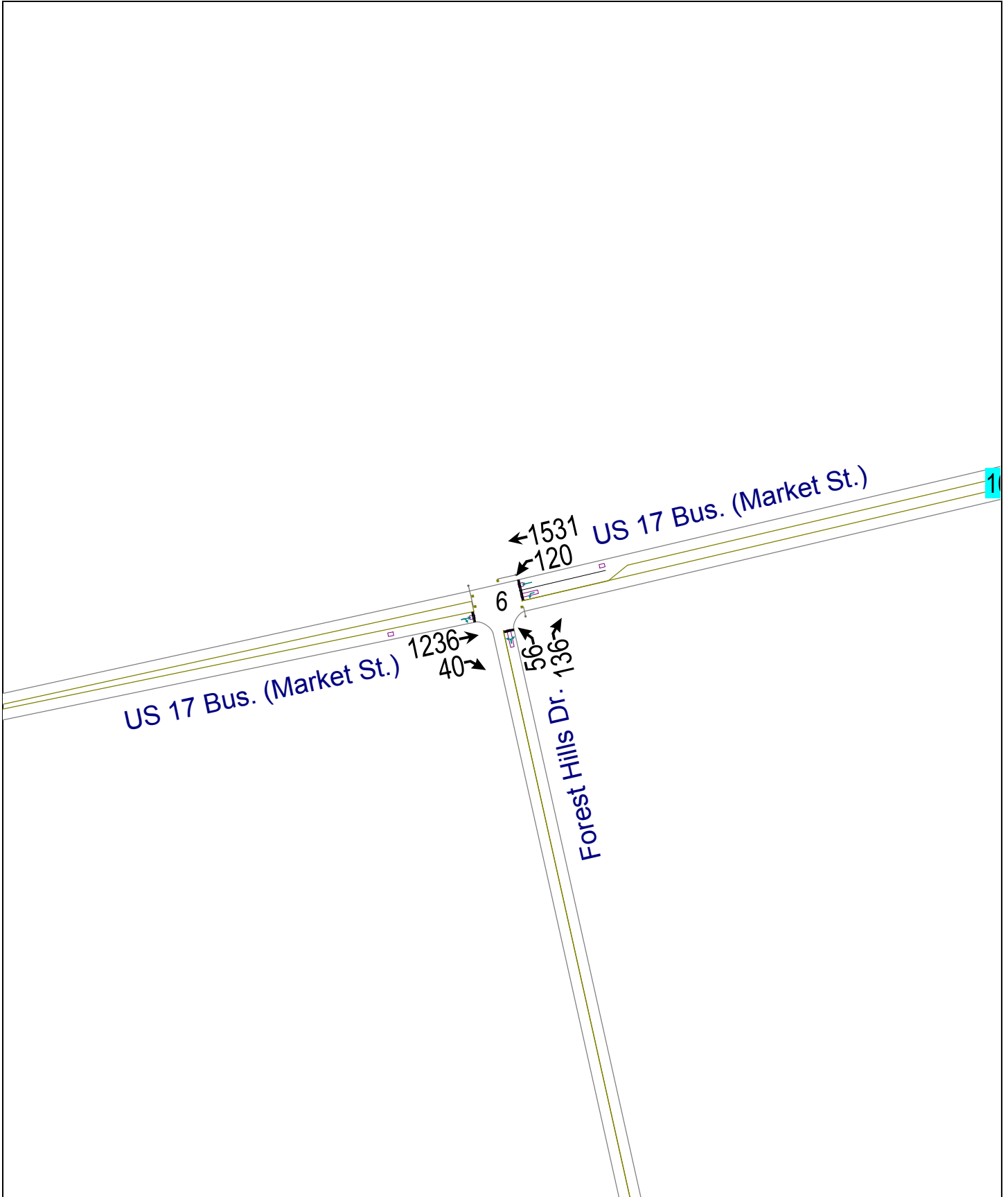
# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

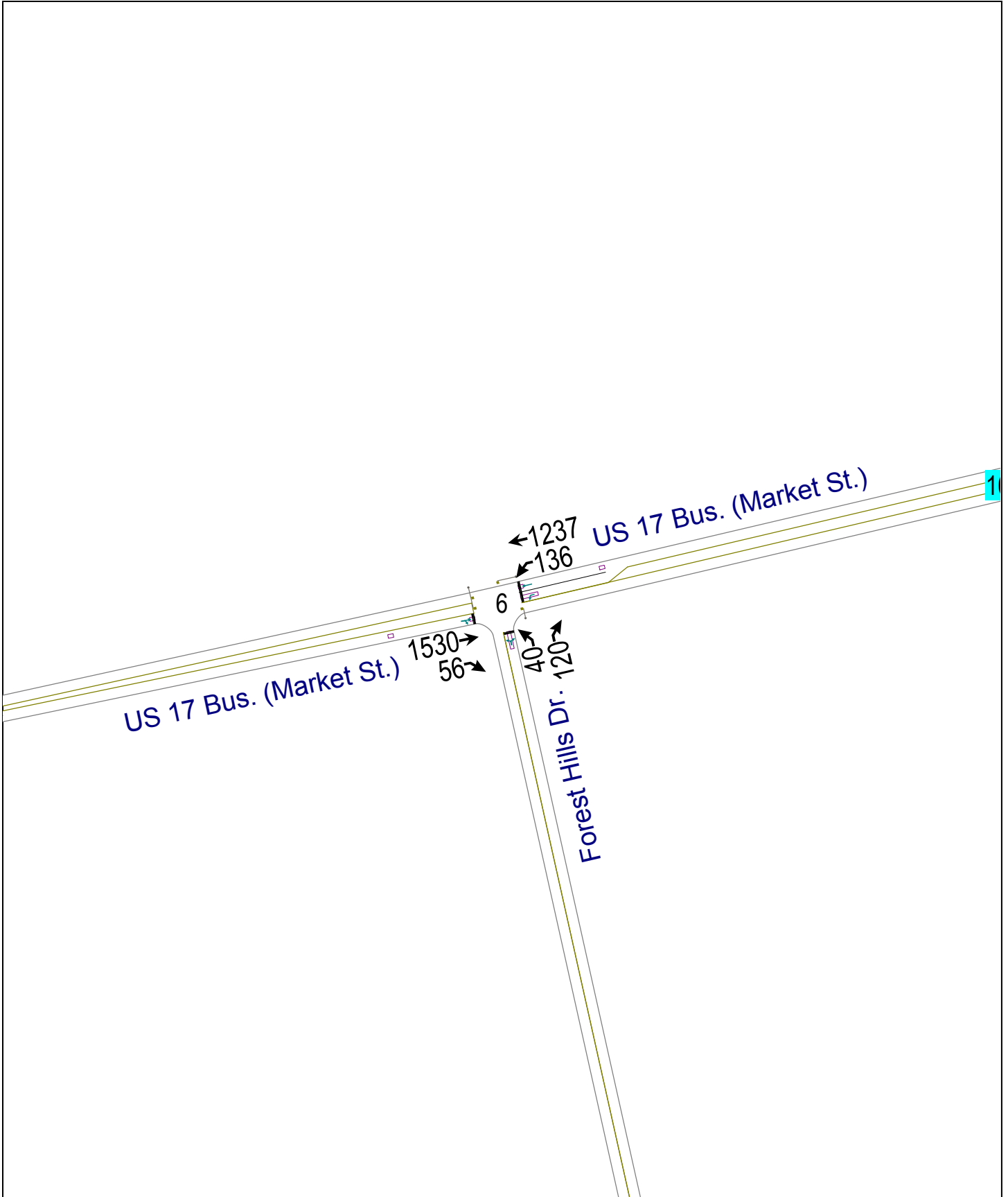
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Wrightsville Ave. & Independence Blvd.



2: Wrightsville Ave. & Independence Blvd.  
 2040 Build PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1236	40	120	1531	56	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		0	0
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	1855	0	1770	1863	1660	0
Flt Permitted			0.950		0.986	
Satd. Flow (perm)	1855	0	1770	1863	1660	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	25	
Link Distance (ft)	1021			581	949	
Travel Time (s)	19.9			11.3	25.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1417	0	133	1701	213	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type			Prot			
Protected Phases	2		1	6	8	
Permitted Phases						
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	
Minimum Split (s)	17.0		14.0	17.0	14.0	
Total Split (s)	136.0	0.0	18.0	154.0	26.0	0.0
Total Split (%)	75.6%	0.0%	10.0%	85.6%	14.4%	0.0%
Maximum Green (s)	129.0		11.0	147.0	19.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	2.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	131.0		13.0	149.0	21.0	
Actuated g/C Ratio	0.73		0.07	0.83	0.12	
v/c Ratio	1.05		1.04	1.10	1.10	
Control Delay	63.3		166.6	74.3	162.2	
Queue Delay	0.0		0.0	0.0	0.0	

6: US 17 Bus. (Market St.) & Forest Hills Dr.  
2040 Build AM Peak

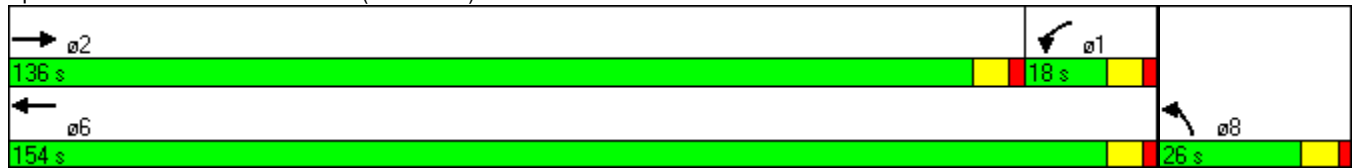


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Delay	63.3		166.6	74.3	162.2	
LOS	E		F	E	F	
Approach Delay	63.3			81.0	162.2	
Approach LOS	E			F	F	
Queue Length 50th (ft)	~1814		~169	~2274	~284	
Queue Length 95th (ft)	#2078		#323	#2526	#467	
Internal Link Dist (ft)	941			501	869	
Turn Bay Length (ft)			100			
Base Capacity (vph)	1350		128	1542	194	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	1.05		1.04	1.10	1.10	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 180  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.10  
 Intersection Signal Delay: 78.8  
 Intersection LOS: E  
 Intersection Capacity Utilization 100.4%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: US 17 Bus. (Market St.) & Forest Hills Dr.



6: US 17 Bus. (Market St.) & Forest Hills Dr.  
 2040 Build AM Peak



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1530	56	136	1237	40	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		0	0
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	1853	0	1770	1863	1655	0
Flt Permitted			0.950		0.988	
Satd. Flow (perm)	1853	0	1770	1863	1655	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			35	25	
Link Distance (ft)	1021			581	949	
Travel Time (s)	19.9			11.3	25.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1762	0	151	1374	177	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type			Prot			
Protected Phases	2		1	6	8	
Permitted Phases						
Detector Phase	2		1	6	8	
Switch Phase						
Minimum Initial (s)	10.0		7.0	10.0	7.0	
Minimum Split (s)	17.0		14.0	17.0	14.0	
Total Split (s)	142.0	0.0	17.0	159.0	21.0	0.0
Total Split (%)	78.9%	0.0%	9.4%	88.3%	11.7%	0.0%
Maximum Green (s)	135.0		10.0	152.0	14.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	2.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		None	C-Max	None	
Act Effct Green (s)	137.0		12.0	154.0	16.0	
Actuated g/C Ratio	0.76		0.07	0.86	0.09	
v/c Ratio	1.25		1.28	0.86	1.20	
Control Delay	141.7		236.3	14.6	203.2	
Queue Delay	0.0		0.0	0.0	0.0	

6: US 17 Bus. (Market St.) & Forest Hills Dr.  
2040 Build PM Peak

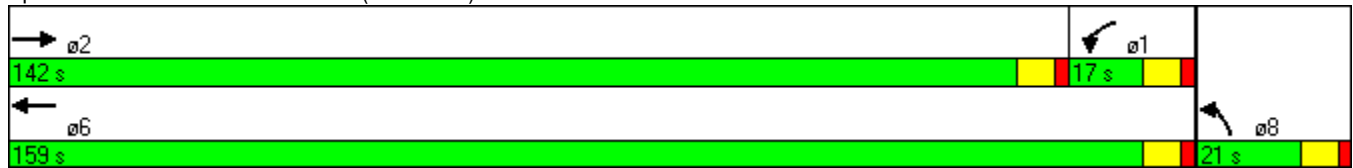


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Delay	141.7		236.3	14.6	203.2	
LOS	F		F	B	F	
Approach Delay	141.7			36.5	203.2	
Approach LOS	F			D	F	
Queue Length 50th (ft)	~2584		~225	729	~253	
Queue Length 95th (ft)	#2834		#386	1008	#427	
Internal Link Dist (ft)	941			501	869	
Turn Bay Length (ft)			100			
Base Capacity (vph)	1410		118	1594	147	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	1.25		1.28	0.86	1.20	

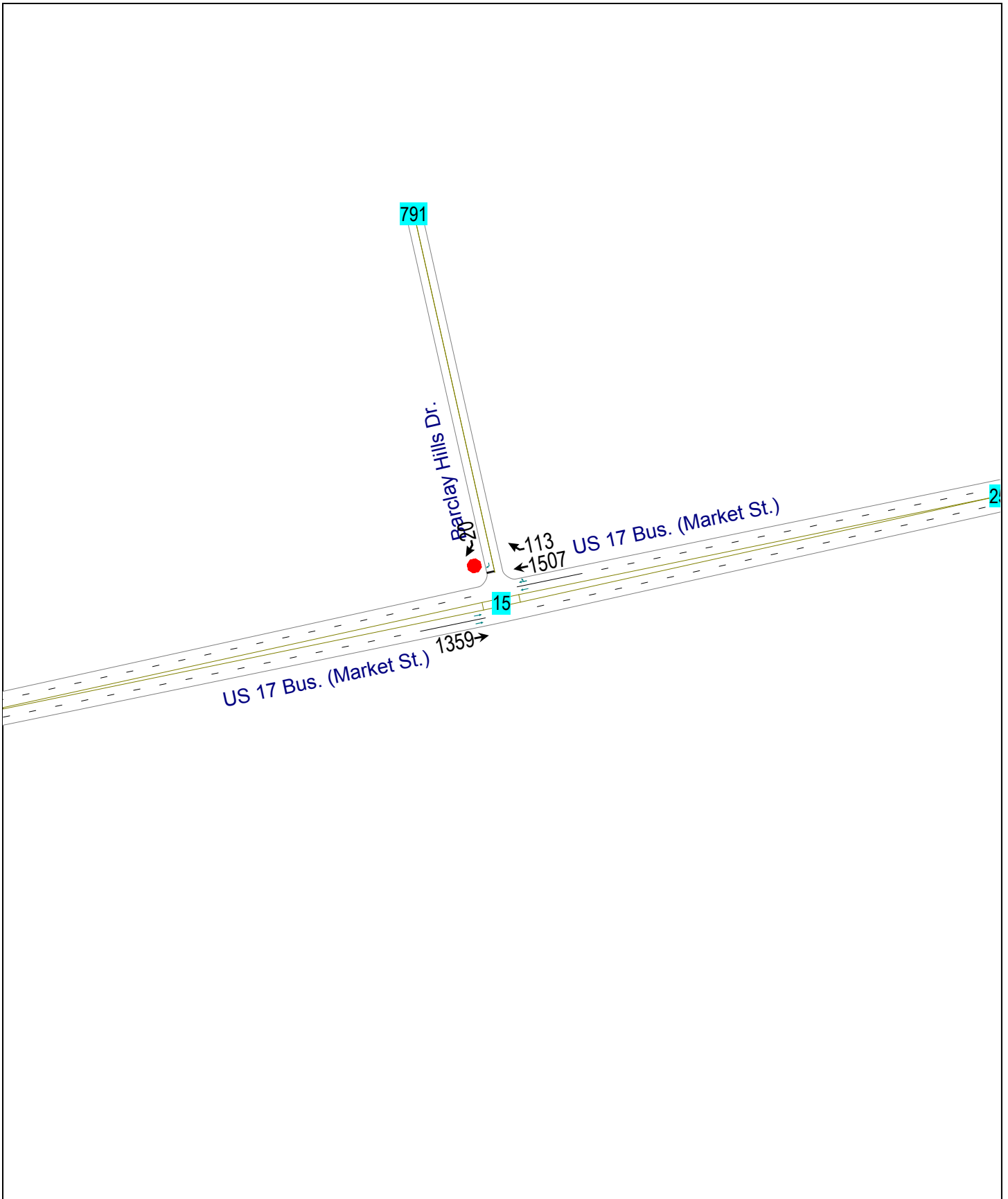
**Intersection Summary**

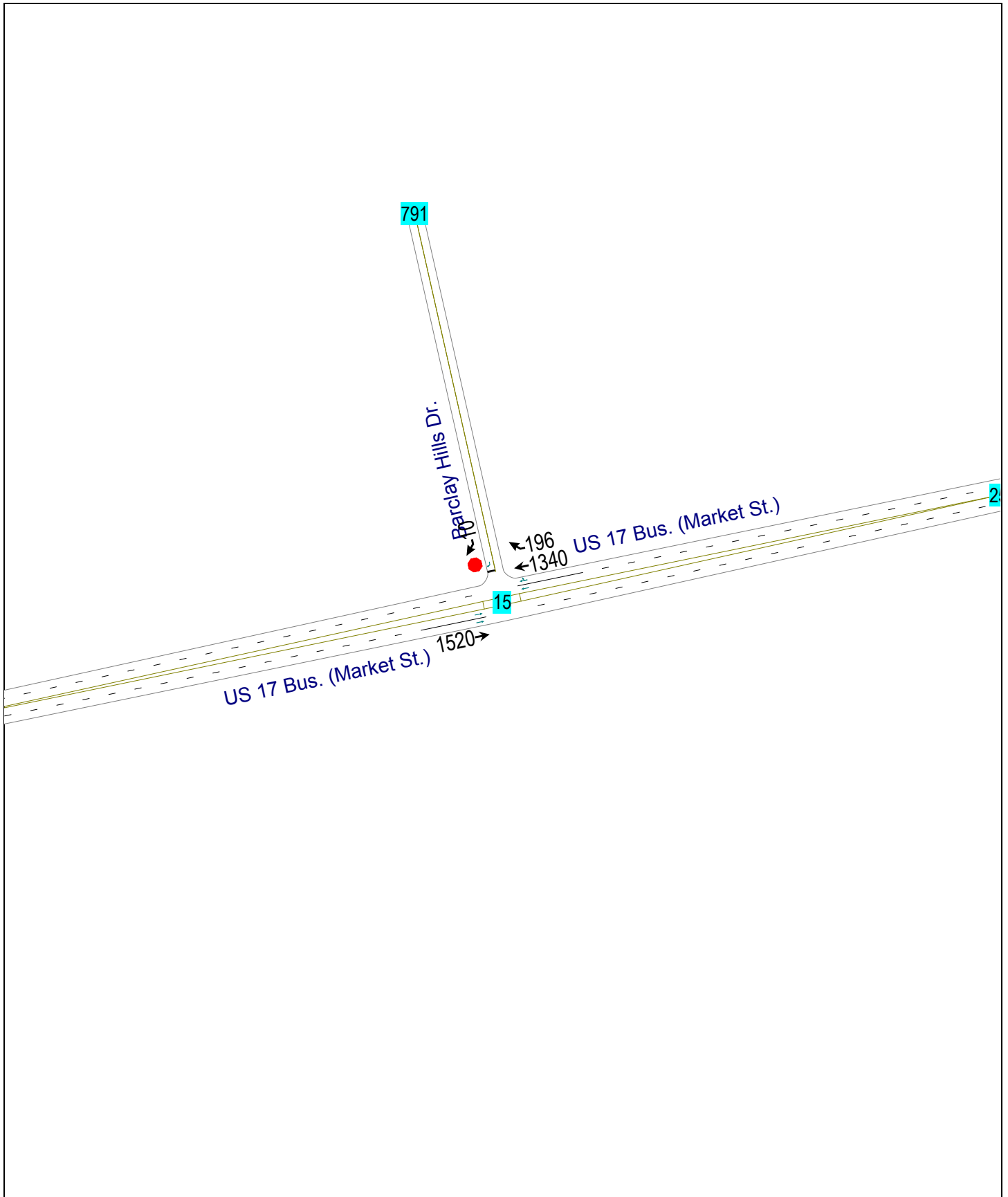
Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 180  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.28  
 Intersection Signal Delay: 98.6  
 Intersection LOS: F  
 Intersection Capacity Utilization 113.6%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 6: US 17 Bus. (Market St.) & Forest Hills Dr.



6: US 17 Bus. (Market St.) & Forest Hills Dr.  
 2040 Build PM Peak





U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Volume (vph)	0	1359	1507	113	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3505	3466	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3505	3466	0	0	1611
Link Speed (mph)		40	40		35	
Link Distance (ft)		923	771		600	
Travel Time (s)		15.7	13.1		11.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1510	1800	0	0	22
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.3%
Analysis Period (min)	15
	ICU Level of Service B

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Volume (veh/h)	0	1359	1507	113	0	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1510	1674	126	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1800				2492	900
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1800				2492	900
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	92
cM capacity (veh/h)	335				24	282

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	755	755	1116	684	22
Volume Left	0	0	0	0	0
Volume Right	0	0	0	126	22
cSH	1700	1700	1700	1700	282
Volume to Capacity	0.44	0.44	0.66	0.40	0.08
Queue Length 95th (ft)	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	18.9
Lane LOS					C
Approach Delay (s)	0.0		0.0		18.9
Approach LOS					C

Intersection Summary					
Average Delay			0.1		
Intersection Capacity Utilization			55.3%	ICU Level of Service	B
Analysis Period (min)			15		

15: US 17 Bus. (Market St.) & Barclay Hills Dr.  
 2040 Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Volume (vph)	0	1520	1340	196	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3505	3438	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3505	3438	0	0	1611
Link Speed (mph)		40	40		35	
Link Distance (ft)		923	771		600	
Travel Time (s)		15.7	13.1		11.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1689	1707	0	0	11
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	53.3%
Analysis Period (min)	15
	ICU Level of Service A

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 10/10/2012



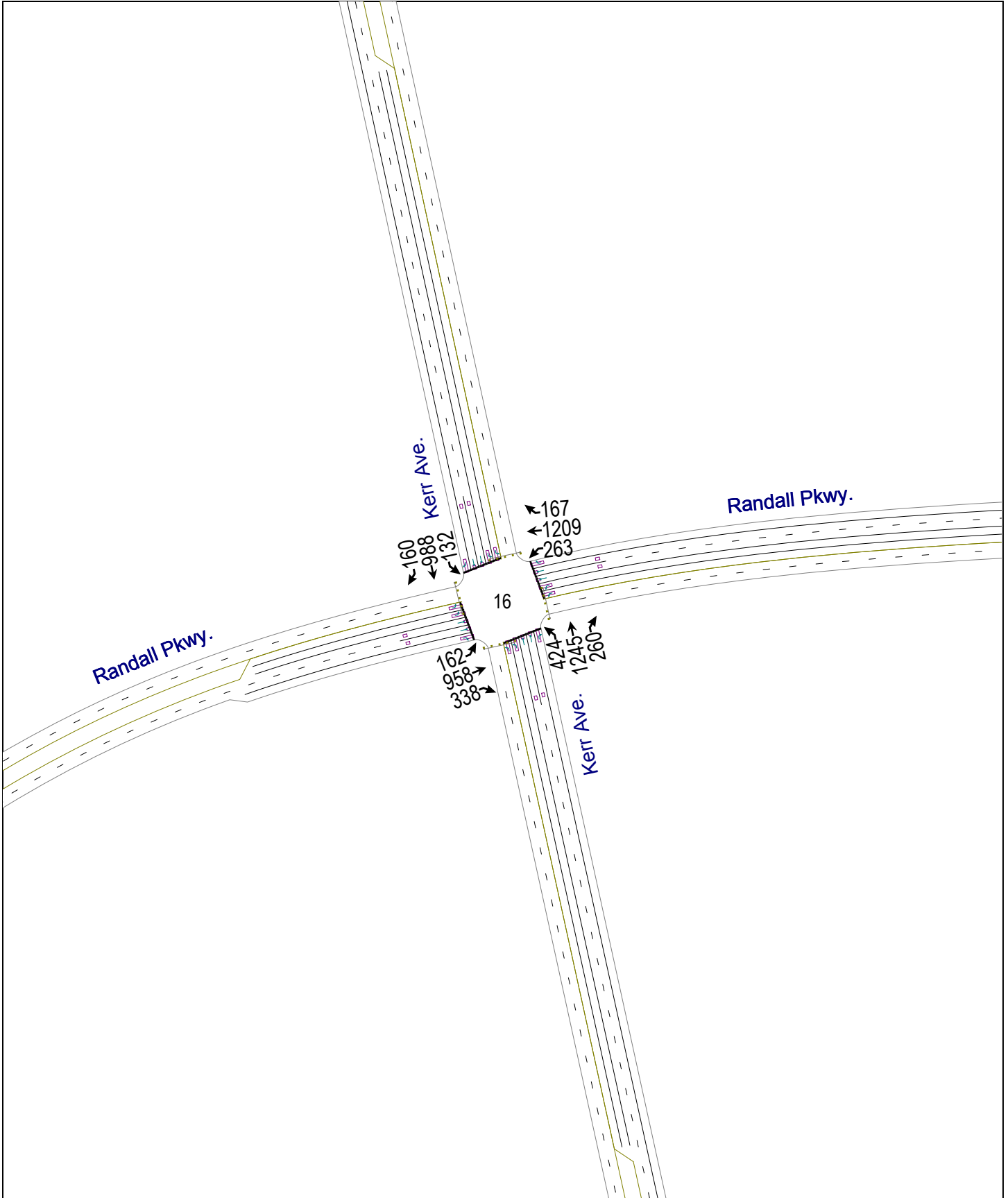
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Volume (veh/h)	0	1520	1340	196	0	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1689	1489	218	0	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1707				2442	853
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1707				2442	853
tC, single (s)	4.2				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	364				26	302

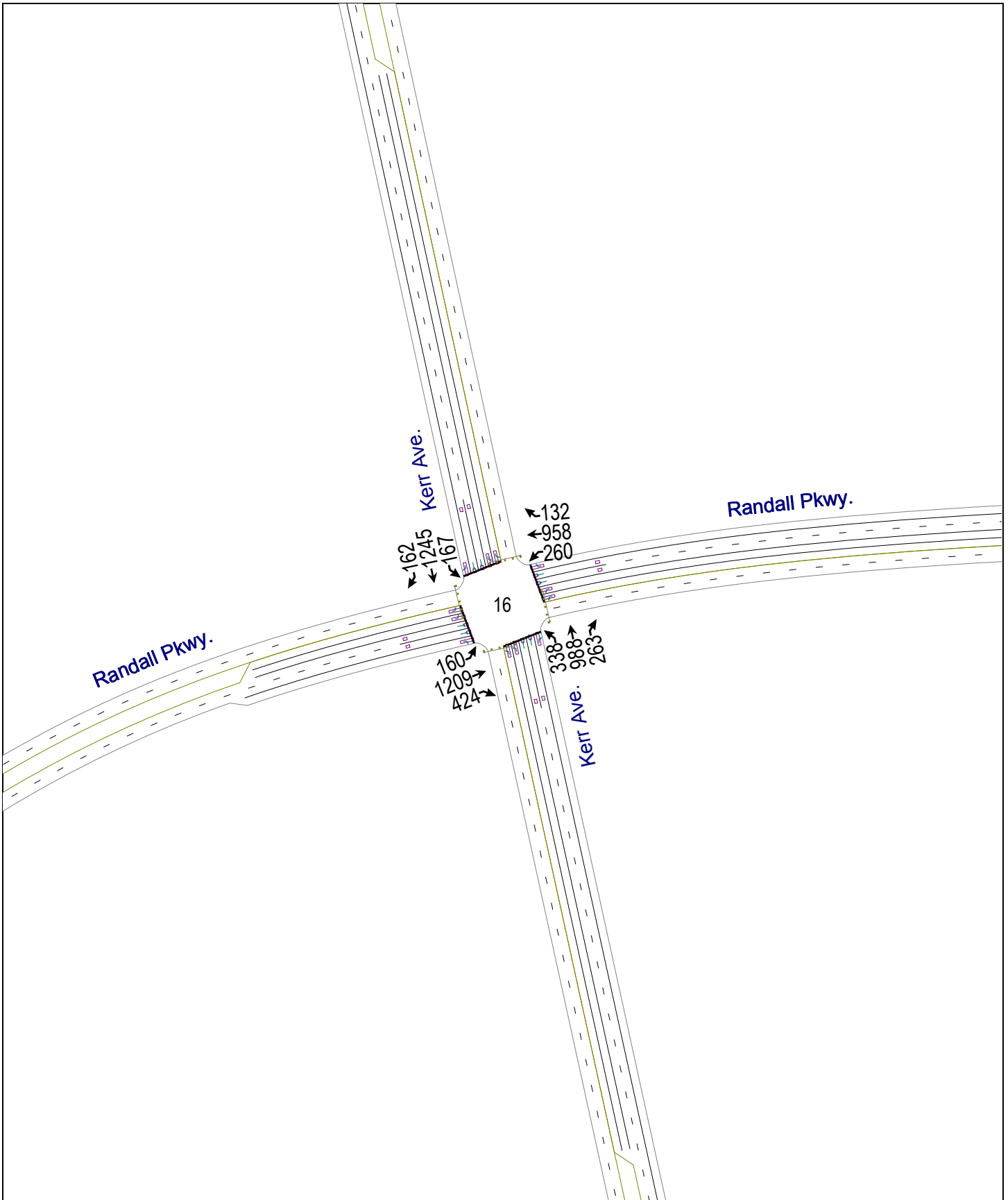
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	844	844	993	714	11
Volume Left	0	0	0	0	0
Volume Right	0	0	0	218	11
cSH	1700	1700	1700	1700	302
Volume to Capacity	0.50	0.50	0.58	0.42	0.04
Queue Length 95th (ft)	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	17.4
Lane LOS					C
Approach Delay (s)	0.0		0.0		17.4
Approach LOS					C

Intersection Summary					
Average Delay			0.1		
Intersection Capacity Utilization			53.3%	ICU Level of Service	A
Analysis Period (min)			15		

15: US 17 Bus. (Market St.) & Barclay Hills Dr.  
 2040 Build PM Peak







U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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10/1/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	162	958	338	263	1209	167	424	1245	260	132	988	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		350	775		1000	775		1000	750		1000
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	1568	3400	3505	1568	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	3505	1568	3400	3505	1568	3367	3471	1553	3367	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			35	
Link Distance (ft)		976			1156			1214			1203	
Travel Time (s)		19.0			22.5			18.4			23.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	180	1064	376	292	1343	186	471	1383	289	147	1098	178
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	14.0	58.0	27.0	20.0	64.0	14.0	27.0	68.0	20.0	14.0	55.0	14.0
Total Split (%)	8.8%	36.3%	16.9%	12.5%	40.0%	8.8%	16.9%	42.5%	12.5%	8.8%	34.4%	8.8%
Maximum Green (s)	7.0	51.0	20.0	13.0	57.0	7.0	20.0	61.0	13.0	7.0	48.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	9.0	52.4	74.4	15.6	59.0	68.0	22.0	63.0	78.6	9.0	50.0	59.0
Actuated g/C Ratio	0.06	0.33	0.46	0.10	0.37	0.42	0.14	0.39	0.49	0.06	0.31	0.37
v/c Ratio	0.94	0.93	0.52	0.88	1.04	0.28	1.02	1.01	0.38	0.78	1.01	0.31
Control Delay	125.0	65.8	20.4	97.5	84.4	21.5	112.7	74.8	19.2	100.4	84.0	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

16: Randall Pkwy. & Kerr Ave.  
2040 Build AM Peak

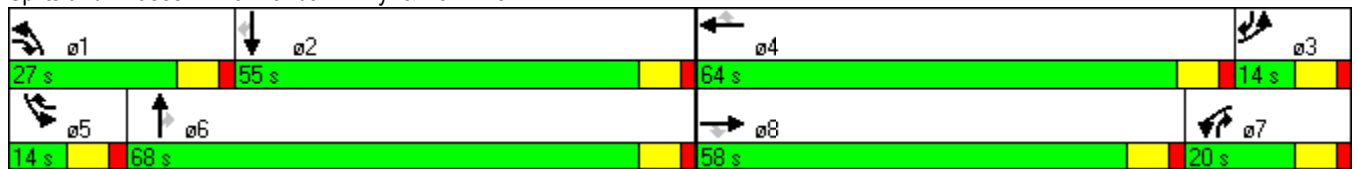


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	125.0	65.8	20.4	97.5	84.4	21.5	112.7	74.8	19.2	100.4	84.0	24.4
LOS	F	E	C	F	F	C	F	E	B	F	F	C
Approach Delay		61.8			80.0			75.6			78.3	
Approach LOS		E			F			E			E	
Queue Length 50th (ft)	98	564	186	158	~794	98	~267	~780	141	79	~621	88
Queue Length 95th (ft)	#180	#691	255	#250	#935	147	#385	#938	199	#137	#774	133
Internal Link Dist (ft)		896			1076			1134			1123	
Turn Bay Length (ft)	325		350	775		1000	775		1000	750		1000
Base Capacity (vph)	191	1161	729	331	1292	666	463	1367	763	189	1085	573
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.92	0.52	0.88	1.04	0.28	1.02	1.01	0.38	0.78	1.01	0.31

**Intersection Summary**

























Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Natural Cycle: 160  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.04  
 Intersection Signal Delay: 74.1  
 Intersection LOS: E  
 Intersection Capacity Utilization 96.2%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 16: Randall Pkwy. & Kerr Ave.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
10/1/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	1209	424	260	958	132	338	988	263	167	1245	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325		350	775		1000	775		1000	750		1000
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	1568	3400	3505	1568	3367	3471	1553	3367	3471	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	3505	1568	3400	3505	1568	3367	3471	1553	3367	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			35	
Link Distance (ft)		976			1156			1214			1203	
Travel Time (s)		19.0			22.5			18.4			23.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	1343	471	289	1064	147	376	1098	292	186	1383	180
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	14.0	51.0	18.0	14.0	51.0	15.0	18.0	60.0	14.0	15.0	57.0	14.0
Total Split (%)	10.0%	36.4%	12.9%	10.0%	36.4%	10.7%	12.9%	42.9%	10.0%	10.7%	40.7%	10.0%
Maximum Green (s)	7.0	44.0	11.0	7.0	44.0	8.0	11.0	53.0	7.0	8.0	50.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	9.2	46.0	59.0	9.0	45.8	55.8	13.0	55.0	64.0	10.0	52.0	61.2
Actuated g/C Ratio	0.07	0.33	0.42	0.06	0.33	0.40	0.09	0.39	0.46	0.07	0.37	0.44
v/c Ratio	0.79	1.17	0.71	1.32	0.93	0.24	1.20	0.80	0.41	0.77	1.07	0.26
Control Delay	88.6	126.2	28.4	220.6	59.8	19.2	169.3	43.3	21.1	84.9	89.0	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

16: Randall Pkwy. & Kerr Ave.  
2040 Build PM Peak

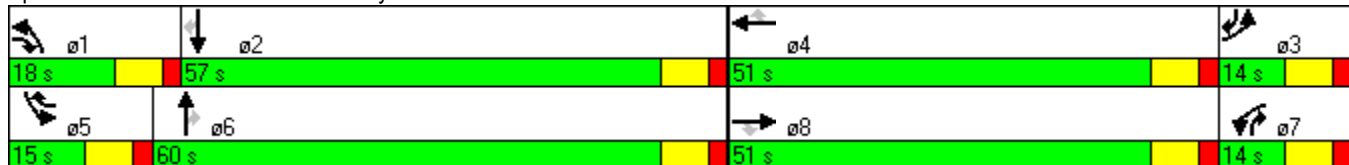


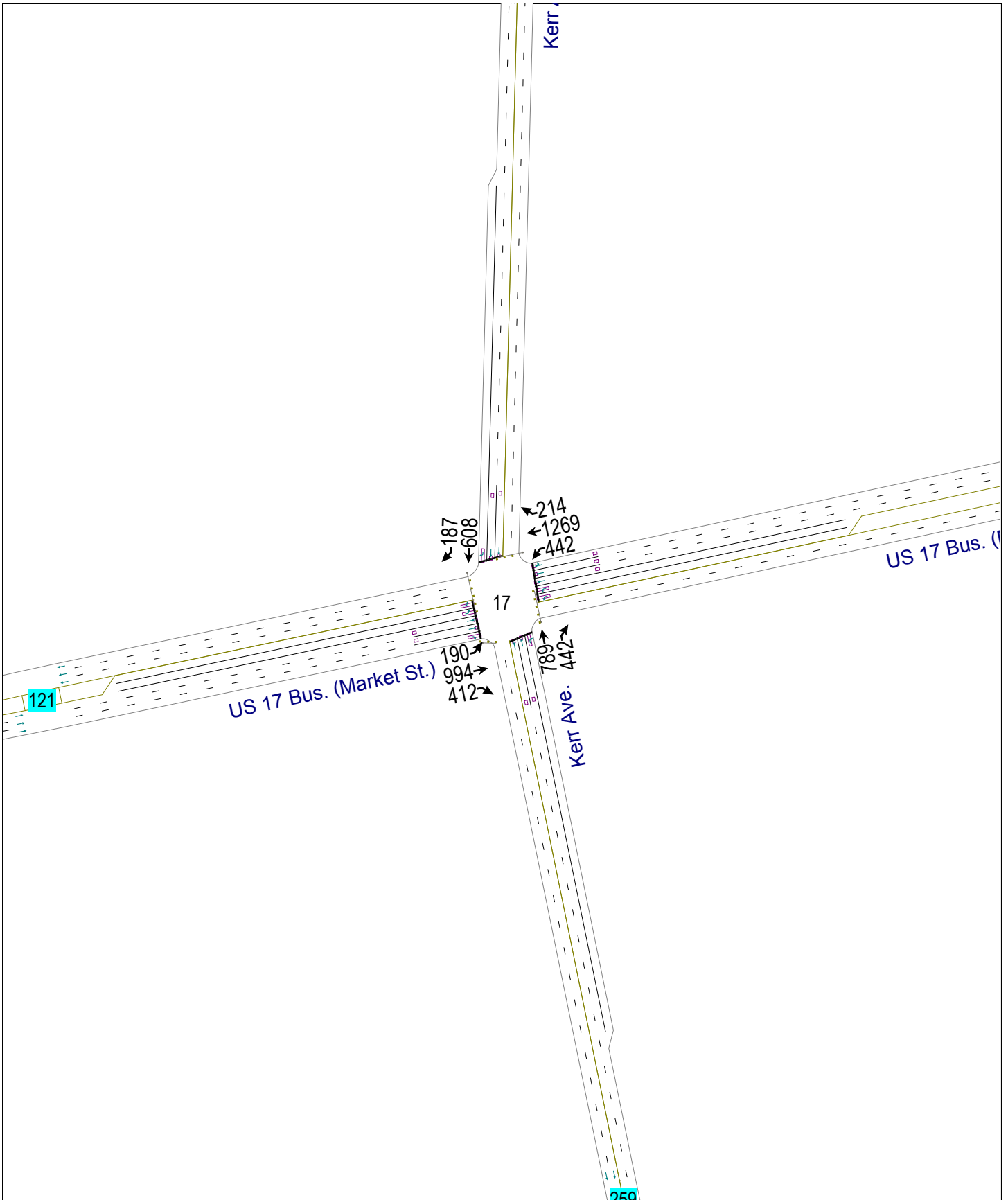
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	88.6	126.2	28.4	220.6	59.8	19.2	169.3	43.3	21.1	84.9	89.0	16.7
LOS	F	F	C	F	E	B	F	D	C	F	F	B
Approach Delay	99.7			86.8			66.5			81.1		
Approach LOS	F			F			E			F		
Queue Length 50th (ft)	84	~763	262	~175	491	67	~213	463	125	87	~734	71
Queue Length 95th (ft)	#146	#903	365	#271	#622	107	#319	554	182	#145	#874	110
Internal Link Dist (ft)	896			1076			1134			1123		
Turn Bay Length (ft)	325		350	775		1000	775		1000	750		1000
Base Capacity (vph)	225	1152	661	219	1152	624	313	1364	710	241	1289	680
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	1.17	0.71	1.32	0.92	0.24	1.20	0.80	0.41	0.77	1.07	0.26

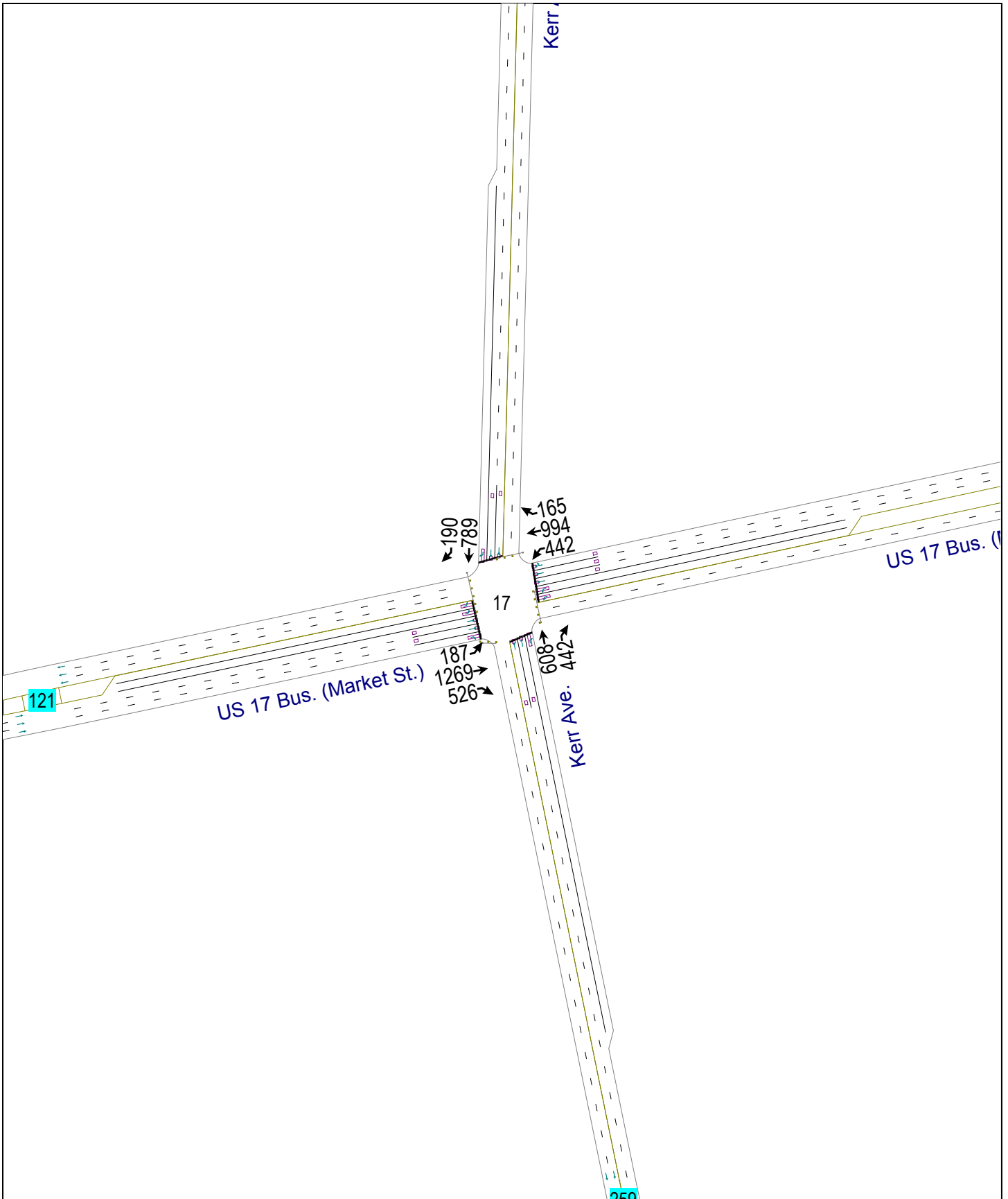
**Intersection Summary**

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Natural Cycle: 140  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.32  
 Intersection Signal Delay: 83.9  
 Intersection LOS: F  
 Intersection Capacity Utilization 101.6%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 16: Randall Pkwy. & Kerr Ave.






































U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
10/1/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		  	  			 			 	
Volume (vph)	190	994	412	442	1269	214	0	789	442	0	608	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	550		0	475		0	0		600	0		550
Storage Lanes	2		1	2		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	1568	3400	4925	0	0	3471	1553	0	3471	1553
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	3400	3505	1568	3400	4925	0	0	3471	1553	0	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35			45	
Link Distance (ft)		706			982			915			1044	
Travel Time (s)		12.0			16.7			17.8			15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	211	1104	458	491	1648	0	0	877	491	0	676	208
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		Perm	Prot					pm+ov			pm+ov
Protected Phases	5	2		1	6			8	1		4	5
Permitted Phases			2						8			4
Detector Phase	5	2	2	1	6			8	1		4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0			12.0	7.0		12.0	7.0
Minimum Split (s)	14.0	19.0	19.0	14.0	19.0			19.0	14.0		19.0	14.0
Total Split (s)	18.0	52.0	52.0	28.0	62.0	0.0	0.0	40.0	28.0	0.0	40.0	18.0
Total Split (%)	15.0%	43.3%	43.3%	23.3%	51.7%	0.0%	0.0%	33.3%	23.3%	0.0%	33.3%	15.0%
Maximum Green (s)	11.0	45.0	45.0	21.0	55.0			33.0	21.0		33.0	11.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead				Lead			Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Recall Mode	None	Max	Max	None	Max			None	None		None	None
Act Effct Green (s)	12.9	47.8	47.8	22.1	57.0			34.1	61.2		34.1	52.0
Actuated g/C Ratio	0.11	0.40	0.40	0.19	0.48			0.29	0.51		0.29	0.44
v/c Ratio	0.57	0.78	0.73	0.78	0.70			0.88	0.62		0.68	0.31
Control Delay	57.4	36.4	38.7	55.6	26.4			52.1	24.4		41.6	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0

17: US 17 Bus. (Market St.) & Kerr Ave.  
2040 Build AM Peak

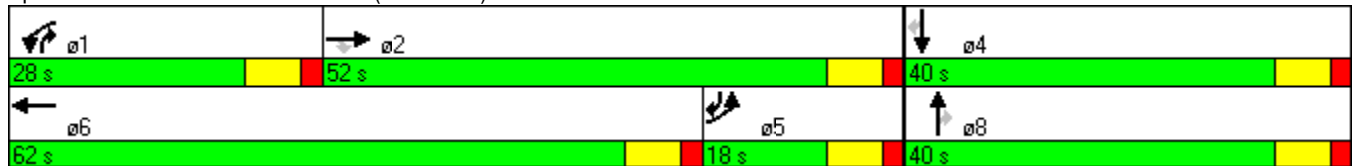


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	57.4	36.4	38.7	55.6	26.4			52.1	24.4		41.6	23.3
LOS	E	D	D	E	C			D	C		D	C
Approach Delay		39.5			33.1			42.2			37.3	
Approach LOS		D			C			D			D	
Queue Length 50th (ft)	81	394	301	187	358			338	255		242	102
Queue Length 95th (ft)	122	483	436	247	416			#444	367		309	160
Internal Link Dist (ft)		626			902			835			964	
Turn Bay Length (ft)	550			475					600			550
Base Capacity (vph)	371	1409	630	658	2360			1021	810		1021	666
Starvation Cap Reductn	0	0	0	0	0			0	0		0	0
Spillback Cap Reductn	0	0	0	0	0			0	0		0	0
Storage Cap Reductn	0	0	0	0	0			0	0		0	0
Reduced v/c Ratio	0.57	0.78	0.73	0.75	0.70			0.86	0.61		0.66	0.31

**Intersection Summary**






























Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	119
Natural Cycle:	75
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.88
Intersection Signal Delay:	37.6
Intersection LOS:	D
Intersection Capacity Utilization:	74.4%
ICU Level of Service:	D
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 17: US 17 Bus. (Market St.) & Kerr Ave.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
10/1/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		  	  			 			 	
Volume (vph)	187	1269	526	442	994	165	0	608	442	0	789	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	550		0	475		0	0		600	0		550
Storage Lanes	2		1	2		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	1568	3400	4930	0	0	3471	1553	0	3471	1553
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	3400	3505	1568	3400	4930	0	0	3471	1553	0	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			35			45	
Link Distance (ft)		706			982			915			1044	
Travel Time (s)		12.0			16.7			17.8			15.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	208	1410	584	491	1287	0	0	676	491	0	877	211
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		Perm	Prot					pm+ov			pm+ov
Protected Phases	5	2		1	6			8	1		4	5
Permitted Phases			2						8			4
Detector Phase	5	2	2	1	6			8	1		4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0			12.0	7.0		12.0	7.0
Minimum Split (s)	14.0	19.0	19.0	14.0	19.0			19.0	14.0		19.0	14.0
Total Split (s)	17.0	59.0	59.0	24.0	66.0	0.0	0.0	37.0	24.0	0.0	37.0	17.0
Total Split (%)	14.2%	49.2%	49.2%	20.0%	55.0%	0.0%	0.0%	30.8%	20.0%	0.0%	30.8%	14.2%
Maximum Green (s)	10.0	52.0	52.0	17.0	59.0			30.0	17.0		30.0	10.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0			5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0			2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead				Lead			Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Recall Mode	None	Max	Max	None	Max			None	None		None	None
Act Effct Green (s)	12.0	54.0	54.0	19.0	61.0			32.0	56.0		32.0	49.0
Actuated g/C Ratio	0.10	0.45	0.45	0.16	0.51			0.27	0.47		0.27	0.41
v/c Ratio	0.61	0.89	0.83	0.91	0.51			0.73	0.68		0.95	0.33
Control Delay	60.1	39.1	40.7	72.3	20.5			45.5	30.8		62.8	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0

17: US 17 Bus. (Market St.) & Kerr Ave.  
2040 Build PM Peak

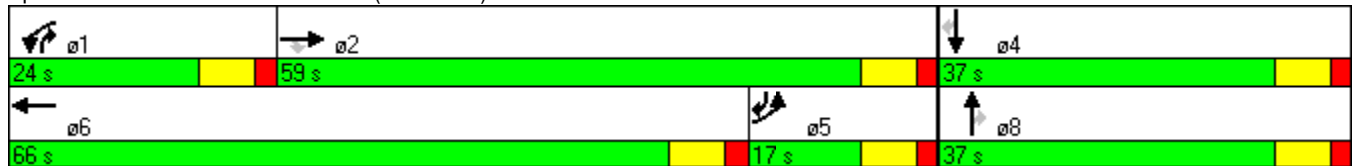


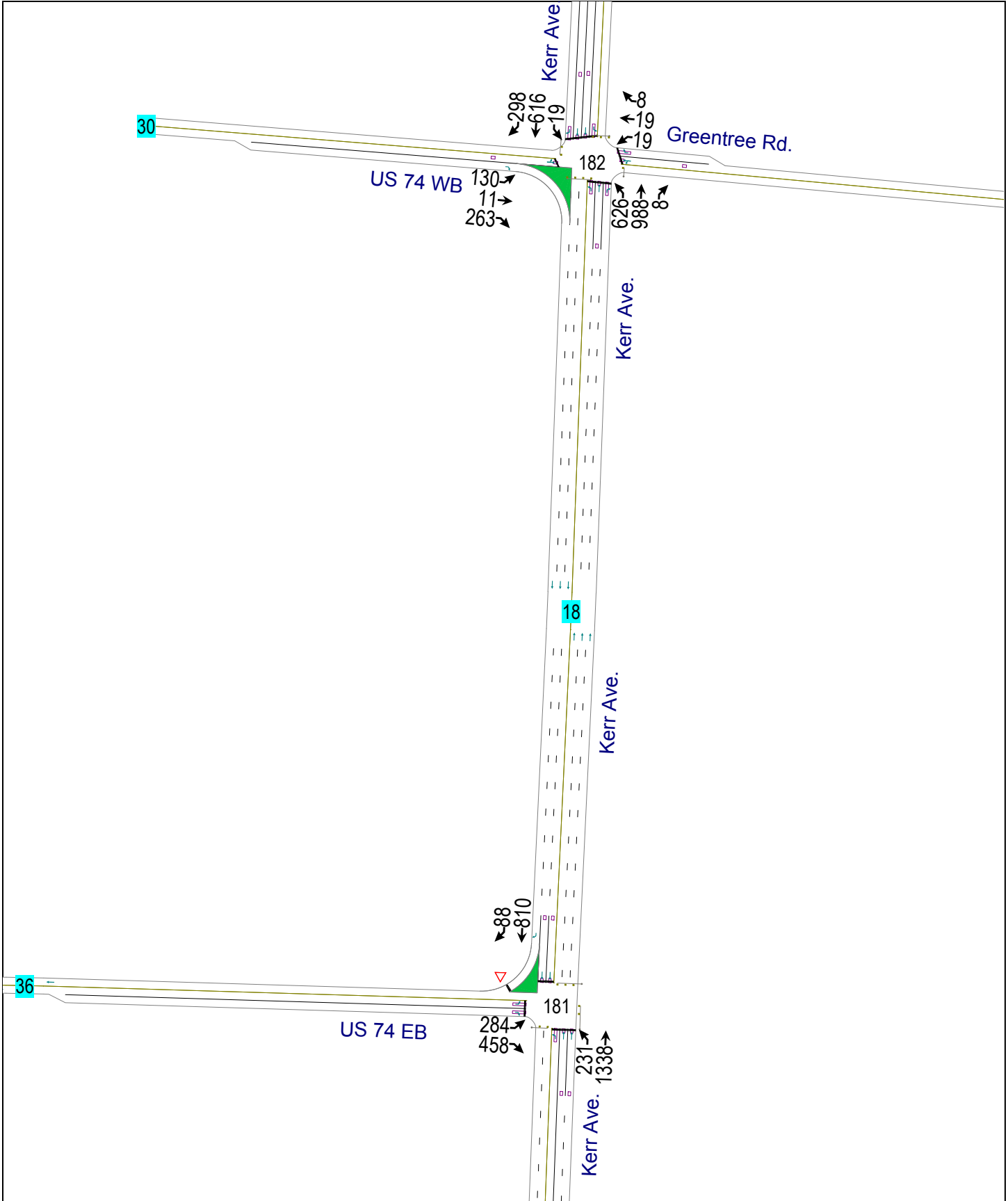
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	60.1	39.1	40.7	72.3	20.5			45.5	30.8		62.8	26.2
LOS	E	D	D	E	C			D	C		E	C
Approach Delay		41.5			34.8			39.3			55.7	
Approach LOS		D			C			D			E	
Queue Length 50th (ft)	80	517	388	195	234			251	289		351	110
Queue Length 95th (ft)	122	626	#595	#293	276			321	418		#481	173
Internal Link Dist (ft)		626			902			835			964	
Turn Bay Length (ft)	550			475					600			550
Base Capacity (vph)	340	1577	706	538	2506			926	725		926	634
Starvation Cap Reductn	0	0	0	0	0			0	0		0	0
Spillback Cap Reductn	0	0	0	0	0			0	0		0	0
Storage Cap Reductn	0	0	0	0	0			0	0		0	0
Reduced v/c Ratio	0.61	0.89	0.83	0.91	0.51			0.73	0.68		0.95	0.33

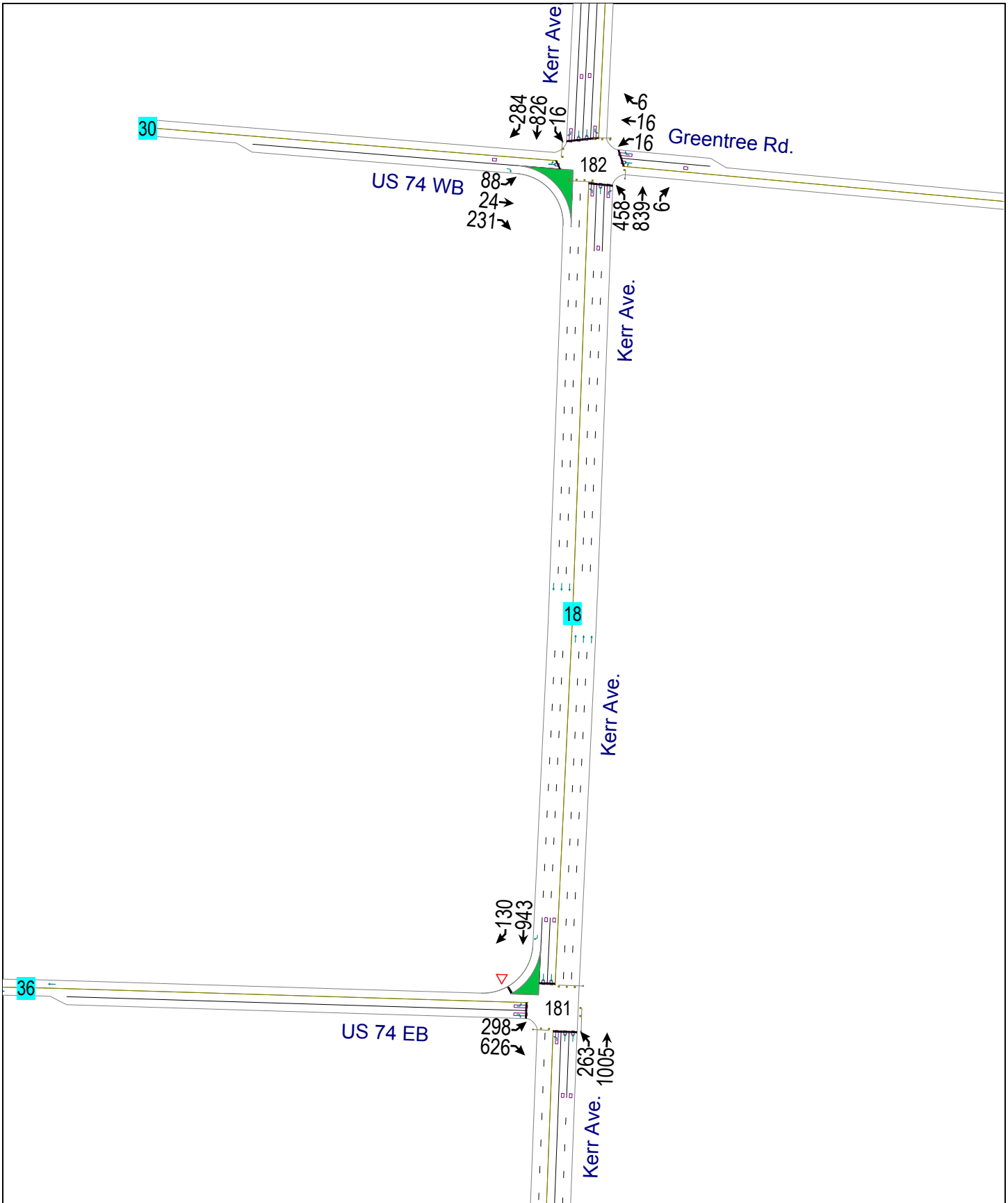
**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.95  
 Intersection Signal Delay: 41.7  
 Intersection LOS: D  
 Intersection Capacity Utilization 82.0%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 17: US 17 Bus. (Market St.) & Kerr Ave.







U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	284	458	231	1338	810	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	690	650			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Satd. Flow (prot)	1736	1553	1736	3471	3471	1553
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1736	3471	3471	1553
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	45			45	45	
Link Distance (ft)	798			1079	591	
Travel Time (s)	12.1			16.3	9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	316	509	257	1487	900	98
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	R NA	Right	Left	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	6	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	38.0	33.0	33.0	82.0	49.0	38.0
Total Split (%)	31.7%	27.5%	27.5%	68.3%	40.8%	31.7%
Maximum Green (s)	31.0	26.0	26.0	75.0	42.0	31.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	28.1	61.1	28.0	81.9	48.9	82.0
Actuated g/C Ratio	0.23	0.51	0.23	0.68	0.41	0.68
v/c Ratio	0.78	0.64	0.63	0.63	0.64	0.09
Control Delay	56.3	25.4	49.5	12.7	14.5	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

181: US 74 EB & Kerr Ave.  
2040 Build AM Peak



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	56.3	25.4	49.5	12.7	14.5	2.7
LOS	E	C	D	B	B	A
Approach Delay	37.2			18.1	13.4	
Approach LOS	D			B	B	
Queue Length 50th (ft)	228	273	180	314	154	7
Queue Length 95th (ft)	319	364	272	426	413	m15
Internal Link Dist (ft)	718			999	511	
Turn Bay Length (ft)		690	650			
Base Capacity (vph)	477	790	405	2370	1416	1048
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.64	0.63	0.63	0.64	0.09

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 98 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 21.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 63.4%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 181: US 74 EB & Kerr Ave.





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	298	626	263	1005	943	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	690	650			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Satd. Flow (prot)	1736	1553	1736	3471	3471	1553
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1736	3471	3471	1553
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	45			45	45	
Link Distance (ft)	798			1079	591	
Travel Time (s)	12.1			16.3	9.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	331	696	292	1117	1048	144
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	R NA	Right	Left	Right	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	6	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	33.0	38.0	38.0	87.0	49.0	33.0
Total Split (%)	27.5%	31.7%	31.7%	72.5%	40.8%	27.5%
Maximum Green (s)	26.0	31.0	31.0	80.0	42.0	26.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	26.7	63.2	31.6	83.3	46.8	78.4
Actuated g/C Ratio	0.22	0.53	0.26	0.69	0.39	0.65
v/c Ratio	0.86	0.85	0.64	0.46	0.77	0.14
Control Delay	66.3	35.5	46.1	9.2	21.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

181: US 74 EB & Kerr Ave.  
2040 Build PM Peak

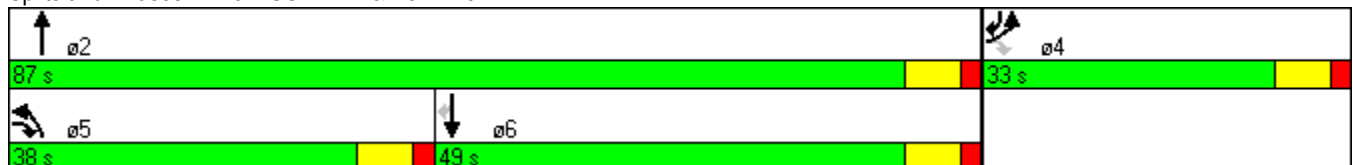


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	66.3	35.5	46.1	9.2	21.1	2.0
LOS	E	D	D	A	C	A
Approach Delay	45.4			16.9	18.8	
Approach LOS	D			B	B	
Queue Length 50th (ft)	244	421	197	193	392	8
Queue Length 95th (ft)	#392	612	293	236	210	m13
Internal Link Dist (ft)	718			999	511	
Turn Bay Length (ft)		690	650			
Base Capacity (vph)	405	837	477	2410	1353	1032
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.83	0.61	0.46	0.77	0.14

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 17 (14%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 25.6  
 Intersection LOS: C  
 Intersection Capacity Utilization 73.2%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 181: US 74 EB & Kerr Ave.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗	↖	↗	↖↖	↗
Volume (vph)	130	11	263	19	19	8	626	988	8	19	616	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		125	0		0	260		260
Storage Lanes	0		1	0		1	1		1	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1747	1553	0	1818	1583	1736	1827	1553	1736	3471	1553
Flt Permitted		0.712			0.658		0.950			0.950		
Satd. Flow (perm)	0	1301	1553	0	1226	1583	1736	1827	1553	1736	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		670			656			674			989	
Travel Time (s)		18.3			17.9			10.2			15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	156	292	0	42	9	696	1098	9	21	684	331
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm		pm+ov	Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	4	4	5	8	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	7.0	12.0	12.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	19.0	14.0	19.0	19.0
Total Split (s)	21.0	21.0	60.0	21.0	21.0	14.0	60.0	85.0	85.0	14.0	39.0	39.0
Total Split (%)	17.5%	17.5%	50.0%	17.5%	17.5%	11.7%	50.0%	70.8%	70.8%	11.7%	32.5%	32.5%
Maximum Green (s)	14.0	14.0	53.0	14.0	14.0	7.0	53.0	78.0	78.0	7.0	32.0	32.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lag			Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?			Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)		16.0	76.0		16.0	30.0	55.0	85.6	85.6	9.0	34.0	34.0
Actuated g/C Ratio		0.13	0.63		0.13	0.25	0.46	0.71	0.71	0.08	0.28	0.28
v/c Ratio		0.90	0.30		0.26	0.02	0.87	0.84	0.01	0.16	0.70	0.75
Control Delay		98.5	10.9		51.3	34.4	34.1	14.9	5.1	55.2	42.8	51.4
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

182: US 74 WB & Kerr Ave.  
2040 Build AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		98.5	10.9		51.3	34.4	34.1	14.9	5.1	55.2	42.8	51.4
LOS		F	B		D	C	C	B	A	E	D	D
Approach Delay		41.4			48.3			22.3			45.8	
Approach LOS		D			D			C			D	
Queue Length 50th (ft)		121	95		30	5	504	325	1	16	248	234
Queue Length 95th (ft)		#250	143		66	19	#719	#1051	m2	42	317	#355
Internal Link Dist (ft)		590			576			594			909	
Turn Bay Length (ft)			450			125				260		260
Base Capacity (vph)		173	984		163	396	796	1303	1108	130	983	440
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.90	0.30		0.26	0.02	0.87	0.84	0.01	0.16	0.70	0.75

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 88 (73%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 32.5 Intersection LOS: C  
 Intersection Capacity Utilization 84.8% ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 182: US 74 WB & Kerr Ave.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↕	↗	↗	↕↕	↗
Volume (vph)	88	24	231	16	16	6	458	839	6	16	826	284
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		450	0		125	0		0	260		260
Storage Lanes	0		1	0		1	1		1	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1757	1553	0	1818	1583	1736	1827	1553	1736	3471	1553
Flt Permitted		0.748			0.786		0.950			0.950		
Satd. Flow (perm)	0	1367	1553	0	1464	1583	1736	1827	1553	1736	3471	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		670			656			674			989	
Travel Time (s)		18.3			17.9			10.2			15.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	125	257	0	36	7	509	932	7	18	918	316
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm		pm+ov	Perm		pm+ov	Prot		Perm	Prot		Perm
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	4	4	5	8	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	12.0	7.0	12.0	12.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	19.0	14.0	19.0	19.0
Total Split (s)	22.0	22.0	51.0	22.0	22.0	14.0	51.0	84.0	84.0	14.0	47.0	47.0
Total Split (%)	18.3%	18.3%	42.5%	18.3%	18.3%	11.7%	42.5%	70.0%	70.0%	11.7%	39.2%	39.2%
Maximum Green (s)	15.0	15.0	44.0	15.0	15.0	7.0	44.0	77.0	77.0	7.0	40.0	40.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead			Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)		15.6	61.8		15.6	29.6	41.1	86.0	86.0	9.0	48.2	48.2
Actuated g/C Ratio		0.13	0.52		0.13	0.25	0.34	0.72	0.72	0.08	0.40	0.40
v/c Ratio		0.70	0.32		0.19	0.02	0.86	0.71	0.01	0.14	0.66	0.51
Control Delay		70.7	17.2		48.3	33.5	56.1	11.1	5.5	54.6	33.4	32.4
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

182: US 74 WB & Kerr Ave.  
2040 Build PM Peak

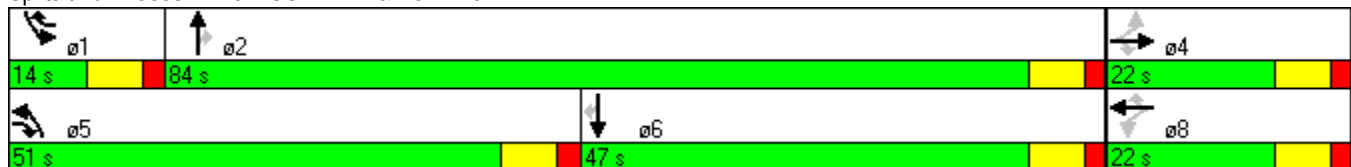


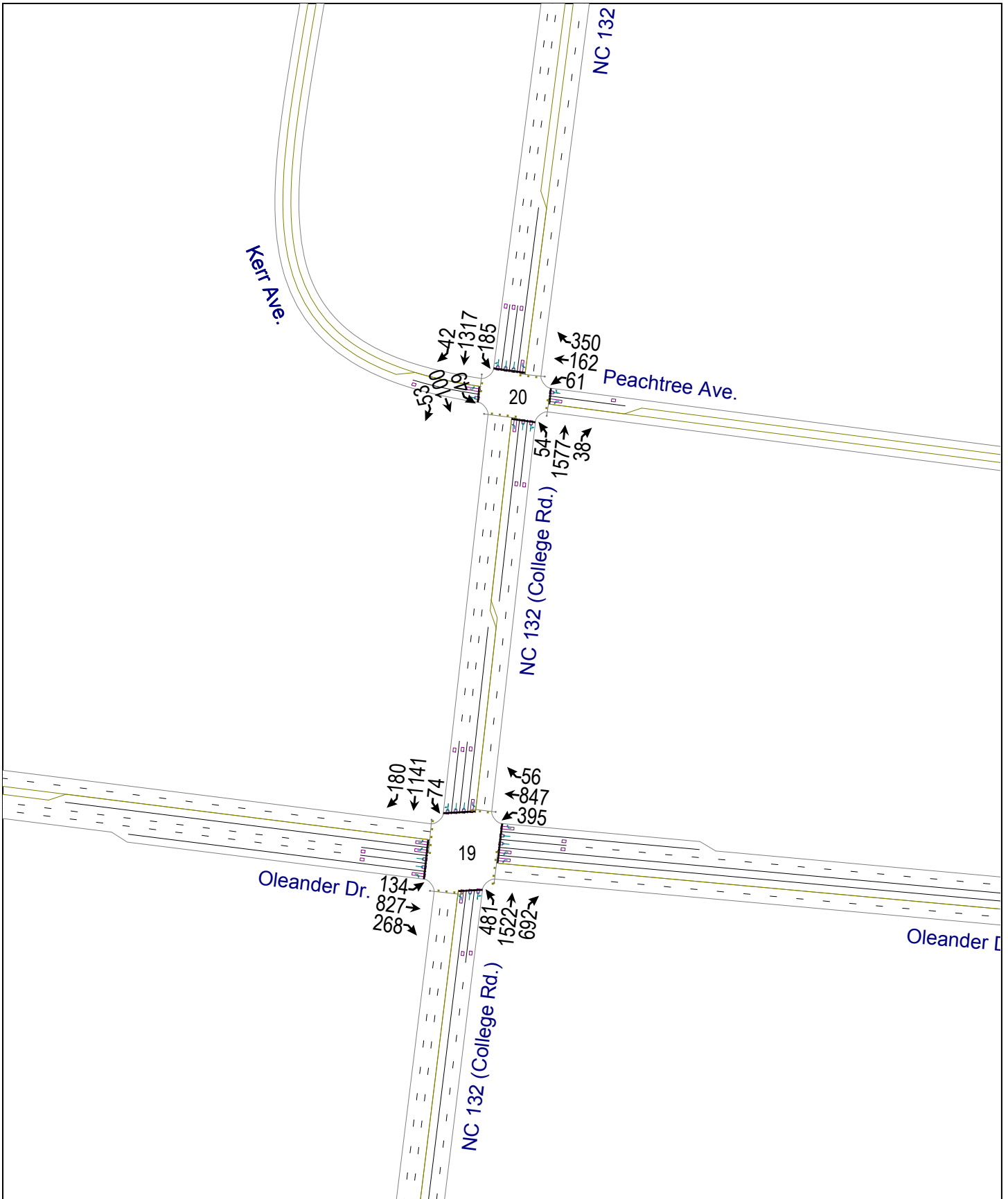
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		70.7	17.2		48.3	33.5	56.1	11.1	5.5	54.6	33.4	32.4
LOS		E	B		D	C	E	B	A	D	C	C
Approach Delay		34.7			45.9			26.9			33.4	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)		93	105		25	4	362	331	1	13	315	190
Queue Length 95th (ft)		#171	150		58	16	m488	389	m3	38	408	296
Internal Link Dist (ft)		590			576			594			909	
Turn Bay Length (ft)			450			125				260		260
Base Capacity (vph)		194	862		207	391	665	1309	1112	130	1395	624
Starvation Cap Reductn		0	0		0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	0		0	0	0	0	0	0	0	0
Storage Cap Reductn		0	0		0	0	0	0	0	0	0	0
Reduced v/c Ratio		0.64	0.30		0.17	0.02	0.77	0.71	0.01	0.14	0.66	0.51

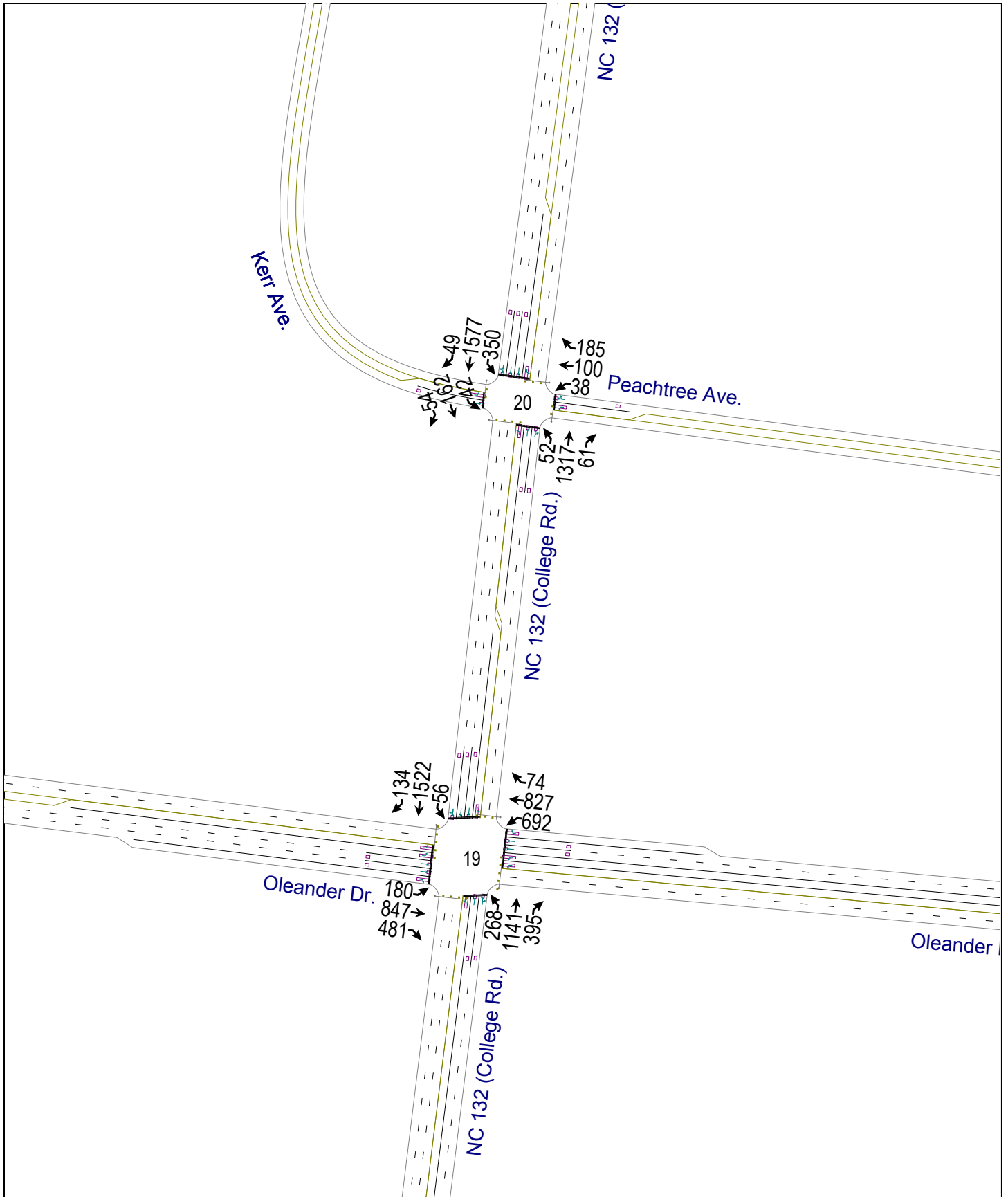
**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 30.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 75.3%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 182: US 74 WB & Kerr Ave.









U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	134	827	268	395	847	56	481	1522	692	74	1141	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)			450	775		300	500		0	275		0
Storage Lanes	1		1	2		1	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	1736	3308	0	1736	4888	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	1736	3308	0	1736	4888	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			45			45			45	
Link Distance (ft)		967			928			1037			690	
Travel Time (s)		16.5			14.1			15.7			10.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	149	919	298	439	941	62	534	2460	0	82	1468	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Prot		Prot	
Protected Phases	3	8	1	7	4	5	1	6		5	2	
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0	14.0	14.0	19.0		14.0	19.0	
Total Split (s)	14.0	41.0	57.0	23.0	50.0	14.0	57.0	102.0	0.0	14.0	59.0	0.0
Total Split (%)	7.8%	22.8%	31.7%	12.8%	27.8%	7.8%	31.7%	56.7%	0.0%	7.8%	32.8%	0.0%
Maximum Green (s)	7.0	34.0	50.0	16.0	43.0	7.0	50.0	95.0		7.0	52.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)	9.0	36.0	88.0	18.0	45.0	54.0	52.0	97.0		9.0	54.0	
Actuated g/C Ratio	0.05	0.20	0.49	0.10	0.25	0.30	0.29	0.54		0.05	0.30	
v/c Ratio	0.89	1.32	0.39	1.30	1.08	0.13	1.06	1.38		0.94	1.00	
Control Delay	127.6	207.9	18.5	214.5	117.1	35.1	117.1	208.2		174.2	59.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.3	

19: Oleander Dr. & NC 132 (College Rd.)  
2040 Build AM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	127.6	207.9	18.5	214.5	117.1	35.1	117.1	208.2		174.2	60.0	
LOS	F	F	B	F	F	D	F	F		F	E	
Approach Delay		157.9			143.2			192.0			66.1	
Approach LOS		F			F			F			E	
Queue Length 50th (ft)	92	~735	148	~341	~652	45	~693	~2018		102	~645	
Queue Length 95th (ft)	#164	#876	205	#460	#793	81	#937	#2125		#226	#754	
Internal Link Dist (ft)		887			848			957			610	
Turn Bay Length (ft)	550		450	775		300	500			275		
Base Capacity (vph)	168	694	759	337	868	466	502	1783		87	1466	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	2	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.89	1.32	0.39	1.30	1.08	0.13	1.06	1.38		0.94	1.00	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 31 (17%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 180  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.38  
 Intersection Signal Delay: 149.5      Intersection LOS: F  
 Intersection Capacity Utilization 120.8%      ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 19: Oleander Dr. & NC 132 (College Rd.)



19: Oleander Dr. & NC 132 (College Rd.)  
 2040 Build AM Peak

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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	847	481	692	827	74	268	1141	395	56	1522	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	550		450	775		300	500		0	275		0
Storage Lanes	1		1	2		1	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3367	3471	1553	3367	3471	1553	1736	3336	0	1736	4928	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3367	3471	1553	3367	3471	1553	1736	3336	0	1736	4928	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			45			45			45	
Link Distance (ft)		967			928			1037			690	
Travel Time (s)		16.5			14.1			15.7			10.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	941	534	769	919	82	298	1707	0	62	1840	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Prot		Prot	
Protected Phases	3	8	1	7	4	5	1	6		5	2	
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0	14.0	14.0	19.0		14.0	19.0	
Total Split (s)	17.0	41.0	26.0	34.0	58.0	14.0	26.0	71.0	0.0	14.0	59.0	0.0
Total Split (%)	10.6%	25.6%	16.3%	21.3%	36.3%	8.8%	16.3%	44.4%	0.0%	8.8%	36.9%	0.0%
Maximum Green (s)	10.0	34.0	19.0	27.0	51.0	7.0	19.0	64.0		7.0	52.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	
Act Effct Green (s)	15.6	36.0	57.0	29.0	49.4	63.4	21.0	66.0		9.0	54.0	
Actuated g/C Ratio	0.10	0.22	0.36	0.18	0.31	0.40	0.13	0.41		0.06	0.34	
v/c Ratio	0.61	1.20	0.97	1.26	0.86	0.13	1.31	1.24		0.63	1.11	
Control Delay	78.2	155.3	59.1	181.1	60.8	30.5	217.3	154.5		83.0	93.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.6	

19: Oleander Dr. & NC 132 (College Rd.)  
2040 Build PM Peak

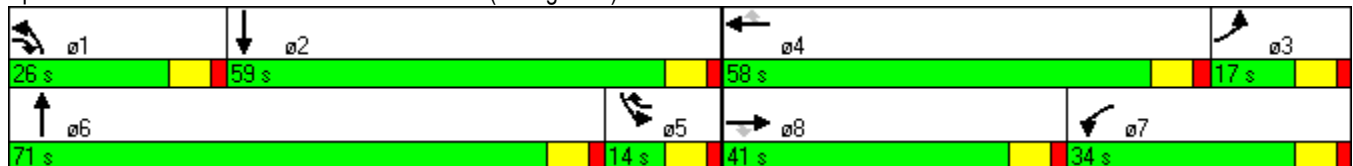


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	78.2	155.3	59.1	181.1	60.8	30.5	217.3	154.5		83.0	94.1	
LOS	E	F	E	F	E	C	F	F		F	F	
Approach Delay		115.4			111.7			163.8				93.7
Approach LOS		F			F			F				F
Queue Length 50th (ft)	106	~627	328	~518	471	54	~399	~1162		65	~802	
Queue Length 95th (ft)	#170	#765	#564	#650	548	92	#598	#1297		m#133	#898	
Internal Link Dist (ft)		887			848			957				610
Turn Bay Length (ft)	550		450	775		300	500			275		
Base Capacity (vph)	329	781	553	610	1150	615	228	1376		98	1663	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	2	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.61	1.20	0.97	1.26	0.80	0.13	1.31	1.24		0.63	1.11	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 24 (15%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 170  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.31  
 Intersection Signal Delay: 122.1  
 Intersection LOS: F  
 Intersection Capacity Utilization 109.8%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Oleander Dr. & NC 132 (College Rd.)



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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	100	53	61	162	350	54	1577	38	185	1317	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	115		0	275		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	1732	0	1736	1639	0	1736	3457	0	1736	4963	0
Flt Permitted	0.072			0.568			0.950			0.950		
Satd. Flow (perm)	132	1732	0	1038	1639	0	1736	3457	0	1736	4963	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		912			981			690			868	
Travel Time (s)		17.8			19.1			10.5			13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	170	0	68	569	0	60	1794	0	206	1510	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0		14.0	19.0	
Total Split (s)	65.0	65.0	0.0	65.0	65.0	0.0	17.0	91.0	0.0	24.0	98.0	0.0
Total Split (%)	36.1%	36.1%	0.0%	36.1%	36.1%	0.0%	9.4%	50.6%	0.0%	13.3%	54.4%	0.0%
Maximum Green (s)	58.0	58.0		58.0	58.0		10.0	84.0		17.0	91.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag							Lag	Lead		Lag	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	60.0	60.0		60.0	60.0		12.0	86.0		19.0	93.0	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.07	0.48		0.11	0.52	
v/c Ratio	1.23	0.29		0.20	1.04		0.52	1.09		1.13	0.59	
Control Delay	257.7	46.1		44.8	106.3		61.8	62.1		172.1	31.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	88.8		0.0	0.0	

20: Kerr Ave. & NC 132 (College Rd.)  
2040 Build AM Peak

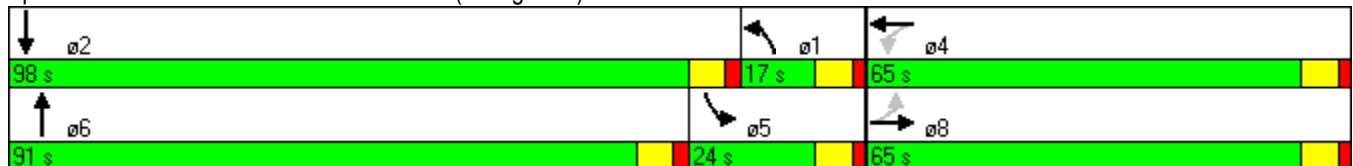


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	257.7	46.1		44.8	106.3		61.8	150.9		172.1	31.4	
LOS	F	D		D	F		E	F		F	C	
Approach Delay		97.1			99.8			148.0			48.3	
Approach LOS		F			F			F			D	
Queue Length 50th (ft)	~78	149		58	~723		73	~1230		~280	447	
Queue Length 95th (ft)	#183	220		103	#970		m58	m405		#463	493	
Internal Link Dist (ft)		832			901			610			788	
Turn Bay Length (ft)	100			115			275			250		
Base Capacity (vph)	44	577		346	546		116	1652		183	2564	
Starvation Cap Reductn	0	0		0	0		0	259		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	1.23	0.29		0.20	1.04		0.52	1.29		1.13	0.59	

Intersection Summary

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.23  
 Intersection Signal Delay: 99.9  
 Intersection LOS: F  
 Intersection Capacity Utilization 107.6%  
 ICU Level of Service G  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: Kerr Ave. & NC 132 (College Rd.)



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
10/1/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	162	54	38	100	185	52	1317	61	350	1577	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	115		0	275		0	250		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1736	1757	0	1736	1650	0	1736	3447	0	1736	4968	0
Flt Permitted	0.171			0.330			0.950			0.950		
Satd. Flow (perm)	312	1757	0	603	1650	0	1736	3447	0	1736	4968	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		912			981			690			868	
Travel Time (s)		17.8			19.1			10.5			13.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	240	0	42	317	0	58	1531	0	389	1806	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Detector Phase	8	8		4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0		14.0	19.0	
Total Split (s)	37.0	37.0	0.0	37.0	37.0	0.0	17.0	80.0	0.0	43.0	106.0	0.0
Total Split (%)	23.1%	23.1%	0.0%	23.1%	23.1%	0.0%	10.6%	50.0%	0.0%	26.9%	66.3%	0.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		10.0	73.0		36.0	99.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag							Lead	Lead		Lag	Lag	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)	32.0	32.0		32.0	32.0		11.2	75.0		38.0	104.6	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.07	0.47		0.24	0.65	
v/c Ratio	0.76	0.68		0.35	0.96		0.48	0.95		0.94	0.56	
Control Delay	120.5	70.4		64.5	102.9		99.8	10.5		91.6	16.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	23.4		0.0	0.2	

20: Kerr Ave. & NC 132 (College Rd.)  
2040 Build PM Peak

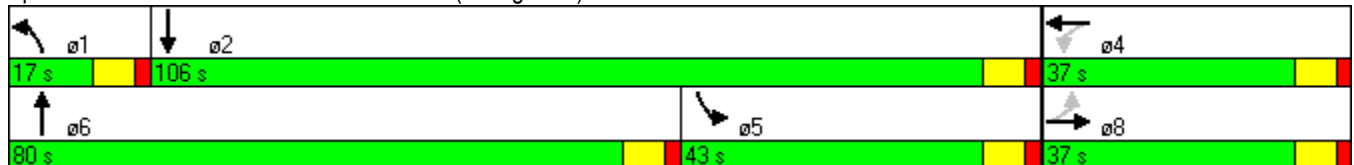


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	120.5	70.4		64.5	102.9		99.8	33.9		91.6	16.7	
LOS	F	E		E	F		F	C		F	B	
Approach Delay		78.6			98.4			36.3			30.0	
Approach LOS		E			F			D			C	
Queue Length 50th (ft)	47	236		38	333		61	176		404	382	
Queue Length 95th (ft)	#127	338		83	#531		m57	m151		#613	423	
Internal Link Dist (ft)		832			901			610			788	
Turn Bay Length (ft)	100			115			275			250		
Base Capacity (vph)	62	351		121	330		130	1616		412	3248	
Starvation Cap Reductn	0	0		0	0		0	157		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	570	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.76	0.68		0.35	0.96		0.45	1.05		0.94	0.67	

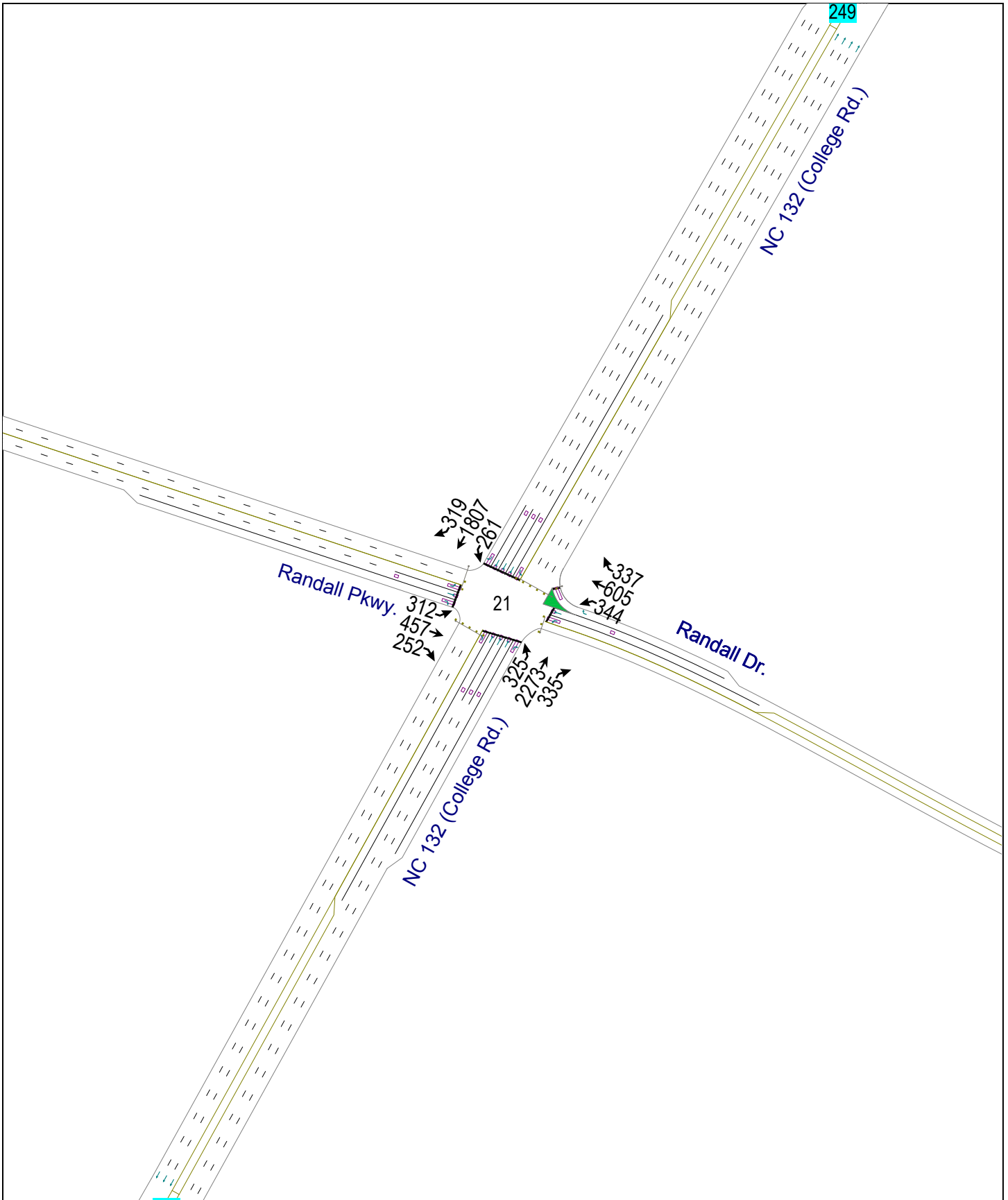
**Intersection Summary**

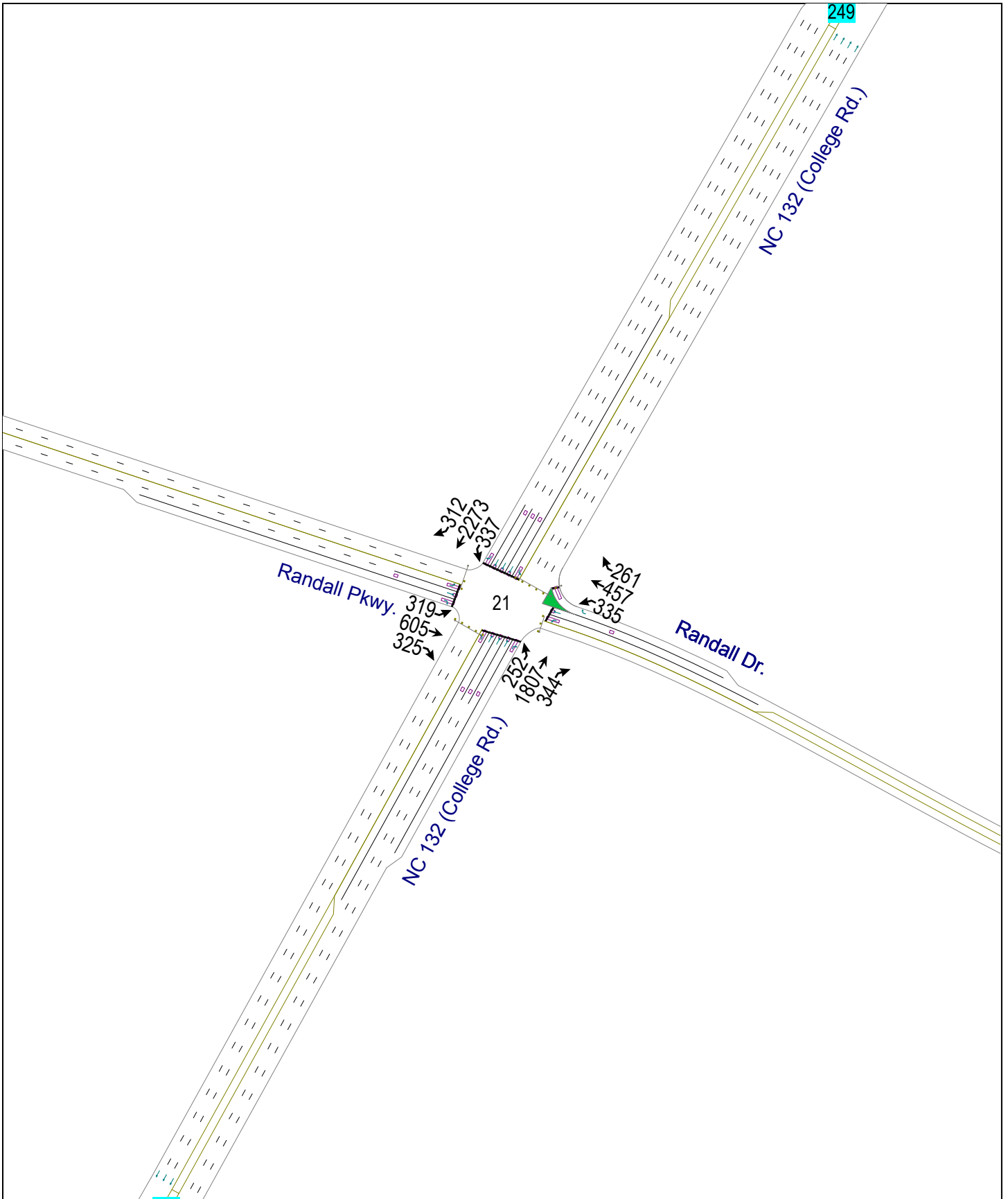
Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Offset: 16 (10%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 40.9 Intersection LOS: D  
 Intersection Capacity Utilization 96.9% ICU Level of Service F  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: Kerr Ave. & NC 132 (College Rd.)









U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	312	457	252	344	605	337	325	2273	335	261	1807	319
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	340		275	450		350	450		0
Storage Lanes	0		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	4988	1553	1736	4988	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	4988	1553	1736	4988	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		1005			988			1040			1025	
Travel Time (s)		19.6			26.9			15.8			15.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	347	508	280	382	672	374	361	2526	372	290	2008	354
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	29.0	46.0	30.0	31.0	48.0	25.0	30.0	68.0	31.0	25.0	63.0	29.0
Total Split (%)	17.1%	27.1%	17.6%	18.2%	28.2%	14.7%	17.6%	40.0%	18.2%	14.7%	37.1%	17.1%
Maximum Green (s)	22.0	39.0	23.0	24.0	41.0	18.0	23.0	61.0	24.0	18.0	56.0	22.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	24.0	41.0	66.0	26.0	43.0	63.0	25.0	63.0	89.0	20.0	58.0	82.0
Actuated g/C Ratio	0.14	0.24	0.39	0.15	0.25	0.37	0.15	0.37	0.52	0.12	0.34	0.48
v/c Ratio	1.40	1.14	0.46	1.43	1.44	0.64	1.42	1.37	0.46	1.42	1.18	0.47
Control Delay	253.9	143.0	24.0	259.8	252.8	30.9	257.2	209.0	15.6	265.3	135.3	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

21: Randall Pkwy. & NC 132 (College Rd.)  
2040 Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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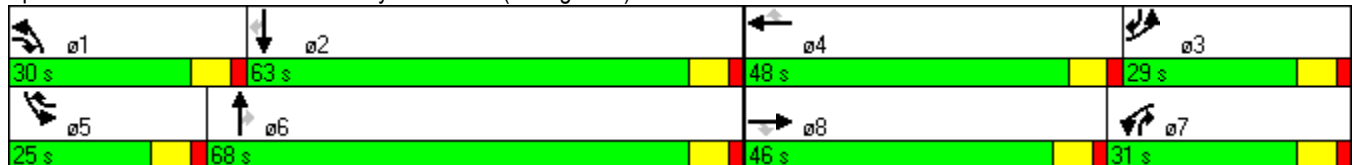


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	253.9	143.0	24.0	259.8	252.8	30.9	257.2	209.0	15.6	265.3	135.3	17.8
LOS	F	F	C	F	F	C	F	F	B	F	F	B
Approach Delay	147.5			196.6			192.3			133.8		
Approach LOS	F			F			F			F		
Queue Length 50th (ft)	~515	~659	147	~572	~1012	229	~538	~1353	153	~433	~977	150
Queue Length 95th (ft)	#727	#896	206	#791	#1263	311	#755	#1428	208	#634	#1065	204
Internal Link Dist (ft)	925			908			960			945		
Turn Bay Length (ft)			500	340			275	450			350	450
Base Capacity (vph)	247	445	609	268	467	581	255	1848	813	204	1702	749
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.40	1.14	0.46	1.43	1.44	0.64	1.42	1.37	0.46	1.42	1.18	0.47

Intersection Summary

Area Type: Other  
 Cycle Length: 170  
 Actuated Cycle Length: 170  
 Natural Cycle: 170  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.44  
 Intersection Signal Delay: 168.7  
 Intersection LOS: F  
 Intersection Capacity Utilization 124.2%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 21: Randall Pkwy. & NC 132 (College Rd.)



21: Randall Pkwy. & NC 132 (College Rd.)  
 2040 Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	319	605	325	335	457	261	252	1807	344	337	2273	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		500	340		275	450		350	450		0
Storage Lanes	0		1	1		1	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1736	4988	1553	1736	4988	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	1845	1568	1752	1845	1568	1736	4988	1553	1736	4988	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		1005			988			1040			1025	
Travel Time (s)		19.6			26.9			15.8			15.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	354	672	361	372	508	290	280	2008	382	374	2526	347
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	12.0	7.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	19.0	14.0	14.0	19.0	14.0
Total Split (s)	29.0	47.0	24.0	30.0	48.0	31.0	24.0	62.0	30.0	31.0	69.0	29.0
Total Split (%)	17.1%	27.6%	14.1%	17.6%	28.2%	18.2%	14.1%	36.5%	17.6%	18.2%	40.6%	17.1%
Maximum Green (s)	22.0	40.0	17.0	23.0	41.0	24.0	17.0	55.0	23.0	24.0	62.0	22.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	24.0	42.0	61.0	25.0	43.0	69.0	19.0	57.0	82.0	26.0	64.0	88.0
Actuated g/C Ratio	0.14	0.25	0.36	0.15	0.25	0.41	0.11	0.34	0.48	0.15	0.38	0.52
v/c Ratio	1.43	1.47	0.64	1.44	1.09	0.46	1.44	1.20	0.51	1.41	1.35	0.43
Control Delay	264.8	267.4	35.7	267.1	124.8	23.0	275.0	144.0	18.4	252.4	199.7	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

21: Randall Pkwy. & NC 132 (College Rd.)  
2040 Build PM Peak

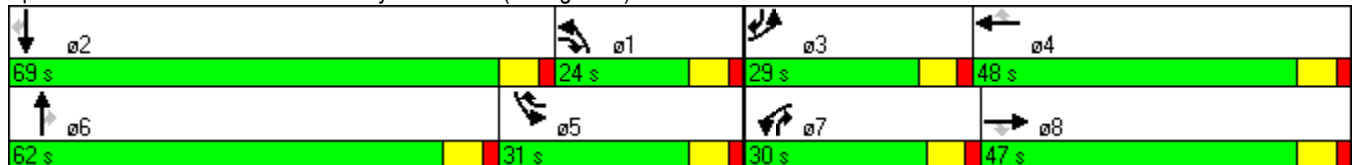


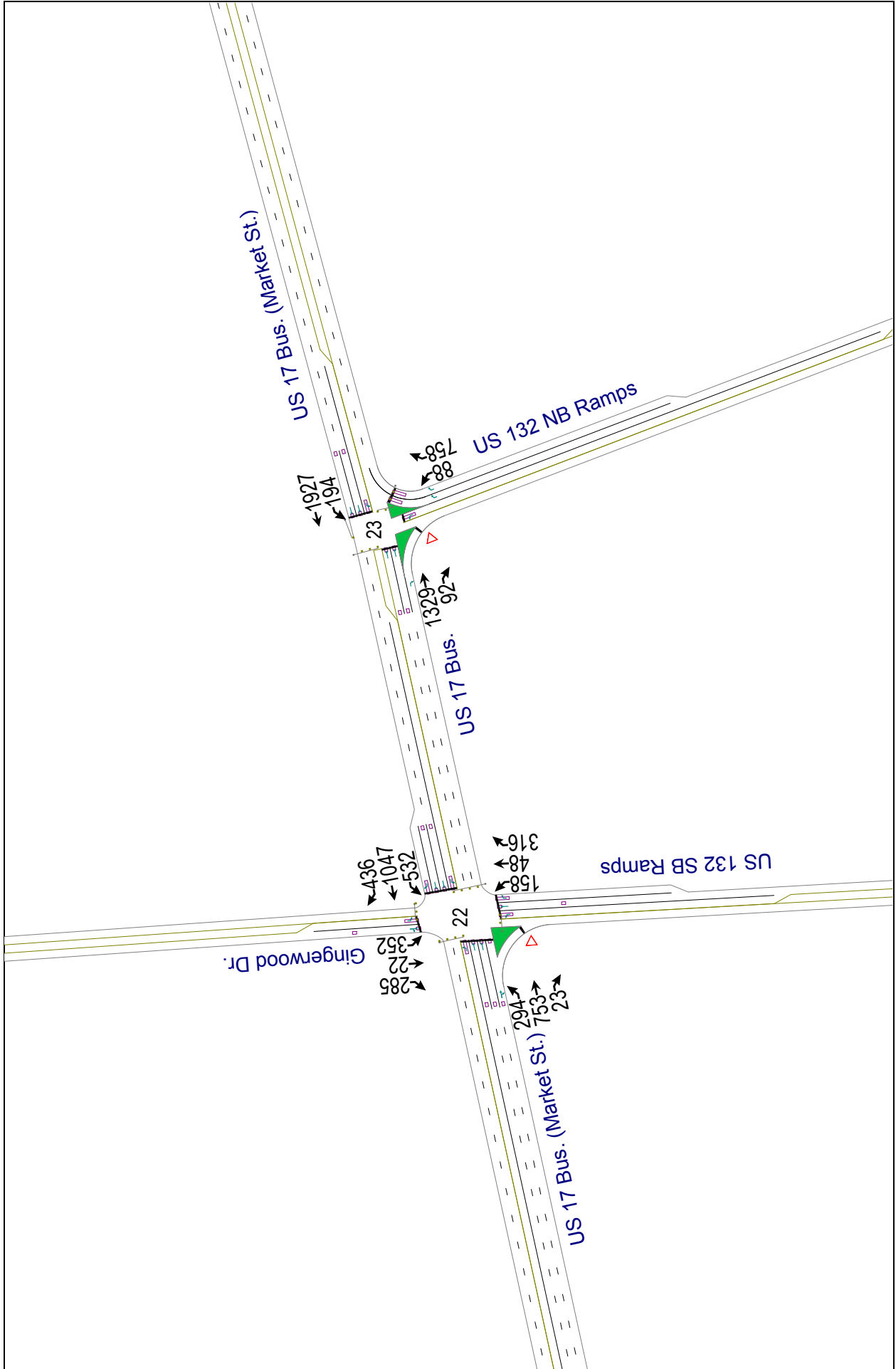
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	264.8	267.4	35.7	267.1	124.8	23.0	275.0	144.0	18.4	252.4	199.7	15.7
LOS	F	F	D	F	F	C	F	F	B	F	F	B
Approach Delay	206.4			144.8			139.7			186.1		
Approach LOS	F			F			F			F		
Queue Length 50th (ft)	~531	~1024	222	~561	~634	151	~422	~989	162	~556	~1340	146
Queue Length 95th (ft)	#743	#1276	303	#778	#871	210	#620	#1077	220	#773	#1415	200
Internal Link Dist (ft)	925			908			960			945		
Turn Bay Length (ft)			500	340			275	450			350	450
Base Capacity (vph)	247	456	563	258	467	636	194	1672	749	266	1878	804
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.43	1.47	0.64	1.44	1.09	0.46	1.44	1.20	0.51	1.41	1.35	0.43

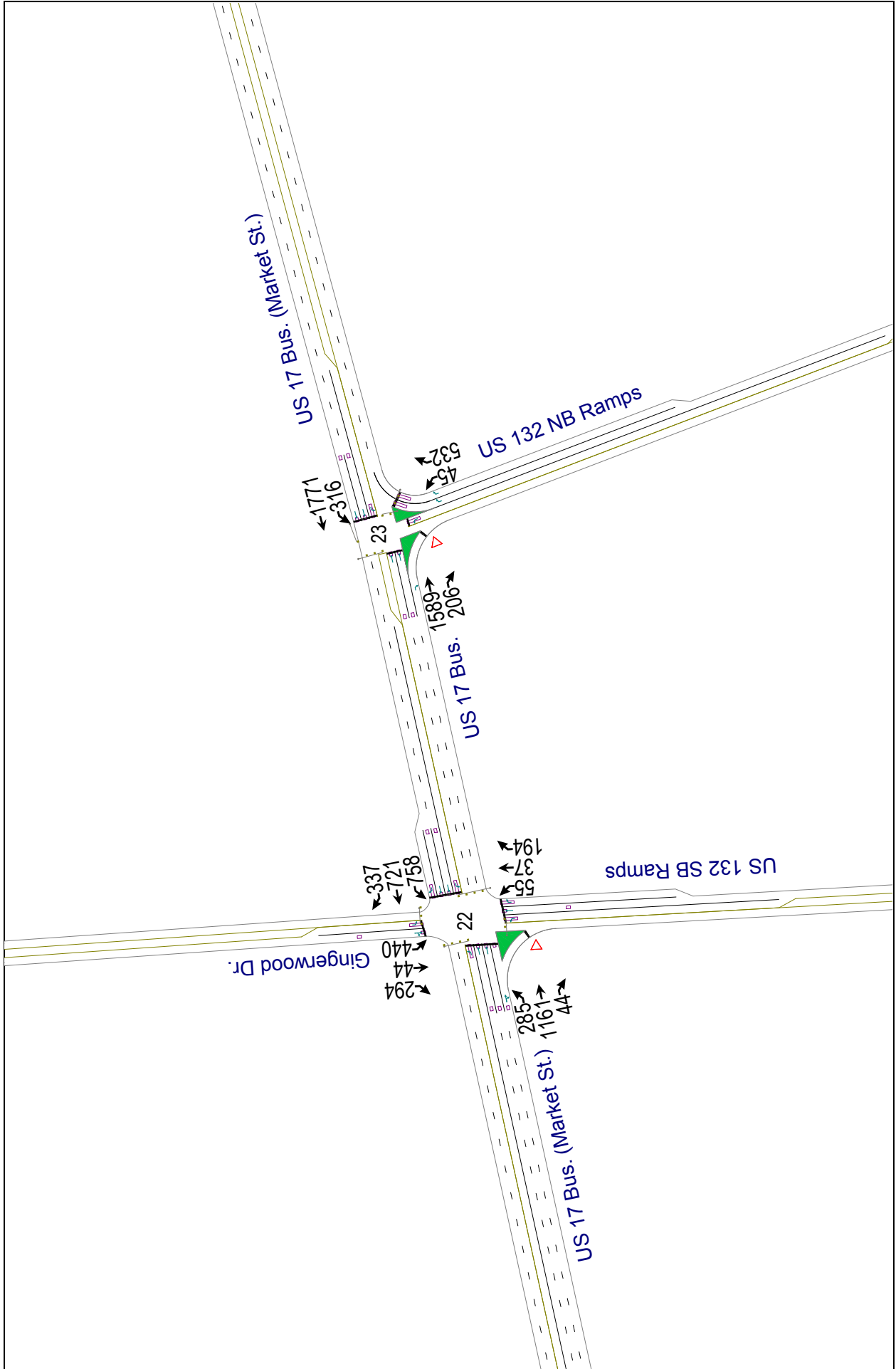
**Intersection Summary**

Area Type: Other  
 Cycle Length: 170  
 Actuated Cycle Length: 170  
 Natural Cycle: 170  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.47  
 Intersection Signal Delay: 169.1      Intersection LOS: F  
 Intersection Capacity Utilization 124.9%      ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 21: Randall Pkwy. & NC 132 (College Rd.)









U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	294	753	23	532	1047	436	158	48	316	352	22	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	750		0	400		100	400		250	150		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	5011	0	1752	3505	1568	1752	1845	1568	1770	1604	0
Flt Permitted	0.950			0.950			0.336			0.722		
Satd. Flow (perm)	1752	5011	0	1752	3505	1568	620	1845	1568	1345	1604	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25				35
Link Distance (ft)		1082			581			996				905
Travel Time (s)		18.4			9.9			27.2				17.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	327	863	0	591	1163	484	176	53	351	391	341	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1			4
Permitted Phases						6	8		8	4		
Detector Phase	5	2		1	6	6	8	8	1	4		4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	19.0	14.0	14.0	14.0	14.0		14.0
Total Split (s)	30.0	31.0	0.0	47.0	48.0	48.0	42.0	42.0	47.0	42.0		42.0
Total Split (%)	25.0%	25.8%	0.0%	39.2%	40.0%	40.0%	35.0%	35.0%	39.2%	35.0%		35.0%
Maximum Green (s)	23.0	24.0		40.0	41.0	41.0	35.0	35.0	40.0	35.0		35.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lag	Lead		Lag	Lead	Lead				Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes				Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None		None
Act Effct Green (s)	24.9	26.5		41.9	43.5	43.5	36.6	36.6	83.5	36.6		36.6
Actuated g/C Ratio	0.21	0.22		0.35	0.36	0.36	0.30	0.30	0.70	0.30		0.30
v/c Ratio	0.90	0.78		0.97	0.92	0.85	0.93	0.09	0.32	0.95		0.70
Control Delay	74.4	49.9		58.4	41.1	42.5	91.5	30.3	8.0	75.6		45.5
Queue Delay	0.0	0.0		1.3	1.1	0.0	0.0	0.0	0.0	0.0		0.0

22: US 17 Bus. (Market St.) & Gingerwood Dr.  
2040 Build AM Peak

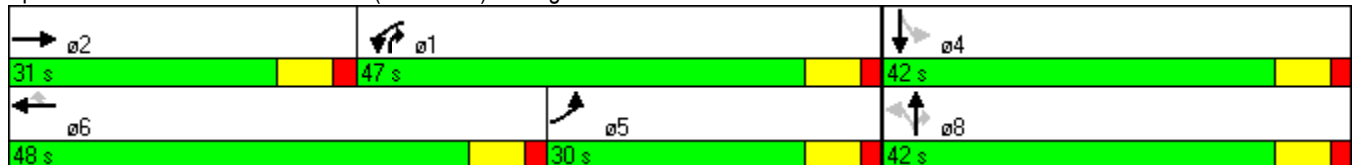


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	74.4	49.9		59.7	42.2	42.5	91.5	30.3	8.0	75.6	45.5	
LOS	E	D		E	D	D	F	C	A	E	D	
Approach Delay		56.6			46.9			35.4				61.5
Approach LOS		E			D			D				E
Queue Length 50th (ft)	249	233		449	455	349	132	29	94	295	232	
Queue Length 95th (ft)	#417	284		#685	#591	#538	#275	61	139	#491	341	
Internal Link Dist (ft)		1002			501			916				825
Turn Bay Length (ft)	750			400		100	400		250	150		
Base Capacity (vph)	365	1106		613	1270	568	191	569	1080	415	495	
Starvation Cap Reductn	0	0		5	25	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.78		0.97	0.93	0.85	0.92	0.09	0.33	0.94	0.69	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 13 (11%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 50.2  
 Intersection LOS: D  
 Intersection Capacity Utilization 89.4%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 22: US 17 Bus. (Market St.) & Gingerwood Dr.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	285	1161	44	758	721	337	55	37	194	440	44	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	750		0	400		100	400		250	150		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	5011	0	1752	3505	1568	1752	1845	1568	1770	1621	0
Flt Permitted	0.950			0.950			0.232			0.730		
Satd. Flow (perm)	1752	5011	0	1752	3505	1568	428	1845	1568	1360	1621	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25				35
Link Distance (ft)		1082			581			996				905
Travel Time (s)		18.4			9.9			27.2				17.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	317	1339	0	842	801	374	61	41	216	489	376	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1			4
Permitted Phases						6	8		8	4		
Detector Phase	5	2		1	6	6	8	8	1	4		4
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	19.0	14.0	14.0	14.0	14.0		14.0
Total Split (s)	31.0	33.0	0.0	50.0	52.0	52.0	37.0	37.0	50.0	37.0		37.0
Total Split (%)	25.8%	27.5%	0.0%	41.7%	43.3%	43.3%	30.8%	30.8%	41.7%	30.8%		30.8%
Maximum Green (s)	24.0	26.0		43.0	45.0	45.0	30.0	30.0	43.0	30.0		30.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag				Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes				Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None		None
Act Effct Green (s)	25.1	28.0		45.0	47.9	47.9	32.0	32.0	82.0	32.0		32.0
Actuated g/C Ratio	0.21	0.23		0.38	0.40	0.40	0.27	0.27	0.68	0.27		0.27
v/c Ratio	0.86	1.15		1.28	0.57	0.60	0.54	0.08	0.20	1.35		0.87
Control Delay	69.0	117.6		166.8	27.0	29.8	57.2	33.7	7.5	209.3		63.5
Queue Delay	0.0	0.0		7.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0

22: US 17 Bus. (Market St.) & Gingerwood Dr.  
2040 Build PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	69.0	117.6		173.8	27.0	29.8	57.2	33.7	7.5	209.3	63.5	
LOS	E	F		F	C	C	E	C	A	F	E	
Approach Delay		108.3			88.8			20.4			145.9	
Approach LOS		F			F			C			F	
Queue Length 50th (ft)	237	~445		~833	257	231	41	24	56	~496	279	
Queue Length 95th (ft)	#386	#541		#1081	322	337	#98	53	87	#705	#451	
Internal Link Dist (ft)		1002			501			916			825	
Turn Bay Length (ft)	750			400		100	400		250	150		
Base Capacity (vph)	380	1169		657	1399	626	114	492	1071	363	432	
Starvation Cap Reductn	0	0		8	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.83	1.15		1.30	0.57	0.60	0.54	0.08	0.20	1.35	0.87	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 57 (48%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 140  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.35  
 Intersection Signal Delay: 101.1      Intersection LOS: F  
 Intersection Capacity Utilization 112.3%      ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 22: US 17 Bus. (Market St.) & Gingerwood Dr.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓↓
Volume (vph)	1329	92	194	1927	88	758
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	225		750	425
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3505	1568	1752	3505	1752	2760
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3505	1568	1752	3505	1752	2760
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	40			40	45	
Link Distance (ft)	581			1044	982	
Travel Time (s)	9.9			17.8	14.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1477	102	216	2141	98	842
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type		Perm	Prot			pm+ov
Protected Phases	2		1	6	8	1
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	1
Switch Phase						
Minimum Initial (s)	12.0	12.0	7.0	12.0	7.0	7.0
Minimum Split (s)	19.0	19.0	14.0	19.0	14.0	14.0
Total Split (s)	69.0	69.0	35.0	104.0	16.0	35.0
Total Split (%)	57.5%	57.5%	29.2%	86.7%	13.3%	29.2%
Maximum Green (s)	62.0	62.0	28.0	97.0	9.0	28.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag			Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	None	Max	None
Act Effct Green (s)	64.0	64.0	29.9	98.9	11.1	46.0
Actuated g/C Ratio	0.53	0.53	0.25	0.82	0.09	0.38
v/c Ratio	0.79	0.12	0.49	0.74	0.60	0.80
Control Delay	12.9	6.6	43.1	6.7	68.9	39.6
Queue Delay	1.2	0.0	0.0	0.0	0.0	0.0

23: US 17 Bus. (Market St.) & US 132 NB Ramps  
2040 Build AM Peak



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Delay	14.1	6.6	43.1	6.7	68.9	39.6
LOS	B	A	D	A	E	D
Approach Delay	13.6			10.1	42.7	
Approach LOS	B			B	D	
Queue Length 50th (ft)	215	17	144	301	74	325
Queue Length 95th (ft)	m250	m23	222	368	#141	416
Internal Link Dist (ft)	501			964	902	
Turn Bay Length (ft)			225		750	425
Base Capacity (vph)	1869	836	438	2892	162	1036
Starvation Cap Reductn	191	0	0	0	0	0
Spillback Cap Reductn	0	0	0	26	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.12	0.49	0.75	0.60	0.81

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 112 (93%), Referenced to phase 2:EBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 17.5  
 Intersection LOS: B  
 Intersection Capacity Utilization 71.6%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: US 17 Bus. (Market St.) & US 132 NB Ramps



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓↓
Volume (vph)	1589	206	316	1771	45	532
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	225		750	425
Storage Lanes		1	1		1	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3505	1568	1752	3505	1752	2760
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3505	1568	1752	3505	1752	2760
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	40			40	45	
Link Distance (ft)	581			1044	982	
Travel Time (s)	9.9			17.8	14.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1766	229	351	1968	50	591
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type		Perm	Prot			pm+ov
Protected Phases	2		1	6	8	1
Permitted Phases		2				8
Detector Phase	2	2	1	6	8	1
Switch Phase						
Minimum Initial (s)	12.0	12.0	7.0	12.0	7.0	7.0
Minimum Split (s)	19.0	19.0	14.0	19.0	14.0	14.0
Total Split (s)	72.0	72.0	34.0	106.0	14.0	34.0
Total Split (%)	60.0%	60.0%	28.3%	88.3%	11.7%	28.3%
Maximum Green (s)	65.0	65.0	27.0	99.0	7.0	27.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag			Lag
Lead-Lag Optimize?	Yes	Yes	Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	None	Max	None
Act Effct Green (s)	67.0	67.0	27.8	99.8	10.2	43.0
Actuated g/C Ratio	0.56	0.56	0.23	0.83	0.08	0.36
v/c Ratio	0.90	0.26	0.86	0.67	0.34	0.60
Control Delay	17.2	3.0	65.6	5.2	59.7	34.5
Queue Delay	1.9	0.0	0.0	0.3	0.0	0.0

23: US 17 Bus. (Market St.) & US 132 NB Ramps  
2040 Build PM Peak

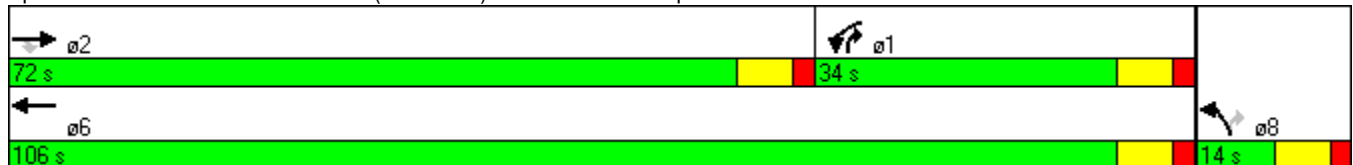


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Total Delay	19.1	3.0	65.6	5.5	59.7	34.5
LOS	B	A	E	A	E	C
Approach Delay	17.2			14.6	36.5	
Approach LOS	B			B	D	
Queue Length 50th (ft)	272	15	259	214	38	210
Queue Length 95th (ft)	m107	m13	#413	258	80	277
Internal Link Dist (ft)	501			964	902	
Turn Bay Length (ft)			225		750	425
Base Capacity (vph)	1957	875	423	2950	148	989
Starvation Cap Reductn	90	0	0	0	0	0
Spillback Cap Reductn	0	0	0	397	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.26	0.83	0.77	0.34	0.60

Intersection Summary

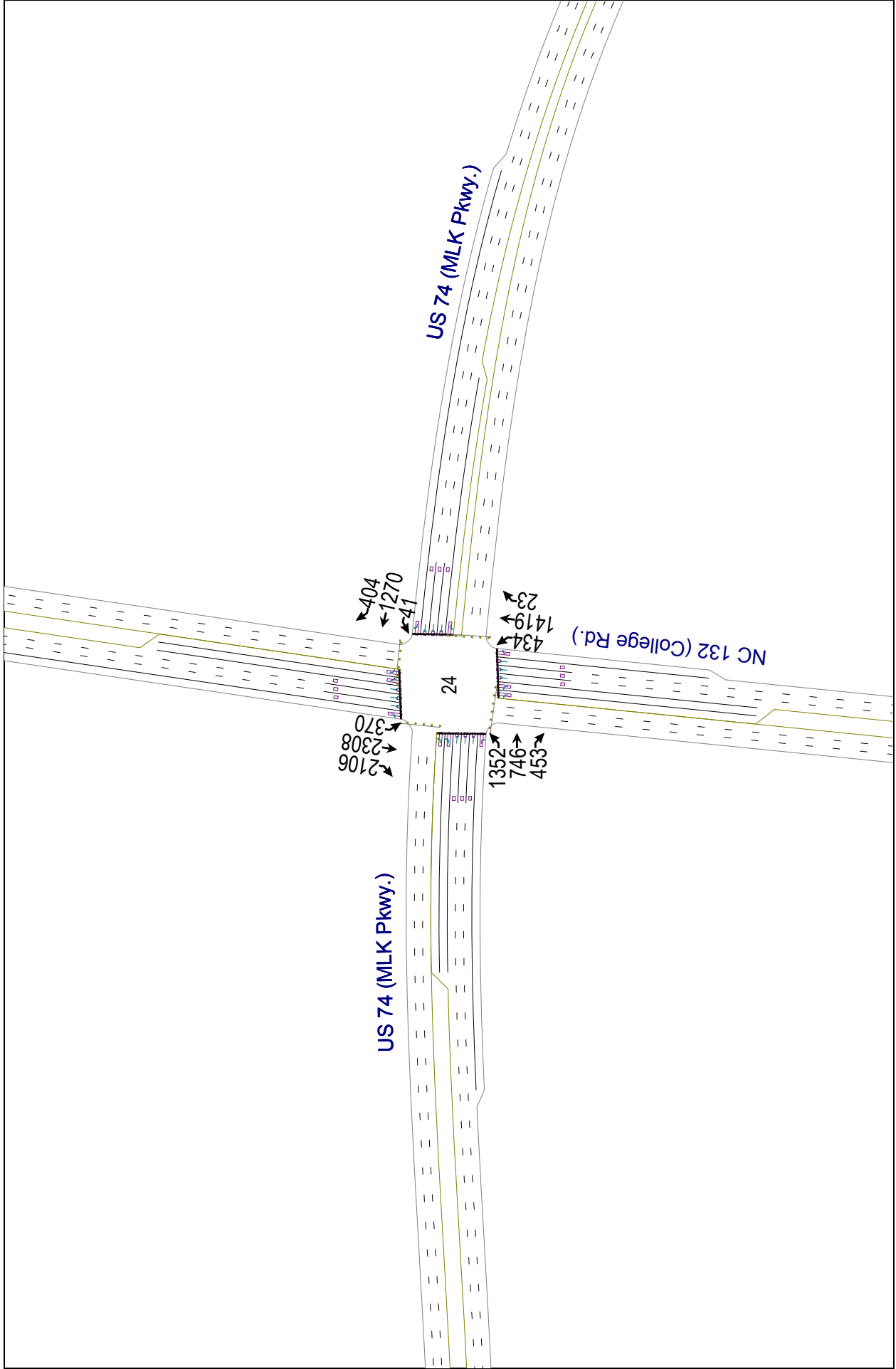
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 18.5                                  Intersection LOS: B  
 Intersection Capacity Utilization 79.8%                                  ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
   Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

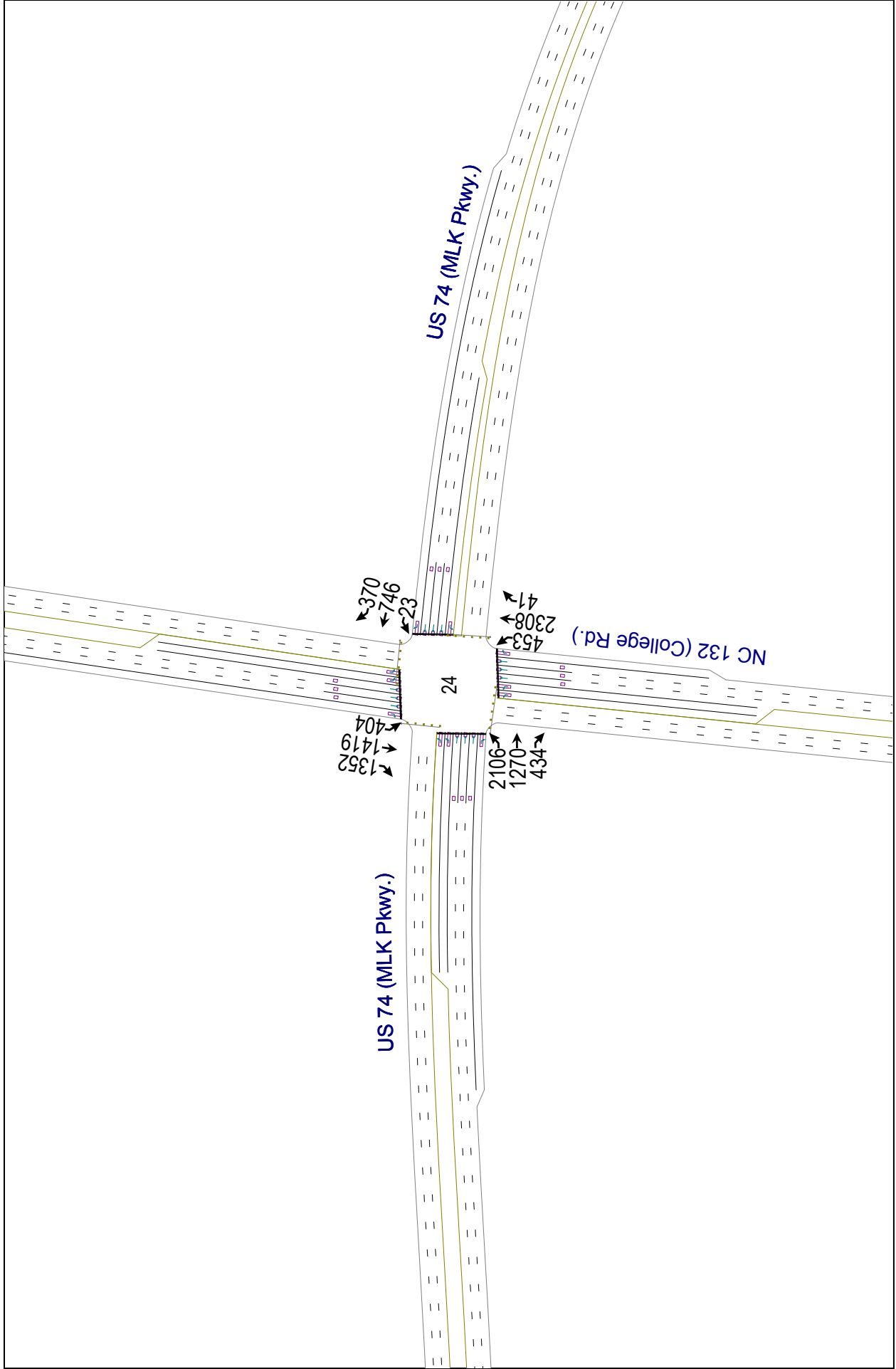
Splits and Phases: 23: US 17 Bus. (Market St.) & US 132 NB Ramps



23: US 17 Bus. (Market St.) & US 132 NB Ramps  
2040 Build PM Peak









































U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
10/1/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			  		 	  		 	 	
Volume (vph)	1352	746	453	41	1270	404	434	1419	23	370	2308	2106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		525	375		675	375		300	350		575
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3335	4940	1538	1719	4940	1538	3367	4988	1553	3367	4988	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	4940	1538	1719	4940	1538	3367	4988	1553	3367	4988	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1054			1097			837			1153	
Travel Time (s)		13.1			13.6			10.4			14.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1502	829	503	46	1411	449	482	1577	26	411	2564	2340
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0
Total Split (s)	62.0	79.0	18.0	14.0	31.0	17.0	18.0	50.0	14.0	17.0	49.0	62.0
Total Split (%)	38.8%	49.4%	11.3%	8.8%	19.4%	10.6%	11.3%	31.3%	8.8%	10.6%	30.6%	38.8%
Maximum Green (s)	55.0	72.0	11.0	7.0	24.0	10.0	11.0	43.0	7.0	10.0	42.0	55.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	57.0	76.8	90.8	9.0	26.0	38.0	13.0	45.0	54.0	12.0	44.0	101.0
Actuated g/C Ratio	0.36	0.48	0.57	0.06	0.16	0.24	0.08	0.28	0.34	0.08	0.28	0.63
v/c Ratio	1.26	0.35	0.58	0.47	1.76	1.23	1.76	1.12	0.05	1.62	1.87	2.39
Control Delay	167.9	27.0	22.9	89.7	382.3	160.5	394.7	116.9	24.4	340.7	425.3	645.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)  
2040 Build AM Peak

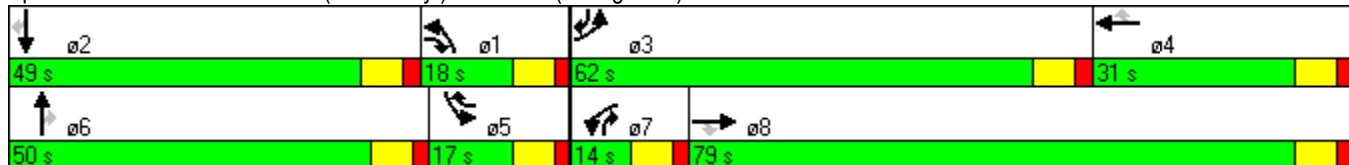


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	167.9	27.0	22.9	89.7	382.3	160.5	394.7	116.9	24.4	340.7	425.3	645.7
LOS	F	C	C	F	F	F	F	F	C	F	F	F
Approach Delay		101.0			323.0			180.0			515.8	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	~1014	202	249	48	~801	~444	~385	~695	14	~318	~1491	~4009
Queue Length 95th (ft)	#1150	239	337	95	#899	#665	#504	#791	33	#430	#1569	#4237
Internal Link Dist (ft)		974			1017			757			1073	
Turn Bay Length (ft)	350		525	375		675	375		300	350		575
Base Capacity (vph)	1188	2371	873	97	803	365	274	1403	524	253	1372	980
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.26	0.35	0.58	0.47	1.76	1.23	1.76	1.12	0.05	1.62	1.87	2.39

**Intersection Summary**

































Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 160  
 Natural Cycle: 160  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 2.39  
 Intersection Signal Delay: 331.0  
 Intersection LOS: F  
 Intersection Capacity Utilization 179.8%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
10/1/2012

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			  		 	  		  		
Volume (vph)	2106	1270	434	23	746	370	453	2308	41	404	1419	1352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		525	375		675	375		300	350		575
Storage Lanes	2		1	1		1	2		1	2		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3335	4940	1538	1719	4940	1538	3367	4988	1553	3367	4988	1553
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	4940	1538	1719	4940	1538	3367	4988	1553	3367	4988	1553
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1054			1097			837			1153	
Travel Time (s)		13.1			13.6			10.4			14.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2340	1411	482	26	829	411	503	2564	46	449	1577	1502
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	8	1	7	4	5	1	6	7	5	2	3
Permitted Phases			8			4			6			2
Detector Phase	3	8	1	7	4	5	1	6	7	5	2	3
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0
Total Split (s)	72.0	85.0	22.0	14.0	27.0	21.0	22.0	60.0	14.0	21.0	59.0	72.0
Total Split (%)	40.0%	47.2%	12.2%	7.8%	15.0%	11.7%	12.2%	33.3%	7.8%	11.7%	32.8%	40.0%
Maximum Green (s)	65.0	78.0	15.0	7.0	20.0	14.0	15.0	53.0	7.0	14.0	52.0	65.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	None	None	Max	None
Act Effct Green (s)	67.0	72.4	90.4	19.4	22.0	38.0	17.0	55.0	74.4	16.0	54.0	121.0
Actuated g/C Ratio	0.37	0.40	0.50	0.11	0.12	0.21	0.09	0.31	0.41	0.09	0.30	0.67
v/c Ratio	1.89	0.71	0.62	0.14	1.37	1.26	1.58	1.68	0.07	1.50	1.05	1.44
Control Delay	432.4	48.5	24.3	74.3	231.8	178.3	322.9	346.5	20.1	292.2	98.1	223.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)  
2040 Build PM Peak

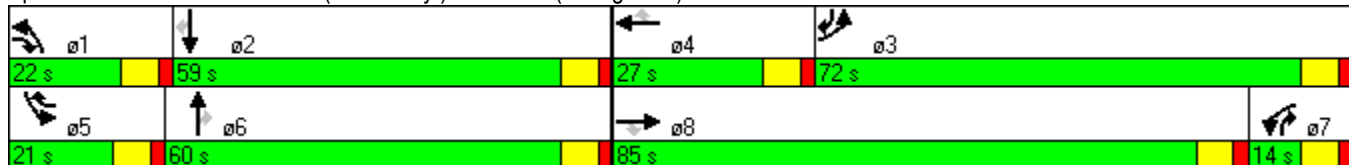


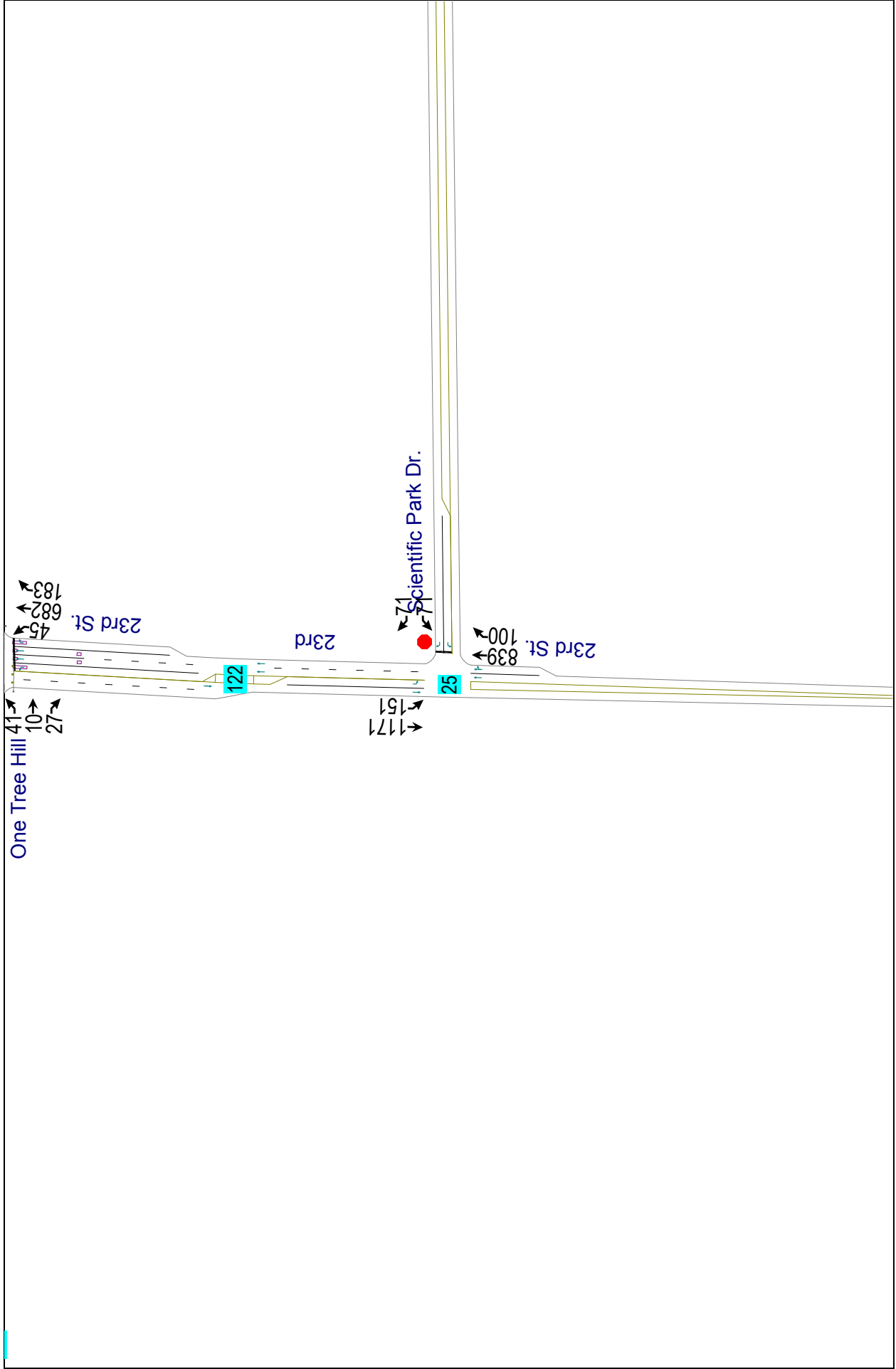
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	432.4	48.5	24.3	74.3	231.8	178.3	322.9	346.5	20.1	292.2	98.1	223.0
LOS	F	D	C	E	F	F	F	F	C	F	F	F
Approach Delay	258.0			211.2			337.9			176.0		
Approach LOS	F			F			F			F		
Queue Length 50th (ft)	~2167	547	283	28	~472	~430	~433	~1613	23	~377	~742	~2396
Queue Length 95th (ft)	#2275	561	375	66	#568	#677	#557	#1684	49	#498	#836	#2656
Internal Link Dist (ft)	974			1017			757			1073		
Turn Bay Length (ft)	350		525	375		675	375		300	350		575
Base Capacity (vph)	1241	2273	772	186	604	325	318	1524	642	299	1496	1044
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.89	0.62	0.62	0.14	1.37	1.26	1.58	1.68	0.07	1.50	1.05	1.44

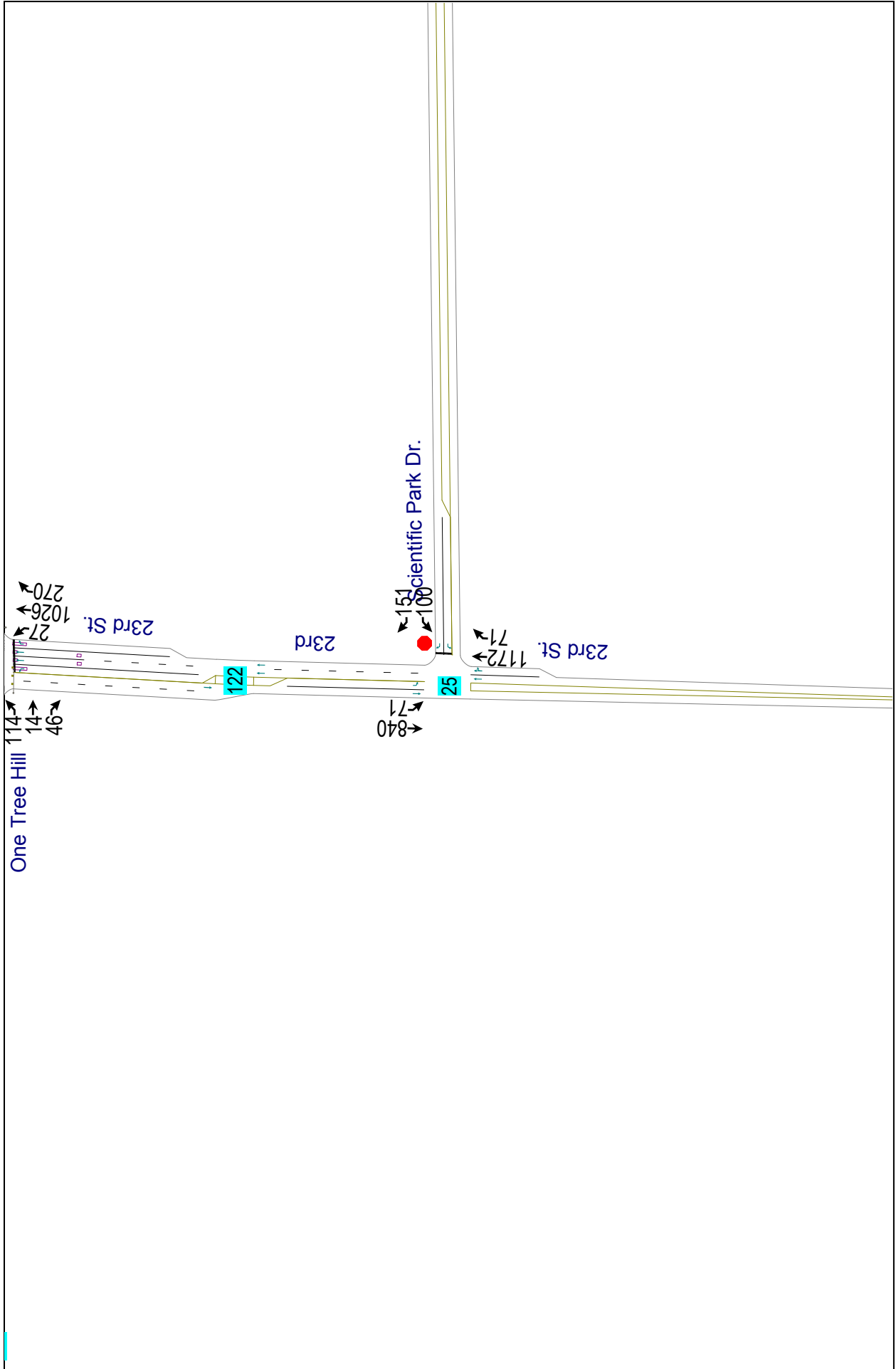
**Intersection Summary**

Area Type: Other  
 Cycle Length: 180  
 Actuated Cycle Length: 180  
 Natural Cycle: 180  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.89  
 Intersection Signal Delay: 249.7  
 Intersection LOS: F  
 Intersection Capacity Utilization 147.3%  
 ICU Level of Service H  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 24: US 74 (MLK Pkwy.) & NC 132 (College Rd.)









U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	71	71	839	100	151	1171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0		100	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25	25		25	25	
Satd. Flow (prot)	1752	1568	3449	0	1752	1845
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1752	1568	3449	0	1752	1845
Link Speed (mph)	35		45			45
Link Distance (ft)	1155		1029			313
Travel Time (s)	22.5		15.6			4.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	79	79	1043	0	168	1301
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	72.2%
	ICU Level of Service C
Analysis Period (min)	15

25: Scientific Park Dr. & 23rd St.  
 2040 Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 10/1/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	71	71	839	100	151	1171
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	79	79	932	111	168	1301
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						666
pX, platoon unblocked	0.18					
vC, conflicting volume	2624	522			1043	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	7662	522			1043	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	84			74	
cM capacity (veh/h)	0	497			656	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	79	79	621	422	168	1301
Volume Left	79	0	0	0	168	0
Volume Right	0	79	0	111	0	0
cSH	0	497	1700	1700	656	1700
Volume to Capacity	Err	0.16	0.37	0.25	0.26	0.77
Queue Length 95th (ft)	Err	14	0	0	25	0
Control Delay (s)	Err	13.6	0.0	0.0	12.4	0.0
Lane LOS	F	B			B	
Approach Delay (s)	5006.3		0.0		1.4	
Approach LOS	F					

Intersection Summary						
Average Delay			296.6			
Intersection Capacity Utilization			72.2%		ICU Level of Service	C
Analysis Period (min)			15			

25: Scientific Park Dr. & 23rd St.  
 2040 Build AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	100	151	1172	71	71	840
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200	0		100	200	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25	25		25	25	
Satd. Flow (prot)	1752	1568	3473	0	1752	1845
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1752	1568	3473	0	1752	1845
Link Speed (mph)	35		45			45
Link Distance (ft)	1155		1029			313
Travel Time (s)	22.5		15.6			4.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	111	168	1381	0	79	933
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	56.4%
	ICU Level of Service B
Analysis Period (min)	15

25: Scientific Park Dr. & 23rd St.  
 2040 Build PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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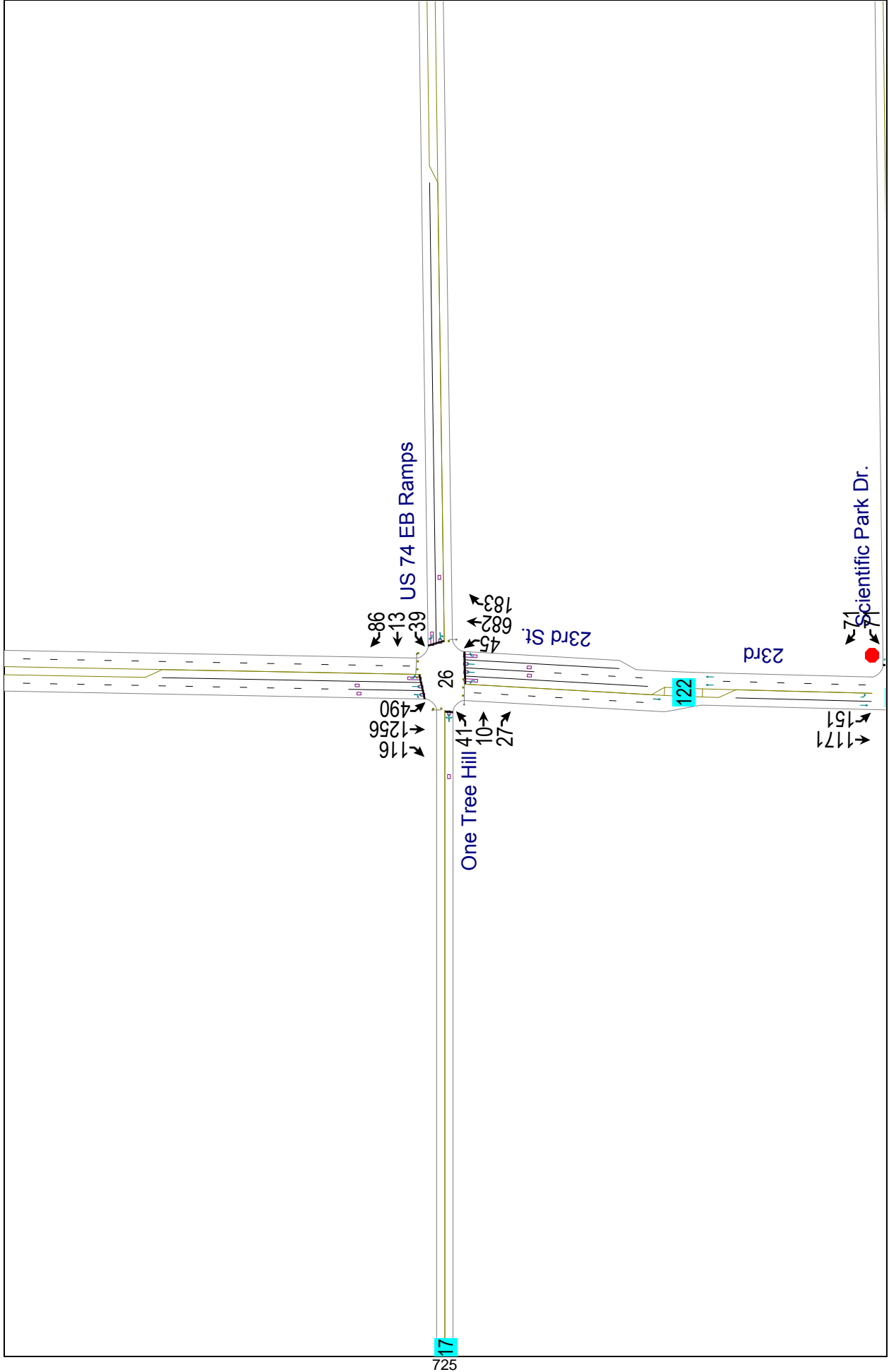


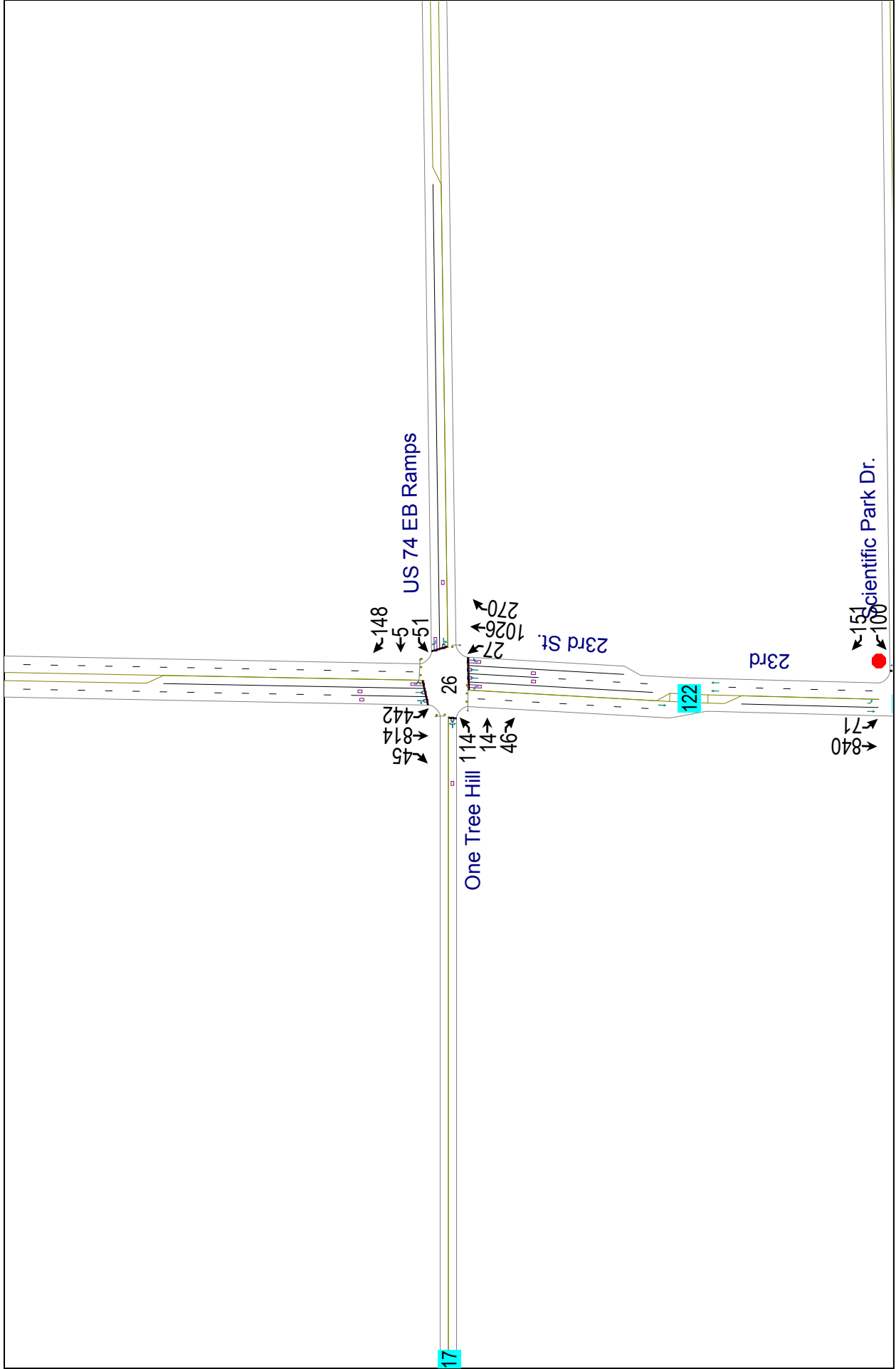
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	100	151	1172	71	71	840
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	111	168	1302	79	79	933
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						666
pX, platoon unblocked	0.81					
vC, conflicting volume	2433	691			1381	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2648	691			1381	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	56			84	
cM capacity (veh/h)	13	385			487	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	111	168	868	513	79	933
Volume Left	111	0	0	0	79	0
Volume Right	0	168	0	79	0	0
cSH	13	385	1700	1700	487	1700
Volume to Capacity	8.86	0.44	0.51	0.30	0.16	0.55
Queue Length 95th (ft)	Err	54	0	0	14	0
Control Delay (s)	Err	21.4	0.0	0.0	13.8	0.0
Lane LOS	F	C			B	
Approach Delay (s)	3996.5		0.0		1.1	
Approach LOS	F					

Intersection Summary						
Average Delay			417.5			
Intersection Capacity Utilization			56.4%		ICU Level of Service	B
Analysis Period (min)			15			

25: Scientific Park Dr. & 23rd St.  
 2040 Build PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Volume (vph)	41	10	27	39	13	86	45	682	183	490	1256	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	675		0	275		225	375		0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1696	0	0	1778	1568	1752	3505	1568	1752	3459	0
Flt Permitted		0.804			0.716		0.169			0.950		
Satd. Flow (perm)	0	1400	0	0	1321	1568	312	3505	1568	1752	3459	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		994			1050			353			1120	
Travel Time (s)		19.4			28.6			5.3			17.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	87	0	0	57	96	50	758	203	544	1525	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm		pm+ov	Perm		Perm		Prot	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6		6			
Detector Phase	8	8		4	4	5	6	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	19.0	19.0	19.0	14.0	19.0	
Total Split (s)	16.0	16.0	0.0	16.0	16.0	49.0	45.0	45.0	45.0	49.0	94.0	0.0
Total Split (%)	14.5%	14.5%	0.0%	14.5%	14.5%	44.5%	40.9%	40.9%	40.9%	44.5%	85.5%	0.0%
Maximum Green (s)	9.0	9.0		9.0	9.0	42.0	38.0	38.0	38.0	42.0	87.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag						Lead	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		10.6			10.6	52.5	47.5	47.5	47.5	39.7	93.2	
Actuated g/C Ratio		0.10			0.10	0.48	0.43	0.43	0.43	0.36	0.85	
v/c Ratio		0.64			0.45	0.13	0.37	0.50	0.30	0.86	0.52	
Control Delay		69.8			58.5	14.2	36.4	26.2	24.7	29.5	1.2	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	

26: One Tree Hill & 23rd St.  
2040 Build AM Peak

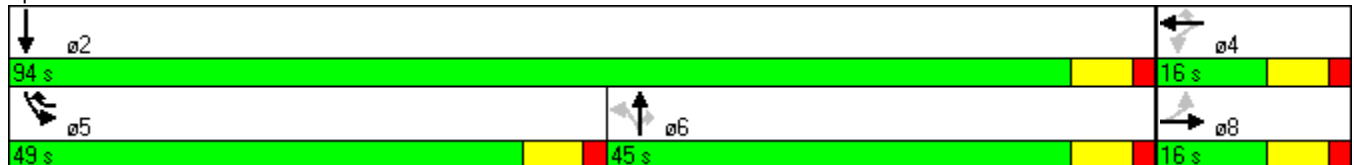


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		69.8			58.5	14.2	36.4	26.2	24.7	29.5	1.2	
LOS		E			E	B	D	C	C	C	A	
Approach Delay		69.8			30.7			26.4			8.6	
Approach LOS		E			C			C			A	
Queue Length 50th (ft)		60			38	33	25	217	100	235	10	
Queue Length 95th (ft)		#130			81	58	70	290	167	m235	m11	
Internal Link Dist (ft)		914			970			273			1040	
Turn Bay Length (ft)							275		225	375		
Base Capacity (vph)		140			132	809	135	1513	677	701	2931	
Starvation Cap Reductn		0			0	0	0	0	0	0	0	
Spillback Cap Reductn		0			0	0	0	0	0	0	0	
Storage Cap Reductn		0			0	0	0	0	0	0	0	
Reduced v/c Ratio		0.62			0.43	0.12	0.37	0.50	0.30	0.78	0.52	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 80 (73%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.86  
 Intersection Signal Delay: 16.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 72.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: One Tree Hill & 23rd St.





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕	↗	↖	↕	↗	↖	↕	↗
Volume (vph)	114	14	46	51	5	148	27	1026	270	442	814	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	675		0	275		225	375		0
Storage Lanes	0		0	1		1	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	1707	0	0	1765	1568	1752	3505	1568	1752	3477	0
Flt Permitted		0.764			0.658		0.300			0.950		
Satd. Flow (perm)	0	1347	0	0	1214	1568	553	3505	1568	1752	3477	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			25			45			45	
Link Distance (ft)		994			1050			353			1120	
Travel Time (s)		19.4			28.6			5.3			17.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	194	0	0	63	164	30	1140	300	491	954	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm		pm+ov	Perm		Perm		Prot	
Protected Phases		8			4	5		6		5	2	
Permitted Phases	8			4		4	6		6			
Detector Phase	8	8		4	4	5	6	6	6	5	2	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	12.0	12.0	12.0	7.0	12.0	
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	19.0	19.0	19.0	14.0	19.0	
Total Split (s)	19.0	19.0	0.0	19.0	19.0	33.0	38.0	38.0	38.0	33.0	71.0	0.0
Total Split (%)	21.1%	21.1%	0.0%	21.1%	21.1%	36.7%	42.2%	42.2%	42.2%	36.7%	78.9%	0.0%
Maximum Green (s)	12.0	12.0		12.0	12.0	26.0	31.0	31.0	31.0	26.0	64.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag						Lead	Lag	Lag	Lag	Lag	Lead	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)		14.0			14.0	46.5	33.5	33.5	33.5	27.5	66.0	
Actuated g/C Ratio		0.16			0.16	0.52	0.37	0.37	0.37	0.31	0.73	
v/c Ratio		0.92			0.33	0.20	0.15	0.87	0.51	0.92	0.37	
Control Delay		85.1			39.4	12.4	21.5	35.5	26.0	38.0	0.7	
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	

26: One Tree Hill & 23rd St.  
2040 Build PM Peak

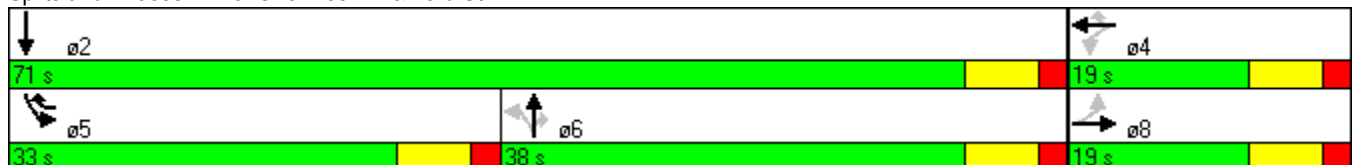


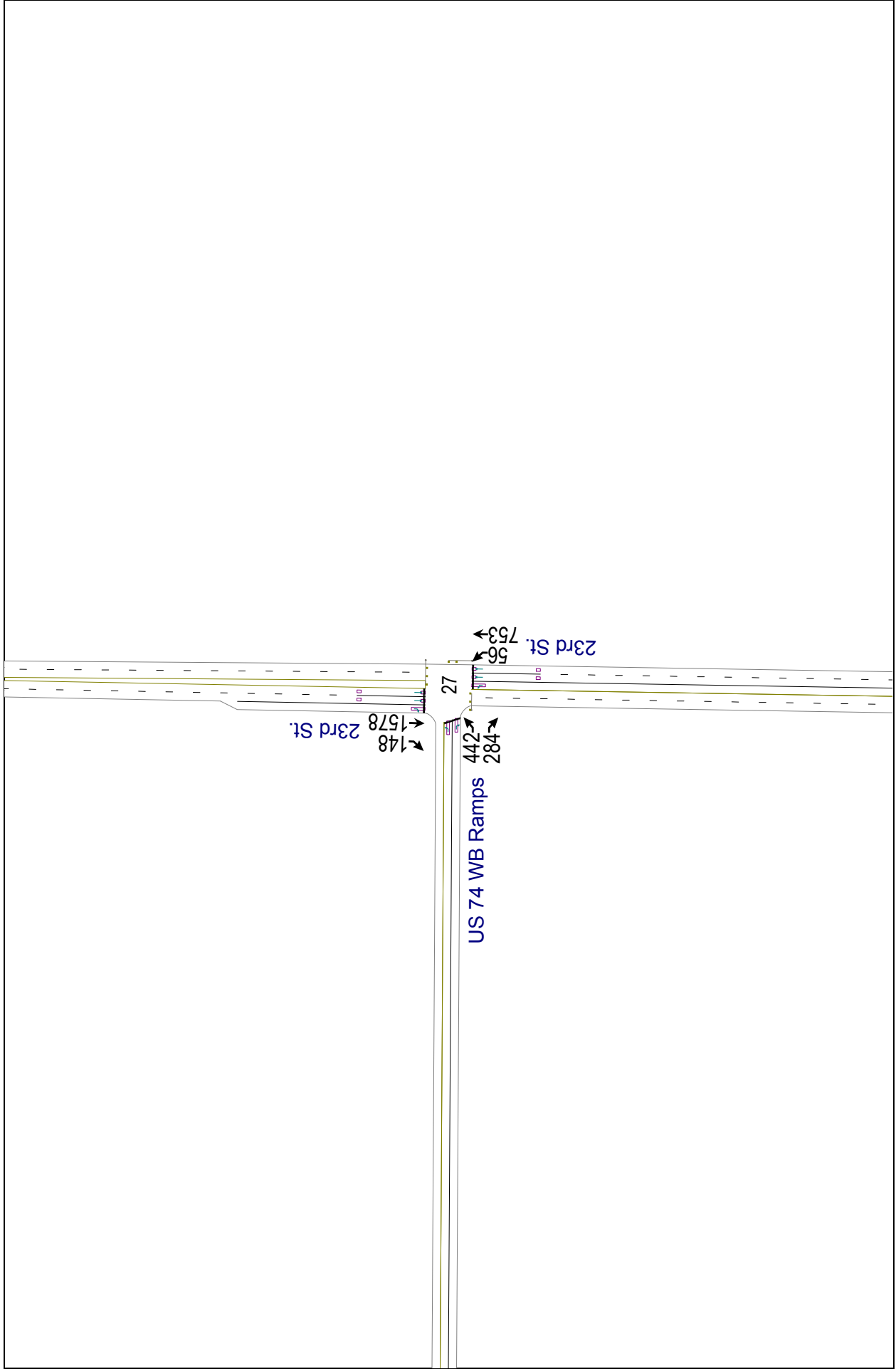
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		85.1			39.4	12.4	21.5	35.5	26.0	38.0		0.7
LOS		F			D	B	C	D	C	D		A
Approach Delay		85.1			19.9			33.3				13.4
Approach LOS		F			B			C				B
Queue Length 50th (ft)		110			32	47	11	315	131	111		9
Queue Length 95th (ft)		#239			71	83	32	#440	211	m#260		m11
Internal Link Dist (ft)		914			970			273				1040
Turn Bay Length (ft)							275		225	375		
Base Capacity (vph)		210			189	819	206	1305	584	545		2550
Starvation Cap Reductn		0			0	0	0	0	0	0		0
Spillback Cap Reductn		0			0	0	0	0	0	0		0
Storage Cap Reductn		0			0	0	0	0	0	0		0
Reduced v/c Ratio		0.92			0.33	0.20	0.15	0.87	0.51	0.90		0.37

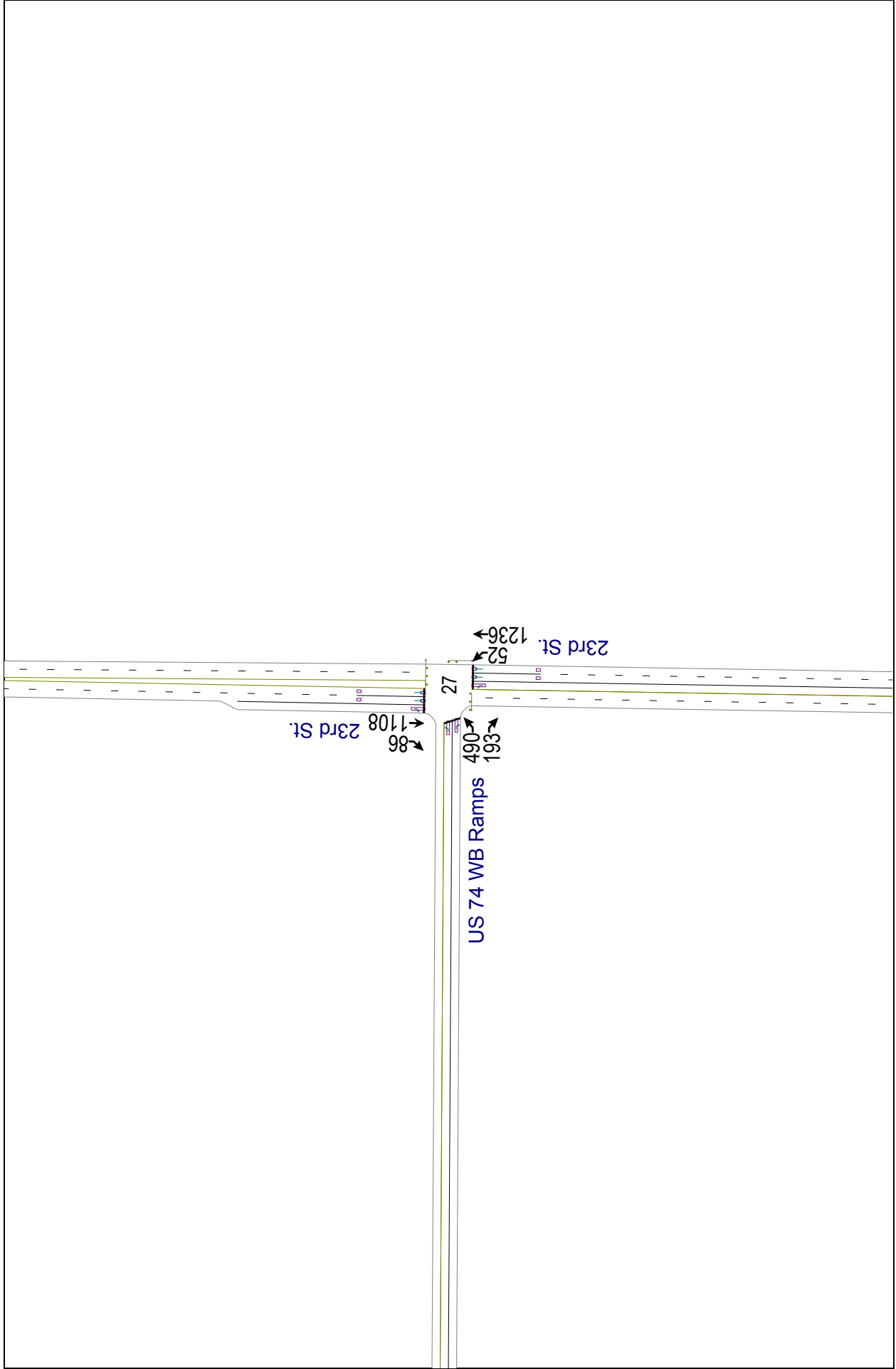
**Intersection Summary**

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 62 (69%), Referenced to phase 2:SBT and 6:NBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 26.8 Intersection LOS: C  
 Intersection Capacity Utilization 81.9% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 26: One Tree Hill & 23rd St.







U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	442	284	56	753	1578	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	975	0	700			275
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Satd. Flow (prot)	1752	1568	1752	3505	3505	1568
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1752	1568	1752	3505	3505	1568
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	25			45	45	
Link Distance (ft)	1174			1083	1057	
Travel Time (s)	32.0			16.4	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	491	316	62	837	1753	164
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8				2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	35.0	14.0	14.0	75.0	61.0	35.0
Total Split (%)	31.8%	12.7%	12.7%	68.2%	55.5%	31.8%
Maximum Green (s)	28.0	7.0	7.0	68.0	54.0	28.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	30.0	44.0	9.0	70.0	56.0	91.0
Actuated g/C Ratio	0.27	0.40	0.08	0.64	0.51	0.83
v/c Ratio	1.03	0.50	0.43	0.38	0.98	0.13
Control Delay	88.5	28.3	47.1	2.5	44.7	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

27: US 74 WB Ramps & 23rd St.  
2040 Build AM Peak



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	88.5	28.3	47.1	2.5	44.7	2.1
LOS	F	C	D	A	D	A
Approach Delay	64.9			5.6	41.1	
Approach LOS	E			A	D	
Queue Length 50th (ft)	~371	165	46	11	616	17
Queue Length 95th (ft)	#576	251	m90	13	#806	28
Internal Link Dist (ft)	1094			1003	977	
Turn Bay Length (ft)	975		700			275
Base Capacity (vph)	478	627	143	2230	1784	1297
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.50	0.43	0.38	0.98	0.13

**Intersection Summary**

Area Type: Other  
 Cycle Length: 110  
 Actuated Cycle Length: 110  
 Offset: 104 (95%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.03  
 Intersection Signal Delay: 37.6  
 Intersection LOS: D  
 Intersection Capacity Utilization 79.4%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 27: US 74 WB Ramps & 23rd St.



27: US 74 WB Ramps & 23rd St.  
 2040 Build AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	490	193	52	1236	1108	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	975	0	700			275
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Satd. Flow (prot)	1752	1568	1752	3505	3505	1568
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1752	1568	1752	3505	3505	1568
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	25			45	45	
Link Distance (ft)	1174			1083	1057	
Travel Time (s)	32.0			16.4	16.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	544	214	58	1373	1231	96
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type		pm+ov	Prot			pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8				2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	36.0	14.0	14.0	54.0	40.0	36.0
Total Split (%)	40.0%	15.6%	15.6%	60.0%	44.4%	40.0%
Maximum Green (s)	29.0	7.0	7.0	47.0	33.0	29.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	30.4	44.4	9.0	49.6	35.6	71.0
Actuated g/C Ratio	0.34	0.49	0.10	0.55	0.40	0.79
v/c Ratio	0.92	0.28	0.33	0.71	0.89	0.08
Control Delay	52.0	14.4	27.8	4.5	35.0	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0

27: US 74 WB Ramps & 23rd St.  
2040 Build PM Peak

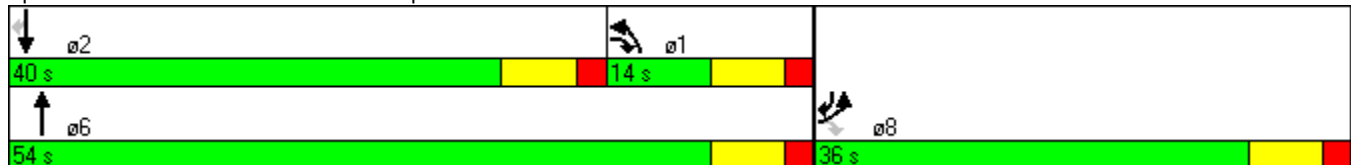


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay	52.0	14.4	27.8	4.5	35.0	2.3
LOS	D	B	C	A	C	A
Approach Delay	41.4			5.5	32.6	
Approach LOS	D			A	C	
Queue Length 50th (ft)	290	67	32	44	340	9
Queue Length 95th (ft)	#486	113	m41	m63	#474	18
Internal Link Dist (ft)	1094			1003	977	
Turn Bay Length (ft)	975		700			275
Base Capacity (vph)	603	773	175	1933	1388	1231
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.28	0.33	0.71	0.89	0.08

**Intersection Summary**

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 23.5 Intersection LOS: C  
 Intersection Capacity Utilization 76.1% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

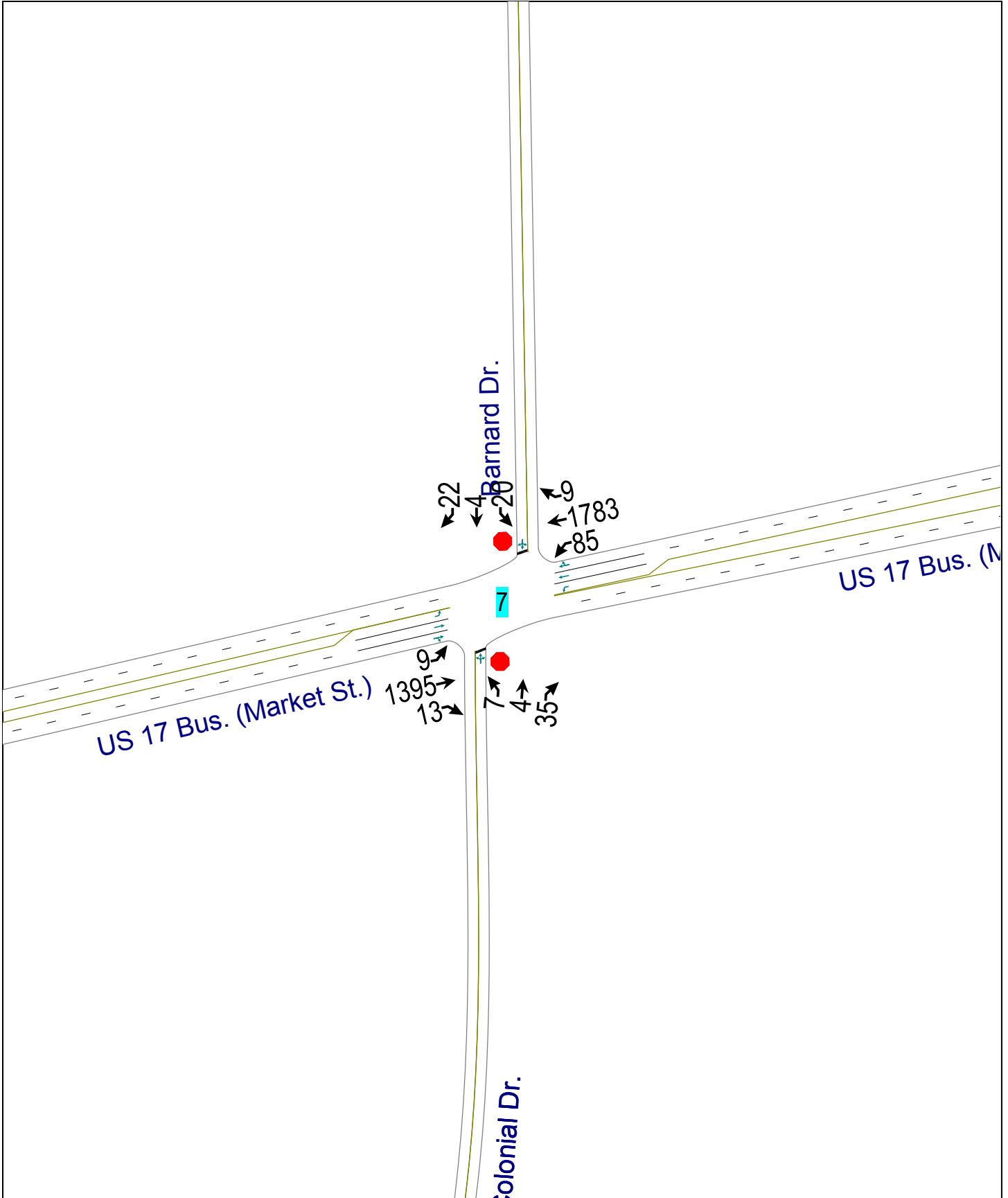
Splits and Phases: 27: US 74 WB Ramps & 23rd St.

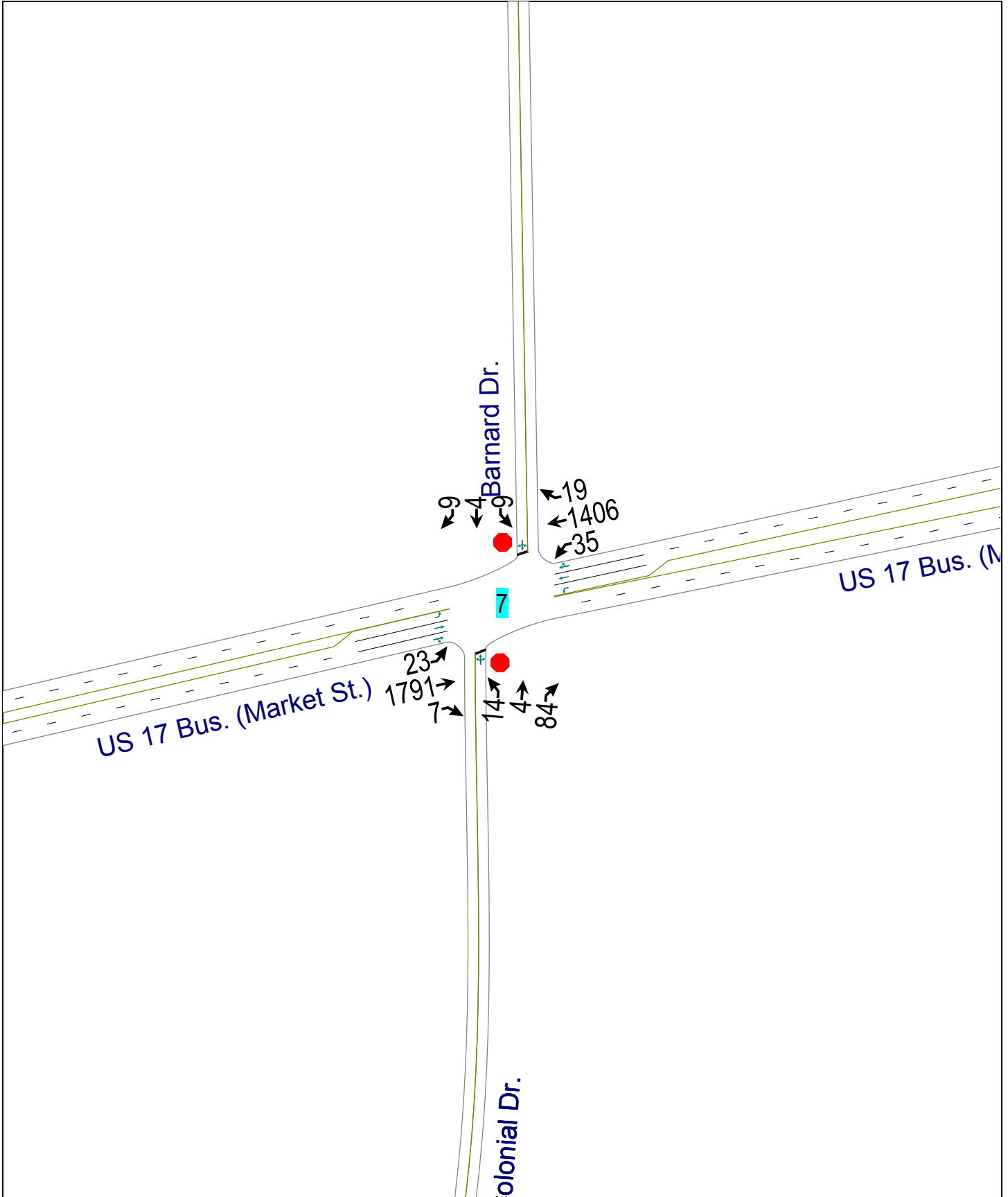




## Build Alternative 2, Quadrant AC

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U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	1395	13	85	1783	9	7	4	35	20	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Flt Permitted	0.950			0.950				0.992			0.978	
Satd. Flow (perm)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		870			861			978			871	
Travel Time (s)		16.9			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1564	0	94	1991	0	0	51	0	0	50	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.0%
ICU Level of Service	C
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 2 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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 9/27/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	1395	13	85	1783	9	7	4	35	20	4	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1550	14	94	1981	10	8	4	39	22	4	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1010			861							
pX, platoon unblocked	0.52			0.75			0.65	0.65	0.75	0.65	0.65	0.52
vC, conflicting volume	1991			1564			2783	3757	782	3011	3759	996
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1067			1079			911	2413	32	1263	2417	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			80			92	73	95	57	73	96
cM capacity (veh/h)	339			480			94	16	773	52	16	566

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	10	1033	531	94	1321	670	51	51
Volume Left	10	0	0	94	0	0	8	22
Volume Right	0	0	14	0	0	10	39	24
cSH	339	1700	1700	480	1700	1700	126	68
Volume to Capacity	0.03	0.61	0.31	0.20	0.78	0.39	0.41	0.75
Queue Length 95th (ft)	2	0	0	18	0	0	43	86
Control Delay (s)	16.0	0.0	0.0	14.3	0.0	0.0	51.8	145.8
Lane LOS	C			B			F	F
Approach Delay (s)	0.1			0.6			51.8	145.8
Approach LOS							F	F

Intersection Summary		
Average Delay		3.1
Intersection Capacity Utilization	69.0%	ICU Level of Service C
Analysis Period (min)		15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 2 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1791	7	35	1406	19	14	4	84	9	4	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Flt Permitted	0.950			0.950				0.993			0.980	
Satd. Flow (perm)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		870			861			978			871	
Travel Time (s)		16.9			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1998	0	39	1583	0	0	113	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

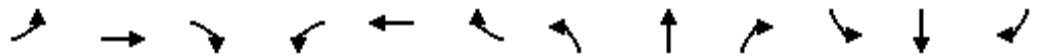
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 2 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	1791	7	35	1406	19	14	4	84	9	4	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	1990	8	39	1562	21	16	4	93	10	4	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (ft)	1010					861						
pX, platoon unblocked	0.77			0.64			0.75	0.75	0.64	0.75	0.75	0.77
vC, conflicting volume	1583			1998			2916	3706	999	2792	3699	792
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1163			1424			1516	2568	0	1351	2560	136
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			87			62	72	86	79	72	99
cM capacity (veh/h)	460			301			41	16	690	48	16	684

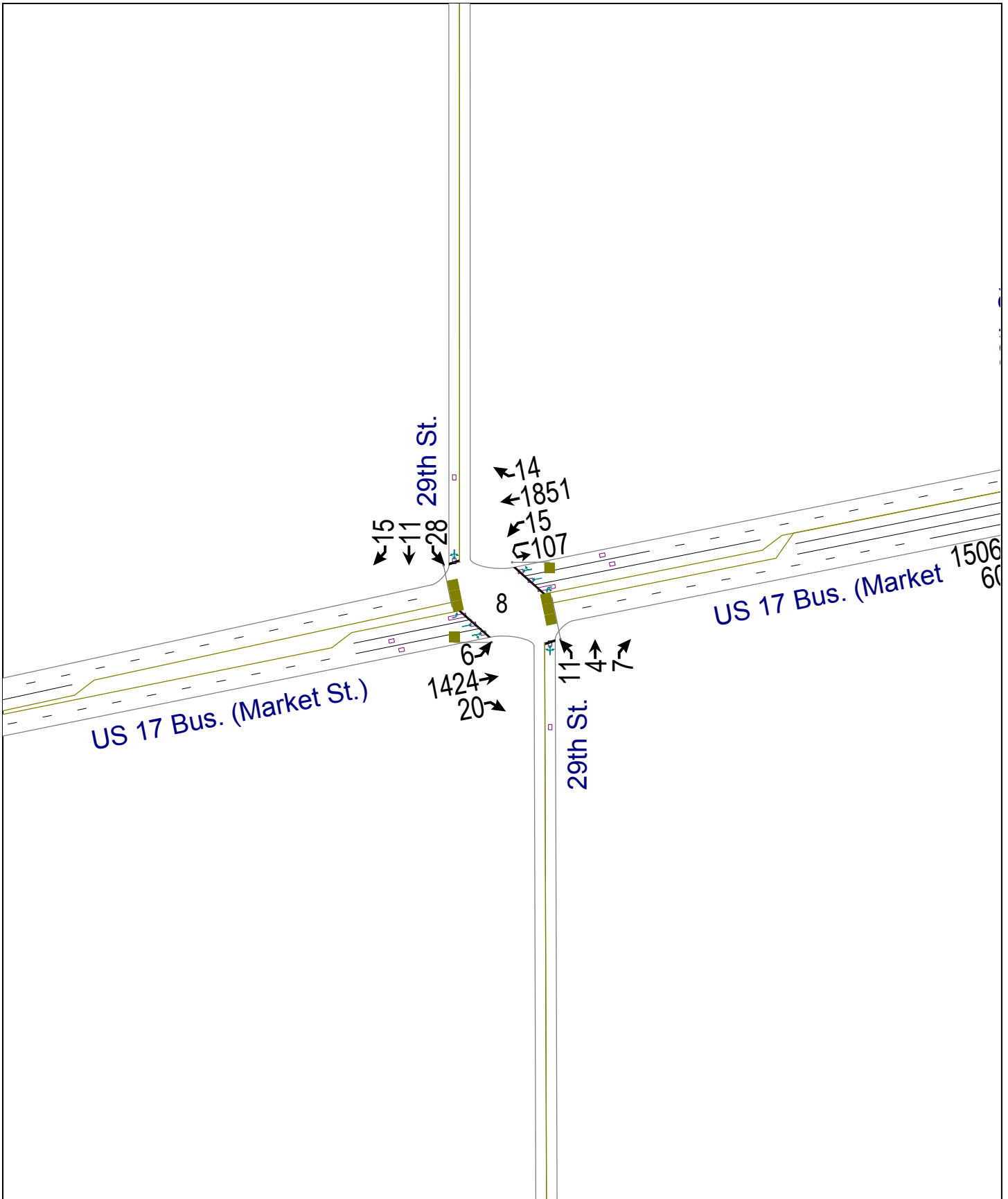
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	26	1327	671	39	1041	542	113	24
Volume Left	26	0	0	39	0	0	16	10
Volume Right	0	0	8	0	0	21	93	10
cSH	460	1700	1700	301	1700	1700	143	49
Volume to Capacity	0.06	0.78	0.39	0.13	0.61	0.32	0.79	0.50
Queue Length 95th (ft)	4	0	0	11	0	0	123	47
Control Delay (s)	13.3	0.0	0.0	18.7	0.0	0.0	88.9	137.0
Lane LOS	B			C			F	F
Approach Delay (s)	0.2			0.4			88.9	137.0
Approach LOS							F	F

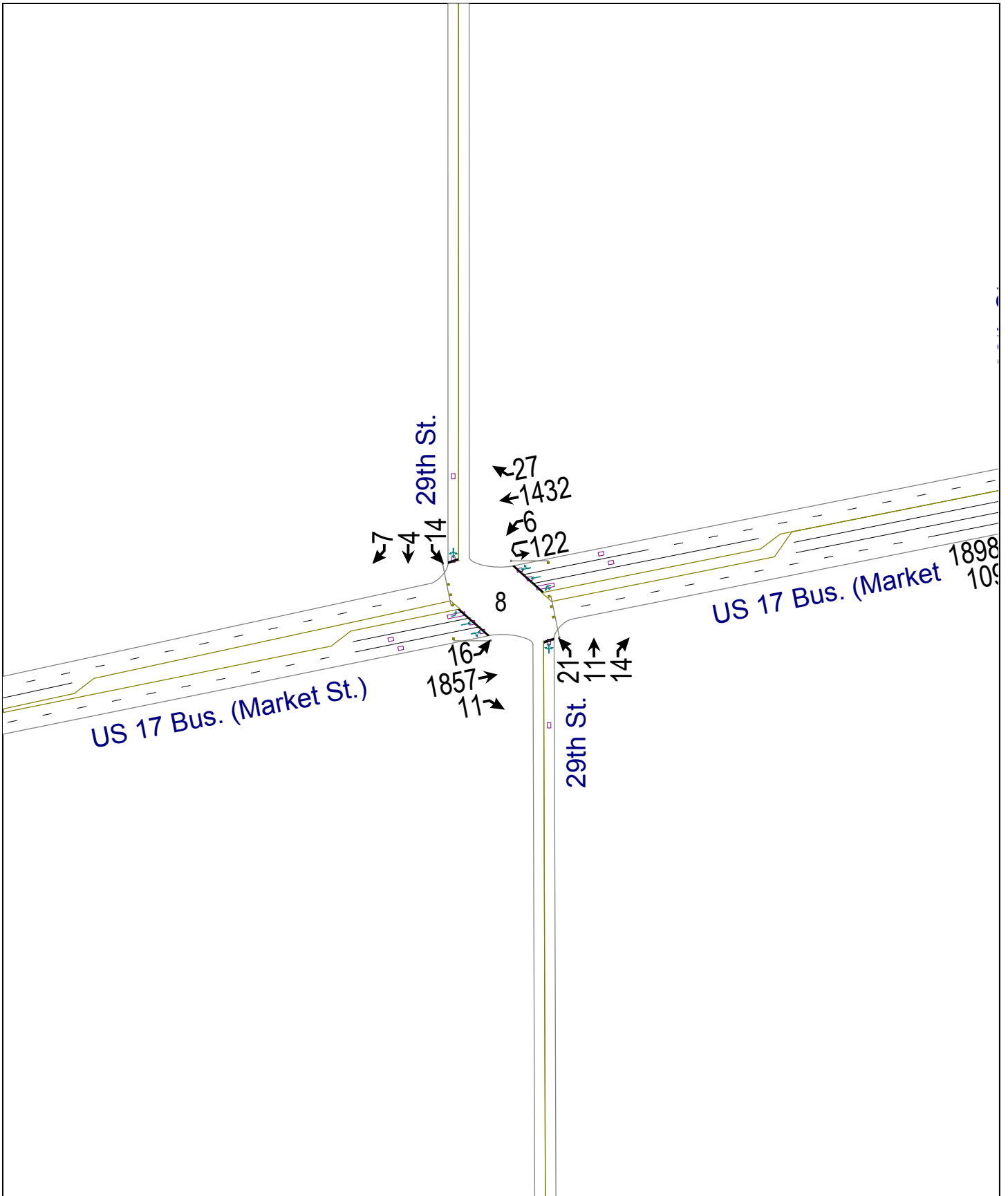
**Intersection Summary**

Average Delay	3.8
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 2 Quad AC PM Peak

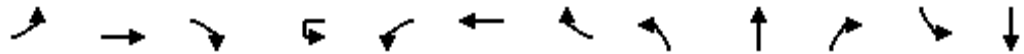






U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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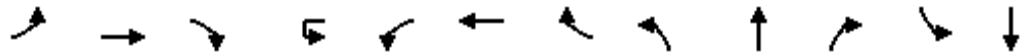


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	6	1424	20	107	15	1851	14	11	4	7	28	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0		225		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3532	0	0	1770	3536	0	0	1736	0	0	1730
Flt Permitted	0.070				0.950				0.976			0.975
Satd. Flow (perm)	130	3532	0	0	1770	3536	0	0	1736	0	0	1730
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			25			25
Link Distance (ft)		861				630			952			799
Travel Time (s)		14.7				10.7			26.0			21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1604	0	0	136	2073	0	0	24	0	0	60
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			0			0
Link Offset(ft)		0				0			48			48
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	71.0	71.0	0.0	21.0	21.0	92.0	0.0	14.0	14.0	0.0	14.0	14.0
Total Split (%)	59.2%	59.2%	0.0%	17.5%	17.5%	76.7%	0.0%	11.7%	11.7%	0.0%	11.7%	11.7%
Maximum Green (s)	64.0	64.0		14.0	14.0	85.0		7.0	7.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	75.8	75.8			14.6	96.4			9.0			9.0
Actuated g/C Ratio	0.63	0.63			0.12	0.80			0.08			0.08
v/c Ratio	0.09	0.72			0.63	0.73			0.18			0.46
Control Delay	12.8	12.5			64.1	4.0			55.7			65.2
Queue Delay	0.0	0.0			0.0	0.1			0.0			0.0

8: US 17 Bus. (Market St.) & 29th St.  
Build Alt. 2 Quad AC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	15
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 2 Quad AC AM Peak

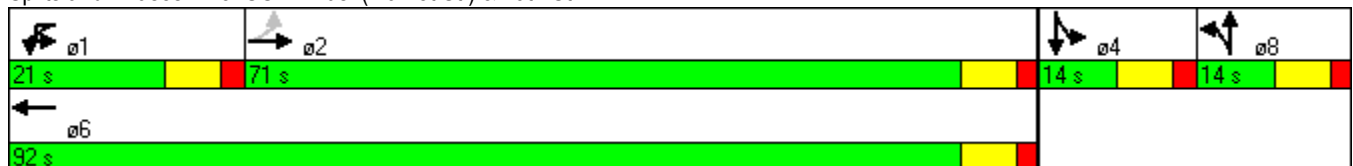


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	12.8	12.5			64.1	4.1			55.7			65.2
LOS	B	B			E	A			E			E
Approach Delay		12.5				7.8			55.7			65.2
Approach LOS		B				A			E			E
Queue Length 50th (ft)	2	243			96	124			18			45
Queue Length 95th (ft)	m4	270			m126	247			46			92
Internal Link Dist (ft)		781				550			872			719
Turn Bay Length (ft)	100				225							
Base Capacity (vph)	82	2230			236	2841			130			130
Starvation Cap Reductn	0	0			0	61			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.09	0.72			0.58	0.75			0.18			0.46

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 115 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 10.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 79.9%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: US 17 Bus. (Market St.) & 29th St.

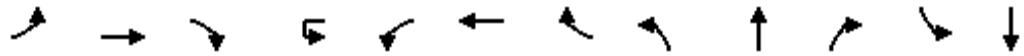




Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	16	1857	11	122	6	1432	27	21	11	14	14	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0		225		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3536	0	0	1770	3529	0	0	1745	0	0	1723
Flt Permitted	0.147				0.950				0.978			0.972
Satd. Flow (perm)	274	3536	0	0	1770	3529	0	0	1745	0	0	1723
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			25			25
Link Distance (ft)		861				630			952			799
Travel Time (s)		14.7				10.7			26.0			21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	2075	0	0	143	1621	0	0	51	0	0	28
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			0			0
Link Offset(ft)		0				0			48			48
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	77.0	77.0	0.0	15.0	15.0	92.0	0.0	14.0	14.0	0.0	14.0	14.0
Total Split (%)	64.2%	64.2%	0.0%	12.5%	12.5%	76.7%	0.0%	11.7%	11.7%	0.0%	11.7%	11.7%
Maximum Green (s)	70.0	70.0		8.0	8.0	85.0		7.0	7.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	77.5	77.5			12.8	96.3			9.1			9.0
Actuated g/C Ratio	0.65	0.65			0.11	0.80			0.08			0.08
v/c Ratio	0.10	0.91			0.76	0.57			0.39			0.22
Control Delay	9.6	18.2			79.0	2.7			61.8			56.6
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

8: US 17 Bus. (Market St.) & 29th St.  
Build Alt. 2 Quad AC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	7
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

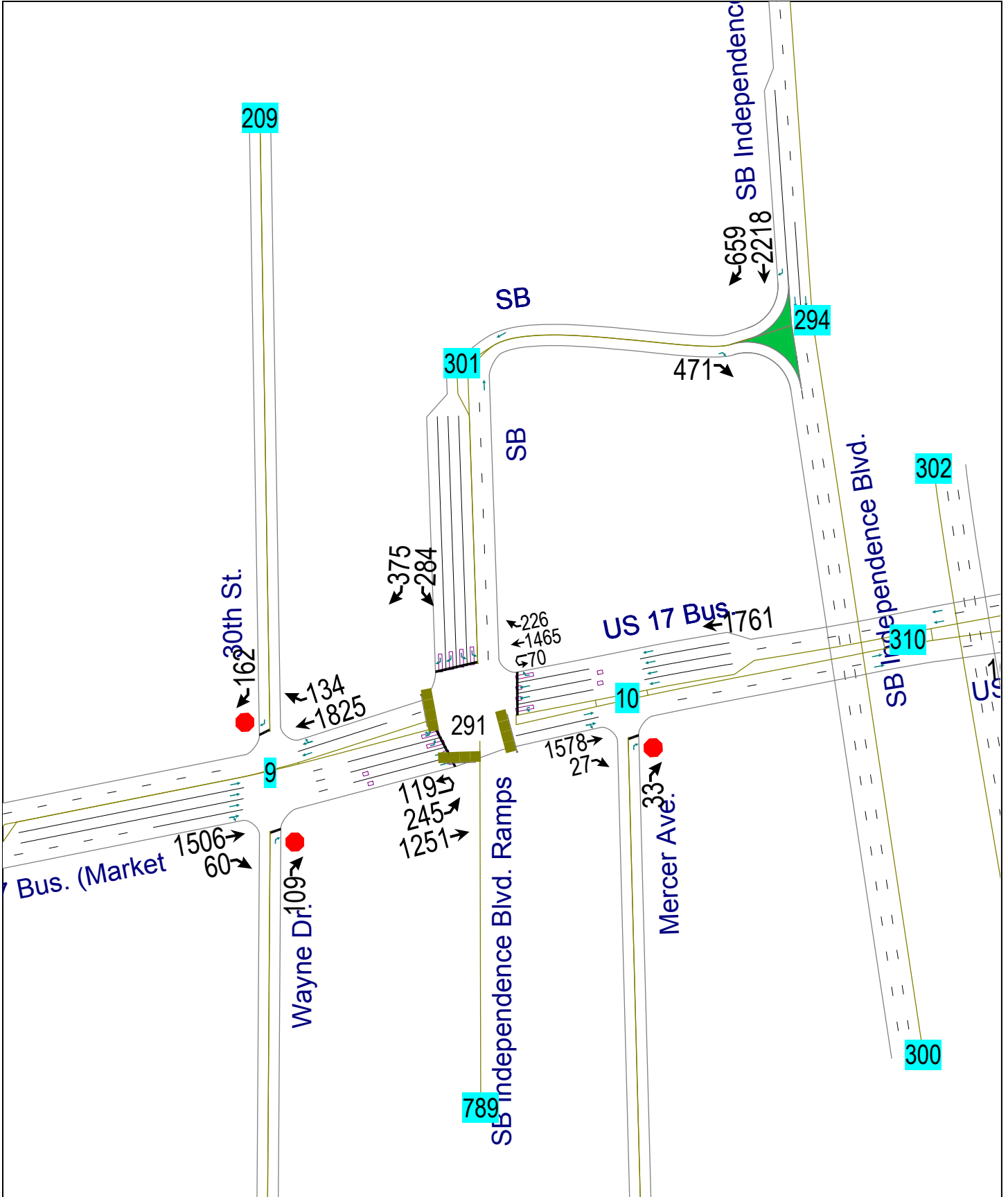
8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 2 Quad AC PM Peak

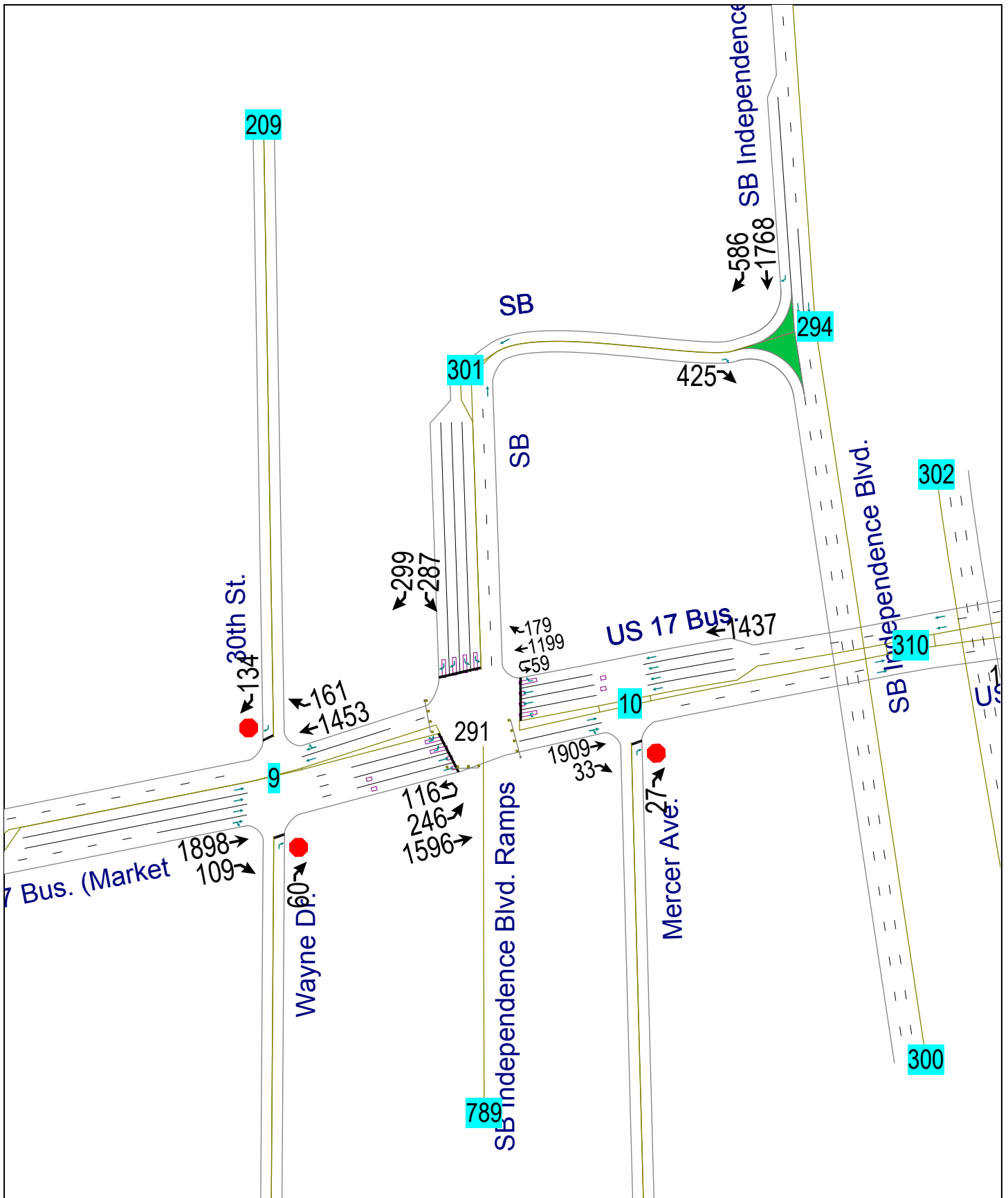






Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	





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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↗			↗
Volume (vph)	0	1506	60	0	1825	134	0	0	109	0	0	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	0		0	0		0
Storage Lanes	2		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	6369	0	0	3504	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	6369	0	0	3504	0	0	0	1611	0	0	1611
Link Speed (mph)		40			40			25				25
Link Distance (ft)		630			230			873				738
Travel Time (s)		10.7			3.9			23.8				20.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1740	0	0	2177	0	0	0	121	0	0	180
Enter Blocked Intersection	No	Yes	Yes	No	Yes	Yes	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	71.4%
Analysis Period (min)	15
	ICU Level of Service C

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 2 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↗			↗
Volume (veh/h)	0	1506	60	0	1825	134	0	0	109	0	0	162
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1673	67	0	2028	149	0	0	121	0	0	180
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		630			230							
pX, platoon unblocked	0.59						0.59	0.59		0.59	0.59	0.59
vC, conflicting volume	2177			1740			2901	3883	452	2642	3842	1088
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1595			1740			2830	4507	452	2389	4437	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	78	100	100	72
cM capacity (veh/h)	238			358			3	1	555	8	1	636

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1	SB 1
Volume Total	478	478	478	306	1352	825	121	180
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	67	0	149	121	180
cSH	1700	1700	1700	1700	1700	1700	555	636
Volume to Capacity	0.28	0.28	0.28	0.18	0.80	0.49	0.22	0.28
Queue Length 95th (ft)	0	0	0	0	0	0	21	29
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	13.3	12.9
Lane LOS							B	B
Approach Delay (s)	0.0				0.0		13.3	12.9
Approach LOS							B	B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization	71.4%		ICU Level of Service C
Analysis Period (min)		15	

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 2 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↗			↗
Volume (vph)	0	1898	109	0	1453	161	0	0	60	0	0	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	0		0	0		0
Storage Lanes	2		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	6357	0	0	3486	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	6357	0	0	3486	0	0	0	1611	0	0	1611
Link Speed (mph)		40			40			25				25
Link Distance (ft)		630			230			873				738
Travel Time (s)		10.7			3.9			23.8				20.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2230	0	0	1793	0	0	0	67	0	0	149
Enter Blocked Intersection	No	Yes	Yes	No	Yes	Yes	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.3%
ICU Level of Service	B
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 2 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↗			↗
Volume (veh/h)	0	1898	109	0	1453	161	0	0	60	0	0	134
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2109	121	0	1614	179	0	0	67	0	0	149
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		630			230							
pX, platoon unblocked	0.70						0.70	0.70		0.70	0.70	0.70
vC, conflicting volume	1793			2230			3126	3963	588	2298	3934	897
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1277			2230			3179	4375	588	1997	4333	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	85	100	100	80
cM capacity (veh/h)	378			230			2	1	452	21	1	759

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1	SB 1
Volume Total	603	603	603	422	1076	717	67	149
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	121	0	179	67	149
cSH	1700	1700	1700	1700	1700	1700	452	759
Volume to Capacity	0.35	0.35	0.35	0.25	0.63	0.42	0.15	0.20
Queue Length 95th (ft)	0	0	0	0	0	0	13	18
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	14.3	10.9
Lane LOS							B	B
Approach Delay (s)	0.0				0.0		14.3	10.9
Approach LOS							B	B

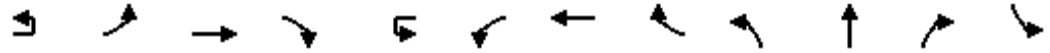
Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization	60.3%		ICU Level of Service B
Analysis Period (min)		15	

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 2 Quad AC PM Peak



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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↘↗	↑↑		↘		↑↑	↗				↘↗
Volume (vph)	119	245	1251	0	70	0	1465	226	0	0	0	284
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	0		0	275
Storage Lanes		2		0		1		1	0		0	1
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	0	3433	3539	0	1752	0	3505	1568	0	0	0	3400
Flt Permitted		0.950			0.950							0.950
Satd. Flow (perm)	0	3433	3539	0	1752	0	3505	1568	0	0	0	3400
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			45		
Link Distance (ft)			230				181			431		
Travel Time (s)			3.9				3.1			6.5		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	0%	3%	3%	0%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	404	1390	0	78	0	1628	251	0	0	0	316
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Right	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				24			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot	Prot			Prot			pm+ov				Prot
Protected Phases	5	5	2		1		6	4				4
Permitted Phases								6				
Detector Phase	5	5	2		1		6	4				4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0		7.0		12.0	7.0				7.0
Minimum Split (s)	14.0	14.0	19.0		14.0		19.0	14.0				14.0
Total Split (s)	22.0	22.0	75.0	0.0	17.0	0.0	70.0	28.0	0.0	0.0	0.0	28.0
Total Split (%)	18.3%	18.3%	62.5%	0.0%	14.2%	0.0%	58.3%	23.3%	0.0%	0.0%	0.0%	23.3%
Maximum Green (s)	15.0	15.0	68.0		10.0		63.0	21.0				21.0
Yellow Time (s)	5.0	5.0	5.0		5.0		5.0	5.0				5.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	2.0				2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	2.0	5.0	2.0	5.0	5.0	2.0	2.0	2.0	5.0
Lead/Lag	Lag	Lag	Lag		Lead		Lead					
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes					
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0				3.0
Recall Mode	None	None	C-Max		None		C-Max	None				None
Act Effct Green (s)		17.0	74.3		11.2		65.7	93.0				22.3
Actuated g/C Ratio		0.14	0.62		0.09		0.55	0.78				0.19
v/c Ratio		0.83	0.63		0.48		0.85	0.21				0.50
Control Delay		47.3	4.9		69.8		16.8	3.0				46.7
Queue Delay		0.0	0.0		0.0		0.0	0.0				0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps  
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Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	375
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		275
Storage Lanes		2
Taper Length (ft)		25
Satd. Flow (prot)	0	2760
Flt Permitted		
Satd. Flow (perm)	0	2760
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	408	
Travel Time (s)	11.1	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	3%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	417
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		custom
Protected Phases		
Permitted Phases		4
Detector Phase		4
Switch Phase		
Minimum Initial (s)		7.0
Minimum Split (s)		14.0
Total Split (s)	0.0	28.0
Total Split (%)	0.0%	23.3%
Maximum Green (s)		21.0
Yellow Time (s)		5.0
All-Red Time (s)		2.0
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		3.0
Recall Mode		None
Act Effct Green (s)		22.3
Actuated g/C Ratio		0.19
v/c Ratio		0.81
Control Delay		60.3
Queue Delay		0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps  
 Build Alt. 2 Quad AC AM Peak



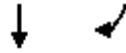
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		47.3	4.9		69.8		16.8	3.0				46.7
LOS		D	A		E		B	A				D
Approach Delay			14.5				17.2					
Approach LOS			B				B					
Queue Length 50th (ft)		161	68		60		254	28				113
Queue Length 95th (ft)		#235	77		m94		344	55				159
Internal Link Dist (ft)			150				101			351		
Turn Bay Length (ft)												275
Base Capacity (vph)		486	2191		175		1919	1211				652
Starvation Cap Reductn		0	0		0		0	0				0
Spillback Cap Reductn		0	0		0		0	0				0
Storage Cap Reductn		0	0		0		0	0				0
Reduced v/c Ratio		0.83	0.63		0.45		0.85	0.21				0.48

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 5 (4%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 22.2 Intersection LOS: C  
 Intersection Capacity Utilization 76.5% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps

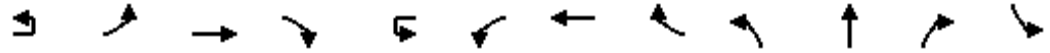




Lane Group	SBT	SBR
Total Delay		60.3
LOS		E
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		176
Queue Length 95th (ft)		#253
Internal Link Dist (ft)	328	
Turn Bay Length (ft)		275
Base Capacity (vph)		529
Starvation Cap Reductn		0
Spillback Cap Reductn		0
Storage Cap Reductn		0
Reduced v/c Ratio		0.79
<b>Intersection Summary</b>		

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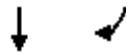


Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↖ ↗	↑ ↑		↘		↑ ↑	↗				↖ ↗
Volume (vph)	116	246	1596	0	59	0	1199	179	0	0	0	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	0		0	275
Storage Lanes		2		0		1		1	0		0	1
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	0	3433	3539	0	1752	0	3505	1568	0	0	0	3400
Flt Permitted		0.950			0.950							0.950
Satd. Flow (perm)	0	3433	3539	0	1752	0	3505	1568	0	0	0	3400
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			45		
Link Distance (ft)			230				181			431		
Travel Time (s)			3.9				3.1			6.5		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	0%	3%	3%	0%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	402	1773	0	66	0	1332	199	0	0	0	319
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				24			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot	Prot			Prot			pm+ov				Prot
Protected Phases	5	5	2		1		6	4				4
Permitted Phases								6				
Detector Phase	5	5	2		1		6	4				4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0		7.0		12.0	7.0				7.0
Minimum Split (s)	14.0	14.0	19.0		14.0		19.0	14.0				14.0
Total Split (s)	26.0	26.0	78.0	0.0	15.0	0.0	67.0	27.0	0.0	0.0	0.0	27.0
Total Split (%)	21.7%	21.7%	65.0%	0.0%	12.5%	0.0%	55.8%	22.5%	0.0%	0.0%	0.0%	22.5%
Maximum Green (s)	19.0	19.0	71.0		8.0		60.0	20.0				20.0
Yellow Time (s)	5.0	5.0	5.0		5.0		5.0	5.0				5.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	2.0				2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	2.0	5.0	2.0	5.0	5.0	2.0	2.0	2.0	5.0
Lead/Lag	Lag	Lag	Lag		Lead		Lead					
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes					
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0				3.0
Recall Mode	None	None	C-Max		None		C-Max	None				None
Act Effct Green (s)		21.0	77.6		9.9		63.7	89.0				20.3
Actuated g/C Ratio		0.18	0.65		0.08		0.53	0.74				0.17
v/c Ratio		0.67	0.77		0.46		0.72	0.17				0.55
Control Delay		32.9	3.5		69.2		14.2	3.4				49.4
Queue Delay		0.0	0.2		0.0		0.0	0.0				0.0

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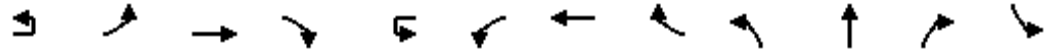


Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	299
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		275
Storage Lanes		2
Taper Length (ft)		25
Satd. Flow (prot)	0	2760
Flt Permitted		
Satd. Flow (perm)	0	2760
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	408	
Travel Time (s)	11.1	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	3%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	332
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		custom
Protected Phases		
Permitted Phases		4
Detector Phase		4
Switch Phase		
Minimum Initial (s)		7.0
Minimum Split (s)		14.0
Total Split (s)	0.0	27.0
Total Split (%)	0.0%	22.5%
Maximum Green (s)		20.0
Yellow Time (s)		5.0
All-Red Time (s)		2.0
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		3.0
Recall Mode		None
Act Effct Green (s)		20.3
Actuated g/C Ratio		0.17
v/c Ratio		0.71
Control Delay		55.9
Queue Delay		0.0

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		32.9	3.7		69.2		14.2	3.4				49.4
LOS		C	A		E		B	A				D
Approach Delay			9.1				15.2					
Approach LOS			A				B					
Queue Length 50th (ft)		142	59		47		246	24				115
Queue Length 95th (ft)		m160	64		m92		298	45				162
Internal Link Dist (ft)			150				101			351		
Turn Bay Length (ft)												275
Base Capacity (vph)		601	2290		147		1861	1157				623
Starvation Cap Reductn		0	70		0		0	0				0
Spillback Cap Reductn		0	0		0		0	0				0
Storage Cap Reductn		0	0		0		0	0				0
Reduced v/c Ratio		0.67	0.80		0.45		0.72	0.17				0.51

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 13 (11%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 17.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 69.8%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps



291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps  
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Lane Group	SBT	SBR
Total Delay		55.9
LOS		E
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		136
Queue Length 95th (ft)		193
Internal Link Dist (ft)	328	
Turn Bay Length (ft)		275
Base Capacity (vph)		506
Starvation Cap Reductn		0
Spillback Cap Reductn		0
Storage Cap Reductn		0
Reduced v/c Ratio		0.66
<b>Intersection Summary</b>		



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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑		↗
Volume (vph)	1578	27	0	1761	0	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		0	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3529	0	0	6408	0	1611
Flt Permitted						
Satd. Flow (perm)	3529	0	0	6408	0	1611
Link Speed (mph)	40			40	25	
Link Distance (ft)	181			324	909	
Travel Time (s)	3.1			5.5	24.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1783	0	0	1957	0	37
Enter Blocked Intersection	Yes	Yes	No	Yes	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	6			6	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.5%
	ICU Level of Service A
Analysis Period (min)	15

10: US 17 Bus. (Market St.) & Mercer Ave.  
 Build Alt. 2 Quad AC AM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑		↗
Volume (veh/h)	1578	27	0	1761	0	33
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1753	30	0	1957	0	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	181			847		
pX, platoon unblocked				0.74	0.74	0.74
vC, conflicting volume				1783	2258	892
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1358	1998	154
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	94
cM capacity (veh/h)				372	39	640

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	1169	614	489	489	489	489	37
Volume Left	0	0	0	0	0	0	0
Volume Right	0	30	0	0	0	0	37
cSH	1700	1700	1700	1700	1700	1700	640
Volume to Capacity	0.69	0.36	0.29	0.29	0.29	0.29	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.0
Lane LOS							B
Approach Delay (s)	0.0		0.0				11.0
Approach LOS							B

Intersection Summary			
Average Delay			0.1
Intersection Capacity Utilization	54.5%		ICU Level of Service A
Analysis Period (min)			15

10: US 17 Bus. (Market St.) & Mercer Ave.  
 Build Alt. 2 Quad AC AM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑		↗
Volume (vph)	1909	33	0	1437	0	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		0	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3529	0	0	6408	0	1611
Flt Permitted						
Satd. Flow (perm)	3529	0	0	6408	0	1611
Link Speed (mph)	40			40	25	
Link Distance (ft)	181			324	909	
Travel Time (s)	3.1			5.5	24.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2158	0	0	1597	0	30
Enter Blocked Intersection	Yes	Yes	No	Yes	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	6			6	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	63.8%
ICU Level of Service	B
Analysis Period (min)	15

10: US 17 Bus. (Market St.) & Mercer Ave.  
 Build Alt. 2 Quad AC PM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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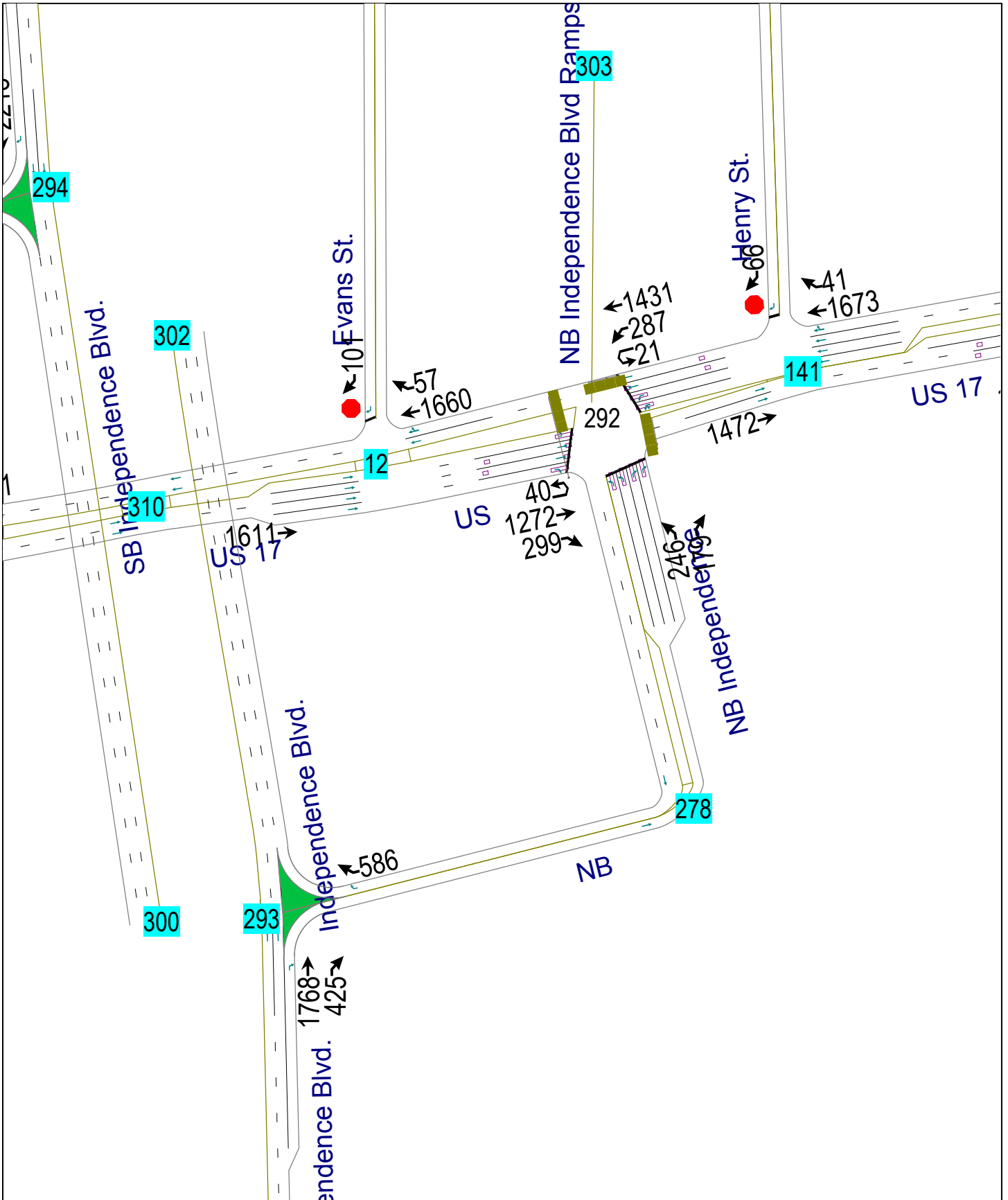


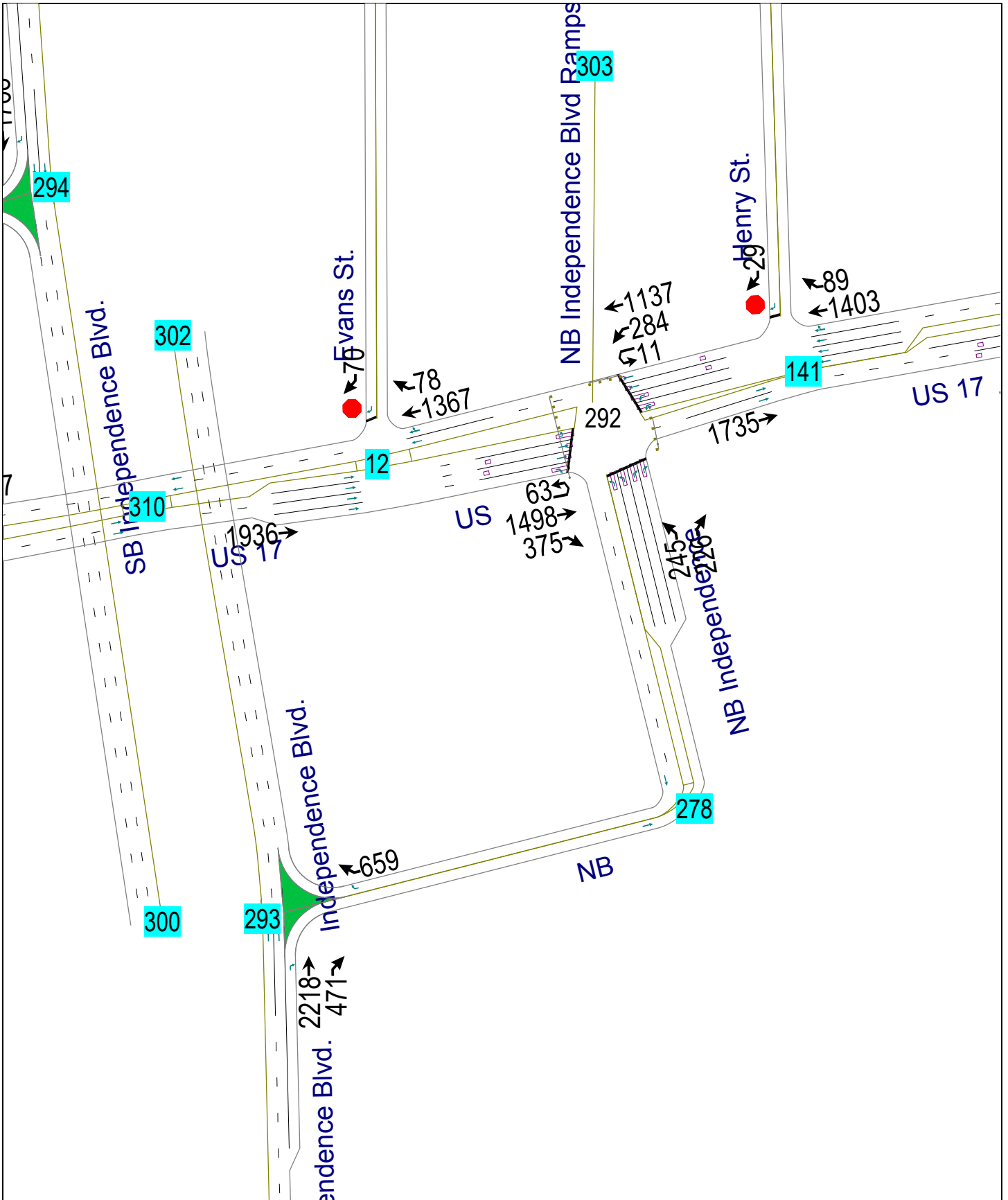
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑		↗
Volume (veh/h)	1909	33	0	1437	0	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2121	37	0	1597	0	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	181			847		
pX, platoon unblocked				0.62	0.62	0.62
vC, conflicting volume	2158			2539	1079	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1638			2254	0	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			100	96	
cM capacity (veh/h)	242			22	671	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	1414	744	399	399	399	399	30
Volume Left	0	0	0	0	0	0	0
Volume Right	0	37	0	0	0	0	30
cSH	1700	1700	1700	1700	1700	1700	671
Volume to Capacity	0.83	0.44	0.23	0.23	0.23	0.23	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.6
Lane LOS							B
Approach Delay (s)	0.0		0.0				10.6
Approach LOS							B

Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			63.8%		ICU Level of Service		B
Analysis Period (min)			15				

10: US 17 Bus. (Market St.) & Mercer Ave.  
 Build Alt. 2 Quad AC PM Peak





U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (vph)	0	1611	1660	57	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	6346	3487	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	6346	3487	0	0	1580
Link Speed (mph)		40	40		25	
Link Distance (ft)		263	260		894	
Travel Time (s)		4.5	4.4		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1790	1907	0	0	112
Enter Blocked Intersection	No	Yes	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.6%
ICU Level of Service	B
Analysis Period (min)	15

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 2 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (veh/h)	0	1611	1660	57	0	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1790	1844	63	0	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		768	260			
pX, platoon unblocked	0.72				0.72	0.72
vC, conflicting volume	1908				2324	954
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1490				2065	171
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	81
cM capacity (veh/h)	320				33	605

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1
Volume Total	448	448	448	448	1230	678	112
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	63	112
cSH	1700	1700	1700	1700	1700	1700	605
Volume to Capacity	0.26	0.26	0.26	0.26	0.72	0.40	0.19
Queue Length 95th (ft)	0	0	0	0	0	0	17
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.3
Lane LOS							B
Approach Delay (s)	0.0				0.0		12.3
Approach LOS							B

Intersection Summary							
Average Delay			0.4				
Intersection Capacity Utilization			60.6%		ICU Level of Service		B
Analysis Period (min)			15				

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 2 Quad AC AM Peak



U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↑
Volume (vph)	0	1936	1367	78	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	6346	3477	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	6346	3477	0	0	1580
Link Speed (mph)		40	40		25	
Link Distance (ft)		263	260		894	
Travel Time (s)		4.5	4.4		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2151	1606	0	0	78
Enter Blocked Intersection	No	Yes	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
ICU Level of Service	A
Analysis Period (min)	15

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 2 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (veh/h)	0	1936	1367	78	0	70
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2151	1519	87	0	78
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		768	260			
pX, platoon unblocked	0.81				0.81	0.81
vC, conflicting volume	1606				2100	803
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1277				1888	285
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	86
cM capacity (veh/h)	432				49	571

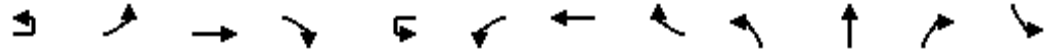
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1
Volume Total	538	538	538	538	1013	593	78
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	87	78
cSH	1700	1700	1700	1700	1700	1700	571
Volume to Capacity	0.32	0.32	0.32	0.32	0.60	0.35	0.14
Queue Length 95th (ft)	0	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.3
Lane LOS							B
Approach Delay (s)	0.0				0.0		12.3
Approach LOS							B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		51.3%	ICU Level of Service A
Analysis Period (min)		15	

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 2 Quad AC PM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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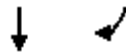


Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	40	0	1272	299	21	287	1431	0	246	0	179	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	175		175	0
Storage Lanes		0		0		0		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			260				232			453		
Travel Time (s)			4.4				4.0			12.4		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	0	1413	332	0	342	1590	0	273	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				36			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	14.0	0.0	74.0	22.0	24.0	24.0	84.0	0.0	22.0	0.0	22.0	0.0
Total Split (%)	11.7%	0.0%	61.7%	18.3%	20.0%	20.0%	70.0%	0.0%	18.3%	0.0%	18.3%	0.0%
Maximum Green (s)	7.0		67.0	15.0	17.0	17.0	77.0		15.0		15.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lag		Lead	Lead	Lead					
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	9.0		71.3	92.2			17.8	83.0	15.8		15.8	
Actuated g/C Ratio	0.08		0.59	0.77			0.15	0.69	0.13		0.13	
v/c Ratio	0.34		0.68	0.28			0.68	0.66	0.61		0.55	
Control Delay	50.8		13.3	3.5			59.7	9.3	55.2		54.5	
Queue Delay	0.0		0.1	0.0			0.0	0.2	0.0		0.0	

292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
Build Alt. 2 Quad AC AM Peak

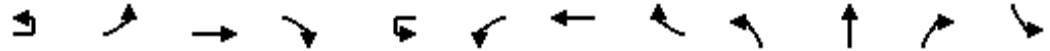
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Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	397	
Travel Time (s)	10.8	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
 Build Alt. 2 Quad AC AM Peak



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	50.8		13.4	3.5		59.7	9.5		55.2		54.5	
LOS	D		B	A		E	A		E		D	
Approach Delay			12.4				18.4					
Approach LOS			B				B					
Queue Length 50th (ft)	31		178	33		127	453		103		82	
Queue Length 95th (ft)	m56		300	52		175	213		148		125	
Internal Link Dist (ft)			180				152			373		
Turn Bay Length (ft)									175		175	
Base Capacity (vph)	131		2084	1220		538	2423		482		391	
Starvation Cap Reductn	0		0	0		0	209		0		0	
Spillback Cap Reductn	0		47	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.34		0.69	0.27		0.64	0.72		0.57		0.51	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 20.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 64.1%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps

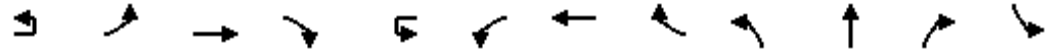




Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	317	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	63	0	1498	375	11	284	1137	0	245	0	226	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	175		175	0
Storage Lanes		0		0		0		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			260				232			453		
Travel Time (s)			4.4				4.0			12.4		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	0	1664	417	0	328	1263	0	272	0	251	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				36			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	15.0	0.0	76.0	22.0	22.0	22.0	83.0	0.0	22.0	0.0	22.0	0.0
Total Split (%)	12.5%	0.0%	63.3%	18.3%	18.3%	18.3%	69.2%	0.0%	18.3%	0.0%	18.3%	0.0%
Maximum Green (s)	8.0		69.0	15.0	15.0	15.0	76.0		15.0		15.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lead		Lag	Lag	Lead					
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	9.8		72.2	93.5		16.5	81.7		16.3		16.3	
Actuated g/C Ratio	0.08		0.60	0.78		0.14	0.68		0.14		0.14	
v/c Ratio	0.49		0.79	0.34		0.70	0.53		0.59		0.67	
Control Delay	52.5		18.4	5.6		56.9	7.1		54.2		58.7	
Queue Delay	0.0		0.4	0.0		0.0	0.1		0.0		0.0	

292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
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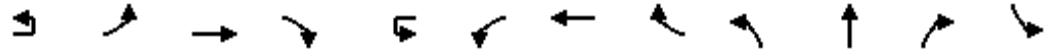
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Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	397	
Travel Time (s)	10.8	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
 Build Alt. 2 Quad AC PM Peak





Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	52.5		18.8	5.6		56.9	7.2		54.2		58.7	
LOS	D		B	A		E	A		D		E	
Approach Delay			17.3				17.5					
Approach LOS			B				B					
Queue Length 50th (ft)	51		339	99		129	178		102		105	
Queue Length 95th (ft)	m73		385	m135		m178	202		148		156	
Internal Link Dist (ft)			180				152			373		
Turn Bay Length (ft)									175		175	
Base Capacity (vph)	146		2110	1218		482	2387		482		391	
Starvation Cap Reductn	0		0	0		0	279		0		0	
Spillback Cap Reductn	0		116	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.48		0.83	0.34		0.68	0.60		0.56		0.64	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 4 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 22.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 70.2%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps



292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
 Build Alt. 2 Quad AC PM Peak



Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	317	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
<b>Intersection Summary</b>		

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (vph)	0	1472	1673	41	0	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	6320	0	0	1596
Flt Permitted						
Satd. Flow (perm)	0	3505	6320	0	0	1596
Link Speed (mph)		40	40		25	
Link Distance (ft)		232	332		767	
Travel Time (s)		4.0	5.7		20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1636	1905	0	0	73
Enter Blocked Intersection	No	Yes	Yes	Yes	No	No
Lane Alignment	Left	Left	Right	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		24	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.0%
Analysis Period (min)	15
	ICU Level of Service A

141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 2 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (veh/h)	0	1472	1673	41	0	66
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1636	1859	46	0	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		232	332			
pX, platoon unblocked					0.72	
vC, conflicting volume	1904				2699	488
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1904				2583	488
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	86
cM capacity (veh/h)	304				15	523

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	818	818	531	531	531	311	73
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	46	73
cSH	1700	1700	1700	1700	1700	1700	523
Volume to Capacity	0.48	0.48	0.31	0.31	0.31	0.18	0.14
Queue Length 95th (ft)	0	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	13.0
Lane LOS							B
Approach Delay (s)	0.0		0.0				13.0
Approach LOS							B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization	44.0%		ICU Level of Service A
Analysis Period (min)		15	

141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 2 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (vph)	0	1735	1403	89	0	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	6289	0	0	1596
Flt Permitted						
Satd. Flow (perm)	0	3505	6289	0	0	1596
Link Speed (mph)		40	40		25	
Link Distance (ft)		232	332		767	
Travel Time (s)		4.0	5.7		20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1928	1658	0	0	32
Enter Blocked Intersection	No	Yes	Yes	Yes	No	No
Lane Alignment	Left	Left	Right	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		24	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
ICU Level of Service	A
Analysis Period (min)	15

141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 2 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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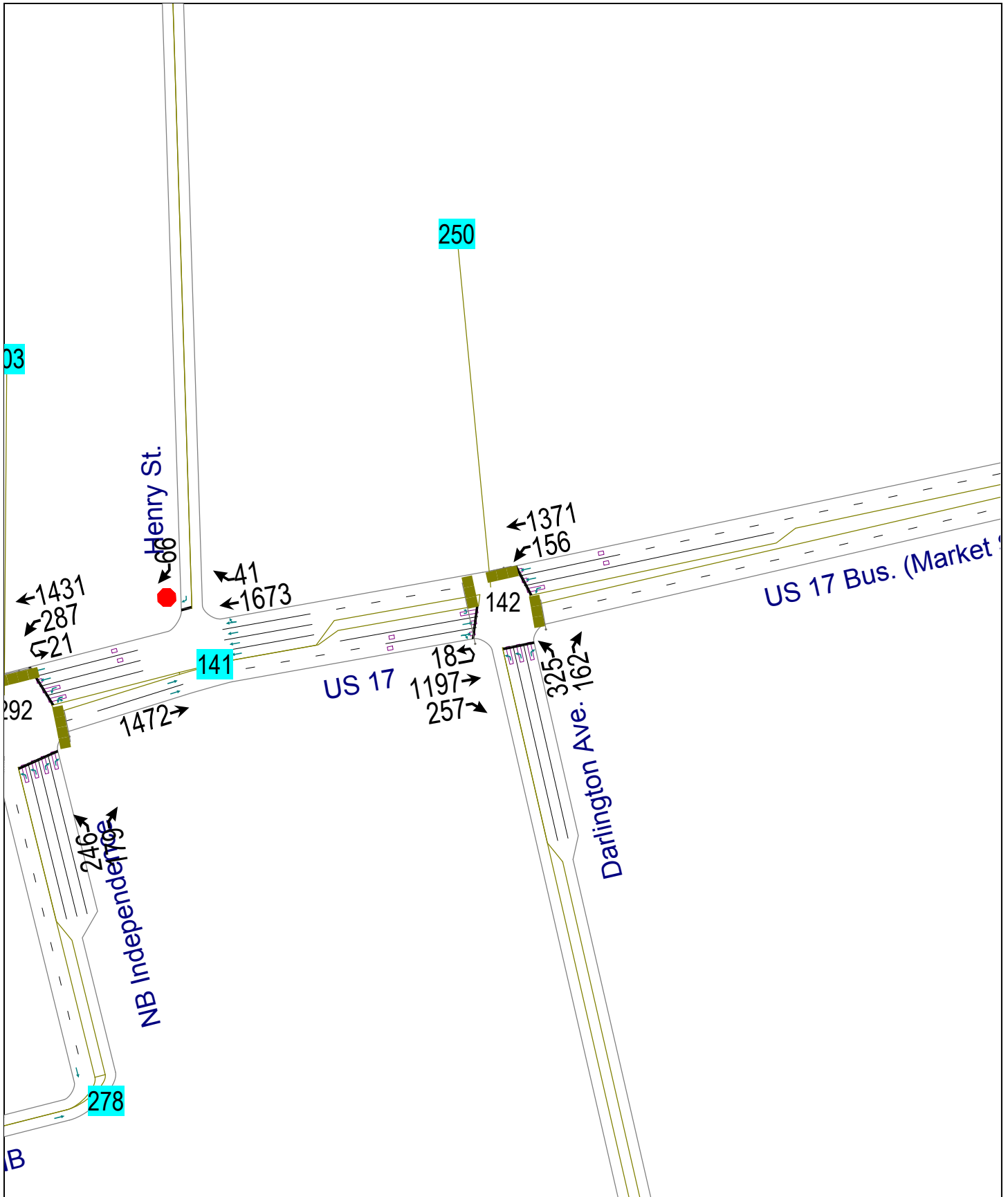


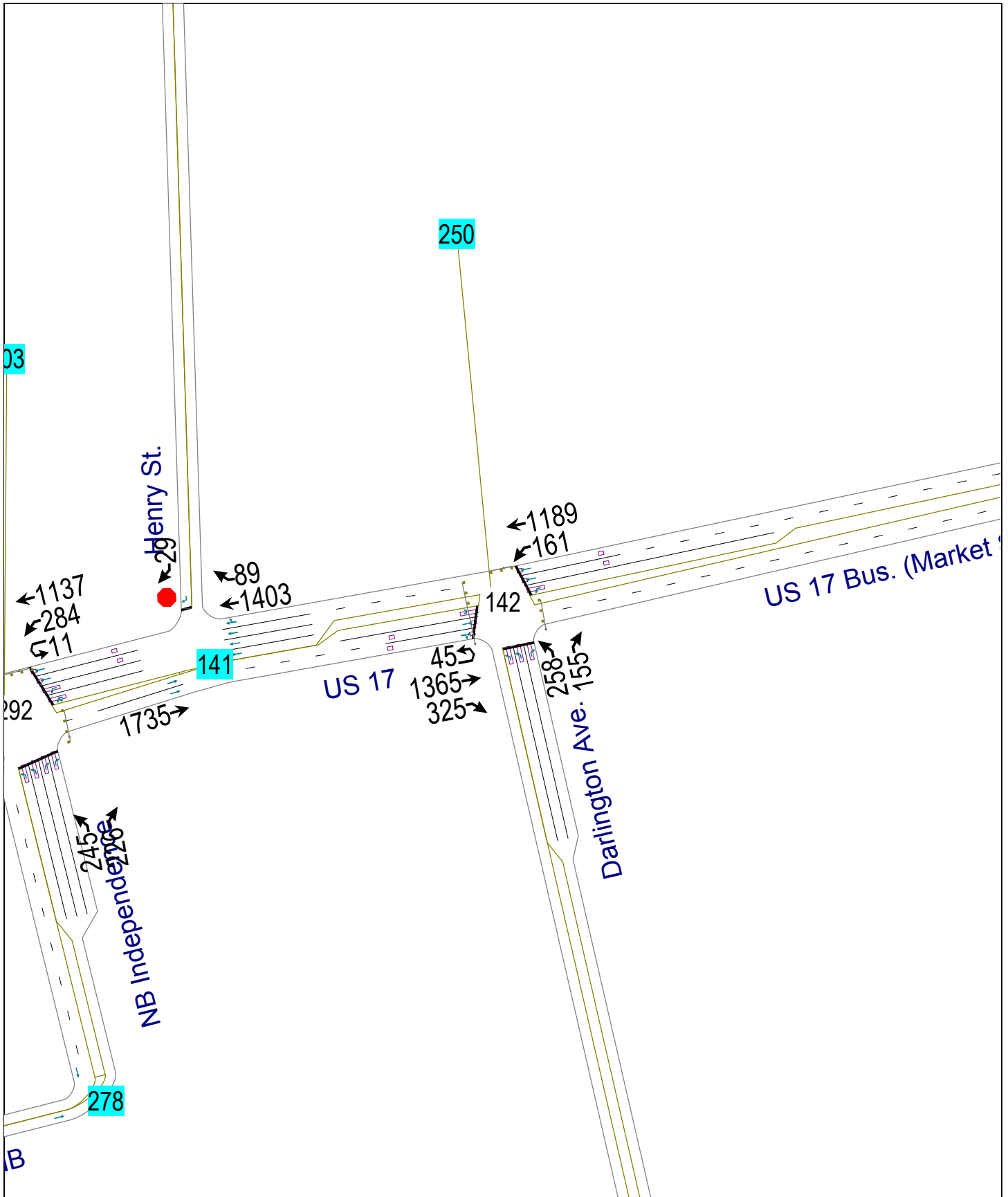
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (veh/h)	0	1735	1403	89	0	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1928	1559	99	0	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		232	332			
pX, platoon unblocked					0.62	
vC, conflicting volume	1658				2572	439
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1658				2306	439
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	380				20	563

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	964	964	445	445	445	322	32
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	99	32
cSH	1700	1700	1700	1700	1700	1700	563
Volume to Capacity	0.57	0.57	0.26	0.26	0.26	0.19	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.8
Lane LOS							B
Approach Delay (s)	0.0		0.0				11.8
Approach LOS							B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		51.3%	ICU Level of Service A
Analysis Period (min)		15	

141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 2 Quad AC PM Peak

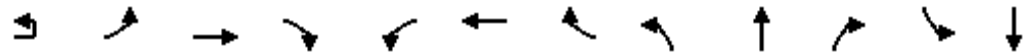






U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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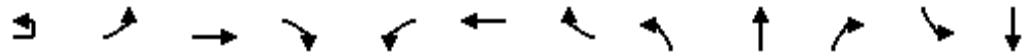


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕↔		↕	↕↕		↕↕		↕		
Volume (vph)	18	0	1197	257	156	1371	0	325	0	162	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		150		0	275		0	225		225	0	
Storage Lanes		1		0	1		0	1		1	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	1752	0	3410	0	1752	3505	0	3433	0	1583	0	0
Flt Permitted	0.950				0.950			0.950				
Satd. Flow (perm)	1752	0	3410	0	1752	3505	0	3433	0	1583	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			30
Link Distance (ft)			332			692			740			419
Travel Time (s)			5.7			11.8			20.2			9.5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	0%	2%	0%	2%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	0	1616	0	173	1523	0	361	0	180	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	R NA	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot				Prot			Prot		custom		
Protected Phases	5		2		1	6		8		1		
Permitted Phases										8		
Detector Phase	5		2		1	6		8		1		
Switch Phase												
Minimum Initial (s)	7.0		12.0		7.0	12.0		7.0		7.0		
Minimum Split (s)	14.0		19.0		14.0	19.0		14.0		14.0		
Total Split (s)	14.0	0.0	75.0	0.0	23.0	84.0	0.0	22.0	0.0	23.0	0.0	0.0
Total Split (%)	11.7%	0.0%	62.5%	0.0%	19.2%	70.0%	0.0%	18.3%	0.0%	19.2%	0.0%	0.0%
Maximum Green (s)	7.0		68.0		16.0	77.0		15.0		16.0		
Yellow Time (s)	5.0		5.0		5.0	5.0		5.0		5.0		
All-Red Time (s)	2.0		2.0		2.0	2.0		2.0		2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	2.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0	2.0
Lead/Lag	Lag		Lag		Lead	Lead				Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes				Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0		3.0		
Recall Mode	None		C-Max		None	C-Max		None		None		
Act Effct Green (s)	9.0		71.7		16.7	87.7		16.7		38.3		
Actuated g/C Ratio	0.08		0.60		0.14	0.73		0.14		0.32		
v/c Ratio	0.15		0.79		0.71	0.59		0.76		0.36		
Control Delay	43.8		12.7		65.6	9.9		60.7		33.2		
Queue Delay	0.0		0.0		0.0	0.0		0.0		0.0		

142: US 17 Bus. (Market St.) &  
Build Alt. 2 Quad AC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

142: US 17 Bus. (Market St.) &  
 Build Alt. 2 Quad AC AM Peak



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	43.8		12.7		65.6	9.9		60.7		33.2		
LOS	D		B		E	A		E		C		
Approach Delay			13.0			15.6						
Approach LOS			B			B						
Queue Length 50th (ft)	14		160		128	206		140		104		
Queue Length 95th (ft)	m22		168		#207	416		193		168		
Internal Link Dist (ft)			252			612			660			339
Turn Bay Length (ft)	150				275			225		225		
Base Capacity (vph)	131		2036		263	2562		486		523		
Starvation Cap Reductn	0		0		0	0		0		0		
Spillback Cap Reductn	0		0		0	31		0		0		
Storage Cap Reductn	0		0		0	0		0		0		
Reduced v/c Ratio	0.15		0.79		0.66	0.60		0.74		0.34		

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 19.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 70.9%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 142: US 17 Bus. (Market St.) &

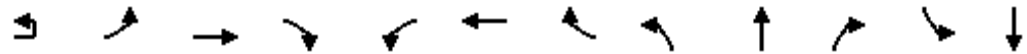




Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Synchro 7 - Report Lanes, Volumes, Timings

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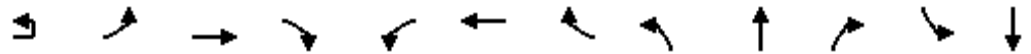


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕↔		↕	↕↕		↕↕		↕		
Volume (vph)	45	0	1365	325	161	1189	0	258	0	155	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		150		0	275		0	225		225	0	
Storage Lanes		1		0	1		0	1		1	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	1752	0	3403	0	1752	3505	0	3433	0	1583	0	0
Flt Permitted	0.950				0.950			0.950				
Satd. Flow (perm)	1752	0	3403	0	1752	3505	0	3433	0	1583	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			30
Link Distance (ft)			332			692			740			419
Travel Time (s)			5.7			11.8			20.2			9.5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	0%	2%	0%	2%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	0	1878	0	179	1321	0	287	0	172	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	R NA	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot				Prot			Prot		custom		
Protected Phases	5		2		1	6		8		1		
Permitted Phases										8		
Detector Phase	5		2		1	6		8		1		
Switch Phase												
Minimum Initial (s)	7.0		12.0		7.0	12.0		7.0		7.0		
Minimum Split (s)	14.0		19.0		14.0	19.0		14.0		14.0		
Total Split (s)	14.0	0.0	80.0	0.0	22.0	88.0	0.0	18.0	0.0	22.0	0.0	0.0
Total Split (%)	11.7%	0.0%	66.7%	0.0%	18.3%	73.3%	0.0%	15.0%	0.0%	18.3%	0.0%	0.0%
Maximum Green (s)	7.0		73.0		15.0	81.0		11.0		15.0		
Yellow Time (s)	5.0		5.0		5.0	5.0		5.0		5.0		
All-Red Time (s)	2.0		2.0		2.0	2.0		2.0		2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	2.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0	2.0
Lead/Lag	Lag		Lead		Lag	Lead				Lag		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes				Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0		3.0		
Recall Mode	None		C-Max		None	C-Max		None		None		
Act Effct Green (s)	9.0		75.6		16.3	85.7		13.1		34.4		
Actuated g/C Ratio	0.08		0.63		0.14	0.71		0.11		0.29		
v/c Ratio	0.38		0.88		0.75	0.53		0.77		0.38		
Control Delay	62.5		9.5		69.7	9.3		66.3		37.0		
Queue Delay	0.0		0.0		0.0	0.0		0.0		0.0		

142: US 17 Bus. (Market St.) &  
Build Alt. 2 Quad AC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

142: US 17 Bus. (Market St.) &  
 Build Alt. 2 Quad AC PM Peak

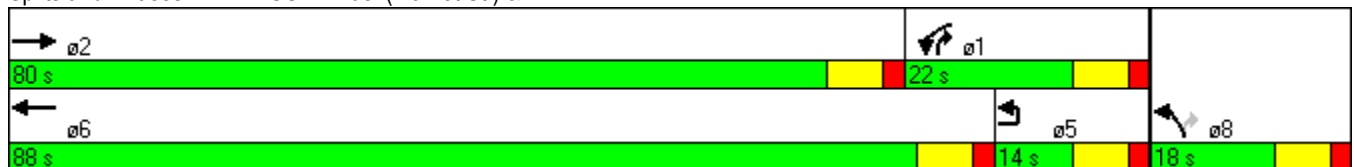


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	62.5		9.5		69.7	9.3		66.3		37.0		
LOS	E		A		E	A		E		D		
Approach Delay			10.8			16.5						
Approach LOS			B			B						
Queue Length 50th (ft)	41		130		134	240		113		106		
Queue Length 95th (ft)	m55		143		#235	292		#174		171		
Internal Link Dist (ft)			252			612			660			339
Turn Bay Length (ft)	150				275			225		225		
Base Capacity (vph)	131		2143		248	2503		375		450		
Starvation Cap Reductn	0		0		0	0		0		0		
Spillback Cap Reductn	0		0		0	0		0		0		
Storage Cap Reductn	0		0		0	0		0		0		
Reduced v/c Ratio	0.38		0.88		0.72	0.53		0.77		0.38		

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 7 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 18.3 Intersection LOS: B  
 Intersection Capacity Utilization 76.1% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 142: US 17 Bus. (Market St.) &





Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	



Intersection: 4: Darlington Ave. & Independence Blvd.

Movement	WB
Directions Served	R
Maximum Queue (ft)	288
Average Queue (ft)	155
95th Queue (ft)	278
Link Distance (ft)	967
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: US 17 Bus. (Market St.) & Forest Hills Dr.

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	R	L	T	T	L	R
Maximum Queue (ft)	1002	325	290	187	227	160	202
Average Queue (ft)	514	28	146	57	90	51	112
95th Queue (ft)	978	159	233	146	206	106	192
Link Distance (ft)	987			520	520		903
Upstream Blk Time (%)	2						
Queuing Penalty (veh)	0						
Storage Bay Dist (ft)		300	350			350	
Storage Blk Time (%)	11	0					
Queuing Penalty (veh)	4	0					

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	44	21	124	811	675
Average Queue (ft)	6	1	46	432	340
95th Queue (ft)	27	9	97	911	708
Link Distance (ft)		414		917	811
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100		100		
Storage Blk Time (%)			3		
Queuing Penalty (veh)			25		

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	20	346	353	151	159	308	66	112
Average Queue (ft)	1	187	199	53	60	85	26	40
95th Queue (ft)	7	290	309	116	136	191	57	85
Link Distance (ft)		719	719		514	514	900	747
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			225				
Storage Blk Time (%)		18						
Queuing Penalty (veh)		1						

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	EB	EB	WB	NB	SB
Directions Served	T	T	TR	TR	R	R
Maximum Queue (ft)	119	72	48	18	324	174
Average Queue (ft)	15	8	2	1	97	68
95th Queue (ft)	64	40	16	6	231	122
Link Distance (ft)			514	145	802	687
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	250	250				
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 10: US 17 Bus. (Market St.) & Mercer Ave.

Movement	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	123	258	292	125	48
Average Queue (ft)	4	99	137	33	18
95th Queue (ft)	41	220	266	123	44
Link Distance (ft)		272	272		859
Upstream Blk Time (%)		0	0		
Queuing Penalty (veh)		1	3		
Storage Bay Dist (ft)	100			100	
Storage Blk Time (%)		5	8	0	
Queuing Penalty (veh)		20	33	0	

Intersection: 12: US 17 Bus. (Market St.) & Evans St.

Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	52	124
Average Queue (ft)	3	56
95th Queue (ft)	20	104
Link Distance (ft)	212	839
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: US 17 Bus. (Market St.) & Barclay Hills Dr.

Movement	SB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	11
95th Queue (ft)	33
Link Distance (ft)	554
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 141: US 17 Bus. (Market St.) & Henry St.

Movement	WB	SB
Directions Served	TR	R
Maximum Queue (ft)	222	158
Average Queue (ft)	12	62
95th Queue (ft)	85	120
Link Distance (ft)	277	701
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 142: US 17 Bus. (Market St.) &

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	U	T	TR	L	T	T	L	L	R
Maximum Queue (ft)	43	251	264	299	360	355	249	224	244
Average Queue (ft)	14	156	171	116	167	200	120	122	91
95th Queue (ft)	37	220	233	229	303	336	187	184	167
Link Distance (ft)		277	277		623	623		688	
Upstream Blk Time (%)			0						
Queuing Penalty (veh)			0						
Storage Bay Dist (ft)	150			275			225		225
Storage Blk Time (%)		8		0	1		0	1	0
Queuing Penalty (veh)		1		0	1		0	3	0

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB	SB
Directions Served	UL	L	T	T	U	T	T	R	L	L	R	R
Maximum Queue (ft)	253	238	158	211	109	157	176	137	108	132	149	146
Average Queue (ft)	172	167	93	129	43	147	156	60	61	74	94	91
95th Queue (ft)	263	258	153	213	87	172	168	114	109	122	138	144
Link Distance (ft)	145	145	145	145	82	82	82	82		319		
Upstream Blk Time (%)	30	27	1	4	4	31	34	3				
Queuing Penalty (veh)	123	110	2	16	17	137	148	15				
Storage Bay Dist (ft)									275		275	275
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	100	194	250	110	195	221	180	216	151	133	129	169
Average Queue (ft)	34	139	165	40	110	130	89	130	68	81	59	62
95th Queue (ft)	76	190	235	78	188	229	169	233	121	129	106	116
Link Distance (ft)	170	170	170	170	138	138	138	138		356		
Upstream Blk Time (%)		2	6		5	15	1	4				
Queuing Penalty (veh)		7	24		21	67	6	16				
Storage Bay Dist (ft)									175		175	175
Storage Blk Time (%)												1
Queuing Penalty (veh)												1

Intersection: 4: Darlington Ave. & Independence Blvd.

Movement	WB
Directions Served	R
Maximum Queue (ft)	982
Average Queue (ft)	599
95th Queue (ft)	1105
Link Distance (ft)	967
Upstream Blk Time (%)	17
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: US 17 Bus. (Market St.) & Forest Hills Dr.

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	333	320	51	182	189	232	109	218
Average Queue (ft)	211	215	14	101	62	95	35	87
95th Queue (ft)	341	320	42	159	148	201	79	171
Link Distance (ft)	987	987			520	520		890
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			300	350			350	
Storage Blk Time (%)		1						
Queuing Penalty (veh)		1						

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	44	48	45	304	68
Average Queue (ft)	19	2	13	130	17
95th Queue (ft)	38	16	40	240	44
Link Distance (ft)		330		917	811
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300		300		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	26	527	608	194	161	215	91	67
Average Queue (ft)	2	308	315	82	34	43	41	19
95th Queue (ft)	11	480	476	165	105	127	83	53
Link Distance (ft)		719	719		514	514	900	747
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			225				
Storage Blk Time (%)		27						
Queuing Penalty (veh)		4						

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	EB	NB	SB
Directions Served	T	TR	R	R
Maximum Queue (ft)	94	133	132	194
Average Queue (ft)	5	10	36	53
95th Queue (ft)	34	60	87	114
Link Distance (ft)	514	514	802	687
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10: US 17 Bus. (Market St.) & Mercer Ave.

Movement	WB	WB	WB	NB
Directions Served	T	T	T	R
Maximum Queue (ft)	160	208	120	47
Average Queue (ft)	64	79	8	18
95th Queue (ft)	141	158	57	42
Link Distance (ft)	272	272		859
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			100	
Storage Blk Time (%)	3	5	0	
Queuing Penalty (veh)	10	17	0	

Intersection: 12: US 17 Bus. (Market St.) & Evans St.

Movement	EB	EB	EB	EB	SB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	124	167	202	125	91
Average Queue (ft)	4	45	63	24	36
95th Queue (ft)	41	130	156	103	68
Link Distance (ft)		212	212		839
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)	100			100	
Storage Blk Time (%)		2	3	0	
Queuing Penalty (veh)		10	15	0	

Intersection: 15: US 17 Bus. (Market St.) & Barclay Hills Dr.

Movement	SB
Directions Served	R
Maximum Queue (ft)	29
Average Queue (ft)	8
95th Queue (ft)	29
Link Distance (ft)	554
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 141: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	WB	WB	SB
Directions Served	T	T	T	TR	R
Maximum Queue (ft)	25	32	39	69	74
Average Queue (ft)	1	2	3	4	20
95th Queue (ft)	8	13	19	27	50
Link Distance (ft)	138	138		277	701
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			100		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 142: US 17 Bus. (Market St.) &

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	U	T	TR	L	T	T	L	L	R
Maximum Queue (ft)	107	231	328	232	289	295	246	225	161
Average Queue (ft)	36	132	167	131	140	140	103	115	88
95th Queue (ft)	81	209	250	227	247	242	188	175	154
Link Distance (ft)		277	277		623	623		688	
Upstream Blk Time (%)			0						
Queuing Penalty (veh)			3						
Storage Bay Dist (ft)	150			275			225		225
Storage Blk Time (%)		3			0		0	0	
Queuing Penalty (veh)		1			0		1	1	

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB	SB
Directions Served	UL	L	T	T	U	T	T	R	L	L	R	R
Maximum Queue (ft)	211	190	239	245	88	188	180	118	117	152	161	191
Average Queue (ft)	112	108	126	159	48	153	155	47	73	94	84	84
95th Queue (ft)	181	179	203	245	84	174	167	101	122	145	135	136
Link Distance (ft)	145	145	145	145	82	82	82	82		319		
Upstream Blk Time (%)	4	3	3	10	3	30	35	2				
Queuing Penalty (veh)	19	16	16	48	10	108	127	6				
Storage Bay Dist (ft)									275		275	275
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	168	257	262	203	209	230	184	215	134	260	167	168
Average Queue (ft)	63	233	240	115	117	147	76	90	71	91	73	72
95th Queue (ft)	136	280	268	188	177	234	142	170	117	163	126	129
Link Distance (ft)	170	170	170	170	138	138	138	138		356		
Upstream Blk Time (%)	0	17	23	1	5	20	1	2				
Queuing Penalty (veh)	0	84	109	5	20	71	2	9				
Storage Bay Dist (ft)									175		175	175
Storage Blk Time (%)										1	0	0
Queuing Penalty (veh)										2	0	0



# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 2 AC Quadrant
Project Description	U-4434 Independence Boulevard Extension		
<b>45</b>		<b>46</b>	
Independence Blvd. SB - to US 17 Bus.		Independence Blvd. NB - from US 17 Bus.	
Merge/Diverge	Diverge	Merge/Diverge	Merge
No. of lanes on Freeway	2	No. of lanes on Freeway	2
Freeway FFS	60 mph	Freeway FFS	60 mph
Freeway Volume (AM/PM)	2877 2354	Freeway Volume (AM/PM)	1768 2218
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	15 mph
Ramp Volume (AM/PM)	659 586	Ramp Volume (AM/PM)	586 659
No. Lanes on Ramp	1	No. Lanes on Ramp	1
Accel/Decel Distance 1	800 ft	Accel/Decel Distance 1	1440 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	N/A ft
Adjacent Upstream	Yes	Adjacent Upstream	Yes
Off/On	On	Off/On	Off
Distance	3530 ft	Distance	90 ft
Truck %	4%	Truck %	3%
Ramp Volume (AM/PM)	1628 1103	Ramp Volume (AM/PM)	425 471
Adjacent Downstream	Yes	Adjacent Downstream	Yes
Off/On	On - N/A	Off/On	Off
Distance	N/A ft	Distance	4810 ft
Truck %	N/A	Truck %	4%
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	1103 1628
Peak Hour Factor	0.90	Peak Hour Factor	0.90
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	1.00
Freeway Truck %	4%	Freeway Truck %	4%
Ramp Truck %	3%	Ramp Truck %	3%
<b>47</b>			
Independence Blvd. SB - from US 17 Bus.		Independence Blvd. SB - from US 17 Bus.	
Merge/Diverge	Merge	Merge/Diverge	Merge
No. of lanes on Freeway	2	No. of lanes on Freeway	2
Freeway FFS	60 mph	Freeway FFS	60 mph
Freeway Volume (AM/PM)	2213 1771	Freeway Volume (AM/PM)	2213 1771
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	15 mph
Ramp Volume (AM/PM)	471 425	Ramp Volume (AM/PM)	471 425
No. Lanes on Ramp	1	No. Lanes on Ramp	1
Accel/Decel Distance 1	1440 ft	Accel/Decel Distance 1	1440 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	N/A ft
Adjacent Upstream	Yes	Adjacent Upstream	Yes
Off/On	Off	Off/On	Off
Distance	90 ft	Distance	90 ft
Truck %	3%	Truck %	3%
Ramp Volume (AM/PM)	659 586	Ramp Volume (AM/PM)	659 586
Adjacent Downstream	No	Adjacent Downstream	No
Off/On	N/A	Off/On	N/A
Distance	N/A ft	Distance	N/A ft
Truck %	N/A	Truck %	N/A
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	N/A N/A
Peak Hour Factor	0.90	Peak Hour Factor	0.90
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	1.00
Freeway Truck %	4%	Freeway Truck %	4%
Ramp Truck %	3%	Ramp Truck %	3%
<b>48</b>			
Independence Blvd. NB - to Darlington		Independence Blvd. NB - to Darlington	
Merge/Diverge	Diverge	Merge/Diverge	Diverge
No. of lanes on Freeway	2	No. of lanes on Freeway	0
Freeway FFS	60 mph	Freeway FFS	0 mph
Freeway Volume (AM/PM)	2205 2695	Freeway Volume (AM/PM)	0 0
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	0 mph
Ramp Volume (AM/PM)	99 133	Ramp Volume (AM/PM)	0 0
No. Lanes on Ramp	1	No. Lanes on Ramp	0
Accel/Decel Distance 1	800 ft	Accel/Decel Distance 1	0 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	0 ft
Adjacent Upstream	No	Adjacent Upstream	Yes
Off/On	N/A	Off/On	On
Distance	N/A ft	Distance	0 ft
Truck %	N/A	Truck %	0
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	0 0
Adjacent Downstream	Yes	Adjacent Downstream	Yes
Off/On	On - N/A	Off/On	On
Distance	N/A ft	Distance	0 ft
Truck %	N/A	Truck %	0
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	0 0
Peak Hour Factor	0.90	Peak Hour Factor	0.00
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	0.00
Freeway Truck %	4%	Freeway Truck %	0%
Ramp Truck %	2%	Ramp Truck %	0%

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

## HIGHWAY CAPACITY SOFTWARE 2010

### NETWORK DATA SUMMARY - WEAVING SEGMENTS

<b>General Information</b>		<b>Site Information</b>	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 2 AC Quadrant
Project Description		U-4434 Independence Boulevard Extension	

<p><b>49</b></p> <p>Independence Blvd. NB - Darlington to Market</p> <p>Sides (One or Two) One</p> <p>No. of Lanes 3</p> <p>Weaving Length, L<sub>s</sub> 1720 ft</p> <p>Multi-Lane FFS 60 mph</p> <p>Min. Speed (Def. = 15) 15 mph</p> <p>Segment Type Multi-Lane</p> <p>Terrain Level</p> <p><b>AM Peak</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">→</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: right;">1684</td> <td style="text-align: center;">Truck</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: right;">87</td> <td style="text-align: center;">4 %</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">↙</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: right;">403</td> <td style="text-align: center;">4 %</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">→</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: right;">22</td> <td style="text-align: center;">4 %</td> <td style="text-align: center;">4 %</td> </tr> </table> <p><b>PM Peak</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">→</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: right;">2134</td> <td style="text-align: center;">Truck</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: right;">79</td> <td style="text-align: center;">4 %</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">↙</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: right;">451</td> <td style="text-align: center;">4 %</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">→</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: right;">20</td> <td style="text-align: center;">4 %</td> <td style="text-align: center;">4 %</td> </tr> </table> <p>Peak Hour Factor 0.90</p> <p>Driver Pop. Adj. 1.00</p> <p>Maneuver Lns., N<sub>WL</sub> 2</p> <p>Interchange Density 3.00</p> <p>Min. RF In. chng., LC<sub>RF</sub> 1</p> <p>Min. FR In. chng., LC<sub>FR</sub> 1</p> <p>Min. RR In. chng., LC<sub>RR</sub> N/A</p> <p style="text-align: center;">20% of vehicles from Darlington exit onto Market</p>	F	→	F	V <sub>FF</sub>	1684	Truck	4 %	F	↘	F	V <sub>RF</sub>	87	4 %	4 %	R	↙	R	V <sub>FR</sub>	403	4 %	4 %	R	→	R	V <sub>RR</sub>	22	4 %	4 %	F	→	F	V <sub>FF</sub>	2134	Truck	4 %	F	↘	F	V <sub>RF</sub>	79	4 %	4 %	R	↙	R	V <sub>FR</sub>	451	4 %	4 %	R	→	R	V <sub>RR</sub>	20	4 %	4 %	<p>Sides (One or Two) One</p> <p>No. of Lanes 0</p> <p>Weaving Length, L<sub>s</sub> 0 ft</p> <p>Freeway FFS 0 mph</p> <p>Min. 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# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 2 AC Quadrant
Project Description		U-4434 Independence Boulevard Extension	

<div style="text-align: center; border: 1px solid black; width: 60px; margin: 0 auto; padding: 2px;"><b>49</b></div> <p>Independence Blvd. NB - Darlington to Market  <u>Interchange</u>                      <u>No.</u>                      Darlington Ave.                      1                      Market St.                              1</p> <p style="font-size: small;">Note: multi-lane only 0.67 mile long                      Interchange Density                      3.00 int/mi</p>	<div style="text-align: center; border: 1px solid black; width: 60px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0  <u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Note: freeway only 3.5 miles long                      Interchange Density                      0.00 int/mi</p>	<div style="text-align: center; border: 1px solid black; width: 60px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0  <u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>
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**HIGHWAY CAPACITY SOFTWARE 2010  
NETWORK DATA SUMMARY - ANALYSIS NOTES**

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 2 Tight Urban DiamondAC Quadrar
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV %	Freeway Truck%			
	FR = DS ramp HV %	Off Ramp Truck %			
	RF = US ramp HV %	On Ramp Truck %			
	RR = DS ramp HV %	Off Ramp Truck %			

Level of Service Standards - Freeways	Level of Service Standards - Signalized Intersections
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004	LOS D or better for overall intersection required
	LOS D or better for individual movements recommended
	If not LOS D for individual movement - v/c ratio must be less than 0.85

**Assumed Improvements**

TIP No.	Description
U-3338	SR 1175 (Kerr Avenue) - widening, including new interchange at US 74

**General Analysis Notes**

- ▶ Interchange/Ramp Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

**Design Specific Analysis Notes**

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

**Locations where LOS D or better not achieved**

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 2 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 3530 ft V <sub>u</sub> = 1628 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : Deceleration Lane Length L <sub>D</sub> : 800 Freeway Volume, V <sub>F</sub> : 2877 Ramp Volume, V <sub>R</sub> : 659 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2877	0.90	Level	4	0	0.980	1.00	3261
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	1628	0.90	Level	4	0	0.980	1.00	1845
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 3261 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	3261	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2518	Exhibit 13-8	4600 No
V <sub>R</sub>	743	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3261	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 25.1 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.755 (Exhibit 13-12)  
 S<sub>R</sub> = 46.4 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 46.4 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
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Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
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### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2354	0.90	Level	4	0	0.980	1.00	2668
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	1103	0.90	Level	4	0	0.980	1.00	1250
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 2668 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2668	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2007	Exhibit 13-8	4600 No
V <sub>R</sub>	661	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2668	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 20.0 (pc/mi/ln)  
 LOS = B (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.747 (Exhibit 13-12)  
 S<sub>R</sub> = 46.5 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 46.5 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 2 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1768	$L_{down} =$ ft
$V_u =$ 425 veh/h	Ramp Volume, $V_R$	586	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1768	0.90	Level	4	0	0.980	1.00	2004
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	425	0.90	Level	3	0	0.985	1.00	479
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ 1.000 using Equation (Exhibit 13-6) $V_{12} =$ 2004 pc/h $V_3$ or $V_{av34} =$ 0 pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h $V_3$ or $V_{av34} =$ pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
--	--

### Capacity Checks

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2665	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
$V_{R12}$	2665	Exhibit 13-8	4600:All	No	$V_{12}$	Exhibit 13-8	

### Level of Service Determination (if not F)

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 16.9 (pc/mi/ln) LOS = B (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
--	---

### Speed Determination

### Speed Determination

$M_S =$ 0.334 (Exhibit 13-11) $S_R =$ 54.0 mph (Exhibit 13-11) $S_0 =$ N/A mph (Exhibit 13-11) $S =$ 54.0 mph (Exhibit 13-13)	$D_s =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
--	--

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 2 AC Quadrant
Project Description U-4434 Independence Boulevard Extension			

Inputs			
Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2218	$L_{down} =$ ft
$V_u =$ 471 veh/h	Ramp Volume, $V_R$	659	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2218	0.90	Level	4	0	0.980	1.00	2514
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	471	0.90	Level	3	0	0.985	1.00	531
DownStream								

Merge Areas					Diverge Areas				
Estimation of $v_{12}$					Estimation of $v_{12}$				
$V_{12} = V_F (P_{FM})$					$V_{12} = V_R + (V_F - V_R)P_{FD}$				
$L_{EQ} =$ (Equation 13-6 or 13-7)					$L_{EQ} =$ (Equation 13-12 or 13-13)				
$P_{FM} =$ 1.000 using Equation (Exhibit 13-6)					$P_{FD} =$ using Equation (Exhibit 13-7)				
$V_{12} =$ 2514 pc/h					$V_{12} =$ pc/h				
$V_3$ or $V_{av34} =$ 0 pc/h (Equation 13-14 or 13-17)					$V_3$ or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)				
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				

Capacity Checks				Capacity Checks			
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3257	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area			
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
$V_{R12}$	3257	Exhibit 13-8	4600:All	No	$V_{12}$	Exhibit 13-8	

Level of Service Determination (if not F)				Level of Service Determination (if not F)			
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$			
$D_R =$ 21.5 (pc/mi/ln)				$D_R =$ (pc/mi/ln)			
LOS = C (Exhibit 13-2)				LOS = (Exhibit 13-2)			

Speed Determination		Speed Determination	
$M_S =$ 0.379 (Exhibit 13-11)		$D_s =$ (Exhibit 13-12)	
$S_R =$ 53.2 mph (Exhibit 13-11)		$S_R =$ mph (Exhibit 13-12)	
$S_0 =$ N/A mph (Exhibit 13-11)		$S_0 =$ mph (Exhibit 13-12)	
$S =$ 53.2 mph (Exhibit 13-13)		$S =$ mph (Exhibit 13-13)	



## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 2 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2213	$L_{down} =$ ft
$V_u =$ 659 veh/h	Ramp Volume, $V_R$	471	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2213	0.90	Level	4	0	0.980	1.00	2508
Ramp	471	0.90	Level	3	0	0.985	1.00	531
UpStream	659	0.90	Level	3	0	0.985	1.00	743
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2508 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3039	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3039	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
$D_R =$ 19.9 (pc/mi/ln)
LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)
LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.359 (Exhibit 13-11)
$S_R =$ 53.5 mph (Exhibit 13-11)
$S_0 =$ N/A mph (Exhibit 13-11)
$S =$ 53.5 mph (Exhibit 13-13)

### Speed Determination

$D_s =$ (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 2 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1771	$L_{down} =$ ft
$V_u =$ 586 veh/h	Ramp Volume, $V_R$	425	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1771	0.90	Level	4	0	0.980	1.00	2007
Ramp	425	0.90	Level	3	0	0.985	1.00	479
UpStream	586	0.90	Level	3	0	0.985	1.00	661
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
(Equation 13-6 or 13-7)

$L_{EQ} =$  1.000 using Equation (Exhibit 13-6)

$P_{FM} =$  2007 pc/h

$V_3$  or  $V_{av34} =$  0 pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
(Equation 13-12 or 13-13)

$L_{EQ} =$  using Equation (Exhibit 13-7)

$P_{FD} =$  pc/h

$V_3$  or  $V_{av34} =$  pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2486	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2486	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$  15.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$  (pc/mi/ln)

LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$  0.325 (Exhibit 13-11)

$S_R =$  54.2 mph (Exhibit 13-11)

$S_0 =$  N/A mph (Exhibit 13-11)

$S =$  54.2 mph (Exhibit 13-13)

### Speed Determination

$D_s =$  (Exhibit 13-12)

$S_R =$  mph (Exhibit 13-12)

$S_0 =$  mph (Exhibit 13-12)

$S =$  mph (Exhibit 13-13)

### RAMPS AND RAMP JUNCTIONS WORKSHEET

<b>General Information</b>		<b>Site Information</b>	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	to Darlington Ave
Date Performed	2013	Jurisdiction	Segment #48
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 2 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

<b>Inputs</b>			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  $L_{up} =$ ft $V_u =$ veh/h	Number of Lanes, N     2 Acceleration Lane Length, $L_A$ Deceleration Lane Length $L_D$ 800 Freeway Volume, $V_F$ 2205 Ramp Volume, $V_R$ 99 Freeway Free-Flow Speed, $S_{FF}$ 60.0 Ramp Free-Flow Speed, $S_{FR}$ 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  $L_{down} =$ ft $V_D =$ veh/h	

<b>Conversion to pc/h Under Base Conditions</b>								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2205	0.90	Level	4	0	0.980	1.00	2499
Ramp	99	0.90	Level	2	0	0.990	1.00	111
UpStream								
DownStream								

<b>Merge Areas</b>					<b>Diverge Areas</b>				
<b>Estimation of <math>v_{12}</math></b> $V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h $V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					<b>Estimation of <math>v_{12}</math></b> $V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 1.000 using Equation (Exhibit 13-7) $V_{12} =$ 2499 pc/h $V_3$ or $V_{av34}$ 0 pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				

<b>Capacity Checks</b>					<b>Capacity Checks</b>				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
$V_{FO}$	Exhibit 13-8				$V_F$	2499	Exhibit 13-8	4600	No
					$V_{FO} = V_F - V_R$	2388	Exhibit 13-8	4600	No
					$V_R$	111	Exhibit 13-10	1800	No

<b>Flow Entering Merge Influence Area</b>					<b>Flow Entering Diverge Influence Area</b>				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
$V_{R12}$		Exhibit 13-8			$V_{12}$	2499	Exhibit 13-8	4400:All	No

<b>Level of Service Determination (if not F)</b>					<b>Level of Service Determination (if not F)</b>				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 18.5 (pc/mi/ln) LOS = B (Exhibit 13-2)				

<b>Speed Determination</b>					<b>Speed Determination</b>				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_S =$ 0.698 (Exhibit 13-12) $S_R =$ 47.4 mph (Exhibit 13-12) $S_0 =$ N/A mph (Exhibit 13-12) $S =$ 47.4 mph (Exhibit 13-13)				

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	to Darlington
Date Performed	2013	Jurisdiction	Segment #48
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 2 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> =      ft  V <sub>u</sub> =      veh/h	Number of Lanes, N                      2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 800 Freeway Volume, V <sub>F</sub> 2695 Ramp Volume, V <sub>R</sub> 133 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> =      ft  V <sub>D</sub> =      veh/h
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### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2695	0.90	Level	4	0	0.980	1.00	3054
Ramp	133	0.90	Level	2	0	0.990	1.00	149
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 3054 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	3054	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2905	Exhibit 13-8	4600 No
V <sub>R</sub>	149	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3054	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 23.3 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.701 (Exhibit 13-12)  
 S<sub>R</sub> = 47.4 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 47.4 mph (Exhibit 13-13)

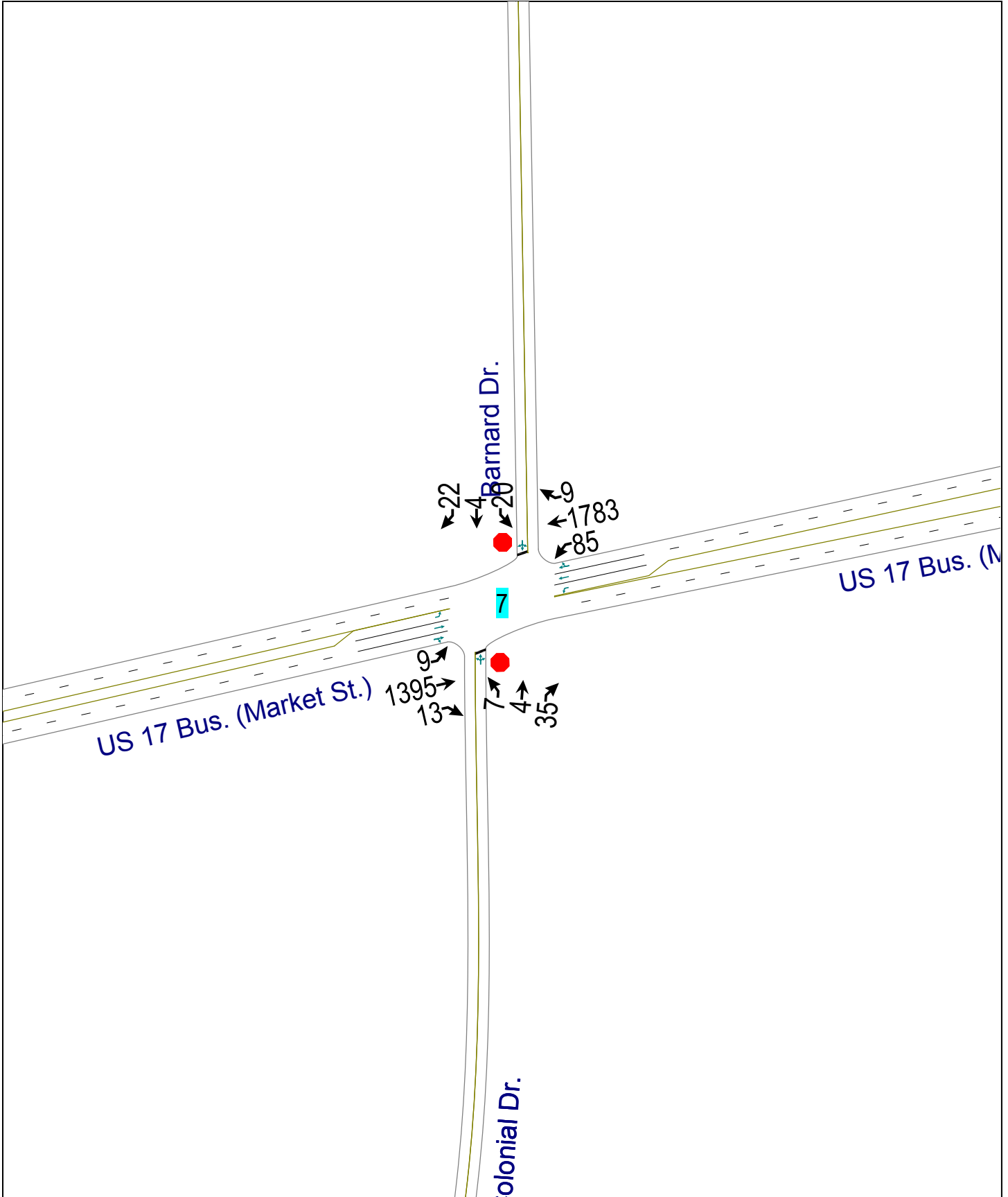
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 2 AC Quadrant			
Analysis Time Period	AM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1720ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	1684	0.90	4	0	1.5	1.2	0.980	1.00	1909
V <sub>RF</sub>	87	0.90	4	0	1.5	1.2	0.980	1.00	99
V <sub>FR</sub>	403	0.90	4	0	1.5	1.2	0.980	1.00	457
V <sub>RR</sub>	22	0.90	4	0	1.5	1.2	0.980	1.00	25
V <sub>NW</sub>	1934							V =	2490
V <sub>W</sub>	556								
VR	0.223								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	556 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	957 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	753 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1710 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	998			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	2490 pc/h				Weaving intensity factor, W	0.225			
Weaving segment capacity, c <sub>w</sub>	6076 veh/h				Weaving segment speed, S	52.0 mph			
Weaving segment v/c ratio	0.402				Average weaving speed, S <sub>W</sub>	51.7 mph			
Weaving segment density, D	16.0 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	52.0 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4776 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

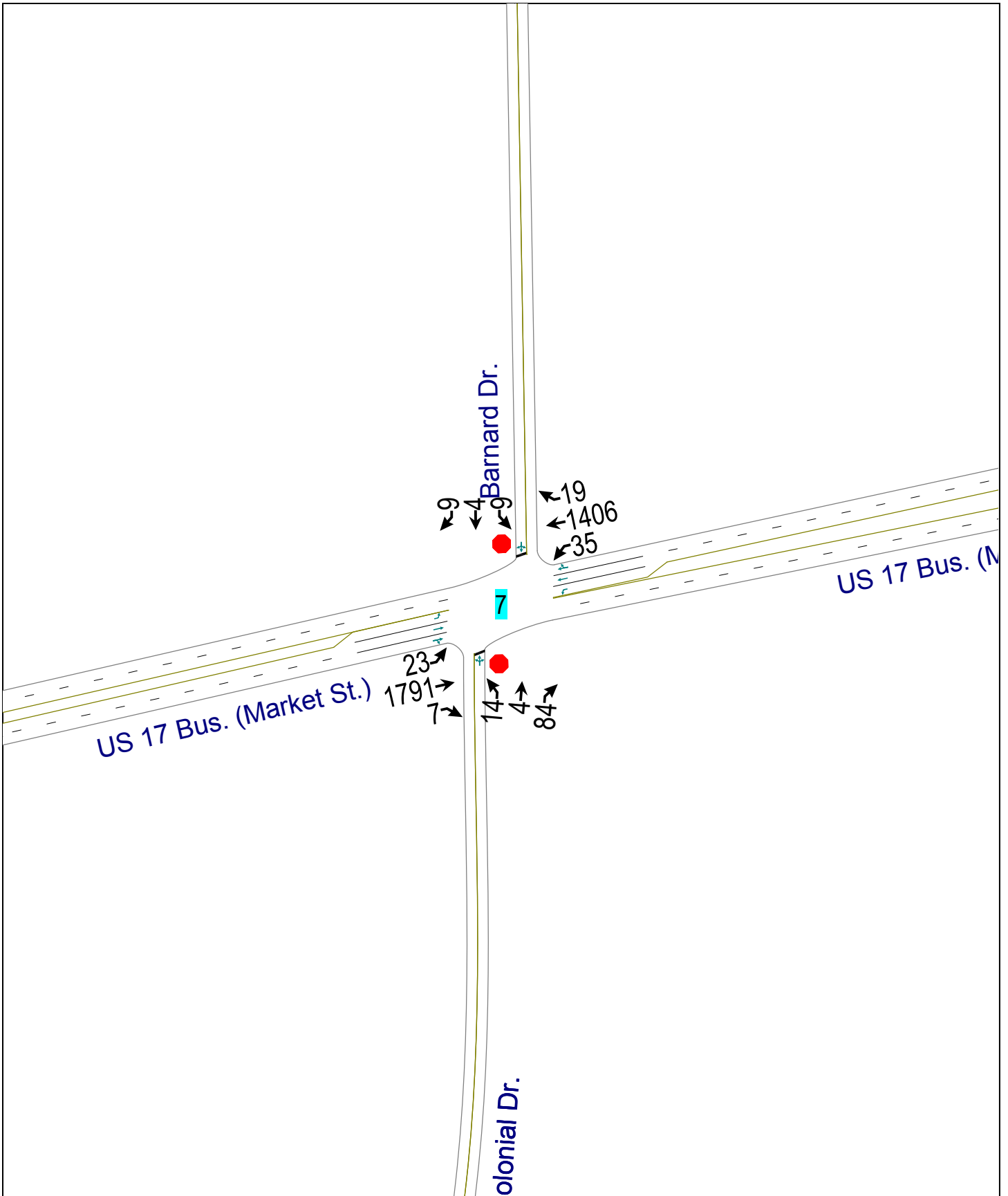
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 2 AC Quadrant			
Analysis Time Period	PM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1720ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	2134	0.90	4	0	1.5	1.2	0.980	1.00	2419
V <sub>RF</sub>	79	0.90	4	0	1.5	1.2	0.980	1.00	90
V <sub>FR</sub>	451	0.90	4	0	1.5	1.2	0.980	1.00	511
V <sub>RR</sub>	21	0.90	4	0	1.5	1.2	0.980	1.00	24
V <sub>NW</sub>	2443							V =	3044
V <sub>W</sub>	601								
VR	0.197								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	601 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	1002 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	858 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1860 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	1261			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	3044 pc/h				Weaving intensity factor, W	0.240			
Weaving segment capacity, c <sub>w</sub>	6138 veh/h				Weaving segment speed, S	50.9 mph			
Weaving segment v/c ratio	0.486				Average weaving speed, S <sub>W</sub>	51.3 mph			
Weaving segment density, D	19.9 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	50.8 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4510 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

## Build Alternative 2, Quadrant BC

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U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 1/16/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	1395	13	85	1783	9	7	4	35	20	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Flt Permitted	0.950			0.950				0.992			0.978	
Satd. Flow (perm)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		818			861			978			871	
Travel Time (s)		15.9			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1564	0	94	1991	0	0	51	0	0	50	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.0%
	ICU Level of Service C
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 2 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/28/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	1395	13	85	1783	9	7	4	35	20	4	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1550	14	94	1981	10	8	4	39	22	4	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1010			861							
pX, platoon unblocked	0.52			0.70			0.67	0.67	0.70	0.67	0.67	0.52
vC, conflicting volume	1991			1564			2783	3757	782	3011	3759	996
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1067			948			667	2116	0	1006	2119	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			81			95	83	95	76	83	96
cM capacity (veh/h)	339			504			162	27	759	91	26	566

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	10	1033	531	94	1321	670	51	51
Volume Left	10	0	0	94	0	0	8	22
Volume Right	0	0	14	0	0	10	39	24
cSH	339	1700	1700	504	1700	1700	191	112
Volume to Capacity	0.03	0.61	0.31	0.19	0.78	0.39	0.27	0.45
Queue Length 95th (ft)	2	0	0	17	0	0	26	50
Control Delay (s)	16.0	0.0	0.0	13.8	0.0	0.0	30.5	61.4
Lane LOS	C			B			D	F
Approach Delay (s)	0.1			0.6			30.5	61.4
Approach LOS							D	F

Intersection Summary

Average Delay		1.6						
Intersection Capacity Utilization		69.0%		ICU Level of Service			C	
Analysis Period (min)		15						

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 2 Quad BC AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
1/16/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1791	7	35	1406	19	14	4	84	9	4	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Flt Permitted	0.950			0.950				0.993			0.980	
Satd. Flow (perm)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		818			861			978			871	
Travel Time (s)		15.9			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1998	0	39	1583	0	0	113	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
Build Alt. 2 Quad BC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/28/2012



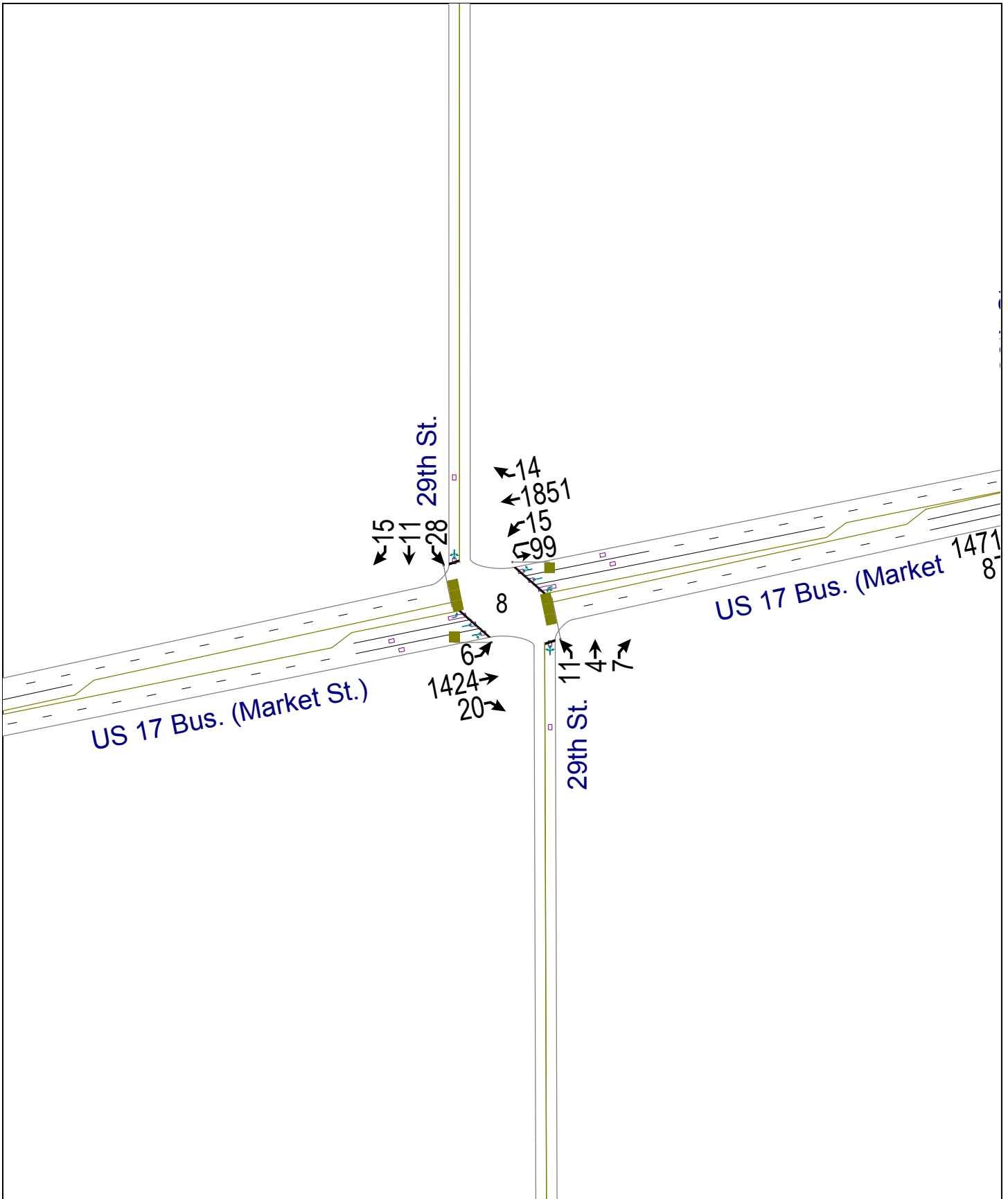
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	1791	7	35	1406	19	14	4	84	9	4	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	1990	8	39	1562	21	16	4	93	10	4	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (ft)	1010					861						
pX, platoon unblocked	0.77			0.58			0.69	0.69	0.58	0.69	0.69	0.77
vC, conflicting volume	1583			1998			2916	3706	999	2792	3699	792
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1163			1266			1391	2532	0	1212	2523	136
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			88			67	71	85	82	72	99
cM capacity (veh/h)	460			315			47	16	627	55	16	684

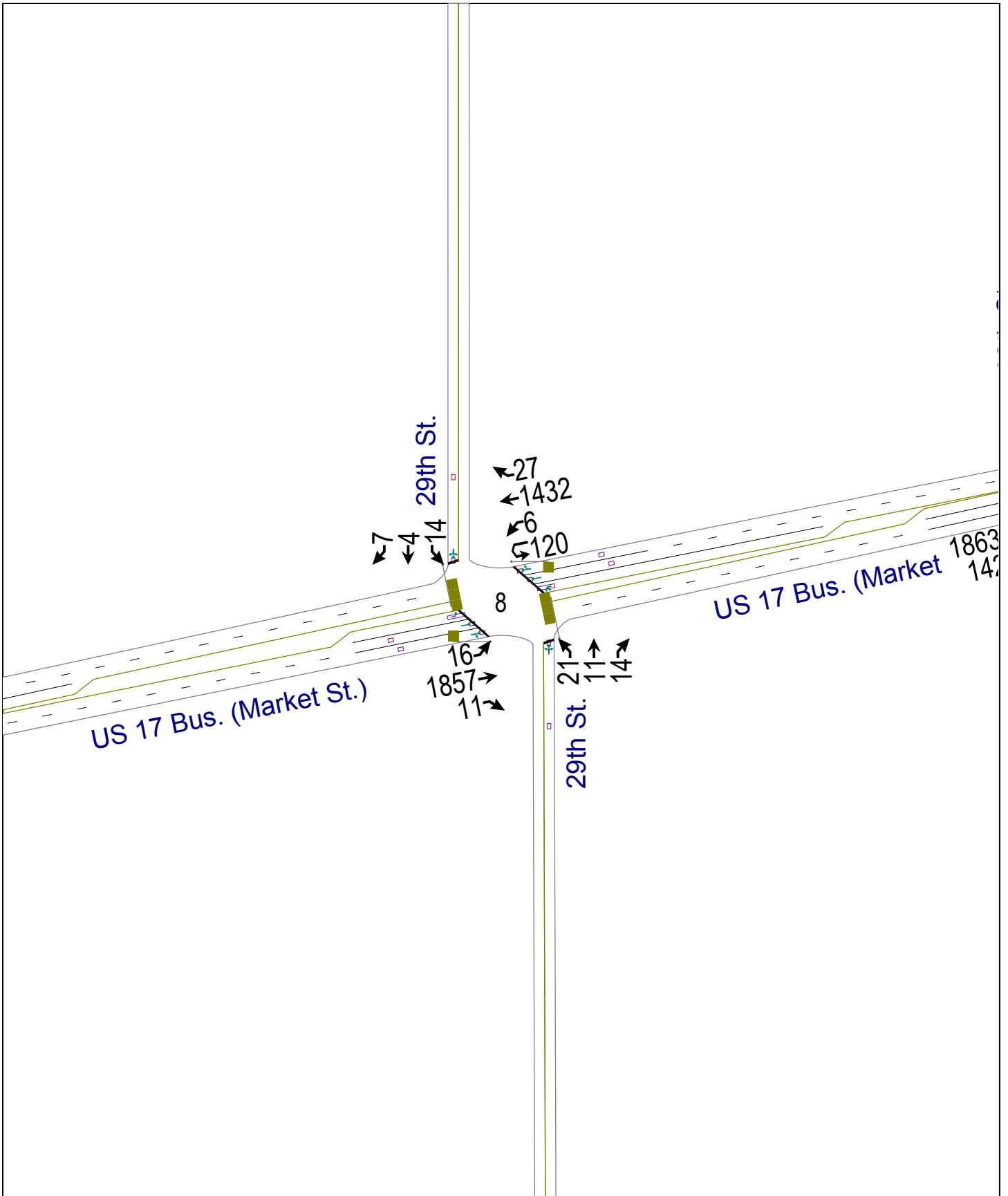
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	26	1327	671	39	1041	542	113	24
Volume Left	26	0	0	39	0	0	16	10
Volume Right	0	0	8	0	0	21	93	10
cSH	460	1700	1700	315	1700	1700	148	51
Volume to Capacity	0.06	0.78	0.39	0.12	0.61	0.32	0.76	0.48
Queue Length 95th (ft)	4	0	0	10	0	0	117	45
Control Delay (s)	13.3	0.0	0.0	18.0	0.0	0.0	81.9	128.1
Lane LOS	B			C			F	F
Approach Delay (s)	0.2			0.4			81.9	128.1
Approach LOS							F	F

**Intersection Summary**

Average Delay	3.6
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 2 Quad BC PM Peak

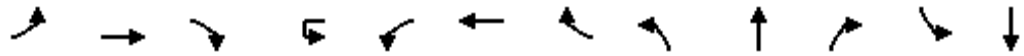






U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/28/2012

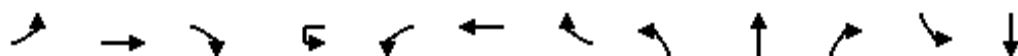


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	6	1424	20	99	15	1851	14	11	4	7	28	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0		300		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3532	0	0	1770	3536	0	0	1736	0	0	1730
Flt Permitted	0.069				0.950				0.976			0.975
Satd. Flow (perm)	129	3532	0	0	1770	3536	0	0	1736	0	0	1730
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			25			25
Link Distance (ft)		861				630			952			799
Travel Time (s)		14.7				10.7			26.0			21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1604	0	0	127	2073	0	0	24	0	0	60
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			0			0
Link Offset(ft)		0				0			48			48
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	72.0	72.0	0.0	20.0	20.0	92.0	0.0	14.0	14.0	0.0	14.0	14.0
Total Split (%)	60.0%	60.0%	0.0%	16.7%	16.7%	76.7%	0.0%	11.7%	11.7%	0.0%	11.7%	11.7%
Maximum Green (s)	65.0	65.0		13.0	13.0	85.0		7.0	7.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	76.5	76.5			13.9	96.4			9.0			9.0
Actuated g/C Ratio	0.64	0.64			0.12	0.80			0.08			0.08
v/c Ratio	0.09	0.71			0.62	0.73			0.18			0.46
Control Delay	6.8	6.4			64.2	5.2			55.7			65.2
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

8: US 17 Bus. (Market St.) & 29th St.  
Build Alt. 2 Quad BC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	15
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 2 Quad BC AM Peak

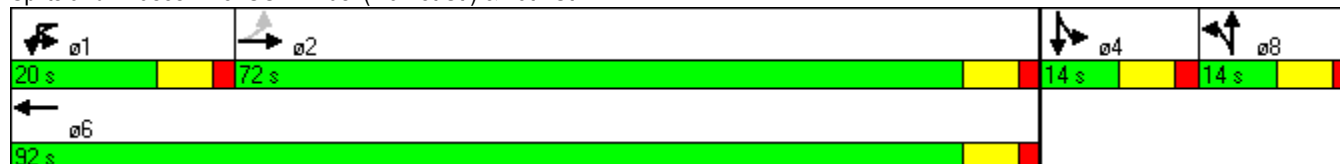


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	6.8	6.4			64.2	5.3			55.7			65.2
LOS	A	A			E	A			E			E
Approach Delay		6.4				8.7			55.7			65.2
Approach LOS		A				A			E			E
Queue Length 50th (ft)	1	138			89	317			18			45
Queue Length 95th (ft)	m1	151			m126	248			46			92
Internal Link Dist (ft)		781				550			872			719
Turn Bay Length (ft)	100				300							
Base Capacity (vph)	82	2253			221	2841			130			130
Starvation Cap Reductn	0	0			0	23			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.09	0.71			0.57	0.74			0.18			0.46

**Intersection Summary**

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	96 (80%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	8.9
Intersection LOS:	A
Intersection Capacity Utilization:	79.9%
ICU Level of Service:	D
Analysis Period (min):	15
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 8: US 17 Bus. (Market St.) & 29th St.



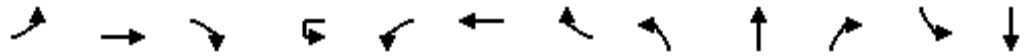
8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 2 Quad BC AM Peak



Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	16	1857	11	120	6	1432	27	21	11	14	14	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0		300		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3536	0	0	1770	3529	0	0	1745	0	0	1723
Flt Permitted	0.146				0.950				0.978			0.972
Satd. Flow (perm)	272	3536	0	0	1770	3529	0	0	1745	0	0	1723
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			25			25
Link Distance (ft)		861				630			952			799
Travel Time (s)		14.7				10.7			26.0			21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	2075	0	0	140	1621	0	0	51	0	0	28
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			0			0
Link Offset(ft)		0				0			48			48
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	77.0	77.0	0.0	15.0	15.0	92.0	0.0	14.0	14.0	0.0	14.0	14.0
Total Split (%)	64.2%	64.2%	0.0%	12.5%	12.5%	76.7%	0.0%	11.7%	11.7%	0.0%	11.7%	11.7%
Maximum Green (s)	70.0	70.0		8.0	8.0	85.0		7.0	7.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	77.8	77.8			12.5	96.3			9.1			9.0
Actuated g/C Ratio	0.65	0.65			0.10	0.80			0.08			0.08
v/c Ratio	0.10	0.90			0.76	0.57			0.39			0.22
Control Delay	5.3	13.5			81.9	4.2			61.8			56.6
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

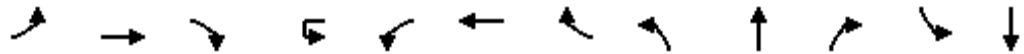
8: US 17 Bus. (Market St.) & 29th St.  
Build Alt. 2 Quad BC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	7
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 2 Quad BC PM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	5.3	13.5			81.9	4.2			61.8			56.6
LOS	A	B			F	A			E			E
Approach Delay		13.4				10.4			61.8			56.6
Approach LOS		B				B			E			E
Queue Length 50th (ft)	2	791			114	127			38			21
Queue Length 95th (ft)	m3	#982			m#241	167			81			52
Internal Link Dist (ft)		781				550			872			719
Turn Bay Length (ft)	100				300							
Base Capacity (vph)	176	2294			184	2832			132			129
Starvation Cap Reductn	0	0			0	0			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.10	0.90			0.76	0.57			0.39			0.22

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 99 (83%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 13.0 Intersection LOS: B  
 Intersection Capacity Utilization 77.0% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: US 17 Bus. (Market St.) & 29th St.

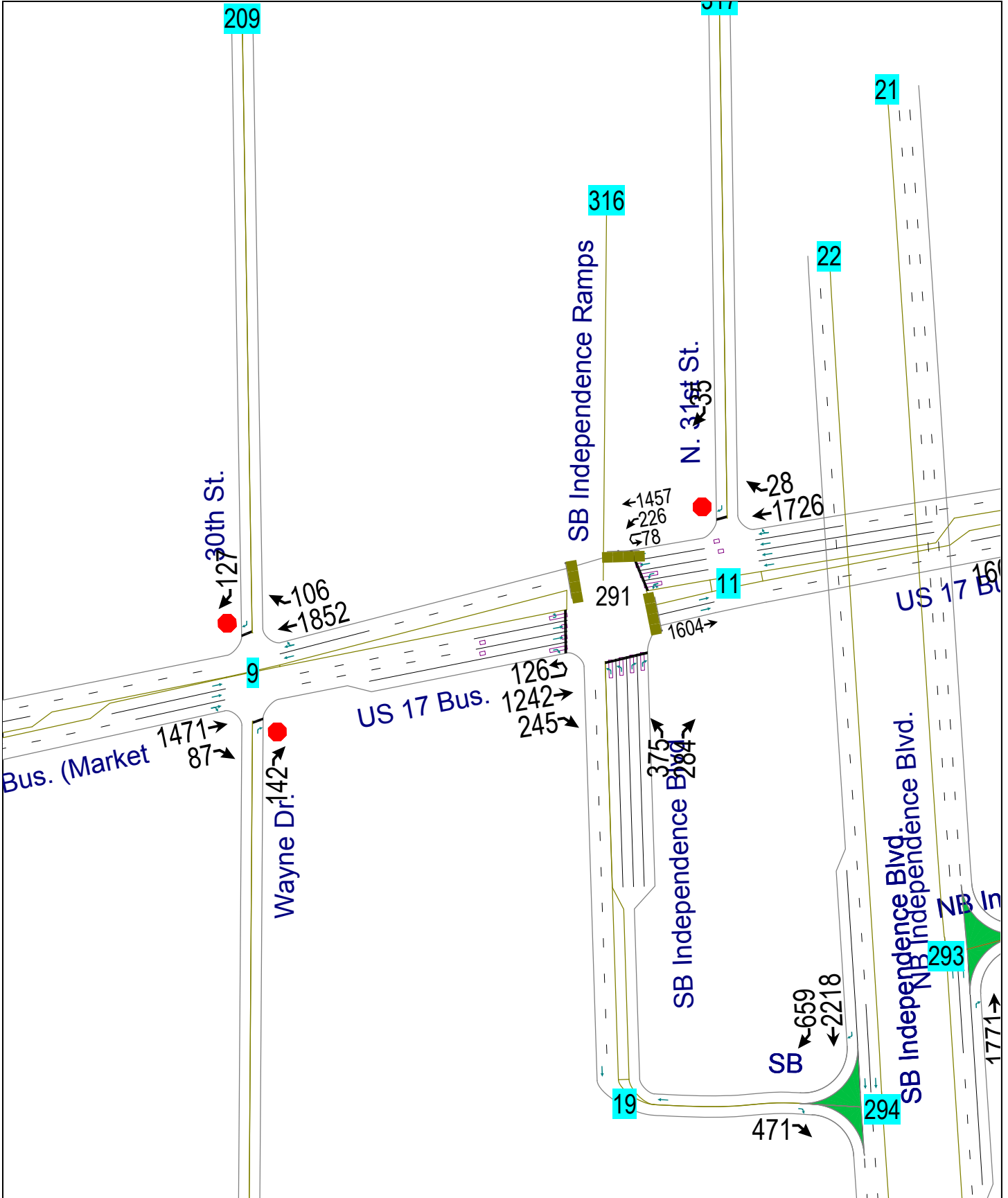


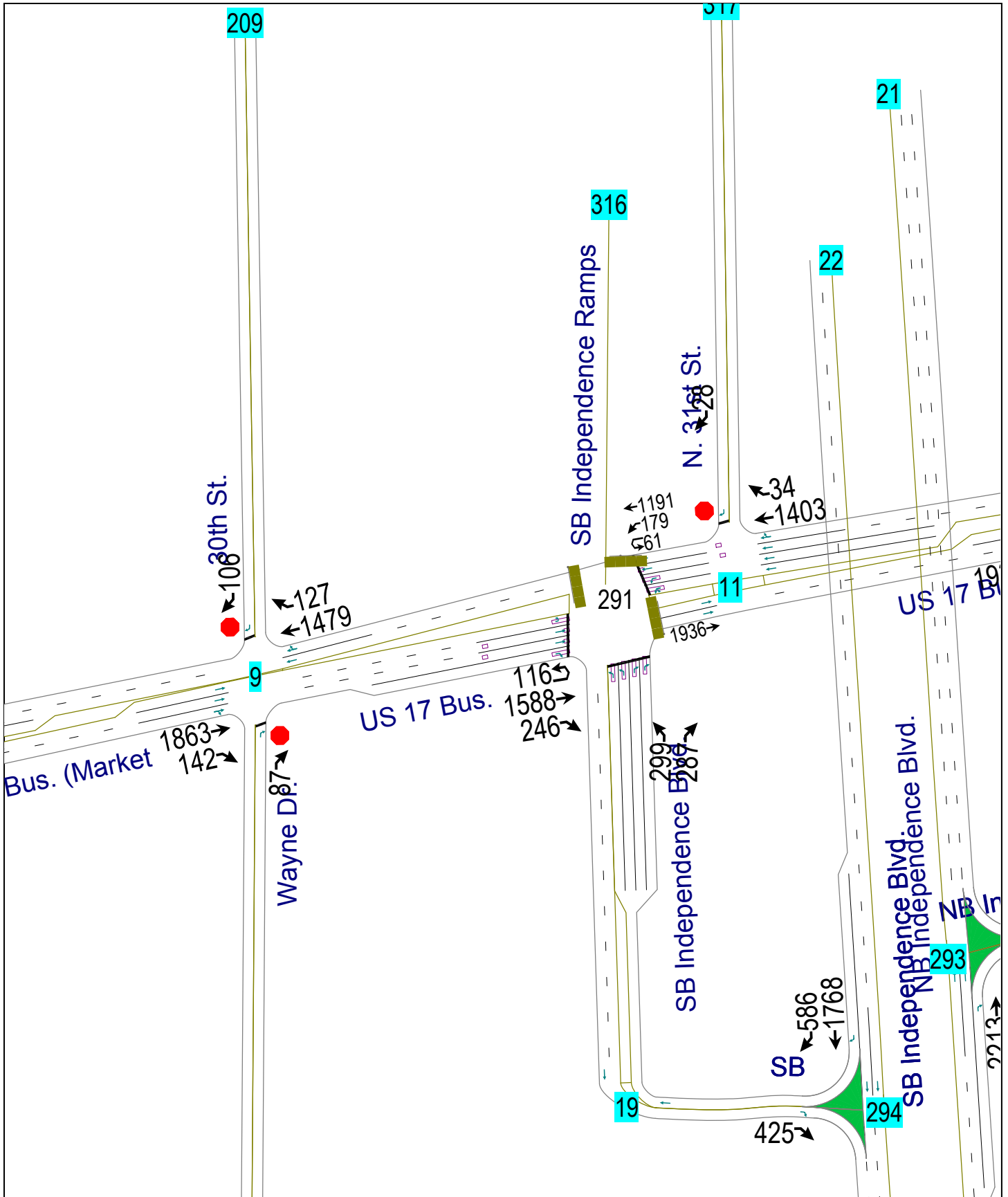
8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 2 Quad BC PM Peak



Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	







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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↑			↑
Volume (vph)	0	1471	87	0	1852	106	0	0	142	0	0	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	300		0	0		0	0		0
Storage Lanes	1		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	5045	0	0	3511	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	5045	0	0	3511	0	0	0	1611	0	0	1611
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			416			873			738	
Travel Time (s)		10.7			7.1			23.8			20.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	0%	2%	2%	0%	0%	2%	0%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1731	0	0	2176	0	0	0	158	0	0	141
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.1%
ICU Level of Service	C
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 2 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↑			↑
Volume (veh/h)	0	1471	87	0	1852	106	0	0	142	0	0	127
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1634	97	0	2058	118	0	0	158	0	0	141
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		630			416							
pX, platoon unblocked	0.62			0.73			0.75	0.75	0.73	0.75	0.75	0.62
vC, conflicting volume	2176			1731			2853	3858	593	2819	3848	1088
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1663			686			623	1957	0	579	1943	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	80	100	100	79
cM capacity (veh/h)	242			666			223	49	787	243	50	669

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	654	654	424	1372	804	158	141
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	97	0	118	158	141
cSH	1700	1700	1700	1700	1700	787	669
Volume to Capacity	0.38	0.38	0.25	0.81	0.47	0.20	0.21
Queue Length 95th (ft)	0	0	0	0	0	19	20
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.7	11.8
Lane LOS						B	B
Approach Delay (s)	0.0			0.0		10.7	11.8
Approach LOS						B	B

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization	69.1%		ICU Level of Service C
Analysis Period (min)		15	

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 2 Quad BC AM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↗			↗
Volume (vph)	0	1863	142	0	1479	127	0	0	87	0	0	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	300		0	0		0	0		0
Storage Lanes	1		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	5029	0	0	3497	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	5029	0	0	3497	0	0	0	1611	0	0	1611
Link Speed (mph)		40			40			25				25
Link Distance (ft)		630			416			873				738
Travel Time (s)		10.7			7.1			23.8				20.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	0%	2%	2%	0%	0%	2%	0%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2228	0	0	1784	0	0	0	97	0	0	118
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.2%
ICU Level of Service	B
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 2 Quad BC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↗			↗
Volume (veh/h)	0	1863	142	0	1479	127	0	0	87	0	0	106
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2070	158	0	1643	141	0	0	97	0	0	118
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		630			416							
pX, platoon unblocked	0.74			0.50			0.63	0.63	0.50	0.63	0.63	0.74
vC, conflicting volume	1784			2228			3088	3933	769	2501	3942	892
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1362			0			109	1451	0	0	1464	160
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	82	100	100	81
cM capacity (veh/h)	379			819			443	83	543	532	82	636

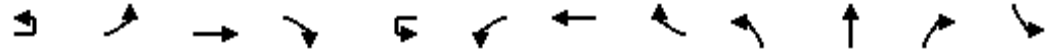
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	828	828	572	1096	689	97	118
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	158	0	141	97	118
cSH	1700	1700	1700	1700	1700	543	636
Volume to Capacity	0.49	0.49	0.34	0.64	0.41	0.18	0.19
Queue Length 95th (ft)	0	0	0	0	0	16	17
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.1	11.9
Lane LOS						B	B
Approach Delay (s)	0.0			0.0		13.1	11.9
Approach LOS						B	B

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		58.2%	ICU Level of Service B
Analysis Period (min)		15	

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 2 Quad BC PM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	126	0	1242	245	78	226	1457	0	375	0	284	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		225		0		0	250		250	0
Storage Lanes		0		1		2		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1770	0	3539	1583	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1770	0	3539	1583	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			416				130			573		
Travel Time (s)			7.1				2.2			15.6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	2%	2%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	0	1380	272	0	338	1619	0	417	0	316	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				44			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	21.0	0.0	71.0	26.0	23.0	23.0	73.0	0.0	26.0	0.0	26.0	0.0
Total Split (%)	17.5%	0.0%	59.2%	21.7%	19.2%	19.2%	60.8%	0.0%	21.7%	0.0%	21.7%	0.0%
Maximum Green (s)	14.0		64.0	19.0	16.0	16.0	66.0		19.0		19.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lag		Lead	Lead	Lead					
Lead-Lag Optimize?	Yes						Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	16.0		67.7	92.8			17.2	68.9	20.1		20.1	
Actuated g/C Ratio	0.13		0.56	0.77			0.14	0.57	0.17		0.17	
v/c Ratio	0.59		0.69	0.22			0.69	0.80	0.73		0.68	
Control Delay	41.8		7.7	1.7			59.9	20.3	55.5		55.0	
Queue Delay	0.0		0.0	0.0			0.0	0.2	0.0		0.0	

291: US 17 Bus. (Market St.) &  
Build Alt. 2 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

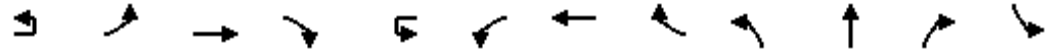
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Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	446	
Travel Time (s)	12.2	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

291: US 17 Bus. (Market St.) &  
 Build Alt. 2 Quad BC AM Peak





Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	41.8		7.7	1.7		59.9	20.4		55.5		55.0	
LOS	D		A	A		E	C		E		E	
Approach Delay			9.5				27.2					
Approach LOS			A				C					
Queue Length 50th (ft)	105		88	17		127	332		158		131	
Queue Length 95th (ft)	m145		107	22		179	473		214		185	
Internal Link Dist (ft)			336				50			493		
Turn Bay Length (ft)				225					250		250	
Base Capacity (vph)	236		1996	1236		510	2012		595		483	
Starvation Cap Reductn	0		0	0		0	42		0		0	
Spillback Cap Reductn	0		0	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.59		0.69	0.22		0.66	0.82		0.70		0.65	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 110 (92%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 24.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 69.6%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) &

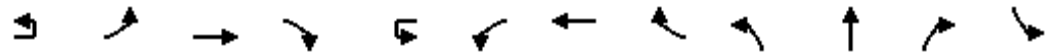




Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	366	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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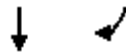


Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	116	0	1588	246	61	179	1191	0	299	0	287	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		225		0		0	250		250	0
Storage Lanes		0		1		2		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1770	0	3539	1583	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1770	0	3539	1583	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			416				130			573		
Travel Time (s)			7.1				2.2			15.6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	2%	2%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	129	0	1764	273	0	267	1323	0	332	0	319	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				42			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	21.0	0.0	78.0	24.0	18.0	18.0	75.0	0.0	24.0	0.0	24.0	0.0
Total Split (%)	17.5%	0.0%	65.0%	20.0%	15.0%	15.0%	62.5%	0.0%	20.0%	0.0%	20.0%	0.0%
Maximum Green (s)	14.0		71.0	17.0	11.0	11.0	68.0		17.0		17.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lag		Lead	Lead	Lead					
Lead-Lag Optimize?	Yes						Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	16.0		73.7	97.0			13.0	70.6	18.4		18.4	
Actuated g/C Ratio	0.13		0.61	0.81			0.11	0.59	0.15		0.15	
v/c Ratio	0.55		0.81	0.21			0.73	0.64	0.64		0.76	
Control Delay	37.4		5.9	1.1			68.6	10.3	53.7		60.8	
Queue Delay	0.0		0.0	0.0			0.0	0.0	0.0		0.0	

291: US 17 Bus. (Market St.) &  
Build Alt. 2 Quad BC PM Peak

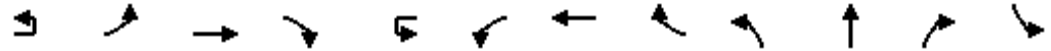
U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	446	
Travel Time (s)	12.2	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

291: US 17 Bus. (Market St.) &  
 Build Alt. 2 Quad BC PM Peak



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	37.4		5.9	1.1		68.6	10.3		53.7		60.8	
LOS	D		A	A		E	B		D		E	
Approach Delay			7.2				20.1					
Approach LOS			A				C					
Queue Length 50th (ft)	91		61	15		96	200		125		135	
Queue Length 95th (ft)	m104		67	m17		#148	217		174		192	
Internal Link Dist (ft)			336				50			493		
Turn Bay Length (ft)				225					250		250	
Base Capacity (vph)	236		2173	1289		368	2064		538		437	
Starvation Cap Reductn	0		0	0		0	0		0		0	
Spillback Cap Reductn	0		0	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.55		0.81	0.21		0.73	0.64		0.62		0.73	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 117 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 19.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 73.3%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) &



291: US 17 Bus. (Market St.) &  
 Build Alt. 2 Quad BC PM Peak



Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	366	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (vph)	0	1604	1726	28	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3539	6395	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	6395	0	0	1611
Link Speed (mph)		40	40		25	
Link Distance (ft)		130	453		658	
Travel Time (s)		2.2	7.7		17.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1782	1949	0	0	39
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.7%
Analysis Period (min)	15
	ICU Level of Service A

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (veh/h)	0	1604	1726	28	0	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1782	1918	31	0	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		130	698			
pX, platoon unblocked					0.72	
vC, conflicting volume	1949				2824	495
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1949				2755	495
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	93
cM capacity (veh/h)	304				12	520

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	891	891	548	548	548	305	39
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	31	39
cSH	1700	1700	1700	1700	1700	1700	520
Volume to Capacity	0.52	0.52	0.32	0.32	0.32	0.18	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.5
Lane LOS							B
Approach Delay (s)	0.0		0.0				12.5
Approach LOS							B

Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			47.7%		ICU Level of Service		A
Analysis Period (min)			15				

11: US 17 Bus. (Market St.) & N. 31st St.  
 Build Alt. 2 Quad BC AM Peak



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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (vph)	0	1936	1403	34	0	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3539	6382	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	6382	0	0	1611
Link Speed (mph)		40	40		25	
Link Distance (ft)		130	453		658	
Travel Time (s)		2.2	7.7		17.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2151	1597	0	0	31
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	56.8%
ICU Level of Service	B
Analysis Period (min)	15

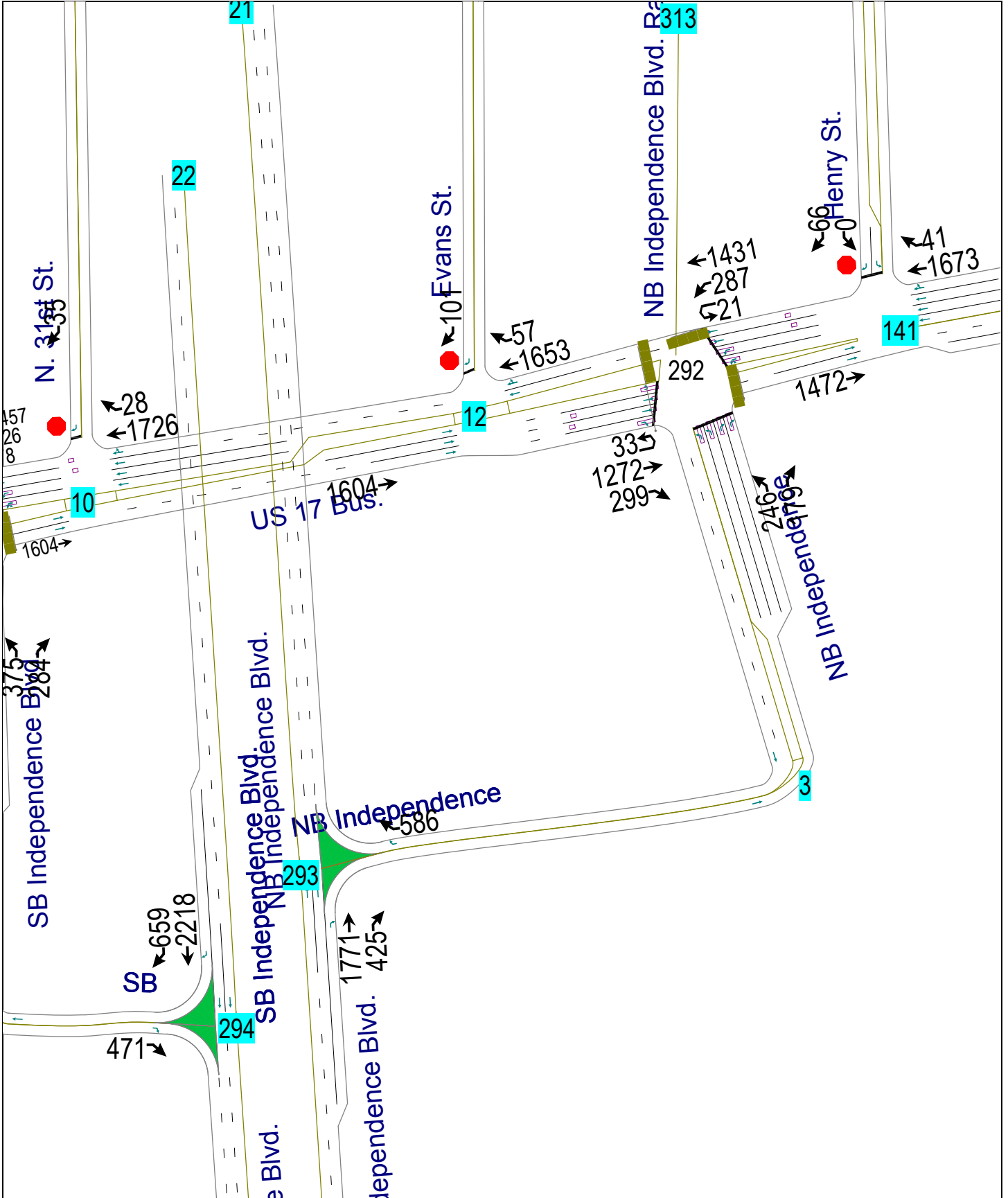
U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

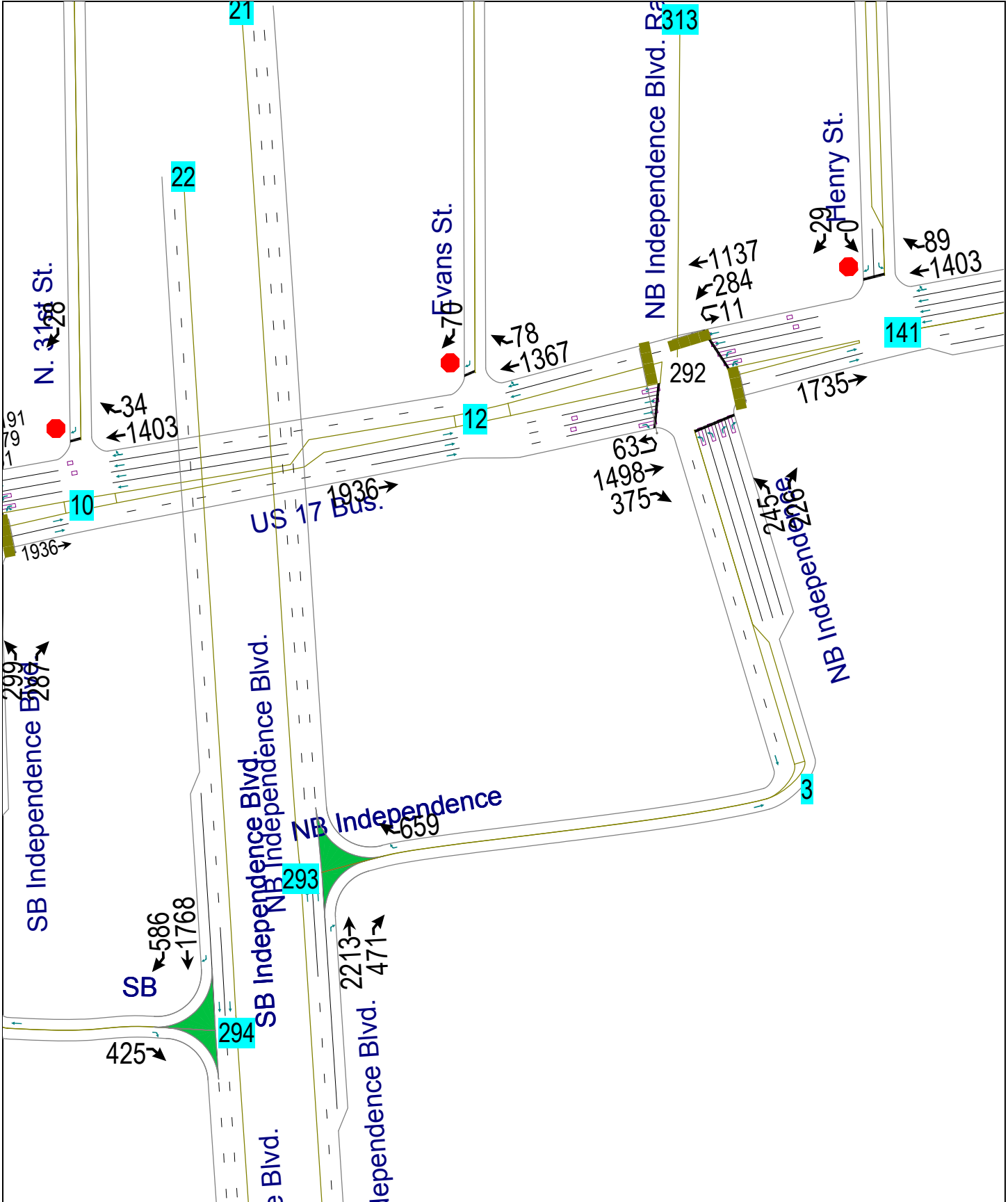
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Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		↑↑	↑↑↑↑			↗	
Volume (veh/h)	0	1936	1403	34	0	28	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	0	2151	1559	38	0	31	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		None	None				
Median storage (veh)							
Upstream signal (ft)		130	698				
pX, platoon unblocked					0.60		
vC, conflicting volume	1597				2653	409	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1597				2426	409	
tC, single (s)	4.1				6.8	6.9	
tC, 2 stage (s)							
tF (s)	2.2				3.5	3.3	
p0 queue free %	100				100	95	
cM capacity (veh/h)	416				17	592	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	1076	1076	445	445	445	260	31
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	38	31
cSH	1700	1700	1700	1700	1700	1700	592
Volume to Capacity	0.63	0.63	0.26	0.26	0.26	0.15	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.4
Lane LOS							B
Approach Delay (s)	0.0		0.0				11.4
Approach LOS							B
Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			56.8%		ICU Level of Service		B
Analysis Period (min)			15				

11: US 17 Bus. (Market St.) & N. 31st St.  
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (vph)	0	1604	1653	57	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	5036	3487	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	5036	3487	0	0	1580
Link Speed (mph)		40	40		25	
Link Distance (ft)		453	245		894	
Travel Time (s)		7.7	4.2		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1782	1900	0	0	112
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.4%
ICU Level of Service	B
Analysis Period (min)	15

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 2 Quad BC AM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (veh/h)	0	1604	1653	57	0	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1782	1837	63	0	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		583	245			
pX, platoon unblocked	0.73				0.85	0.73
vC, conflicting volume	1900				2462	950
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1500				749	204
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	81
cM capacity (veh/h)	332				298	584

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	594	594	594	1224	676	112
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	63	112
cSH	1700	1700	1700	1700	1700	584
Volume to Capacity	0.35	0.35	0.35	0.72	0.40	0.19
Queue Length 95th (ft)	0	0	0	0	0	18
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.6
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.6
Approach LOS						B

Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			60.4%		ICU Level of Service	B
Analysis Period (min)			15			

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 2 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (vph)	0	1936	1367	78	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	5036	3477	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	5036	3477	0	0	1580
Link Speed (mph)		40	40		25	
Link Distance (ft)		453	245		894	
Travel Time (s)		7.7	4.2		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2151	1606	0	0	78
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
ICU Level of Service	A
Analysis Period (min)	15

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 2 Quad BC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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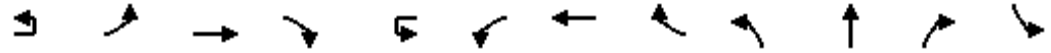
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (veh/h)	0	1936	1367	78	0	70
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2151	1519	87	0	78
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		583	245			
pX, platoon unblocked	0.81				0.76	0.81
vC, conflicting volume	1606				2279	803
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1277				256	286
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	86
cM capacity (veh/h)	445				544	571
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	717	717	717	1013	593	78
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	87	78
cSH	1700	1700	1700	1700	1700	571
Volume to Capacity	0.42	0.42	0.42	0.60	0.35	0.14
Queue Length 95th (ft)	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.3
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.3
Approach LOS						B
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			51.3%		ICU Level of Service	A
Analysis Period (min)			15			

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 2 Quad BC PM Peak



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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	33	0	1272	299	21	287	1431	0	246	0	179	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	225		225	0
Storage Lanes		1		0		2		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			245				245			487		
Travel Time (s)			4.2				4.2			13.3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	0	1413	332	0	342	1590	0	273	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				36			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	14.0	0.0	74.0	22.0	24.0	24.0	84.0	0.0	22.0	0.0	22.0	0.0
Total Split (%)	11.7%	0.0%	61.7%	18.3%	20.0%	20.0%	70.0%	0.0%	18.3%	0.0%	18.3%	0.0%
Maximum Green (s)	7.0		67.0	15.0	17.0	17.0	77.0		15.0		15.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lead		Lag	Lag	Lead					
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	9.0		71.3	92.2			17.8	85.8	15.8		15.8	
Actuated g/C Ratio	0.08		0.59	0.77			0.15	0.72	0.13		0.13	
v/c Ratio	0.28		0.68	0.28			0.68	0.63	0.61		0.55	
Control Delay	52.4		13.0	4.3			51.0	7.2	55.2		54.5	
Queue Delay	0.0		0.1	0.0			0.0	0.1	0.0		0.0	

292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
Build Alt. 2 Quad BC AM Peak

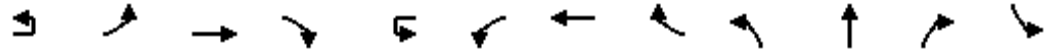
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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	397	
Travel Time (s)	10.8	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
 Build Alt. 2 Quad BC AM Peak

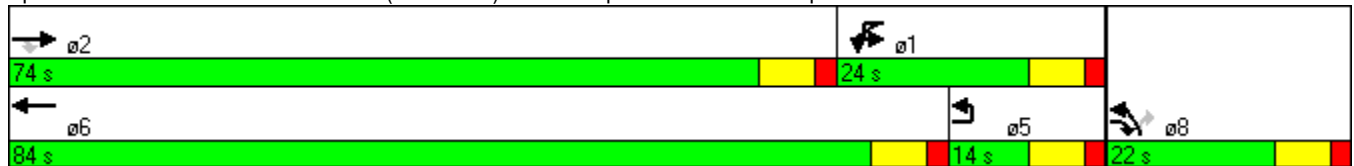


Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	52.4		13.0	4.3		51.0	7.4		55.2		54.5	
LOS	D		B	A		D	A		E		D	
Approach Delay			12.2				15.1					
Approach LOS			B				B					
Queue Length 50th (ft)	29		192	47		132	285		103		82	
Queue Length 95th (ft)	m42		275	103		184	243		148		125	
Internal Link Dist (ft)			165				165			407		
Turn Bay Length (ft)									225		225	
Base Capacity (vph)	131		2084	1193		538	2505		482		391	
Starvation Cap Reductn	0		0	0		0	198		0		0	
Spillback Cap Reductn	0		45	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.28		0.69	0.28		0.64	0.69		0.57		0.51	

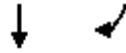
**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 18.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 64.1%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps



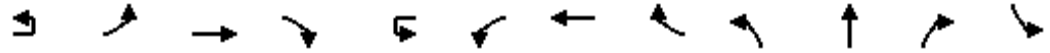
292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
 Build Alt. 2 Quad BC AM Peak



Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	317	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
<b>Intersection Summary</b>		

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	63	0	1498	375	11	284	1137	0	245	0	226	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	225		225	0
Storage Lanes		1		0		2		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			245				245			487		
Travel Time (s)			4.2				4.2			13.3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	0	1664	417	0	328	1263	0	272	0	251	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				36			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	15.0	0.0	76.0	22.0	22.0	22.0	83.0	0.0	22.0	0.0	22.0	0.0
Total Split (%)	12.5%	0.0%	63.3%	18.3%	18.3%	18.3%	69.2%	0.0%	18.3%	0.0%	18.3%	0.0%
Maximum Green (s)	8.0		69.0	15.0	15.0	15.0	76.0		15.0		15.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lag		Lead	Lead	Lead					
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	9.8		72.2	93.5		16.5	81.7		16.3		16.3	
Actuated g/C Ratio	0.08		0.60	0.78		0.14	0.68		0.14		0.14	
v/c Ratio	0.49		0.79	0.34		0.70	0.53		0.59		0.67	
Control Delay	50.0		11.8	1.2		62.6	6.5		54.2		58.7	
Queue Delay	0.0		0.2	0.0		0.0	0.1		0.0		0.0	

292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
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U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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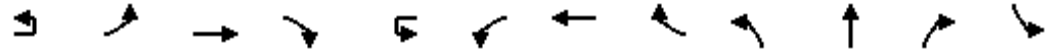


Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	397	
Travel Time (s)	10.8	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	50.0		12.0	1.2		62.6	6.6		54.2		58.7	
LOS	D		B	A		E	A		D		E	
Approach Delay			11.1				18.1					
Approach LOS			B				B					
Queue Length 50th (ft)	52		362	12		119	136		102		105	
Queue Length 95th (ft)	m65		366	m24		167	154		148		156	
Internal Link Dist (ft)			165				165			407		
Turn Bay Length (ft)									225		225	
Base Capacity (vph)	146		2110	1231		482	2387		482		391	
Starvation Cap Reductn	0		72	0		0	264		0		0	
Spillback Cap Reductn	0		24	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.48		0.82	0.34		0.68	0.59		0.56		0.64	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 19.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 70.2%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps



292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
 Build Alt. 2 Quad BC PM Peak



Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	317	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
<b>Intersection Summary</b>		



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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑		↘	↗
Volume (vph)	0	1472	1673	41	0	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	50	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	6320	0	1900	1568
Flt Permitted						
Satd. Flow (perm)	0	3505	6320	0	1900	1568
Link Speed (mph)		40	40		25	
Link Distance (ft)		245	338		767	
Travel Time (s)		4.2	5.8		20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1636	1905	0	0	73
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		24	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.0%
Analysis Period (min)	15
	ICU Level of Service A

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑		↘	↗
Volume (veh/h)	0	1472	1673	41	0	66
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1636	1859	46	0	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		245	338			
pX, platoon unblocked					0.70	
vC, conflicting volume	1904				2699	488
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1904				2573	488
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	86
cM capacity (veh/h)	317				15	523

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1	SB 2
Volume Total	818	818	531	531	531	311	0	73
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	46	0	73
cSH	1700	1700	1700	1700	1700	1700	1700	523
Volume to Capacity	0.48	0.48	0.31	0.31	0.31	0.18	0.00	0.14
Queue Length 95th (ft)	0	0	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0
Lane LOS							A	B
Approach Delay (s)	0.0		0.0				13.0	
Approach LOS							B	

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization	44.0%		ICU Level of Service A
Analysis Period (min)		15	

141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 2 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑		↘	↗
Volume (vph)	0	1735	1403	89	0	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	50	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	6289	0	1900	1568
Flt Permitted						
Satd. Flow (perm)	0	3505	6289	0	1900	1568
Link Speed (mph)		40	40		25	
Link Distance (ft)		245	338		767	
Travel Time (s)		4.2	5.8		20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1928	1658	0	0	32
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		24	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
ICU Level of Service	A
Analysis Period (min)	15

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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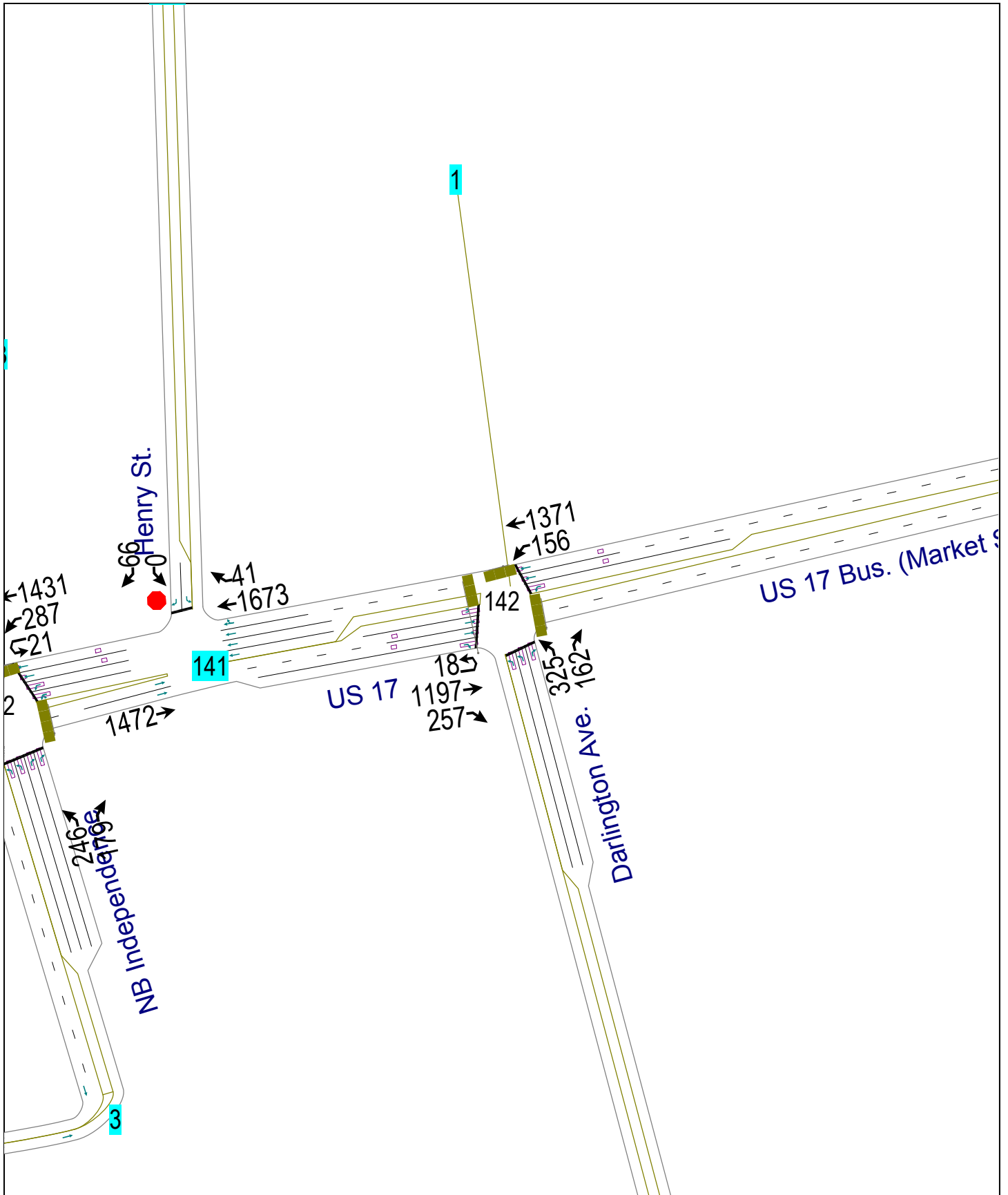


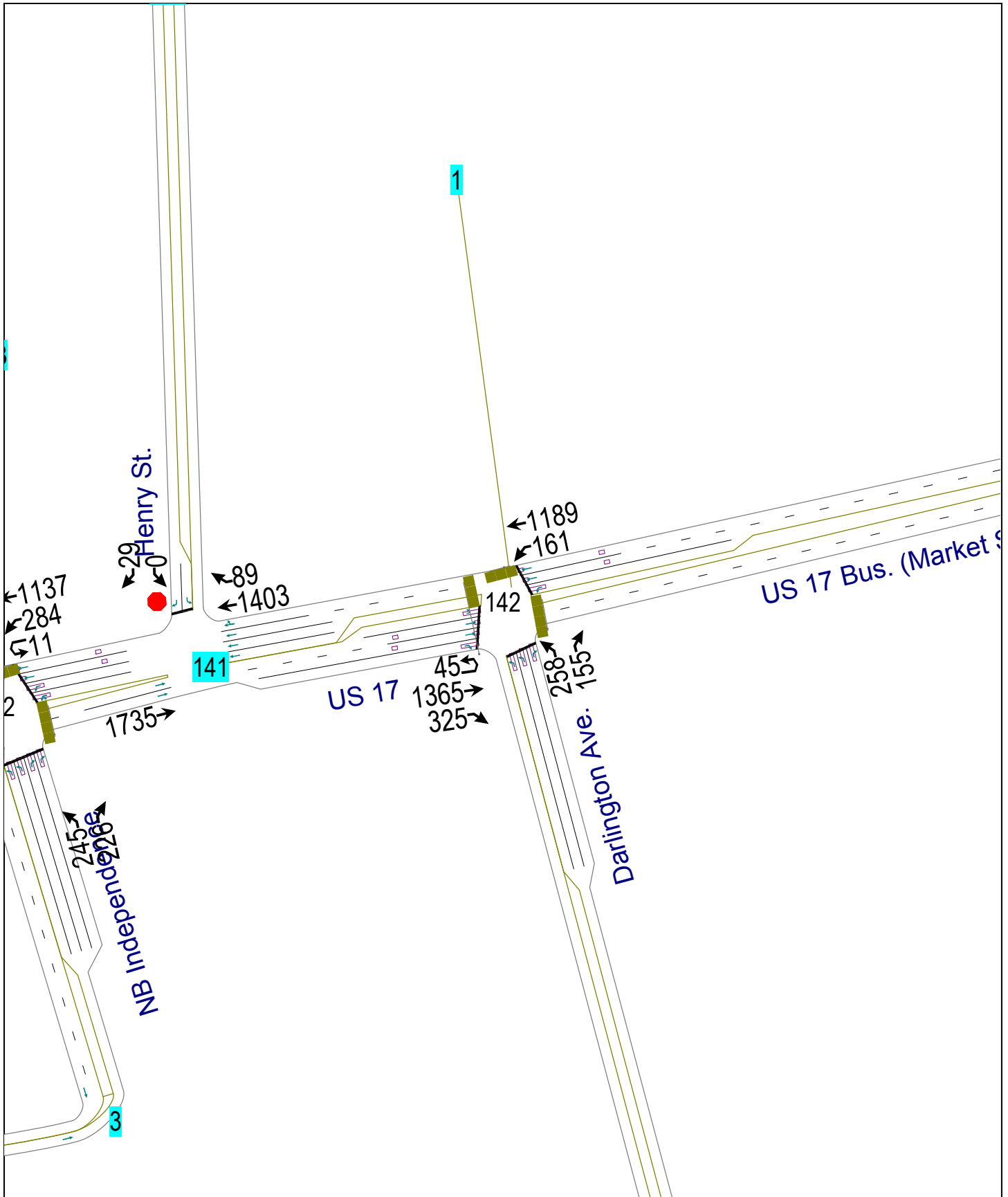
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑		↘	↗
Volume (veh/h)	0	1735	1403	89	0	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1928	1559	99	0	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		245	338			
pX, platoon unblocked					0.63	
vC, conflicting volume	1658				2572	439
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1658				2317	439
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	394				20	563

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1	SB 2
Volume Total	964	964	445	445	445	322	0	32
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	99	0	32
cSH	1700	1700	1700	1700	1700	1700	1700	563
Volume to Capacity	0.57	0.57	0.26	0.26	0.26	0.19	0.00	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8
Lane LOS							A	B
Approach Delay (s)	0.0		0.0				11.8	
Approach LOS							B	

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		51.3%	ICU Level of Service A
Analysis Period (min)		15	

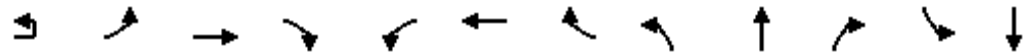
141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 2 Quad BC PM Peak





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Synchro 7 - Report Lanes, Volumes, Timings

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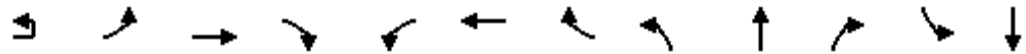
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↑	↗	↖	↑↑		↖↗		↗		
Volume (vph)	18	0	1197	257	156	1371	0	325	0	162	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		125		250	225		0	250		250	0	
Storage Lanes		1		1	1		0	1		1	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	1752	0	3505	1568	1752	3505	0	3433	0	1583	0	0
Flt Permitted	0.950				0.950			0.950				
Satd. Flow (perm)	1752	0	3505	1568	1752	3505	0	3433	0	1583	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			30
Link Distance (ft)			338			689			817			480
Travel Time (s)			5.8			11.7			22.3			10.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	0%	2%	0%	2%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	0	1330	286	173	1523	0	361	0	180	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	R NA	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot			Perm	Prot			Prot		custom		
Protected Phases	5		2		1	6		8				
Permitted Phases				2						8		
Detector Phase	5		2	2	1	6		8		8		
Switch Phase												
Minimum Initial (s)	7.0		12.0	12.0	7.0	12.0		7.0		7.0		
Minimum Split (s)	14.0		19.0	19.0	14.0	19.0		14.0		14.0		
Total Split (s)	14.0	0.0	67.0	67.0	25.0	78.0	0.0	28.0	0.0	28.0	0.0	0.0
Total Split (%)	11.7%	0.0%	55.8%	55.8%	20.8%	65.0%	0.0%	23.3%	0.0%	23.3%	0.0%	0.0%
Maximum Green (s)	7.0		60.0	60.0	18.0	71.0		21.0		21.0		
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0		5.0		5.0		
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0		2.0		2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0	2.0
Lead/Lag	Lag		Lead	Lead	Lag	Lead						
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0		3.0		
Recall Mode	None		C-Max	C-Max	None	C-Max		None		None		
Act Effct Green (s)	9.0		67.3	67.3	17.7	84.4		20.0		20.0		
Actuated g/C Ratio	0.08		0.56	0.56	0.15	0.70		0.17		0.17		
v/c Ratio	0.15		0.68	0.33	0.67	0.62		0.63		0.68		
Control Delay	59.6		9.0	5.8	61.3	12.4		51.4		60.3		
Queue Delay	0.0		0.2	0.0	0.0	0.0		0.0		0.0		

142: US 17 Bus. (Market St.) &  
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Lane Group	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

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 Build Alt. 2 Quad BC AM Peak



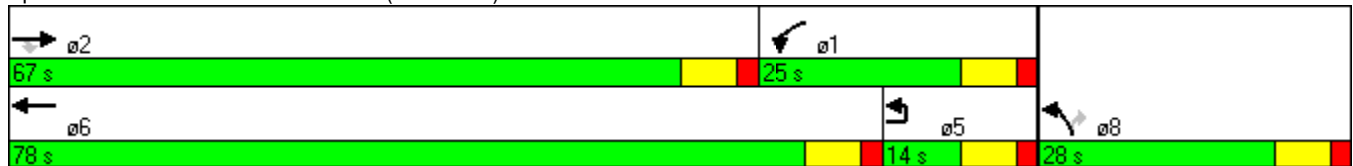


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	59.6		9.2	5.8	61.3	12.4		51.4		60.3		
LOS	E		A	A	E	B		D		E		
Approach Delay			9.2			17.4						
Approach LOS			A			B						
Queue Length 50th (ft)	17		231	39	127	244		134		131		
Queue Length 95th (ft)	m25		382	80	202	488		181		207		
Internal Link Dist (ft)			258			609			737			400
Turn Bay Length (ft)	125			250	225			250		250		
Base Capacity (vph)	131		1966	880	292	2465		658		303		
Starvation Cap Reductn	0		125	0	0	0		0		0		
Spillback Cap Reductn	0		0	0	0	0		0		0		
Storage Cap Reductn	0		0	0	0	0		0		0		
Reduced v/c Ratio	0.15		0.72	0.33	0.59	0.62		0.55		0.59		

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 119 (99%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 19.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 64.7%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 142: US 17 Bus. (Market St.) &

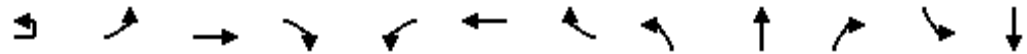




Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/28/2012

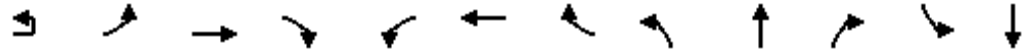


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↕		↑↑	↗	↖	↑↑		↖↗		↗		
Volume (vph)	45	0	1365	325	161	1189	0	258	0	155	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		125		250	225		0	250		250	0	
Storage Lanes		1		1	1		0	1		1	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	1752	0	3505	1568	1752	3505	0	3433	0	1583	0	0
Flt Permitted	0.950				0.950			0.950				
Satd. Flow (perm)	1752	0	3505	1568	1752	3505	0	3433	0	1583	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			30
Link Distance (ft)			338			689			817			480
Travel Time (s)			5.8			11.7			22.3			10.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	0%	2%	0%	2%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	0	1517	361	179	1321	0	287	0	172	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	R NA	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot			Perm	Prot			Prot		custom		
Protected Phases	5		2		1	6		8				
Permitted Phases				2						8		
Detector Phase	5		2	2	1	6		8		8		
Switch Phase												
Minimum Initial (s)	7.0		12.0	12.0	7.0	12.0		7.0		7.0		
Minimum Split (s)	14.0		19.0	19.0	14.0	19.0		14.0		14.0		
Total Split (s)	14.0	0.0	69.0	69.0	25.0	80.0	0.0	26.0	0.0	26.0	0.0	0.0
Total Split (%)	11.7%	0.0%	57.5%	57.5%	20.8%	66.7%	0.0%	21.7%	0.0%	21.7%	0.0%	0.0%
Maximum Green (s)	7.0		62.0	62.0	18.0	73.0		19.0		19.0		
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0		5.0		5.0		
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0		2.0		2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0	2.0
Lead/Lag	Lag		Lag	Lag	Lead	Lead						
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0		3.0		
Recall Mode	None		C-Max	C-Max	None	C-Max		None		None		
Act Effct Green (s)	9.0		68.5	68.5	17.9	80.2		18.6		18.6		
Actuated g/C Ratio	0.08		0.57	0.57	0.15	0.67		0.16		0.16		
v/c Ratio	0.38		0.76	0.40	0.69	0.56		0.54		0.70		
Control Delay	47.3		13.2	10.8	62.0	12.9		50.3		63.4		
Queue Delay	0.0		0.4	0.0	0.0	0.0		0.0		0.0		

142: US 17 Bus. (Market St.) &  
Build Alt. 2 Quad BC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

142: US 17 Bus. (Market St.) &  
 Build Alt. 2 Quad BC PM Peak



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	47.3		13.6	10.8	62.0	12.9		50.3		63.4		
LOS	D		B	B	E	B		D		E		
Approach Delay			14.0			18.7						
Approach LOS			B			B						
Queue Length 50th (ft)	37		171	77	131	296		105		126		
Queue Length 95th (ft)	m47		266	m104	208	366		148		202		
Internal Link Dist (ft)			258			609			737			400
Turn Bay Length (ft)	125			250	225			250		250		
Base Capacity (vph)	131		2001	895	292	2343		601		277		
Starvation Cap Reductn	0		145	0	0	0		0		0		
Spillback Cap Reductn	0		0	0	0	0		0		0		
Storage Cap Reductn	0		0	0	0	0		0		0		
Reduced v/c Ratio	0.38		0.82	0.40	0.61	0.56		0.48		0.62		

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 14 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 20.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 65.7%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 142: US 17 Bus. (Market St.) &



142: US 17 Bus. (Market St.) &  
 Build Alt. 2 Quad BC PM Peak



Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection: 4: Darlington Ave. & Independence Blvd.

Movement	WB
Directions Served	R
Maximum Queue (ft)	204
Average Queue (ft)	77
95th Queue (ft)	196
Link Distance (ft)	967
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: US 17 Bus. (Market St.) & Forest Hills Dr.

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	427	397	53	206	236	324	148	195
Average Queue (ft)	195	216	17	108	81	125	47	108
95th Queue (ft)	332	336	46	174	199	300	111	183
Link Distance (ft)	987	987			520	520		890
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			300	350			350	
Storage Blk Time (%)		1						
Queuing Penalty (veh)		1						

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	22	110	330	193
Average Queue (ft)	5	40	117	64
95th Queue (ft)	19	82	253	136
Link Distance (ft)			917	811
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100	100		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		4		

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	23	167	234	177	222	218	48	240
Average Queue (ft)	1	69	105	52	57	79	20	77
95th Queue (ft)	7	136	206	117	144	166	49	170
Link Distance (ft)		719	719		516	516	900	747
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			300				
Storage Blk Time (%)		4						
Queuing Penalty (veh)		0						

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	NB	SB
Directions Served	TR	R	R
Maximum Queue (ft)	30	198	142
Average Queue (ft)	2	73	70
95th Queue (ft)	12	139	128
Link Distance (ft)	516	813	689
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: US 17 Bus. (Market St.) & N. 31st St.

Movement	WB	WB	WB	WB	SB
Directions Served	T	T	T	TR	R
Maximum Queue (ft)	158	223	355	395	244
Average Queue (ft)	59	73	173	186	110
95th Queue (ft)	134	154	303	323	228
Link Distance (ft)			390	390	583
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				1	
Storage Bay Dist (ft)	200	200			
Storage Blk Time (%)			4		
Queuing Penalty (veh)			37		



Intersection: 12: US 17 Bus. (Market St.) & Evans St.

Movement	EB	EB	WB	SB
Directions Served	T	T	TR	R
Maximum Queue (ft)	20	42	31	132
Average Queue (ft)	1	2	1	49
95th Queue (ft)	6	17	10	104
Link Distance (ft)	390	390	156	838
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 15: US 17 Bus. (Market St.) & Barclay Hills Dr.

Movement	SB
Directions Served	R
Maximum Queue (ft)	29
Average Queue (ft)	12
95th Queue (ft)	34
Link Distance (ft)	554
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 141: US 17 Bus. (Market St.) & Henry St.

Movement	WB	WB	WB	WB	SB
Directions Served	T	T	T	TR	R
Maximum Queue (ft)	31	72	122	162	88
Average Queue (ft)	2	8	13	26	33
95th Queue (ft)	15	43	61	98	62
Link Distance (ft)			282	282	700
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	125	125			
Storage Blk Time (%)			0		10
Queuing Penalty (veh)			1		0

**Intersection: 142: US 17 Bus. (Market St.) &**

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	U	T	T	R	L	T	T	L	L	R
Maximum Queue (ft)	40	216	202	154	249	519	368	242	193	220
Average Queue (ft)	8	97	115	60	101	214	178	115	105	120
95th Queue (ft)	25	157	177	125	170	363	287	197	177	213
Link Distance (ft)		282	282			619	619		754	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	125			250	225			250		250
Storage Blk Time (%)		1				2		0		
Queuing Penalty (veh)		0				4		0		

**Intersection: 291: US 17 Bus. (Market St.) &**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	210	243	273	250	68	76	81	80	196	198	106	141
Average Queue (ft)	96	152	206	57	62	62	75	75	89	97	48	68
95th Queue (ft)	179	236	279	187	75	71	90	82	145	150	86	111
Link Distance (ft)	313	313	313		63	63	63	63		467		
Upstream Blk Time (%)					45	52	30	32				
Queuing Penalty (veh)					196	230	130	142				
Storage Bay Dist (ft)				225					250		250	250
Storage Blk Time (%)			3	0								
Queuing Penalty (veh)			6	0								

**Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	83	235	246	174	146	144	159	154	159	152	90	131
Average Queue (ft)	17	128	155	66	103	108	84	82	84	78	50	71
95th Queue (ft)	46	205	233	133	150	156	160	167	142	126	89	116
Link Distance (ft)	156	156	156	156	138	138	138	138		390		
Upstream Blk Time (%)		5	11	0	2	6	2	4				
Queuing Penalty (veh)		20	45	1	9	26	9	16				
Storage Bay Dist (ft)									225		225	225
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 4: Darlington Ave. & NB Independence Blvd.

Movement	WB
Directions Served	R
Maximum Queue (ft)	1003
Average Queue (ft)	927
95th Queue (ft)	1112
Link Distance (ft)	967
Upstream Blk Time (%)	76
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: US 17 Bus. (Market St.) & Forest Hills Dr.

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	T	T	R	L	T	T	LR
Maximum Queue (ft)	418	416	325	226	275	353	235
Average Queue (ft)	253	281	19	116	121	163	133
95th Queue (ft)	392	422	117	189	254	313	215
Link Distance (ft)	988	988			918	918	889
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			300	300			
Storage Blk Time (%)		5					
Queuing Penalty (veh)		3					

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	L	TR	LTR	LTR
Maximum Queue (ft)	45	444	419	109	16	333	67
Average Queue (ft)	18	43	55	26	1	114	22
95th Queue (ft)	42	214	230	64	5	248	53
Link Distance (ft)		918	918		719	916	811
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	300			300			
Storage Blk Time (%)		0					
Queuing Penalty (veh)		0					

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	124	765	769	154	164	242	91	66
Average Queue (ft)	5	388	449	76	67	80	41	21
95th Queue (ft)	42	775	826	156	167	187	86	51
Link Distance (ft)		719	719		516	516	900	747
Upstream Blk Time (%)		2	3					
Queuing Penalty (veh)		16	24					
Storage Bay Dist (ft)	100			300				
Storage Blk Time (%)		29						
Queuing Penalty (veh)		5						

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	EB	WB	NB	SB
Directions Served	T	TR	TR	R	R
Maximum Queue (ft)	68	84	20	149	113
Average Queue (ft)	2	5	1	62	55
95th Queue (ft)	23	35	7	120	102
Link Distance (ft)	516	516	313	813	689
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 10: US 17 Bus. (Market St.) & N. 31st St.

Movement	WB	WB	WB	WB	SB
Directions Served	T	T	T	TR	R
Maximum Queue (ft)	111	103	203	306	51
Average Queue (ft)	43	46	61	73	21
95th Queue (ft)	102	102	162	192	46
Link Distance (ft)			390	390	583
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	200			
Storage Blk Time (%)			0		
Queuing Penalty (veh)			1		

Intersection: 12: US 17 Bus. (Market St.) & Evans St.

Movement	EB	EB	SB
Directions Served	T	T	R
Maximum Queue (ft)	58	276	69
Average Queue (ft)	4	19	34
95th Queue (ft)	26	110	67
Link Distance (ft)	390	390	838
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: US 17 Bus. (Market St.) & Barclay Hills Dr.

Movement	SB
Directions Served	R
Maximum Queue (ft)	29
Average Queue (ft)	9
95th Queue (ft)	30
Link Distance (ft)	554
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 141: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	WB	WB	WB	WB	SB
Directions Served	T	T	T	T	T	TR	R
Maximum Queue (ft)	248	253	119	107	51	27	50
Average Queue (ft)	11	10	20	30	3	1	17
95th Queue (ft)	88	87	82	90	20	9	44
Link Distance (ft)	138	138			282	282	700
Upstream Blk Time (%)	0	0					
Queuing Penalty (veh)	4	3					
Storage Bay Dist (ft)			125	125			
Storage Blk Time (%)			0	0			1
Queuing Penalty (veh)			0	0			0

Intersection: 142: US 17 Bus. (Market St.) &

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	U	T	T	R	L	T	T	L	L	R
Maximum Queue (ft)	149	366	350	274	249	254	266	157	155	219
Average Queue (ft)	36	188	194	135	121	154	136	89	82	122
95th Queue (ft)	108	299	291	244	221	267	257	140	128	208
Link Distance (ft)		282	282			619	619		754	
Upstream Blk Time (%)		4	2	0						
Queuing Penalty (veh)		32	16	0						
Storage Bay Dist (ft)	125			250	225			250		250
Storage Blk Time (%)	2	18	3	1		1				
Queuing Penalty (veh)	17	8	10	6		2				

Intersection: 291: US 17 Bus. (Market St.) &

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	236	283	310	250	103	78	130	78	146	154	144	191
Average Queue (ft)	73	165	212	49	64	61	69	70	91	93	72	103
95th Queue (ft)	168	254	286	162	88	81	108	98	135	149	126	166
Link Distance (ft)	313	313	313		63	63	63	63		467		
Upstream Blk Time (%)				0	53	56	22	21				
Queuing Penalty (veh)			1		189	199	78	76				
Storage Bay Dist (ft)				225					250		250	250
Storage Blk Time (%)			2	0								
Queuing Penalty (veh)			6	0								

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	105	244	236	116	146	154	156	161	176	176	157	193
Average Queue (ft)	46	132	167	59	108	119	83	91	93	86	75	97
95th Queue (ft)	91	220	240	111	161	166	152	166	147	156	136	156
Link Distance (ft)	156	156	156	156	138	138	138	138		390		
Upstream Blk Time (%)		4	9		12	22	1	1				
Queuing Penalty (veh)		21	45		43	79	3	4				
Storage Bay Dist (ft)									225		225	225
Storage Blk Time (%)												
Queuing Penalty (veh)												

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 2 BC Quadrant
Project Description	U-4434 Independence Boulevard Extension		
<b>45</b>		<b>46</b>	
Independence Blvd. SB - to US 17 Bus.		Independence Blvd. NB - from US 17 Bus.	
Merge/Diverge	Diverge	Merge/Diverge	Merge
No. of lanes on Freeway	2	No. of lanes on Freeway	2
Freeway FFS	60 mph	Freeway FFS	60 mph
Freeway Volume (AM/PM)	2877 2354	Freeway Volume (AM/PM)	1768 2218
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	15 mph
Ramp Volume (AM/PM)	659 586	Ramp Volume (AM/PM)	586 659
No. Lanes on Ramp	1	No. Lanes on Ramp	1
Accel/Decel Distance 1	800 ft	Accel/Decel Distance 1	1440 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	N/A ft
Adjacent Upstream	Yes	Adjacent Upstream	Yes
Off/On	On	Off/On	Off
Distance	4510 ft	Distance	90 ft
Truck %	4%	Truck %	3%
Ramp Volume (AM/PM)	1628 1103	Ramp Volume (AM/PM)	425 471
Adjacent Downstream	Yes	Adjacent Downstream	Yes
Off/On	On - N/A	Off/On	Off
Distance	N/A ft	Distance	4810 ft
Truck %	N/A	Truck %	4%
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	1103 1628
Peak Hour Factor	0.90	Peak Hour Factor	0.90
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	1.00
Freeway Truck %	4%	Freeway Truck %	4%
Ramp Truck %	3%	Ramp Truck %	3%
<b>47</b>		<b>48</b>	
Independence Blvd. SB - from US 17 Bus.		Independence Blvd. NB - to Darlington	
Merge/Diverge	Merge	Merge/Diverge	Diverge
No. of lanes on Freeway	2	No. of lanes on Freeway	0
Freeway FFS	60 mph	Freeway FFS	0 mph
Freeway Volume (AM/PM)	2213 1771	Freeway Volume (AM/PM)	0 0
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	0 mph
Ramp Volume (AM/PM)	471 425	Ramp Volume (AM/PM)	0 0
No. Lanes on Ramp	1	No. Lanes on Ramp	0
Accel/Decel Distance 1	1440 ft	Accel/Decel Distance 1	0 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	0 ft
Adjacent Upstream	Yes	Adjacent Upstream	Yes
Off/On	Off	Off/On	On
Distance	90 ft	Distance	0 ft
Truck %	3%	Truck %	0
Ramp Volume (AM/PM)	659 586	Ramp Volume (AM/PM)	0 0
Adjacent Downstream	No	Adjacent Downstream	Yes
Off/On	N/A	Off/On	On
Distance	N/A ft	Distance	0 ft
Truck %	N/A	Truck %	0
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	0 0
Peak Hour Factor	0.90	Peak Hour Factor	0.00
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	0.00
Freeway Truck %	4%	Freeway Truck %	0%
Ramp Truck %	3%	Ramp Truck %	0%
<b>48</b>			
Independence Blvd. NB - to Darlington			
Merge/Diverge	Diverge	Merge/Diverge	Diverge
No. of lanes on Freeway	2	No. of lanes on Freeway	0
Freeway FFS	60 mph	Freeway FFS	0 mph
Freeway Volume (AM/PM)	2205 2695	Freeway Volume (AM/PM)	0 0
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	0 mph
Ramp Volume (AM/PM)	99 133	Ramp Volume (AM/PM)	0 0
No. Lanes on Ramp	1	No. Lanes on Ramp	0
Accel/Decel Distance 1	800 ft	Accel/Decel Distance 1	0 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	0 ft
Adjacent Upstream	No	Adjacent Upstream	Yes
Off/On	N/A	Off/On	On
Distance	N/A ft	Distance	0 ft
Truck %	N/A	Truck %	0
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	0 0
Adjacent Downstream	Yes	Adjacent Downstream	Yes
Off/On	On - N/A	Off/On	On
Distance	N/A ft	Distance	0 ft
Truck %	N/A	Truck %	0
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	0 0
Peak Hour Factor	0.90	Peak Hour Factor	0.00
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	0.00
Freeway Truck %	4%	Freeway Truck %	0%
Ramp Truck %	2%	Ramp Truck %	0%

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 2 BC Quadrant
Project Description	U-4434 Independence Boulevard Extension		

49																																						
Independence Blvd. NB - Darlington to Market																																						
Sides (One or Two)	One	Sides (One or Two)																																				
No. of Lanes	3	No. of Lanes																																				
Weaving Length, L <sub>s</sub>	1720 ft	Weaving Length, L <sub>s</sub>																																				
Multi-Lane FFS	60 mph	Freeway FFS																																				
Min. Speed (Def. = 15)	15 mph	Min. Speed (Def. = 15)																																				
Segment Type	Multi-Lane	Segment Type																																				
Terrain	Level	Terrain																																				
		Freeway Rolling																																				
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R →	R <sub>VRR</sub> 0	0 %																																				
Peak Hour Factor	0.90	Peak Hour Factor																																				
Driver Pop. Adj.	1.00	Driver Pop. Adj.																																				
Maneuver Lns., N <sub>WL</sub>	2	Maneuver Lns., N <sub>WL</sub>																																				
Interchange Density	3.00	Interchange Density																																				
Min. RF In. chng., LC <sub>RF</sub>	1	Min. RF In. chng., LC <sub>RF</sub>																																				
Min. FR In. chng., LC <sub>FR</sub>	1	Min. FR In. chng., LC <sub>FR</sub>																																				
Min. RR In. chng., LC <sub>RR</sub>	N/A	Min. RR In. chng., LC <sub>RR</sub>																																				
20% of vehicles from Darlington exit onto Market																																						

(Place weaving % assumption here)																																						
Independence Blvd. NB - Darlington to Market																																						
Sides (One or Two)	One	Sides (One or Two)																																				
No. of Lanes	0	No. of Lanes																																				
Weaving Length, L <sub>s</sub>	0 ft	Weaving Length, L <sub>s</sub>																																				
Freeway FFS	0 mph	Freeway FFS																																				
Min. Speed (Def. = 15)	0 mph	Min. Speed (Def. = 15)																																				
Segment Type	Freeway	Segment Type																																				
Terrain	Rolling	Terrain																																				
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↗	R <sub>VFR</sub> 0	0 %																																				
R →	R <sub>VRR</sub> 0	0 %																																				
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;"></td> <td style="width: 33%;"></td> </tr> <tr> <td style="text-align: center;">AM Peak</td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td style="text-align: center;">F<sub>VFF</sub> 0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>↘</td> <td style="text-align: center;">F<sub>VRF</sub> 0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>↗</td> <td style="text-align: center;">R<sub>VFR</sub> 0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>R →</td> <td style="text-align: center;">R<sub>VRR</sub> 0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td style="text-align: center;">PM Peak</td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td style="text-align: center;">F<sub>VFF</sub> 0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>↘</td> <td style="text-align: center;">F<sub>VRF</sub> 0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>↗</td> <td style="text-align: center;">R<sub>VFR</sub> 0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>R →</td> <td style="text-align: center;">R<sub>VRR</sub> 0</td> <td style="text-align: center;">0 %</td> </tr> </table>						AM Peak	Vol	Truck	F →	F <sub>VFF</sub> 0	0 %	↘	F <sub>VRF</sub> 0	0 %	↗	R <sub>VFR</sub> 0	0 %	R →	R <sub>VRR</sub> 0	0 %				PM Peak	Vol	Truck	F →	F <sub>VFF</sub> 0	0 %	↘	F <sub>VRF</sub> 0	0 %	↗	R <sub>VFR</sub> 0	0 %	R →	R <sub>VRR</sub> 0	0 %
AM Peak	Vol	Truck																																				
F →	F <sub>VFF</sub> 0	0 %																																				
↘	F <sub>VRF</sub> 0	0 %																																				
↗	R <sub>VFR</sub> 0	0 %																																				
R →	R <sub>VRR</sub> 0	0 %																																				
PM Peak	Vol	Truck																																				
F →	F <sub>VFF</sub> 0	0 %																																				
↘	F <sub>VRF</sub> 0	0 %																																				
↗	R <sub>VFR</sub> 0	0 %																																				
R →	R <sub>VRR</sub> 0	0 %																																				
Peak Hour Factor	0.00	Peak Hour Factor																																				
Driver Pop. Adj.	0.00	Driver Pop. Adj.																																				
Maneuver Lns., N <sub>WL</sub>	0	Maneuver Lns., N <sub>WL</sub>																																				
Interchange Density	0.00	Interchange Density																																				
Min. RF In. chng., LC <sub>RF</sub>	0	Min. RF In. chng., LC <sub>RF</sub>																																				
Min. FR In. chng., LC <sub>FR</sub>	0	Min. FR In. chng., LC <sub>FR</sub>																																				
Min. RR In. chng., LC <sub>RR</sub>	N/A	Min. RR In. chng., LC <sub>RR</sub>																																				
(Place weaving % assumption here)																																						



# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 2 BC Quadrant
Project Description		U-4434 Independence Boulevard Extension	

<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>49</b></div> <p>Independence Blvd. NB - Darlington to Market  <u>Interchange</u>                      <u>No.</u>                      Darlington Ave.                      1                      Market St.                              1</p> <p>Note: multi-lane only 0.67 mile long                      Interchange Density                      3.00 int/mi</p>	<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0</p> <p><u>Interchange</u>                      <u>No.</u></p> <p>Note: freeway only 3.5 miles long                      Interchange Density                      0.00 int/mi</p>	<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0</p> <p><u>Interchange</u>                      <u>No.</u></p> <p>Interchange Density                      0.00 int/mi</p>
<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0</p> <p><u>Interchange</u>                      <u>No.</u></p> <p>Interchange Density                      0.00 int/mi</p>	<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0</p> <p><u>Interchange</u>                      <u>No.</u></p> <p>Interchange Density                      0.00 int/mi</p>	<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0</p> <p><u>Interchange</u>                      <u>No.</u></p> <p>Interchange Density                      0.00 int/mi</p>

**HIGHWAY CAPACITY SOFTWARE 2010  
NETWORK DATA SUMMARY - ANALYSIS NOTES**

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 2 BC Quadrant
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV %	Freeway Truck%			
	FR = DS ramp HV %	Off Ramp Truck %			
	RF = US ramp HV %	On Ramp Truck %			
	RR = DS ramp HV %	Off Ramp Truck %			

Level of Service Standards - Freeways	Level of Service Standards - Signalized Intersections
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004	LOS D or better for overall intersection required
	LOS D or better for individual movements recommended
	If not LOS D for individual movement - v/c ratio must be less than 0.85

**Assumed Improvements**

TIP No.	Description
U-3338	SR 1175 (Kerr Avenue) - widening, including new interchange at US 74

**General Analysis Notes**

- ▶ Interchange/Ramp Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

**Design Specific Analysis Notes**

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

**Locations where LOS D or better not achieved**

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 2 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 4510 ft V <sub>u</sub> = 1628 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> : 800 Freeway Volume, V <sub>F</sub> : 2877 Ramp Volume, V <sub>R</sub> : 659 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2877	0.90	Level	4	0	0.980	1.00	3261
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	1628	0.90	Level	4	0	0.980	1.00	1845
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 3261 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	3261	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2518	Exhibit 13-8	4600 No
V <sub>R</sub>	743	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3261	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 25.1 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.755 (Exhibit 13-12)  
 S<sub>R</sub> = 46.4 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 46.4 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 2 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 4510 ft V <sub>u</sub> = 1103 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : Deceleration Lane Length L <sub>D</sub> : 800 Freeway Volume, V <sub>F</sub> : 2354 Ramp Volume, V <sub>R</sub> : 586 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2354	0.90	Level	4	0	0.980	1.00	2668
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	1103	0.90	Level	4	0	0.980	1.00	1250
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 2668 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2668	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2007	Exhibit 13-8	4600 No
V <sub>R</sub>	661	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2668	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 20.0 (pc/mi/ln)  
 LOS = B (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.747 (Exhibit 13-12)  
 S<sub>R</sub> = 46.5 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 46.5 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 2 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1768	$L_{down} =$ ft
$V_u =$ 425 veh/h	Ramp Volume, $V_R$	586	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1768	0.90	Level	4	0	0.980	1.00	2004
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	425	0.90	Level	3	0	0.985	1.00	479
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2004 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2665	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2665	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
$D_R =$ 16.9 (pc/mi/ln)
LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)
LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.334 (Exhibit 13-11)
$S_R =$ 54.0 mph (Exhibit 13-11)
$S_0 =$ N/A mph (Exhibit 13-11)
$S =$ 54.0 mph (Exhibit 13-13)

### Speed Determination

$D_s =$ (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 2 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2218	$L_{down} =$ ft
$V_u =$ 471 veh/h	Ramp Volume, $V_R$	659	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2218	0.90	Level	4	0	0.980	1.00	2514
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	471	0.90	Level	3	0	0.985	1.00	531
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2514 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3257	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3257	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	
$D_R =$	21.5 (pc/mi/ln)
LOS =	C (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$	(pc/mi/ln)
LOS =	(Exhibit 13-2)

### Speed Determination

$M_S =$	0.379 (Exhibit 13-11)
$S_R =$	53.2 mph (Exhibit 13-11)
$S_0 =$	N/A mph (Exhibit 13-11)
$S =$	53.2 mph (Exhibit 13-13)

### Speed Determination

$D_s =$	(Exhibit 13-12)
$S_R =$	mph (Exhibit 13-12)
$S_0 =$	mph (Exhibit 13-12)
$S =$	mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 2 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2213	$L_{down} =$ ft
$V_u =$ 659 veh/h	Ramp Volume, $V_R$	471	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2213	0.90	Level	4	0	0.980	1.00	2508
Ramp	471	0.90	Level	3	0	0.985	1.00	531
UpStream	659	0.90	Level	3	0	0.985	1.00	743
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2508 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3039	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3039	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
$D_R =$ 19.9 (pc/mi/ln)
LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)
LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.359 (Exhibit 13-11)
$S_R =$ 53.5 mph (Exhibit 13-11)
$S_0 =$ N/A mph (Exhibit 13-11)
$S =$ 53.5 mph (Exhibit 13-13)

### Speed Determination

$D_s =$ (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 2 BC Quadrant
Project Description U-4434 Independence Boulevard Extension			

Inputs			
Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1771	$L_{down} =$ ft
$V_u =$ 586 veh/h	Ramp Volume, $V_R$	425	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1771	0.90	Level	4	0	0.980	1.00	2007
Ramp	425	0.90	Level	3	0	0.985	1.00	479
UpStream	586	0.90	Level	3	0	0.985	1.00	661
DownStream								

Merge Areas					Diverge Areas				
<b>Estimation of <math>v_{12}</math></b>					<b>Estimation of <math>v_{12}</math></b>				
$V_{12} = V_F (P_{FM})$					$V_{12} = V_R + (V_F - V_R)P_{FD}$				
$L_{EQ} =$ (Equation 13-6 or 13-7)					$L_{EQ} =$ (Equation 13-12 or 13-13)				
$P_{FM} =$ 1.000 using Equation (Exhibit 13-6)					$P_{FD} =$ using Equation (Exhibit 13-7)				
$V_{12} =$ 2007 pc/h					$V_{12} =$ pc/h				
$V_3$ or $V_{av34} =$ 0 pc/h (Equation 13-14 or 13-17)					$V_3$ or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)				
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				

Capacity Checks				Capacity Checks			
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2486	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area			
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
$V_{R12}$	2486	Exhibit 13-8	4600:All	No	$V_{12}$	Exhibit 13-8	

Level of Service Determination (if not F)				Level of Service Determination (if not F)			
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$			
$D_R =$ 15.6 (pc/mi/ln)				$D_R =$ (pc/mi/ln)			
LOS = B (Exhibit 13-2)				LOS = (Exhibit 13-2)			

Speed Determination		Speed Determination	
$M_S =$ 0.325 (Exhibit 13-11)		$D_s =$ (Exhibit 13-12)	
$S_R =$ 54.2 mph (Exhibit 13-11)		$S_R =$ mph (Exhibit 13-12)	
$S_0 =$ N/A mph (Exhibit 13-11)		$S_0 =$ mph (Exhibit 13-12)	
$S =$ 54.2 mph (Exhibit 13-13)		$S =$ mph (Exhibit 13-13)	



RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd NB			
Agency or Company					Junction	to Darlington Ave			
Date Performed	2013				Jurisdiction	Segment #48			
Analysis Time Period	AM Peak				Analysis Year	2040 Build - Alt 2 BC Quadrant			
Project Description U-4434 Independence Boulevard Extension									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> = ft  V <sub>u</sub> = veh/h	Number of Lanes, N 2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 800 Freeway Volume, V <sub>F</sub> 2205 Ramp Volume, V <sub>R</sub> 99 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 15.0				Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> = ft  V <sub>D</sub> = veh/h				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	2205	0.90	Level	4	0	0.980	1.00	2499	
Ramp	99	0.90	Level	2	0	0.990	1.00	111	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v <sub>12</sub>					Estimation of v <sub>12</sub>				
$V_{12} = V_F (P_{FM})$ L <sub>EQ</sub> = (Equation 13-6 or 13-7) P <sub>FM</sub> = using Equation (Exhibit 13-6) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L <sub>EQ</sub> = (Equation 13-12 or 13-13) P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7) V <sub>12</sub> = 2499 pc/h V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V <sub>FO</sub>		Exhibit 13-8			V <sub>F</sub>	2499	Exhibit 13-8	4600	No
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2388	Exhibit 13-8	4600	No
					V <sub>R</sub>	111	Exhibit 13-10	1800	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>	2499	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D <sub>R</sub> = 5.475 + 0.00734 v <sub>R</sub> + 0.0078 V <sub>12</sub> - 0.00627 L <sub>A</sub>					D <sub>R</sub> = 4.252 + 0.0086 V <sub>12</sub> - 0.009 L <sub>D</sub>				
D <sub>R</sub> = (pc/mi/ln)					D <sub>R</sub> = 18.5 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M <sub>S</sub> = (Exhibit 13-11)					D <sub>s</sub> = 0.698 (Exhibit 13-12)				
S <sub>R</sub> = mph (Exhibit 13-11)					S <sub>R</sub> = 47.4 mph (Exhibit 13-12)				
S <sub>0</sub> = mph (Exhibit 13-11)					S <sub>0</sub> = N/A mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 47.4 mph (Exhibit 13-13)				

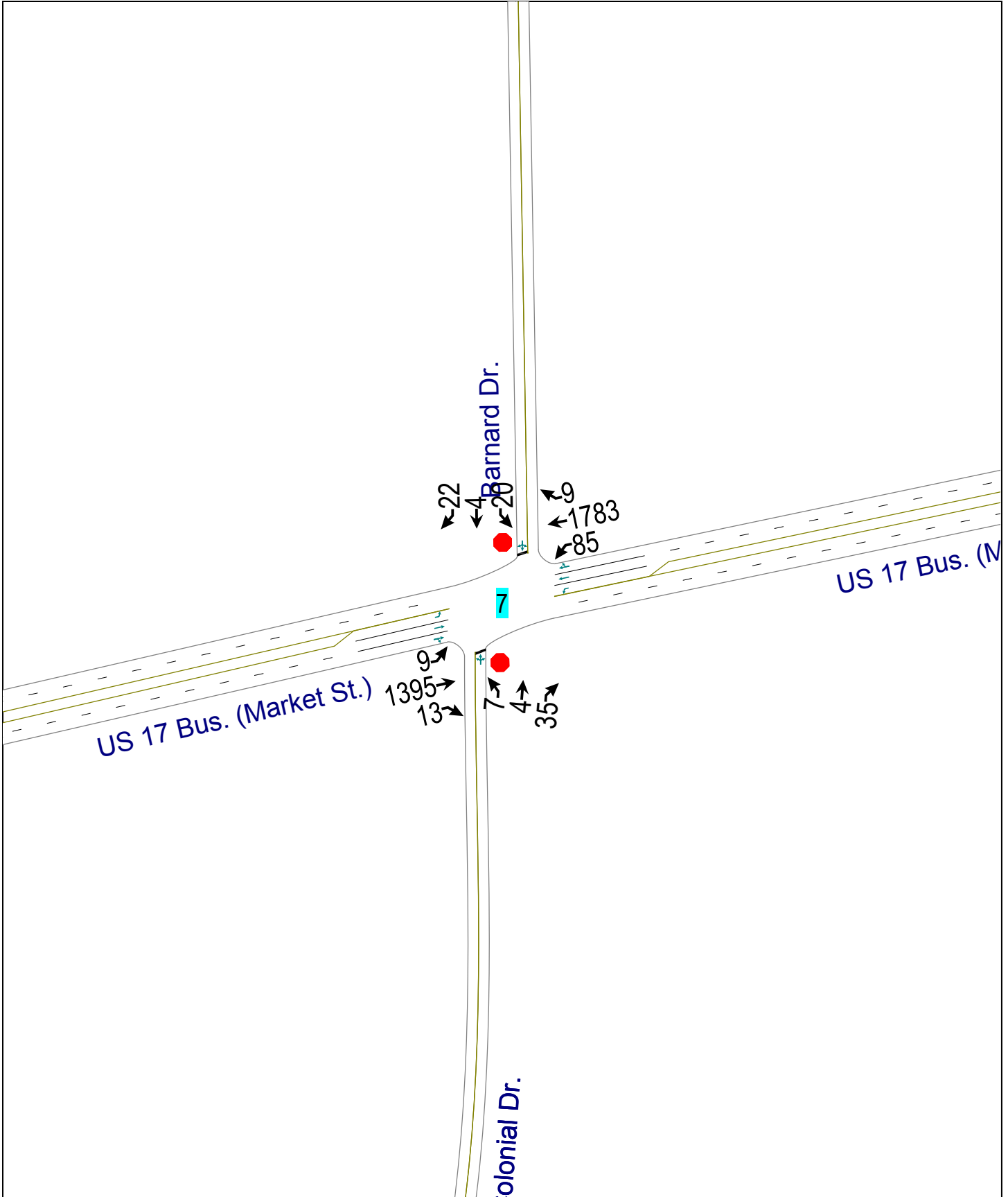
<b>RAMPS AND RAMP JUNCTIONS WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst		URS			Freeway/Dir of Travel		Independence Blvd NB		
Agency or Company					Junction		to Darlington		
Date Performed		2013			Jurisdiction		Segment #48		
Analysis Time Period		PM Peak			Analysis Year		2040 Build - Alt 2 BC Quadrant		
Project Description U-4434 Independence Boulevard Extension									
<b>Inputs</b>									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> = ft  V <sub>u</sub> = veh/h		Number of Lanes, N 2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 800 Freeway Volume, V <sub>F</sub> 2695 Ramp Volume, V <sub>R</sub> 133 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 15.0				Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> = ft  V <sub>D</sub> = veh/h			
<b>Conversion to pc/h Under Base Conditions</b>									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	2695	0.90	Level	4	0	0.980	1.00	3054	
Ramp	133	0.90	Level	2	0	0.990	1.00	149	
UpStream									
DownStream									
<b>Merge Areas</b>					<b>Diverge Areas</b>				
<b>Estimation of v<sub>12</sub></b>					<b>Estimation of v<sub>12</sub></b>				
$V_{12} = V_F (P_{FM})$ L <sub>EQ</sub> = (Equation 13-6 or 13-7) P <sub>FM</sub> = using Equation (Exhibit 13-6) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L <sub>EQ</sub> = (Equation 13-12 or 13-13) P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7) V <sub>12</sub> = 3054 pc/h V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)				
<b>Capacity Checks</b>					<b>Capacity Checks</b>				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V <sub>FO</sub>		Exhibit 13-8			V <sub>F</sub>	3054	Exhibit 13-8	4600	No
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2905	Exhibit 13-8	4600	No
					V <sub>R</sub>	149	Exhibit 13-10	1800	No
<b>Flow Entering Merge Influence Area</b>					<b>Flow Entering Diverge Influence Area</b>				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>	3054	Exhibit 13-8	4400:All	No
<b>Level of Service Determination (if not F)</b>					<b>Level of Service Determination (if not F)</b>				
D <sub>R</sub> = 5.475 + 0.00734 v <sub>R</sub> + 0.0078 V <sub>12</sub> - 0.00627 L <sub>A</sub>					D <sub>R</sub> = 4.252 + 0.0086 V <sub>12</sub> - 0.009 L <sub>D</sub>				
D <sub>R</sub> = (pc/mi/ln)					D <sub>R</sub> = 23.3 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = C (Exhibit 13-2)				
<b>Speed Determination</b>					<b>Speed Determination</b>				
M <sub>S</sub> = (Exhibit 13-11)					D <sub>S</sub> = 0.701 (Exhibit 13-12)				
S <sub>R</sub> = mph (Exhibit 13-11)					S <sub>R</sub> = 47.4 mph (Exhibit 13-12)				
S <sub>0</sub> = mph (Exhibit 13-11)					S <sub>0</sub> = N/A mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 47.4 mph (Exhibit 13-13)				

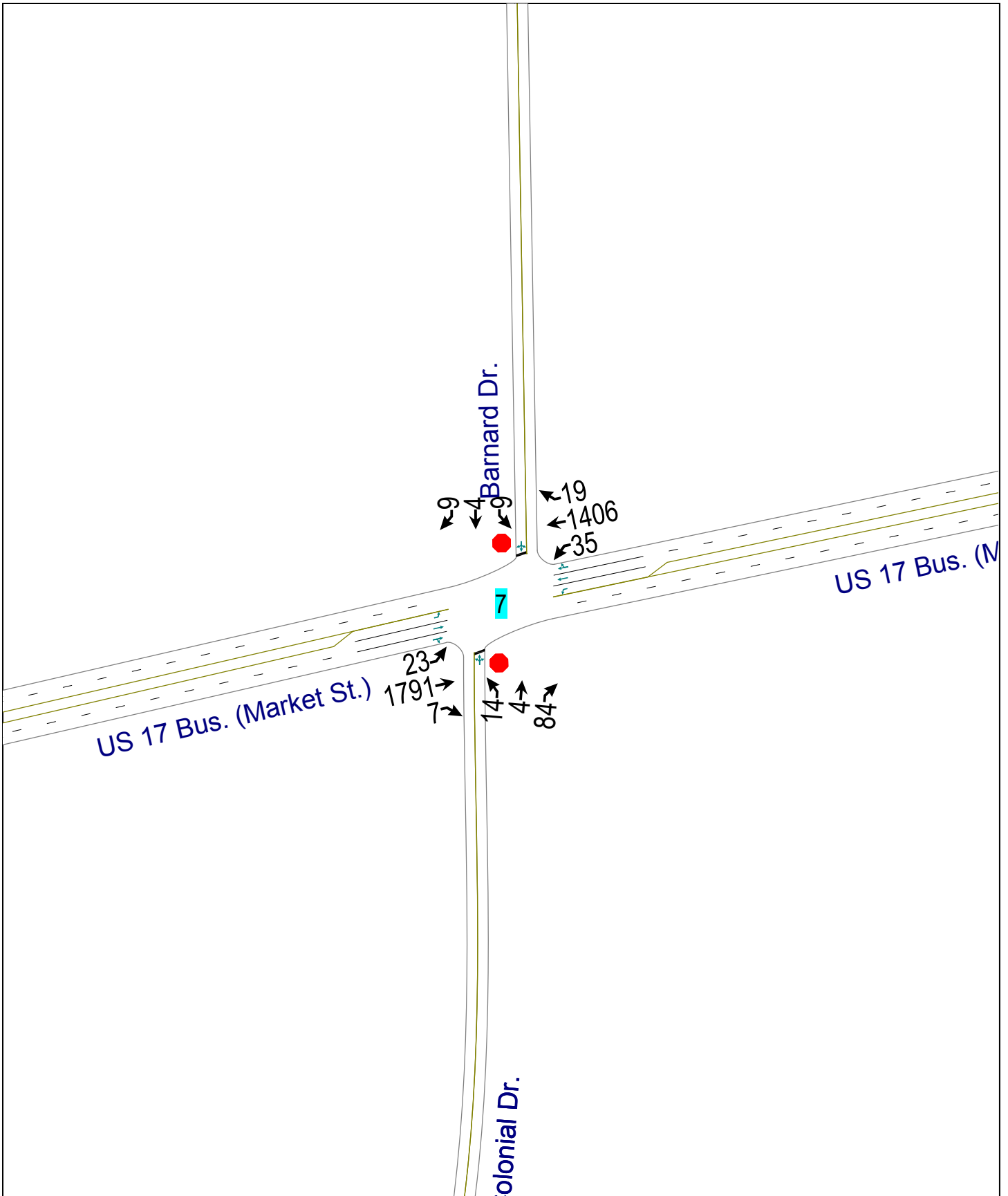
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 2 BC Quadrant			
Analysis Time Period	AM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/ Multilane Highways			
Weaving number of lanes, N	3				Freeway minimum speed, $S_{MIN}$	15			
Weaving segment length, $L_S$	1720ft				Freeway maximum capacity, $C_{IFL}$	2300			
Freeway free-flow speed, FFS	60 mph				Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	$E_T$	$E_R$	$f_{HV}$	$f_p$	v (pc/h)
$V_{FF}$	1684	0.90	4	0	1.5	1.2	0.980	1.00	1909
$V_{RF}$	87	0.90	4	0	1.5	1.2	0.980	1.00	99
$V_{FR}$	403	0.90	4	0	1.5	1.2	0.980	1.00	457
$V_{RR}$	22	0.90	4	0	1.5	1.2	0.980	1.00	25
$V_{NW}$	1934							V =	2490
$V_W$	556								
VR	0.223								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, $N_{WL}$	2 lc				Minimum weaving lane changes, $LC_{MIN}$	556 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, $LC_W$	957 lc/h			
Minimum RF lane changes, $LC_{RF}$	1 lc/pc				Non-weaving lane changes, $LC_{NW}$	753 lc/h			
Minimum FR lane changes, $LC_{FR}$	1 lc/pc				Total lane changes, $LC_{ALL}$	1710 lc/h			
Minimum RR lane changes, $LC_{RR}$	lc/pc				Non-weaving vehicle index, $I_{NW}$	998			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	2490 pc/h				Weaving intensity factor, W	0.225			
Weaving segment capacity, $c_w$	6076 veh/h				Weaving segment speed, S	52.0 mph			
Weaving segment v/c ratio	0.402				Average weaving speed, $S_W$	51.7 mph			
Weaving segment density, D	16.0 pc/mi/ln				Average non-weaving speed, $S_{NW}$	52.0 mph			
Level of Service, LOS	B				Maximum weaving length, $L_{MAX}$	4776 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 2 BC Quadrant			
Analysis Time Period	PM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/ Multilane Highways			
Weaving number of lanes, N	3				Freeway minimum speed, $S_{MIN}$	15			
Weaving segment length, $L_S$	1720ft				Freeway maximum capacity, $C_{IFL}$	2300			
Freeway free-flow speed, FFS	60 mph				Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	$E_T$	$E_R$	$f_{HV}$	$f_p$	v (pc/h)
$V_{FF}$	2134	0.90	4	0	1.5	1.2	0.980	1.00	2419
$V_{RF}$	79	0.90	4	0	1.5	1.2	0.980	1.00	90
$V_{FR}$	451	0.90	4	0	1.5	1.2	0.980	1.00	511
$V_{RR}$	21	0.90	4	0	1.5	1.2	0.980	1.00	24
$V_{NW}$	2443							V =	3044
$V_W$	601								
VR	0.197								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, $N_{WL}$	2 lc				Minimum weaving lane changes, $LC_{MIN}$	601 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, $LC_W$	1002 lc/h			
Minimum RF lane changes, $LC_{RF}$	1 lc/pc				Non-weaving lane changes, $LC_{NW}$	858 lc/h			
Minimum FR lane changes, $LC_{FR}$	1 lc/pc				Total lane changes, $LC_{ALL}$	1860 lc/h			
Minimum RR lane changes, $LC_{RR}$	lc/pc				Non-weaving vehicle index, $I_{NW}$	1261			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	3044 pc/h				Weaving intensity factor, W	0.240			
Weaving segment capacity, $c_w$	6138 veh/h				Weaving segment speed, S	50.9 mph			
Weaving segment v/c ratio	0.486				Average weaving speed, $S_W$	51.3 mph			
Weaving segment density, D	19.9 pc/mi/ln				Average non-weaving speed, $S_{NW}$	50.8 mph			
Level of Service, LOS	B				Maximum weaving length, $L_{MAX}$	4510 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

## Build Alternative 2, Tight Urban Diamond

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U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	1395	13	85	1783	9	7	4	35	20	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Flt Permitted	0.950			0.950				0.992			0.978	
Satd. Flow (perm)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		774			861			978			871	
Travel Time (s)		15.1			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1564	0	94	1991	0	0	51	0	0	50	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.0%
ICU Level of Service	C
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	1395	13	85	1783	9	7	4	35	20	4	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1550	14	94	1981	10	8	4	39	22	4	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1991			1564			2783	3757	782	3011	3759	996
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1991			1564			2783	3757	782	3011	3759	996
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			77			0	0	88	0	0	90
cM capacity (veh/h)	285			418			0	3	337	0	3	243

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	10	1033	531	94	1321	670	51	51
Volume Left	10	0	0	94	0	0	8	22
Volume Right	0	0	14	0	0	10	39	24
cSH	285	1700	1700	418	1700	1700	0	0
Volume to Capacity	0.04	0.61	0.31	0.23	0.78	0.39	Err	Err
Queue Length 95th (ft)	3	0	0	21	0	0	Err	Err
Control Delay (s)	18.1	0.0	0.0	16.1	0.0	0.0	Err	Err
Lane LOS	C			C			F	F
Approach Delay (s)	0.1			0.7			Err	Err
Approach LOS							F	F

**Intersection Summary**

Average Delay		Err	
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1791	7	35	1406	19	14	4	84	9	4	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Flt Permitted	0.950			0.950				0.993			0.980	
Satd. Flow (perm)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		774			861			978			871	
Travel Time (s)		15.1			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1998	0	39	1583	0	0	113	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 2 TUDI PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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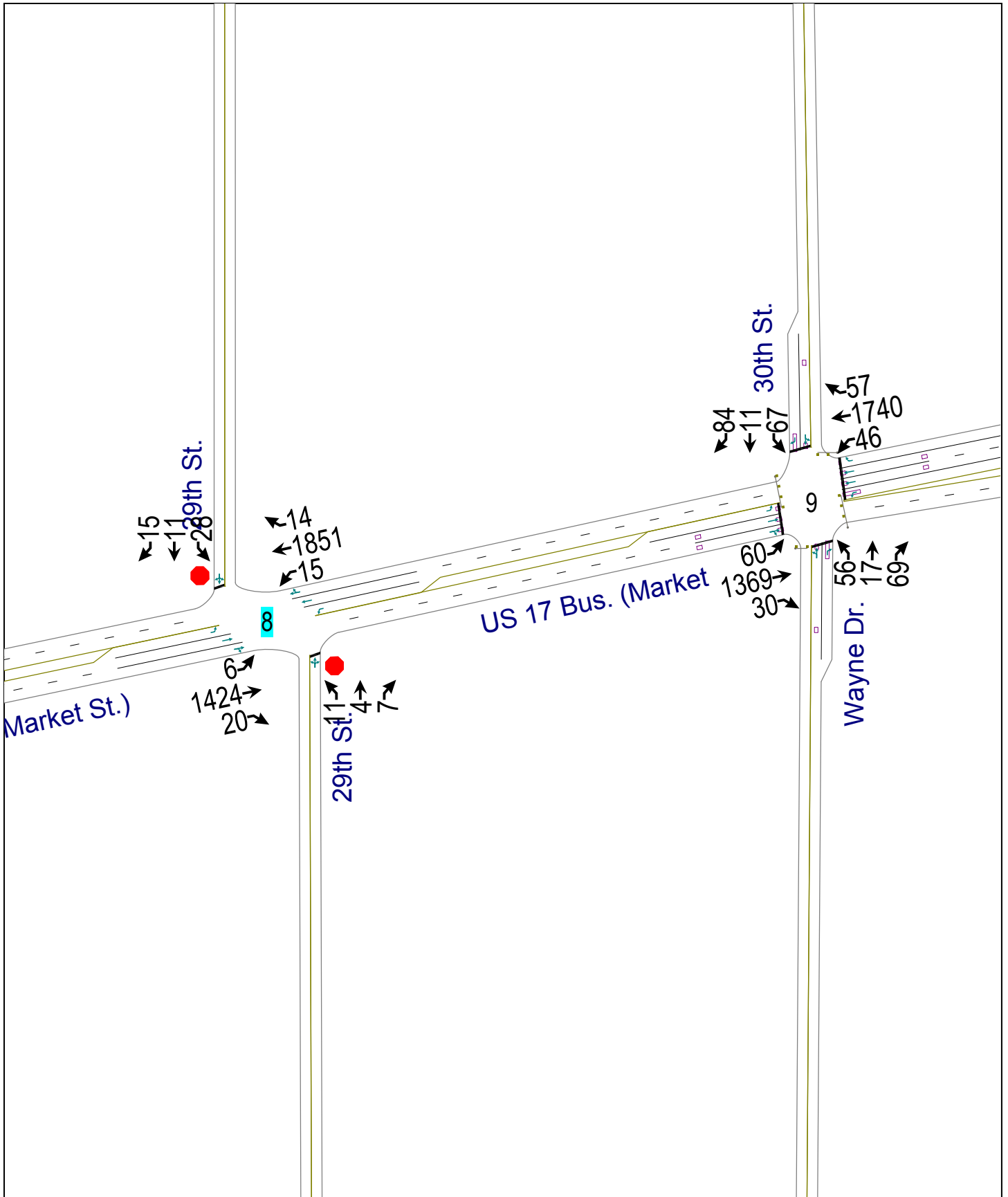
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	1791	7	35	1406	19	14	4	84	9	4	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	1990	8	39	1562	21	16	4	93	10	4	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1583			1998			2916	3706	999	2792	3699	792
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1583			1998			2916	3706	999	2792	3699	792
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			86			0	0	61	0	0	97
cM capacity (veh/h)	411			284			0	4	242	0	4	332

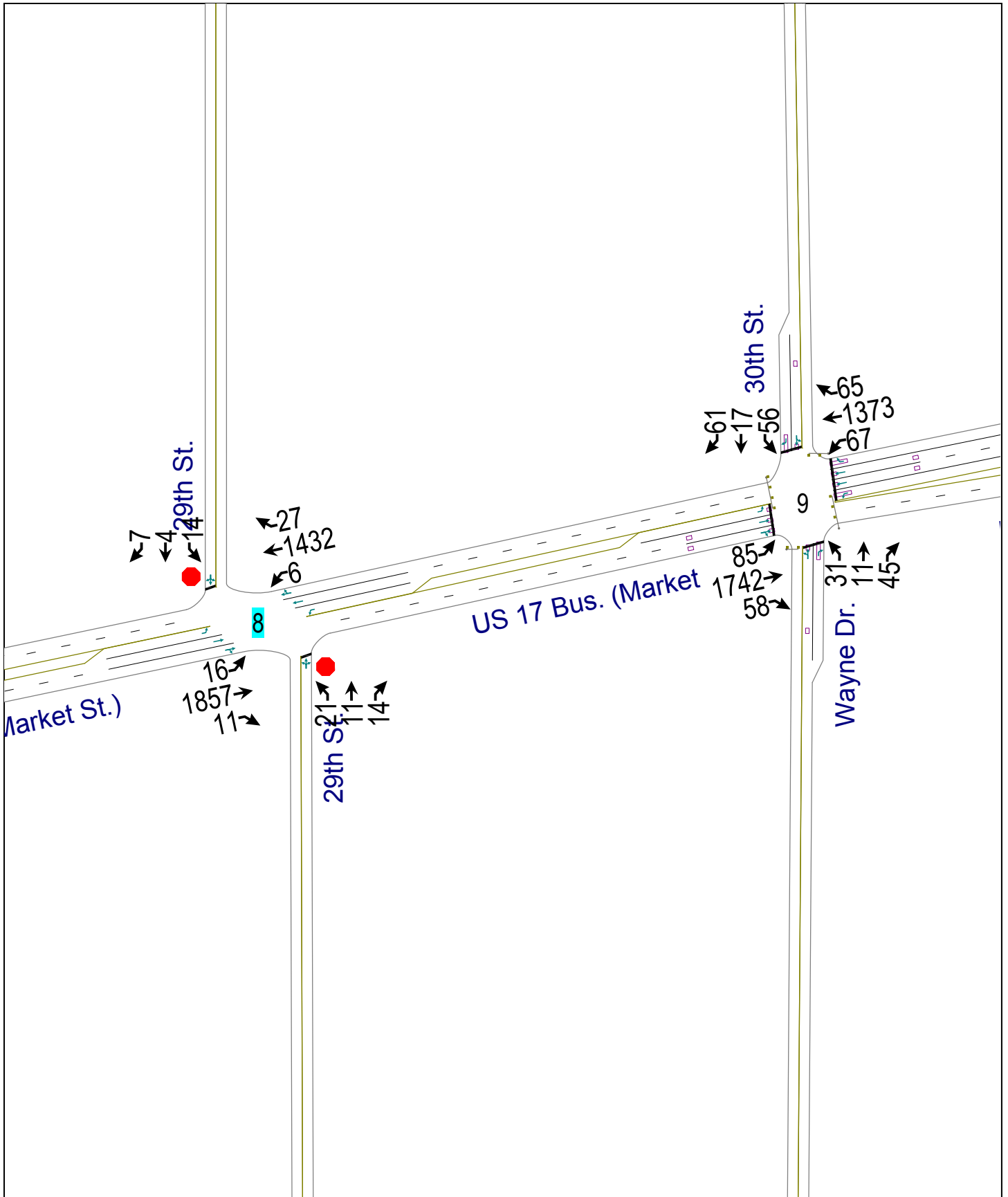
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	26	1327	671	39	1041	542	113	24
Volume Left	26	0	0	39	0	0	16	10
Volume Right	0	0	8	0	0	21	93	10
cSH	411	1700	1700	284	1700	1700	0	0
Volume to Capacity	0.06	0.78	0.39	0.14	0.61	0.32	Err	Err
Queue Length 95th (ft)	5	0	0	12	0	0	Err	Err
Control Delay (s)	14.3	0.0	0.0	19.7	0.0	0.0	Err	Err
Lane LOS	B			C			F	F
Approach Delay (s)	0.2			0.5			Err	Err
Approach LOS							F	F

Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization		62.9%	ICU Level of Service B
Analysis Period (min)		15	

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	1424	20	15	1851	14	11	4	7	28	11	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3532	0	1770	3536	0	0	1736	0	0	1730	0
Flt Permitted	0.950			0.950				0.976			0.975	
Satd. Flow (perm)	1770	3532	0	1770	3536	0	0	1736	0	0	1730	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		861			630			952			799	
Travel Time (s)		14.7			10.7			26.0			21.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1604	0	17	2073	0	0	24	0	0	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			48			48	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.1%
ICU Level of Service	B
Analysis Period (min)	15

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 2 TUDI AM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	1424	20	15	1851	14	11	4	7	28	11	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	1582	22	17	2057	16	12	4	8	31	12	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					630							
pX, platoon unblocked	0.56						0.56	0.56		0.56	0.56	0.56
vC, conflicting volume	2072			1604			2691	3712	802	2912	3716	1036
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1339			1604			2447	4275	802	2843	4281	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			0	0	98	0	0	97
cM capacity (veh/h)	285			404			0	1	327	0	1	604

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	7	1055	550	17	1371	701	24	60
Volume Left	7	0	0	17	0	0	12	31
Volume Right	0	0	22	0	0	16	8	17
cSH	285	1700	1700	404	1700	1700	0	0
Volume to Capacity	0.02	0.62	0.32	0.04	0.81	0.41	Err	Err
Queue Length 95th (ft)	2	0	0	3	0	0	Err	Err
Control Delay (s)	17.9	0.0	0.0	14.3	0.0	0.0	Err	Err
Lane LOS	C			B			F	F
Approach Delay (s)	0.1			0.1			Err	Err
Approach LOS							F	F

Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization		62.1%	ICU Level of Service B
Analysis Period (min)		15	

8: US 17 Bus. (Market St.) & 29th St.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	1857	11	6	1432	27	21	11	14	14	4	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3529	0	0	1745	0	0	1723	0
Flt Permitted	0.950			0.950				0.978			0.972	
Satd. Flow (perm)	1770	3536	0	1770	3529	0	0	1745	0	0	1723	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		861			630			952			799	
Travel Time (s)		14.7			10.7			26.0			21.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	2075	0	7	1621	0	0	51	0	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			48			48	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.7%
ICU Level of Service	B
Analysis Period (min)	15

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 2 TUDI PM Peak

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	1857	11	6	1432	27	21	11	14	14	4	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	2063	12	7	1591	30	23	12	16	16	4	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					630							
pX, platoon unblocked	0.73						0.73	0.73		0.73	0.73	0.73
vC, conflicting volume	1621			2076			2924	3739	1038	2708	3731	811
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1119			2076			2896	4009	1038	2602	3996	14
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			0	0	93	0	0	99
cM capacity (veh/h)	454			264			0	2	228	0	2	777

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	18	1376	700	7	1061	560	51	28
Volume Left	18	0	0	7	0	0	23	16
Volume Right	0	0	12	0	0	30	16	8
cSH	454	1700	1700	264	1700	1700	0	0
Volume to Capacity	0.04	0.81	0.41	0.03	0.62	0.33	Err	Err
Queue Length 95th (ft)	3	0	0	2	0	0	Err	Err
Control Delay (s)	13.2	0.0	0.0	19.0	0.0	0.0	Err	Err
Lane LOS	B			C			F	F
Approach Delay (s)	0.1			0.1			Err	Err
Approach LOS							F	F






















Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization		61.7%	ICU Level of Service
Analysis Period (min)		15	B

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 2 TUDI PM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	1369	30	46	1740	57	56	17	69	67	11	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	300		300	0		125	0		125
Storage Lanes	1		0	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3529	0	1770	3539	1583	0	1794	1583	0	1786	1583
Flt Permitted	0.950			0.950				0.695			0.694	
Satd. Flow (perm)	1770	3529	0	1770	3539	1583	0	1295	1583	0	1293	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			622			873			738	
Travel Time (s)		10.7			10.6			23.8			20.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	1554	0	51	1933	63	0	81	77	0	86	93
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Perm		pm+ov	Perm		pm+ov
Protected Phases	5	2		1	6			8	1		4	5
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	1	4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	15.0	86.0	0.0	14.0	85.0	85.0	20.0	20.0	14.0	20.0	20.0	15.0
Total Split (%)	12.5%	71.7%	0.0%	11.7%	70.8%	70.8%	16.7%	16.7%	11.7%	16.7%	16.7%	12.5%
Maximum Green (s)	8.0	79.0		7.0	78.0	78.0	13.0	13.0	7.0	13.0	13.0	8.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag			Lag			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	9.9	89.2		9.0	84.5	84.5		13.4	24.6		13.4	25.5
Actuated g/C Ratio	0.08	0.74		0.08	0.70	0.70		0.11	0.20		0.11	0.21
v/c Ratio	0.46	0.59		0.38	0.78	0.06		0.56	0.24		0.59	0.28
Control Delay	63.0	10.7		51.8	9.4	5.2		65.3	39.4		67.4	39.6
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0	0.0		0.0	0.0

9: US 17 Bus. (Market St.) & 30th St.  
Build Alt. 2 TUDI AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	63.0	10.7		51.8	9.5	5.2		65.3	39.4		67.4	39.6
LOS	E	B		D	A	A		E	D		E	D
Approach Delay		12.9			10.4			52.7			53.0	
Approach LOS		B			B			D			D	
Queue Length 50th (ft)	50	335		39	297	12		59	48		63	58
Queue Length 95th (ft)	99	403		m58	351	m20		113	91		119	105
Internal Link Dist (ft)		550			542			793			658	
Turn Bay Length (ft)	175			300		300			125			125
Base Capacity (vph)	149	2624		133	2492	1115		162	324		162	338
Starvation Cap Reductn	0	0		0	76	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.45	0.59		0.38	0.80	0.06		0.50	0.24		0.53	0.28

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 102 (85%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 15.0 Intersection LOS: B  
 Intersection Capacity Utilization 72.3% ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.






















Splits and Phases: 9: US 17 Bus. (Market St.) & 30th St.



9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 2 TUDI AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1742	58	67	1373	65	31	11	45	56	17	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	300		300	0		125	0		125
Storage Lanes	1		0	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3522	0	1770	3539	1583	0	1796	1583	0	1794	1583
Flt Permitted	0.950			0.950				0.722			0.746	
Satd. Flow (perm)	1770	3522	0	1770	3539	1583	0	1345	1583	0	1390	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			622			873			738	
Travel Time (s)		10.7			10.6			23.8			20.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	2000	0	74	1526	72	0	46	50	0	81	68
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Perm		pm+ov	Perm		pm+ov
Protected Phases	5	2		1	6			8	1		4	5
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	1	4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	17.0	87.0	0.0	14.0	84.0	84.0	19.0	19.0	14.0	19.0	19.0	17.0
Total Split (%)	14.2%	72.5%	0.0%	11.7%	70.0%	70.0%	15.8%	15.8%	11.7%	15.8%	15.8%	14.2%
Maximum Green (s)	10.0	80.0		7.0	77.0	77.0	12.0	12.0	7.0	12.0	12.0	10.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead		Lag	Lead	Lead			Lag			Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	11.4	90.0		9.0	83.7	83.7		12.6	23.8		12.6	26.3
Actuated g/C Ratio	0.10	0.75		0.08	0.70	0.70		0.10	0.20		0.10	0.22
v/c Ratio	0.56	0.76		0.56	0.62	0.07		0.32	0.16		0.55	0.20
Control Delay	64.8	14.3		69.5	6.2	4.2		55.5	38.2		65.4	37.0
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0	0.0		0.0	0.0

9: US 17 Bus. (Market St.) & 30th St.  
Build Alt. 2 TUDI PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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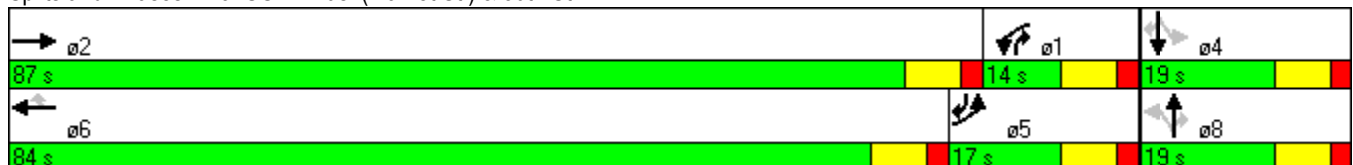


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	64.8	14.3		69.5	6.3	4.2		55.5	38.2		65.4	37.0
LOS	E	B		E	A	A		E	D		E	D
Approach Delay		16.6			9.0			46.5			52.4	
Approach LOS		B			A			D			D	
Queue Length 50th (ft)	70	542		61	166	14		33	31		60	41
Queue Length 95th (ft)	127	655		m#116	188	m24		72	66		113	80
Internal Link Dist (ft)		550			542			793			658	
Turn Bay Length (ft)	175			300		300			125			125
Base Capacity (vph)	177	2641		133	2470	1105		157	314		162	354
Starvation Cap Reductn	0	0		0	106	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.53	0.76		0.56	0.65	0.07		0.29	0.16		0.50	0.19

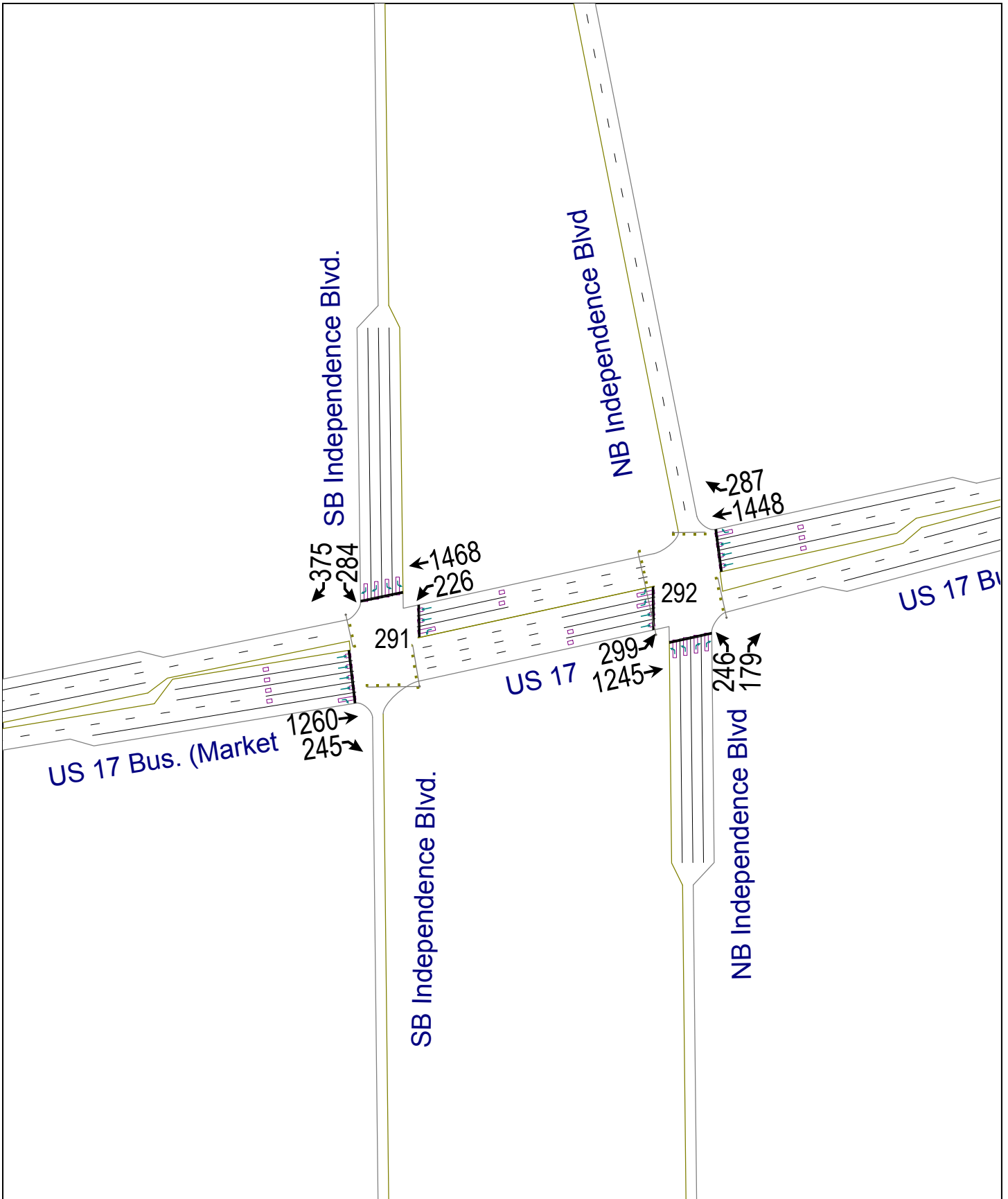
Intersection Summary

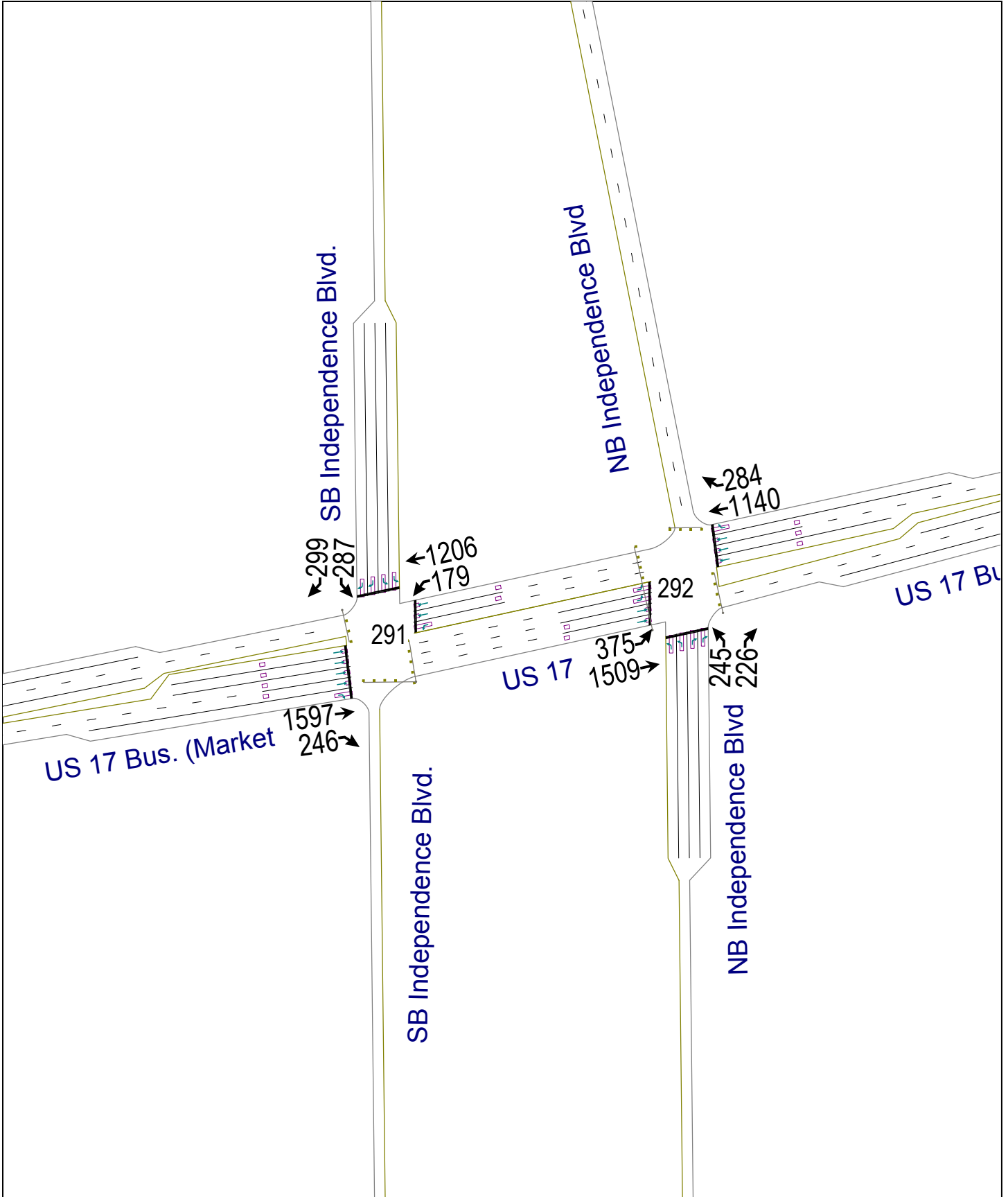
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 100 (83%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 15.5 Intersection LOS: B  
 Intersection Capacity Utilization 79.0% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: US 17 Bus. (Market St.) & 30th St.



9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 2 TUDI PM Peak







U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↖↗		↗↖
Volume (vph)	0	1260	245	226	1468	0	0	0	0	284	0	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		300	0		0	0		0	300		300
Storage Lanes	2		1	0		0	0		0	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	6408	1583	1752	3505	0	0	0	0	3400	0	2760
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1752	3505	0	0	0	0	3400	0	2760
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			30				45
Link Distance (ft)		622			327			881				961
Travel Time (s)		10.6			5.6			20.0				14.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	3%	3%	0%	0%	0%	0%	3%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1400	272	251	1631	0	0	0	0	316	0	417
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Right
Median Width(ft)		12			12			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	Prot						Prot		custom
Protected Phases		2		1	6					4		4
Permitted Phases			2									
Detector Phase		2	2	1	6					4		4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0		7.0
Minimum Split (s)		19.0	19.0	14.0	19.0					14.0		14.0
Total Split (s)	0.0	49.0	49.0	36.0	85.0	0.0	0.0	0.0	0.0	35.0	0.0	35.0
Total Split (%)	0.0%	40.8%	40.8%	30.0%	70.8%	0.0%	0.0%	0.0%	0.0%	29.2%	0.0%	29.2%
Maximum Green (s)		42.0	42.0	29.0	78.0					28.0		28.0
Yellow Time (s)		5.0	5.0	5.0	5.0					5.0		5.0
All-Red Time (s)		2.0	2.0	2.0	2.0					2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	5.0	2.0	5.0
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		C-Max	C-Max	None	C-Max					None		None
Act Effct Green (s)		48.8	48.8	31.0	84.8					25.2		25.2
Actuated g/C Ratio		0.41	0.41	0.26	0.71					0.21		0.21
v/c Ratio		0.54	0.42	0.55	0.66					0.44		0.72
Control Delay		20.8	21.2	31.4	6.5					42.7		51.3
Queue Delay		0.0	0.0	2.5	0.1					0.0		0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd.  
Build Alt. 2 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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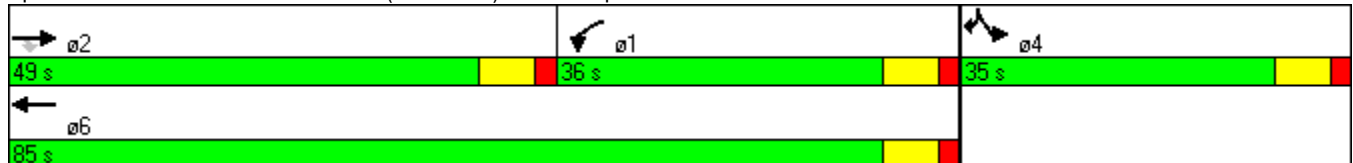


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		20.9	21.2	33.9	6.5					42.7		51.3
LOS		C	C	C	A					D		D
Approach Delay		20.9			10.2							
Approach LOS		C			B							
Queue Length 50th (ft)		127	85	165	111					110		172
Queue Length 95th (ft)		185	152	240	129					147		223
Internal Link Dist (ft)		542			247			801			881	
Turn Bay Length (ft)			300							300		300
Base Capacity (vph)		2608	644	453	2478					850		690
Starvation Cap Reductn		0	0	107	93					0		0
Spillback Cap Reductn		59	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.55	0.42	0.73	0.68					0.37		0.60

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 97 (81%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 20.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 62.0%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd.



291: US 17 Bus. (Market St.) & SB Independence Blvd.  
 Build Alt. 2 TUDI AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↖↗		↗↖
Volume (vph)	0	1597	246	179	1206	0	0	0	0	287	0	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		300	0		0	0		0	300		300
Storage Lanes	2		1	0		0	0		0	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	6408	1583	1752	3505	0	0	0	0	3400	0	2760
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1752	3505	0	0	0	0	3400	0	2760
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			30				45
Link Distance (ft)		622			327			881				961
Travel Time (s)		10.6			5.6			20.0				14.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	3%	3%	0%	0%	0%	0%	3%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1774	273	199	1340	0	0	0	0	319	0	332
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Right
Median Width(ft)		12			12			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	Prot						Prot		custom
Protected Phases		2		1	6					4		4
Permitted Phases			2									
Detector Phase		2	2	1	6					4		4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0		7.0
Minimum Split (s)		19.0	19.0	14.0	19.0					14.0		14.0
Total Split (s)	0.0	57.0	57.0	32.0	89.0	0.0	0.0	0.0	0.0	31.0	0.0	31.0
Total Split (%)	0.0%	47.5%	47.5%	26.7%	74.2%	0.0%	0.0%	0.0%	0.0%	25.8%	0.0%	25.8%
Maximum Green (s)		50.0	50.0	25.0	82.0					24.0		24.0
Yellow Time (s)		5.0	5.0	5.0	5.0					5.0		5.0
All-Red Time (s)		2.0	2.0	2.0	2.0					2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	5.0	2.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		C-Max	C-Max	None	C-Max					None		None
Act Effct Green (s)		62.7	62.7	20.8	88.4					21.6		21.6
Actuated g/C Ratio		0.52	0.52	0.17	0.74					0.18		0.18
v/c Ratio		0.53	0.33	0.66	0.52					0.52		0.67
Control Delay		11.2	10.2	73.9	1.7					47.2		52.5
Queue Delay		0.0	0.0	0.8	0.1					0.0		0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd.  
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 Synchro 7 - Report Lanes, Volumes, Timings

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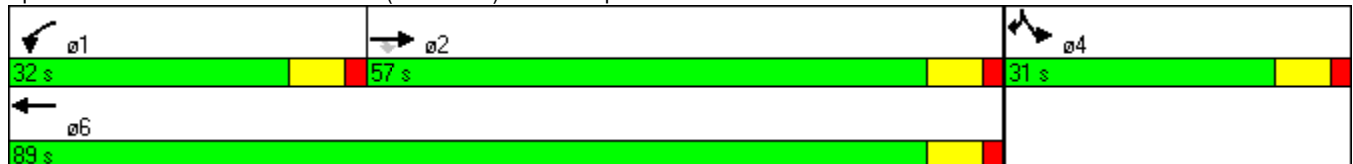


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		11.2	10.2	74.7	1.9					47.2		52.5
LOS		B	B	E	A					D		D
Approach Delay		11.1			11.3							
Approach LOS		B			B							
Queue Length 50th (ft)		152	61	158	24					116		137
Queue Length 95th (ft)		256	m138	212	31					155		184
Internal Link Dist (ft)		542			247			801			881	
Turn Bay Length (ft)			300							300		300
Base Capacity (vph)		3347	827	394	2583					737		598
Starvation Cap Reductn		0	0	52	307					0		0
Spillback Cap Reductn		140	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.55	0.33	0.58	0.59					0.43		0.56

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 17.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 58.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd.



291: US 17 Bus. (Market St.) & SB Independence Blvd.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑			↑↑↑	↖	↖↗		↖↗			
Volume (vph)	299	1245	0	0	1448	287	246	0	179	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		275	250		250	0		0
Storage Lanes	0		0	1		1	1		2	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	0	0	5036	1568	3400	0	2760	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3400	3505	0	0	5036	1568	3400	0	2760	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			45				30
Link Distance (ft)		327			542			920				889
Travel Time (s)		5.6			9.2			13.9				20.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	0%	0%	3%	3%	3%	0%	3%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	332	1383	0	0	1609	319	273	0	199	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8		8			
Permitted Phases						6						
Detector Phase	5	2			6	6	8		8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0		7.0			
Minimum Split (s)	14.0	19.0			19.0	19.0	14.0		14.0			
Total Split (s)	29.0	96.0	0.0	0.0	67.0	67.0	24.0	0.0	24.0	0.0	0.0	0.0
Total Split (%)	24.2%	80.0%	0.0%	0.0%	55.8%	55.8%	20.0%	0.0%	20.0%	0.0%	0.0%	0.0%
Maximum Green (s)	22.0	89.0			60.0	60.0	17.0		17.0			
Yellow Time (s)	5.0	5.0			5.0	5.0	5.0		5.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0			
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	2.0	5.0	5.0	5.0	2.0	5.0	2.0	2.0	2.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Recall Mode	None	C-Max			C-Max	C-Max	None		None			
Act Effct Green (s)	18.9	93.5			69.6	69.6	16.5		16.5			
Actuated g/C Ratio	0.16	0.78			0.58	0.58	0.14		0.14			
v/c Ratio	0.62	0.51			0.55	0.35	0.58		0.52			
Control Delay	67.9	6.1			6.7	6.1	53.5		52.9			
Queue Delay	0.0	0.7			0.3	0.0	0.0		0.0			

292: US 17 Bus. (Market St.) & NB Independence Blvd  
Build Alt. 2 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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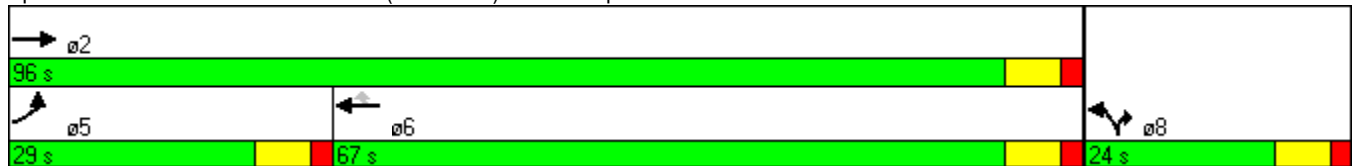


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	67.9	6.8			7.0	6.1	53.5		52.9			
LOS	E	A			A	A	D		D			
Approach Delay		18.6			6.9							
Approach LOS		B			A							
Queue Length 50th (ft)	119	105			116	63	103		82			
Queue Length 95th (ft)	156	150			205	m95	145		122			
Internal Link Dist (ft)		247			462			840			809	
Turn Bay Length (ft)						275	250		250			
Base Capacity (vph)	680	2731			2921	909	538		437			
Starvation Cap Reductn	0	888			616	0	0		0			
Spillback Cap Reductn	0	79			50	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.49	0.75			0.70	0.35	0.51		0.46			

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 115 (96%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.62  
 Intersection Signal Delay: 17.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 62.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd



292: US 17 Bus. (Market St.) & NB Independence Blvd  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘	↑↑			↑↑↑	↗	↗↘		↗↘			
Volume (vph)	375	1509	0	0	1140	284	245	0	226	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		275	250		250	0		0
Storage Lanes	0		0	1		1	1		2	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	0	0	5036	1568	3400	0	2760	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3400	3505	0	0	5036	1568	3400	0	2760	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			45				30
Link Distance (ft)		327			542			920				889
Travel Time (s)		5.6			9.2			13.9				20.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	0%	0%	3%	3%	3%	0%	3%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	417	1677	0	0	1267	316	272	0	251	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8		8			
Permitted Phases						6						
Detector Phase	5	2			6	6	8		8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0		7.0			
Minimum Split (s)	14.0	19.0			19.0	19.0	14.0		14.0			
Total Split (s)	33.0	94.0	0.0	0.0	61.0	61.0	26.0	0.0	26.0	0.0	0.0	0.0
Total Split (%)	27.5%	78.3%	0.0%	0.0%	50.8%	50.8%	21.7%	0.0%	21.7%	0.0%	0.0%	0.0%
Maximum Green (s)	26.0	87.0			54.0	54.0	19.0		19.0			
Yellow Time (s)	5.0	5.0			5.0	5.0	5.0		5.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0			
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	2.0	5.0	5.0	5.0	2.0	5.0	2.0	2.0	2.0
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Recall Mode	None	C-Max			C-Max	C-Max	None		None			
Act Effct Green (s)	28.0	92.2			59.2	59.2	17.8		17.8			
Actuated g/C Ratio	0.23	0.77			0.49	0.49	0.15		0.15			
v/c Ratio	0.53	0.62			0.51	0.41	0.54		0.62			
Control Delay	32.4	5.2			7.6	7.5	51.1		54.3			
Queue Delay	1.4	0.2			0.0	0.0	0.0		0.0			

292: US 17 Bus. (Market St.) & NB Independence Blvd  
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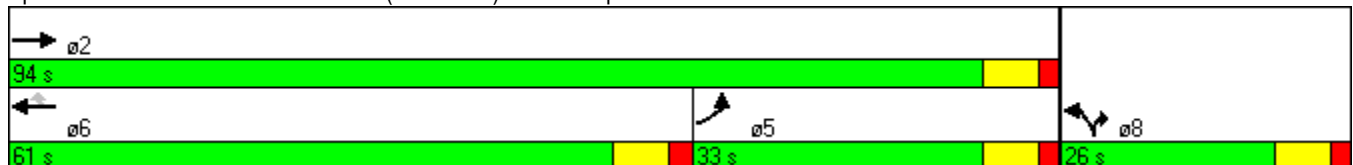


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	33.9	5.3			7.6	7.5	51.1		54.3			
LOS	C	A			A	A	D		D			
Approach Delay		11.0			7.6							
Approach LOS		B			A							
Queue Length 50th (ft)	146	150			85	58	101		104			
Queue Length 95th (ft)	204	235			126	99	142		149			
Internal Link Dist (ft)		247			462			840			809	
Turn Bay Length (ft)						275	250		250			
Base Capacity (vph)	793	2694			2486	774	595		483			
Starvation Cap Reductn	204	265			0	0	0		0			
Spillback Cap Reductn	0	40			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.71	0.69			0.51	0.41	0.46		0.52			

Intersection Summary

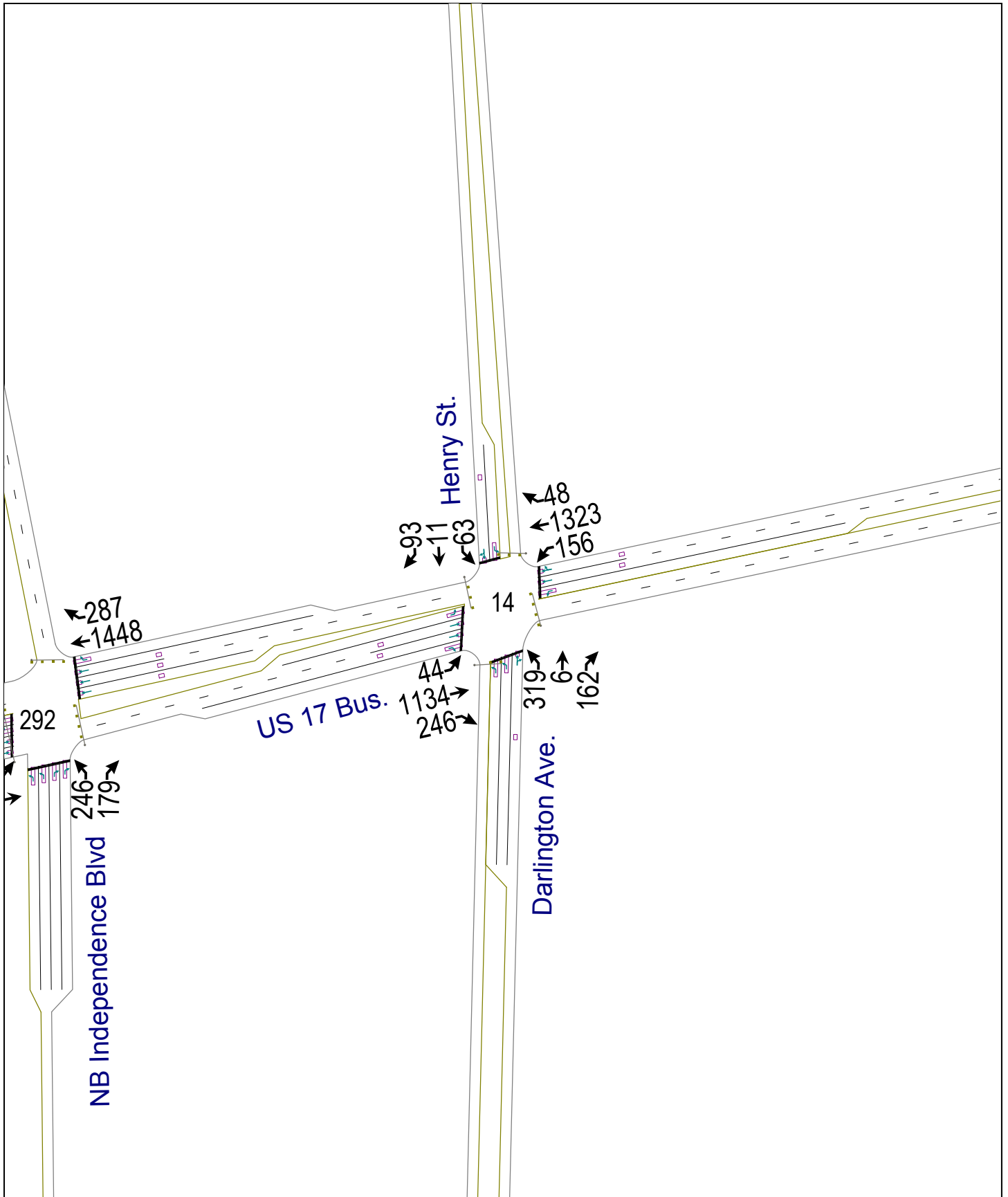
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 116 (97%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.62  
 Intersection Signal Delay: 14.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 58.0%  
 ICU Level of Service B  
 Analysis Period (min) 15

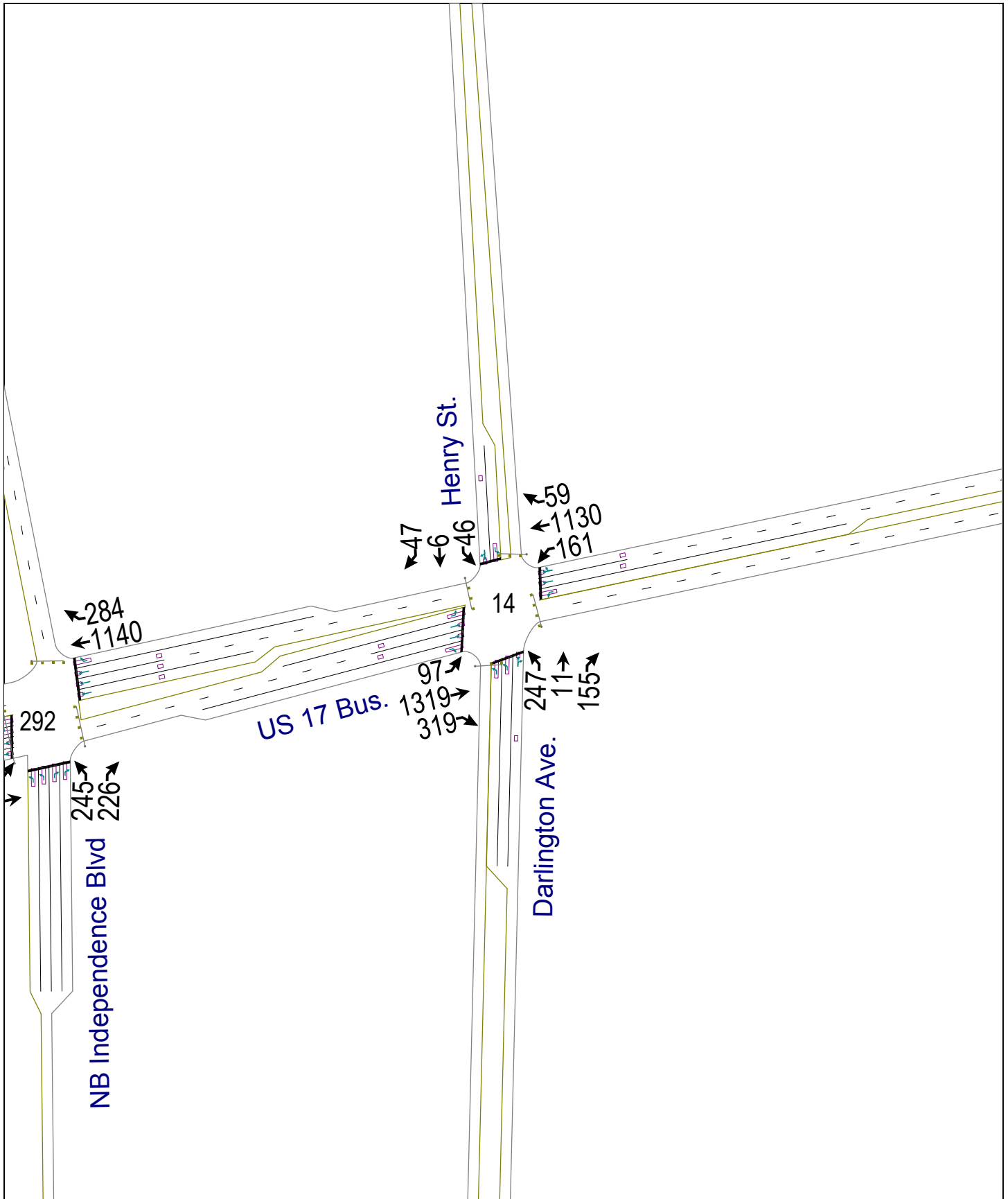
Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd



292: US 17 Bus. (Market St.) & NB Independence Blvd  
 Build Alt. 2 TUDI PM Peak




























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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	1134	246	156	1323	48	319	6	162	63	11	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		300	350		0	225		0	125		0
Storage Lanes	1		1	1		0	2		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3505	1568	1752	3487	0	3433	1595	0	1752	1597	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	3505	1568	1752	3487	0	3433	1595	0	1752	1597	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		542			1024			915			767	
Travel Time (s)		9.2			17.5			25.0			20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	1260	273	173	1523	0	354	187	0	70	115	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot			Split			Split		
Protected Phases	5	2	8	1	6		8	8		4	4	
Permitted Phases			2									
Detector Phase	5	2	8	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	58.0	24.0	21.0	65.0	0.0	24.0	24.0	0.0	17.0	17.0	0.0
Total Split (%)	11.7%	48.3%	20.0%	17.5%	54.2%	0.0%	20.0%	20.0%	0.0%	14.2%	14.2%	0.0%
Maximum Green (s)	7.0	51.0	17.0	14.0	58.0		17.0	17.0		10.0	10.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lead		Lag	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	None	None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	54.3	77.7	15.5	63.6		18.4	18.4		11.8	11.8	
Actuated g/C Ratio	0.08	0.45	0.65	0.13	0.53		0.15	0.15		0.10	0.10	
v/c Ratio	0.37	0.79	0.27	0.77	0.82		0.67	0.76		0.41	0.73	
Control Delay	59.6	12.9	1.3	72.4	29.5		54.8	69.2		58.4	79.1	
Queue Delay	0.0	0.6	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

14: US 17 Bus. (Market St.) & Henry St.  
Build Alt. 2 TUDI AM Peak

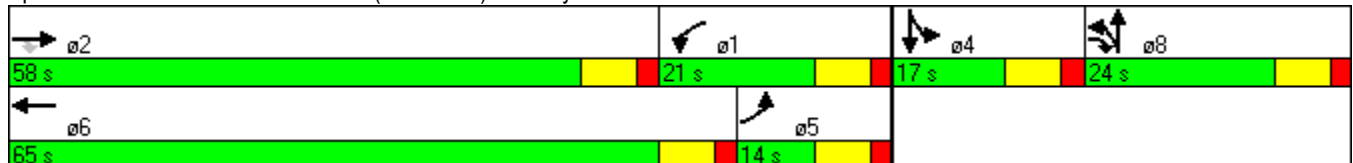


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	59.6	13.5	1.3	72.4	29.5		54.8	69.2		58.4	79.1	
LOS	E	B	A	E	C		D	E		E	E	
Approach Delay		12.8			33.9			59.8			71.2	
Approach LOS		B			C			E			E	
Queue Length 50th (ft)	41	322	14	131	534		134	140		52	88	
Queue Length 95th (ft)	m82	214	17	#236	645		186	#246		100	#179	
Internal Link Dist (ft)		462			944			835			687	
Turn Bay Length (ft)	200		300	350			225			125		
Base Capacity (vph)	131	1587	1010	234	1849		544	253		175	160	
Starvation Cap Reductn	0	94	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.37	0.84	0.27	0.74	0.82		0.65	0.74		0.40	0.72	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 104 (87%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 30.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 76.8%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: US 17 Bus. (Market St.) & Henry St.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
11/28/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	1319	319	161	1130	59	247	11	155	46	6	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		300	350		0	225		0	125		0
Storage Lanes	1		1	1		0	2		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3505	1568	1752	3480	0	3433	1602	0	1752	1601	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	3505	1568	1752	3480	0	3433	1602	0	1752	1601	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		542			1024			915			767	
Travel Time (s)		9.2			17.5			25.0			20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	1466	354	179	1322	0	274	184	0	51	59	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot			Split			Split		
Protected Phases	5	2	8	1	6		8	8		4	4	
Permitted Phases			2									
Detector Phase	5	2	8	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	19.0	62.0	23.0	21.0	64.0	0.0	23.0	23.0	0.0	14.0	14.0	0.0
Total Split (%)	15.8%	51.7%	19.2%	17.5%	53.3%	0.0%	19.2%	19.2%	0.0%	11.7%	11.7%	0.0%
Maximum Green (s)	12.0	55.0	16.0	14.0	57.0		16.0	16.0		7.0	7.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	None	None	C-Max		None	None		None	None	
Act Effct Green (s)	14.0	60.7	79.2	15.6	62.3		17.5	17.5		9.0	9.0	
Actuated g/C Ratio	0.12	0.51	0.66	0.13	0.52		0.15	0.15		0.08	0.08	
v/c Ratio	0.53	0.83	0.34	0.79	0.73		0.55	0.79		0.39	0.49	
Control Delay	51.8	24.1	5.5	74.6	26.4		52.0	73.0		62.1	67.8	
Queue Delay	0.0	1.3	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

14: US 17 Bus. (Market St.) & Henry St.  
Build Alt. 2 TUDI PM Peak

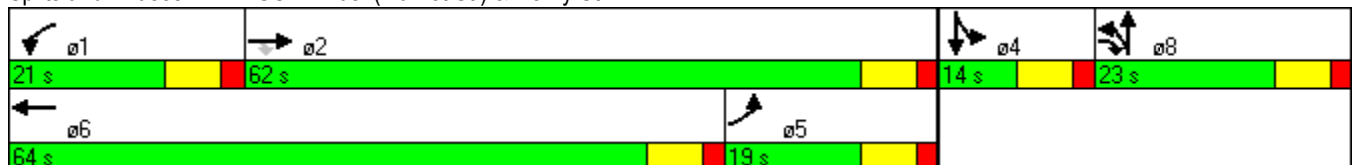


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	51.8	25.3	5.5	74.6	26.4		52.0	73.0		62.1	67.8	
LOS	D	C	A	E	C		D	E		E	E	
Approach Delay		23.2			32.2			60.4			65.2	
Approach LOS		C			C			E			E	
Queue Length 50th (ft)	78	316	36	136	428		102	139		38	45	
Queue Length 95th (ft)	m128	477	113	#247	521		147	#250		81	90	
Internal Link Dist (ft)		462			944			835			687	
Turn Bay Length (ft)	200		300	350			225			125		
Base Capacity (vph)	204	1774	1042	234	1806		515	240		131	120	
Starvation Cap Reductn	0	138	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.53	0.90	0.34	0.76	0.73		0.53	0.77		0.39	0.49	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 7 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 32.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 78.0%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: US 17 Bus. (Market St.) & Henry St.



Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	WB	WB	WB	NB	SB
Directions Served	L	L	T	TR	LTR	LTR
Maximum Queue (ft)	22	124	738	735	931	827
Average Queue (ft)	7	81	155	158	607	609
95th Queue (ft)	23	92	604	614	1025	982
Link Distance (ft)			716	716	916	812
Upstream Blk Time (%)			1	1	23	40
Queuing Penalty (veh)			9	11	0	0
Storage Bay Dist (ft)	100	100				
Storage Blk Time (%)		32				
Queuing Penalty (veh)		287				

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	WB	WB	WB	NB	SB
Directions Served	L	L	T	TR	LTR	LTR
Maximum Queue (ft)	1	26	74	86	264	768
Average Queue (ft)	0	1	6	10	155	466
95th Queue (ft)	0	8	37	51	265	848
Link Distance (ft)			515	515	906	753
Upstream Blk Time (%)						28
Queuing Penalty (veh)						0
Storage Bay Dist (ft)	100	100				
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	LT	R
Maximum Queue (ft)	199	317	372	112	327	327	52	91	105	158	150
Average Queue (ft)	48	164	205	35	161	187	8	41	41	60	58
95th Queue (ft)	114	287	319	73	286	289	34	74	89	129	124
Link Distance (ft)		515	515		530	530		819		674	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	175			300			300		125		125
Storage Blk Time (%)		5			0	0				3	2
Queuing Penalty (veh)		3			0	0				2	2

Intersection: 14: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	L	TR	L	TR
Maximum Queue (ft)	82	230	222	118	374	496	586	224	235	278	130	176
Average Queue (ft)	23	115	111	23	154	326	385	105	122	139	52	73
95th Queue (ft)	58	188	186	74	292	503	511	176	206	236	112	129
Link Distance (ft)		429	429			977	977			842		715
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			300	350			225	225		125	
Storage Blk Time (%)		0				4		0	0	1	2	2
Queuing Penalty (veh)		0				6		0	0	4	2	1

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	L	L	R	R
Maximum Queue (ft)	85	224	533	538	325	262	177	182	118	164	213	200
Average Queue (ft)	30	69	204	225	111	118	98	110	84	100	121	115
95th Queue (ft)	67	166	405	415	254	202	150	164	121	156	192	185
Link Distance (ft)			530	530		255	255	255		911		
Upstream Blk Time (%)			0	1		0						
Queuing Penalty (veh)			2	6		2						
Storage Bay Dist (ft)	200	200			300				300		300	300
Storage Blk Time (%)			7	3	0							
Queuing Penalty (veh)			41	7	0							

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	R	L	L	R	R
Maximum Queue (ft)	248	242	161	196	134	457	461	291	196	181	126	127
Average Queue (ft)	110	130	53	85	33	147	165	68	89	88	62	63
95th Queue (ft)	174	184	102	140	84	291	303	160	158	144	109	112
Link Distance (ft)	255	255	255	255		429	429			864		
Upstream Blk Time (%)	0	0				0	0					
Queuing Penalty (veh)	0	0				2	3					
Storage Bay Dist (ft)					200			275	250		250	250
Storage Blk Time (%)						1	0	0				
Queuing Penalty (veh)						4	1	0				

Network Summary

Network wide Queuing Penalty: 394



Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	L	T	TR	LTR	LTR
Maximum Queue (ft)	44	26	124	396	380	931	265
Average Queue (ft)	11	1	47	40	40	879	158
95th Queue (ft)	33	9	96	215	213	1026	295
Link Distance (ft)		704		716	716	916	812
Upstream Blk Time (%)						74	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)	100		100				
Storage Blk Time (%)			21				
Queuing Penalty (veh)			150				

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	2	27	912	484
Average Queue (ft)	0	2	583	270
95th Queue (ft)	1	12	880	456
Link Distance (ft)			906	753
Upstream Blk Time (%)			1	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	100	100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	LT	R
Maximum Queue (ft)	199	400	521	180	234	294	74	111	69	155	105
Average Queue (ft)	81	243	306	78	121	137	11	32	26	58	44
95th Queue (ft)	173	387	457	148	211	223	41	75	51	117	89
Link Distance (ft)		515	515		530	530		819		674	
Upstream Blk Time (%)			0								
Queuing Penalty (veh)			1								
Storage Bay Dist (ft)	175			300			300		125		125
Storage Blk Time (%)	3	9				0		0		1	0
Queuing Penalty (veh)	25	8				0		0		0	0

Intersection: 14: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	L	TR	L	TR
Maximum Queue (ft)	131	436	451	323	265	436	461	158	173	208	88	88
Average Queue (ft)	65	216	226	87	142	262	334	79	89	103	32	49
95th Queue (ft)	112	316	322	178	250	412	449	134	146	185	69	84
Link Distance (ft)		429	429			977	977			842		715
Upstream Blk Time (%)		0	0									
Queuing Penalty (veh)		3	2									
Storage Bay Dist (ft)	200			300	350			225	225		125	
Storage Blk Time (%)		6	1	0		1				0		
Queuing Penalty (veh)		5	3	0		1				0		

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd.

Movement	EB	EB	EB	EB	EB	WB	SB	SB	SB	SB
Directions Served	T	T	T	T	R	L	L	L	R	R
Maximum Queue (ft)	96	224	392	480	324	267	201	171	240	197
Average Queue (ft)	41	67	143	201	88	133	95	99	109	101
95th Queue (ft)	88	146	289	348	199	235	163	170	184	165
Link Distance (ft)			530	530		255		911		
Upstream Blk Time (%)						2				
Queuing Penalty (veh)						9				
Storage Bay Dist (ft)	200	200			300		300		300	300
Storage Blk Time (%)			2	1	0					
Queuing Penalty (veh)			12	3	0					

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	R	L	L	R	R
Maximum Queue (ft)	238	241	201	229	88	184	205	140	135	147	134	148
Average Queue (ft)	126	141	62	88	38	120	129	69	84	88	74	79
95th Queue (ft)	211	225	134	165	80	184	187	132	122	132	117	128
Link Distance (ft)	255	255	255	255		429	429			864		
Upstream Blk Time (%)	0	0										
Queuing Penalty (veh)	0	0										
Storage Bay Dist (ft)					200			275	250		250	250
Storage Blk Time (%)							0					
Queuing Penalty (veh)							0					

Network Summary

Network wide Queuing Penalty: 224

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 2 Tight Urban Diamond
Project Description	U-4434 Independence Boulevard Extension		
<b>45</b>		<b>46</b>	
Independence Blvd. SB - to US 17 Bus.		Independence Blvd. NB - from US 17 Bus.	
Merge/Diverge	Diverge	Merge/Diverge	Merge
No. of lanes on Freeway	2	No. of lanes on Freeway	2
Freeway FFS	60 mph	Freeway FFS	60 mph
Freeway Volume (AM/PM)	2877 2354	Freeway Volume (AM/PM)	1768 2218
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	50 mph	Ramp FFS	50 mph
Ramp Volume (AM/PM)	659 586	Ramp Volume (AM/PM)	586 659
No. Lanes on Ramp	1	No. Lanes on Ramp	1
Accel/Decel Distance 1	540 ft	Accel/Decel Distance 1	480 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	N/A ft
Adjacent Upstream	Yes	Adjacent Upstream	Yes
Off/On	On	Off/On	Off
Distance	2720 ft	Distance	2510 ft
Truck %	4%	Truck %	3%
Ramp Volume (AM/PM)	1628 1103	Ramp Volume (AM/PM)	425 471
Adjacent Downstream	Yes	Adjacent Downstream	Yes
Off/On	On - N/A	Off/On	Off
Distance	N/A ft	Distance	3160 ft
Truck %	N/A	Truck %	4%
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	1103 1628
Peak Hour Factor	0.90	Peak Hour Factor	0.90
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	1.00
Freeway Truck %	4%	Freeway Truck %	4%
Ramp Truck %	3%	Ramp Truck %	3%
<b>47</b>		<b>48</b>	
Independence Blvd. SB - from US 17 Bus.		Independence Blvd. NB - to Darlington	
Merge/Diverge	Merge	Merge/Diverge	Diverge
No. of lanes on Freeway	2	No. of lanes on Freeway	0
Freeway FFS	60 mph	Freeway FFS	0 mph
Freeway Volume (AM/PM)	2213 1771	Freeway Volume (AM/PM)	0 0
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	50 mph	Ramp FFS	0 mph
Ramp Volume (AM/PM)	471 425	Ramp Volume (AM/PM)	0 0
No. Lanes on Ramp	1	No. Lanes on Ramp	0
Accel/Decel Distance 1	480 ft	Accel/Decel Distance 1	0 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	0 ft
Adjacent Upstream	Yes	Adjacent Upstream	Yes
Off/On	Off	Off/On	On
Distance	2410 ft	Distance	0 ft
Truck %	3%	Truck %	0%
Ramp Volume (AM/PM)	659 586	Ramp Volume (AM/PM)	0 0
Adjacent Downstream	No	Adjacent Downstream	Yes
Off/On	N/A	Off/On	On
Distance	N/A ft	Distance	0 ft
Truck %	N/A	Truck %	0%
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	0 0
Peak Hour Factor	0.90	Peak Hour Factor	0.00
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	0.00
Freeway Truck %	4%	Freeway Truck %	0%
Ramp Truck %	3%	Ramp Truck %	0%

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 2 Tight Urban Diamond
Project Description	U-4434 Independence Boulevard Extension		

49																																						
Independence Blvd. NB - Darlington to Market																																						
Sides (One or Two)	One	Sides (One or Two)																																				
No. of Lanes	3	No. of Lanes																																				
Weaving Length, L <sub>s</sub>	1720 ft	Weaving Length, L <sub>s</sub>																																				
Multi-Lane FFS	60 mph	Freeway FFS																																				
Min. Speed (Def. = 15)	15 mph	Min. Speed (Def. = 15)																																				
Segment Type	Multi-Lane	Segment Type																																				
Terrain	Level	Terrain																																				
		Freeway Rolling																																				
		Freeway Rolling																																				
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;"></td> <td style="width: 33%;"></td> </tr> <tr> <td style="text-align: center;">AM Peak</td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>F ↘</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>R ↗</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>R →</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td style="text-align: center;">PM Peak</td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>F ↘</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>R ↗</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>R →</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: center;">0</td> </tr> </table>						AM Peak	Vol	Truck	F →	V <sub>FF</sub>	0	F ↘	V <sub>RF</sub>	0	R ↗	V <sub>FR</sub>	0	R →	V <sub>RR</sub>	0				PM Peak	Vol	Truck	F →	V <sub>FF</sub>	0	F ↘	V <sub>RF</sub>	0	R ↗	V <sub>FR</sub>	0	R →	V <sub>RR</sub>	0
AM Peak	Vol	Truck																																				
F →	V <sub>FF</sub>	0																																				
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F ↘	V <sub>RF</sub>	0																																				
R ↗	V <sub>FR</sub>	0																																				
R →	V <sub>RR</sub>	0																																				
Peak Hour Factor	0.90	Peak Hour Factor																																				
Driver Pop. Adj.	1.00	Driver Pop. Adj.																																				
Maneuver Lns., N <sub>WL</sub>	2	Maneuver Lns., N <sub>WL</sub>																																				
Interchange Density	3.00	Interchange Density																																				
Min. RF In. chng., LC <sub>RF</sub>	1	Min. RF In. chng., LC <sub>RF</sub>																																				
Min. FR In. chng., LC <sub>FR</sub>	1	Min. FR In. chng., LC <sub>FR</sub>																																				
Min. RR In. chng., LC <sub>RR</sub>	N/A	Min. RR In. chng., LC <sub>RR</sub>																																				
20% of vehicles from Darlington exit onto Market																																						

(Place weaving % assumption here)																																						
Sides (One or Two)	One	Sides (One or Two)																																				
No. of Lanes	0	No. of Lanes																																				
Weaving Length, L <sub>s</sub>	0 ft	Weaving Length, L <sub>s</sub>																																				
Freeway FFS	0 mph	Freeway FFS																																				
Min. Speed (Def. = 15)	0 mph	Min. Speed (Def. = 15)																																				
Segment Type	Freeway	Segment Type																																				
Terrain	Rolling	Terrain																																				
		Freeway Rolling																																				
		Freeway Rolling																																				
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;"></td> <td style="width: 33%;"></td> </tr> <tr> <td style="text-align: center;">AM Peak</td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>F ↘</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>R ↗</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>R →</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="3"> </td> </tr> <tr> <td style="text-align: center;">PM Peak</td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>F ↘</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>R ↗</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>R →</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: center;">0</td> </tr> </table>						AM Peak	Vol	Truck	F →	V <sub>FF</sub>	0	F ↘	V <sub>RF</sub>	0	R ↗	V <sub>FR</sub>	0	R →	V <sub>RR</sub>	0				PM Peak	Vol	Truck	F →	V <sub>FF</sub>	0	F ↘	V <sub>RF</sub>	0	R ↗	V <sub>FR</sub>	0	R →	V <sub>RR</sub>	0
AM Peak	Vol	Truck																																				
F →	V <sub>FF</sub>	0																																				
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R →	V <sub>RR</sub>	0																																				
PM Peak	Vol	Truck																																				
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R →	V <sub>RR</sub>	0																																				
Peak Hour Factor	0.00	Peak Hour Factor																																				
Driver Pop. Adj.	0.00	Driver Pop. Adj.																																				
Maneuver Lns., N <sub>WL</sub>	0	Maneuver Lns., N <sub>WL</sub>																																				
Interchange Density	0.00	Interchange Density																																				
Min. RF In. chng., LC <sub>RF</sub>	0	Min. RF In. chng., LC <sub>RF</sub>																																				
Min. FR In. chng., LC <sub>FR</sub>	0	Min. FR In. chng., LC <sub>FR</sub>																																				
Min. RR In. chng., LC <sub>RR</sub>	N/A	Min. RR In. chng., LC <sub>RR</sub>																																				
(Place weaving % assumption here)																																						

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 2 Tight Urban Diamond
Project Description		U-4434 Independence Boulevard Extension	

<div style="text-align: right; margin-bottom: 10px;"><b>49</b></div> <p>Independence Blvd. NB - Darlington to Market  <u>Interchange</u>                      <u>No.</u>                      Darlington Ave.                      1                      Market St.                              1</p> <p style="font-size: small;">Note: multi-lane only 0.67 mile long                      Interchange Density                      3.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Note: freeway only 3.5 miles long                      Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>
<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>

**HIGHWAY CAPACITY SOFTWARE 2010**  
**NETWORK DATA SUMMARY - ANALYSIS NOTES**

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 2 Tight Urban Diamond
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV %	Freeway Truck%			
	FR = DS ramp HV %	Off Ramp Truck %			
	RF = US ramp HV %	On Ramp Truck %			
	RR = DS ramp HV %	Off Ramp Truck %			

Level of Service Standards - Freeways	Level of Service Standards - Signalized Intersections
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004	LOS D or better for overall intersection required
	LOS D or better for individual movements recommended
	If not LOS D for individual movement - v/c ratio must be less than 0.85

**Assumed Improvements**

TIP No.	Description
U-3338	SR 1175 (Kerr Avenue) - widening, including new interchange at US 74

**General Analysis Notes**

- ▶ Interchange/Ramp Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

**Design Specific Analysis Notes**

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

**Locations where LOS D or better not achieved**

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Build 2 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 2720 ft V <sub>u</sub> = 1628 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : Deceleration Lane Length L <sub>D</sub> : 540 Freeway Volume, V <sub>F</sub> : 2877 Ramp Volume, V <sub>R</sub> : 659 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 50.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2877	0.90	Level	4	0	0.980	1.00	3261
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	1628	0.90	Level	4	0	0.980	1.00	1845
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 3261 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	3261	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2518	Exhibit 13-8	4600 No
V <sub>R</sub>	743	Exhibit 13-10	2100 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3261	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 27.4 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>s</sub> = 0.300 (Exhibit 13-12)  
 S<sub>R</sub> = 54.6 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 54.6 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Build 2 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On  <input type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> = 2720 ft  V <sub>u</sub> = 1103 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : Deceleration Lane Length L <sub>D</sub> : 540 Freeway Volume, V <sub>F</sub> : 2354 Ramp Volume, V <sub>R</sub> : 586 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 50.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On  <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> = ft  V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2354	0.90	Level	4	0	0.980	1.00	2668
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	1103	0.90	Level	4	0	0.980	1.00	1250
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 2668 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2668	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2007	Exhibit 13-8	4600 No
V <sub>R</sub>	661	Exhibit 13-10	2100 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2668	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 22.3 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>s</sub> = 0.292 (Exhibit 13-12)  
 S<sub>R</sub> = 54.7 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 54.7 mph (Exhibit 13-13)



## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
---------------------	------------------

Analyst: URS	Freeway/Dir of Travel: Independence Blvd NB
Agency or Company:	Junction: from US 17 Business
Date Performed: 2012	Jurisdiction: Segment #46
Analysis Time Period: AM Peak	Analysis Year: 2040 Build - Build 2 TUDI

Project Description: U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =            ft V <sub>u</sub> =            veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : 480 Deceleration Lane Length L <sub>D</sub> : Freeway Volume, V <sub>F</sub> : 1768 Ramp Volume, V <sub>R</sub> : 586 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 50.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L <sub>down</sub> =        3160 ft V <sub>D</sub> =            1103 veh/h
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### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1768	0.90	Level	4	0	0.980	1.00	2004
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream								
DownStream	1103	0.90	Level	4	0	0.980	1.00	1250

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$

L<sub>EQ</sub> =                            (Equation 13-6 or 13-7)  
 P<sub>FM</sub> =                            1.000 using Equation (Exhibit 13-6)  
 V<sub>12</sub> =                            2004 pc/h  
 V<sub>3</sub> or V<sub>av34</sub>                    0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> =                    pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L<sub>EQ</sub> =                            (Equation 13-12 or 13-13)  
 P<sub>FD</sub> =                            using Equation (Exhibit 13-7)  
 V<sub>12</sub> =                            pc/h  
 V<sub>3</sub> or V<sub>av34</sub>                    pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> =                    pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V <sub>FO</sub>	2665	Exhibit 13-8	No	V <sub>F</sub>		Exhibit 13-8	
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8	
				V <sub>R</sub>		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>	2665	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D<sub>R</sub> =    22.9 (pc/mi/ln)  
 LOS =    C (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D<sub>R</sub> =    (pc/mi/ln)  
 LOS =    (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> =    0.329 (Exhibit 13-11)  
 S<sub>R</sub> =    54.1 mph (Exhibit 13-11)  
 S<sub>0</sub> =    N/A mph (Exhibit 13-11)  
 S =    54.1 mph (Exhibit 13-13)

### Speed Determination

D<sub>s</sub> =    (Exhibit 13-12)  
 S<sub>R</sub> =    mph (Exhibit 13-12)  
 S<sub>0</sub> =    mph (Exhibit 13-12)  
 S =    mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Build 2 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	480	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input type="checkbox"/> No <input checked="" type="checkbox"/> Off
$L_{up} =$ ft	Freeway Volume, $V_F$	2218	$L_{down} =$ 3160 ft
$V_u =$ veh/h	Ramp Volume, $V_R$	659	$V_D =$ 1628 veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	50.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2218	0.90	Level	4	0	0.980	1.00	2514
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream								
DownStream	1628	0.90	Level	4	0	0.980	1.00	1845

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2514 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3257	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3257	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
$D_R =$ 27.5 (pc/mi/ln)
LOS =      C (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)
LOS =      (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.374 (Exhibit 13-11)
$S_R =$ 53.3 mph (Exhibit 13-11)
$S_0 =$ N/A mph (Exhibit 13-11)
$S =$ 53.3 mph (Exhibit 13-13)

### Speed Determination

$D_s =$ (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Build 2 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	480	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 2410 ft	Freeway Volume, $V_F$	2213	$L_{down} =$ ft
$V_u =$ 659 veh/h	Ramp Volume, $V_R$	471	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	50.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2213	0.90	Level	4	0	0.980	1.00	2508
Ramp	471	0.90	Level	3	0	0.985	1.00	531
UpStream	659	0.90	Level	3	0	0.985	1.00	743
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$

$L_{EQ} =$  (Equation 13-6 or 13-7)

$P_{FM} =$  1.000 using Equation (Exhibit 13-6)

$V_{12} =$  2508 pc/h

$V_3$  or  $V_{av34} =$  0 pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$

$L_{EQ} =$  (Equation 13-12 or 13-13)

$P_{FD} =$  using Equation (Exhibit 13-7)

$V_{12} =$  pc/h

$V_3$  or  $V_{av34} =$  pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3039	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3039	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$  25.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$  (pc/mi/ln)

LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$  0.354 (Exhibit 13-11)

$S_R =$  53.6 mph (Exhibit 13-11)

$S_0 =$  N/A mph (Exhibit 13-11)

$S =$  53.6 mph (Exhibit 13-13)

### Speed Determination

$D_s =$  (Exhibit 13-12)

$S_R =$  mph (Exhibit 13-12)

$S_0 =$  mph (Exhibit 13-12)

$S =$  mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
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Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Build 2 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	480	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 2410 ft	Freeway Volume, $V_F$	1771	$L_{down} =$ ft
$V_u =$ 586 veh/h	Ramp Volume, $V_R$	425	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	50.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1771	0.90	Level	4	0	0.980	1.00	2007
Ramp	425	0.90	Level	3	0	0.985	1.00	479
UpStream	586	0.90	Level	3	0	0.985	1.00	661
DownStream								

Merge Areas	Diverge Areas
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Estimation of $v_{12}$	Estimation of $v_{12}$
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$V_{12} = V_F (P_{FM})$ $L_{EQ} = \text{(Equation 13-6 or 13-7)}$ $P_{FM} = 1.000 \text{ using Equation (Exhibit 13-6)}$ $V_{12} = 2007 \text{ pc/h}$ $V_3 \text{ or } V_{av34} = 0 \text{ pc/h (Equation 13-14 or 13-17)}$ <p>Is <math>V_3</math> or <math>V_{av34} &gt; 2,700</math> pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Is <math>V_3</math> or <math>V_{av34} &gt; 1.5 * V_{12}/2</math> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If Yes, <math>V_{12a} =</math> pc/h (Equation 13-16, 13-18, or 13-19)</p>	$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} = \text{(Equation 13-12 or 13-13)}$ $P_{FD} = \text{using Equation (Exhibit 13-7)}$ $V_{12} = \text{pc/h}$ $V_3 \text{ or } V_{av34} = \text{pc/h (Equation 13-14 or 13-17)}$ <p>Is <math>V_3</math> or <math>V_{av34} &gt; 2,700</math> pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is <math>V_3</math> or <math>V_{av34} &gt; 1.5 * V_{12}/2</math> <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes, <math>V_{12a} =</math> pc/h (Equation 13-16, 13-18, or 13-19)</p>
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2486	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
$V_{R12}$	2486	Exhibit 13-8	4600:All	No	$V_{12}$	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R = 21.6 \text{ (pc/mi/ln)}$ $LOS = C \text{ (Exhibit 13-2)}$	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R = \text{(pc/mi/ln)}$ $LOS = \text{(Exhibit 13-2)}$
--	---

Speed Determination	Speed Determination
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$M_S = 0.320 \text{ (Exhibit 13-11)}$ $S_R = 54.2 \text{ mph (Exhibit 13-11)}$ $S_0 = \text{N/A mph (Exhibit 13-11)}$ $S = 54.2 \text{ mph (Exhibit 13-13)}$	$D_s = \text{(Exhibit 13-12)}$ $S_R = \text{mph (Exhibit 13-12)}$ $S_0 = \text{mph (Exhibit 13-12)}$ $S = \text{mph (Exhibit 13-13)}$
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<b>RAMPS AND RAMP JUNCTIONS WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst		URS			Freeway/Dir of Travel		Independence Blvd NB		
Agency or Company					Junction		to Darlington Ave		
Date Performed		2013			Jurisdiction		Segment #48		
Analysis Time Period		AM Peak			Analysis Year		2040 Build - Alt 2 TUDI		
Project Description U-4434 Independence Boulevard Extension									
<b>Inputs</b>									
Upstream Adj Ramp		Number of Lanes, N					Downstream Adj Ramp		
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, $L_A$					<input type="checkbox"/> Yes <input type="checkbox"/> On		
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length $L_D$					<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
$L_{up}$ = ft		Freeway Volume, $V_F$					$L_{down}$ = ft		
$V_u$ = veh/h		Ramp Volume, $V_R$					$V_D$ = veh/h		
					Freeway Free-Flow Speed, $S_{FF}$				
					Ramp Free-Flow Speed, $S_{FR}$				
<b>Conversion to pc/h Under Base Conditions</b>									
(pc/h)	$V$ (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	2205	0.90	Level	4	0	0.980	1.00	2499	
Ramp	99	0.90	Level	2	0	0.990	1.00	111	
UpStream									
DownStream									
<b>Merge Areas</b>					<b>Diverge Areas</b>				
<b>Estimation of <math>v_{12}</math></b>					<b>Estimation of <math>v_{12}</math></b>				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
$L_{EQ} =$ using Equation (Exhibit 13-6)					$L_{EQ} =$ 1.000 using Equation (Exhibit 13-7)				
$P_{FM} =$ pc/h					$P_{FD} =$ 2499 pc/h				
$V_{12} =$ pc/h (Equation 13-14 or 13-17)					$V_{12} =$ 0 pc/h (Equation 13-14 or 13-17)				
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No					Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No					Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
<b>Capacity Checks</b>					<b>Capacity Checks</b>				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
$V_{FO}$		Exhibit 13-8			$V_F$	2499	Exhibit 13-8	4600	No
					$V_{FO} = V_F - V_R$	2388	Exhibit 13-8	4600	No
					$V_R$	111	Exhibit 13-10	1800	No
<b>Flow Entering Merge Influence Area</b>					<b>Flow Entering Diverge Influence Area</b>				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
$V_{R12}$		Exhibit 13-8			$V_{12}$	2499	Exhibit 13-8	4400:All	No
<b>Level of Service Determination (if not F)</b>					<b>Level of Service Determination (if not F)</b>				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 18.5 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)				
<b>Speed Determination</b>					<b>Speed Determination</b>				
$M_S =$ (Exhibit 13-11)					$D_s =$ 0.698 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 47.4 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ N/A mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 47.4 mph (Exhibit 13-13)				

<b>RAMPS AND RAMP JUNCTIONS WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst		URS			Freeway/Dir of Travel		Independence Blvd NB		
Agency or Company					Junction		to Darlington		
Date Performed		2013			Jurisdiction		Segment #48		
Analysis Time Period		PM Peak			Analysis Year		2040 Build - Alt 2 TUDI		
Project Description U-4434 Independence Boulevard Extension									
<b>Inputs</b>									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = ft V <sub>u</sub> = veh/h		Number of Lanes, N 2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 800 Freeway Volume, V <sub>F</sub> 2695 Ramp Volume, V <sub>R</sub> 133 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 15.0				Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h			
<b>Conversion to pc/h Under Base Conditions</b>									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	2695	0.90	Level	4	0	0.980	1.00	3054	
Ramp	133	0.90	Level	2	0	0.990	1.00	149	
UpStream									
DownStream									
<b>Merge Areas</b>					<b>Diverge Areas</b>				
<b>Estimation of v<sub>12</sub></b>					<b>Estimation of v<sub>12</sub></b>				
$V_{12} = V_F (P_{FM})$ L <sub>EQ</sub> = (Equation 13-6 or 13-7) P <sub>FM</sub> = using Equation (Exhibit 13-6) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L <sub>EQ</sub> = (Equation 13-12 or 13-13) P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7) V <sub>12</sub> = 3054 pc/h V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)				
<b>Capacity Checks</b>					<b>Capacity Checks</b>				
		Actual	Capacity	LOS F?			Actual	Capacity	LOS F?
V <sub>FO</sub>			Exhibit 13-8		V <sub>F</sub>	3054	Exhibit 13-8	4600	No
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2905	Exhibit 13-8	4600	No
					V <sub>R</sub>	149	Exhibit 13-10	1800	No
<b>Flow Entering Merge Influence Area</b>					<b>Flow Entering Diverge Influence Area</b>				
		Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?
V <sub>R12</sub>			Exhibit 13-8		V <sub>12</sub>	3054	Exhibit 13-8	4400:All	No
<b>Level of Service Determination (if not F)</b>					<b>Level of Service Determination (if not F)</b>				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 23.3 (pc/mi/ln) LOS = C (Exhibit 13-2)				
<b>Speed Determination</b>					<b>Speed Determination</b>				
M <sub>S</sub> = (Exhibit 13-11) S <sub>R</sub> = mph (Exhibit 13-11) S <sub>0</sub> = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D <sub>S</sub> = 0.701 (Exhibit 13-12) S <sub>R</sub> = 47.4 mph (Exhibit 13-12) S <sub>0</sub> = N/A mph (Exhibit 13-12) S = 47.4 mph (Exhibit 13-13)				

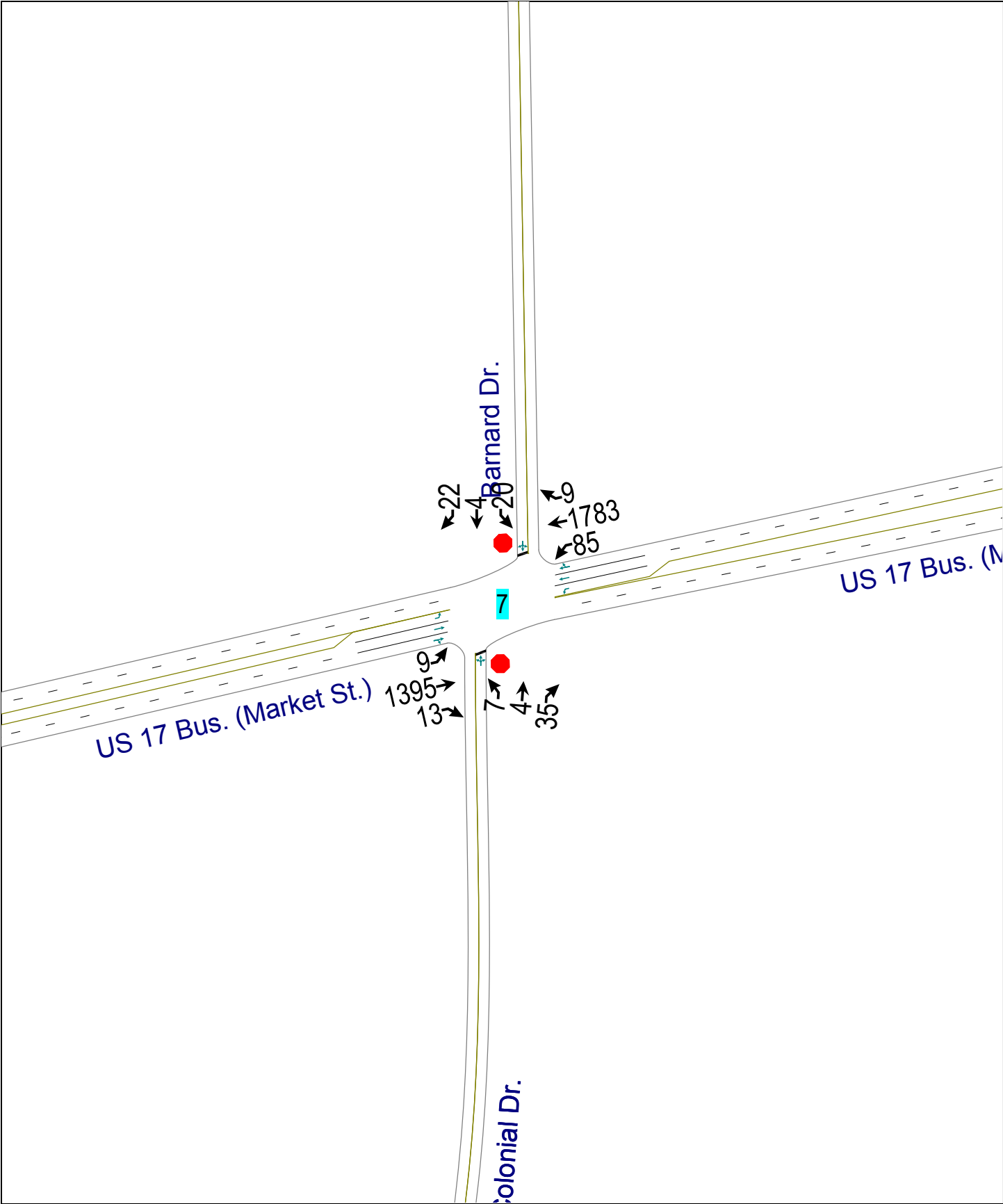
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 2 TUDI			
Analysis Time Period	AM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/ Multilane Highways			
Weaving number of lanes, N	3				Freeway minimum speed, $S_{MIN}$	15			
Weaving segment length, $L_S$	1120ft				Freeway maximum capacity, $C_{IFL}$	2300			
Freeway free-flow speed, FFS	60 mph				Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	$E_T$	$E_R$	$f_{HV}$	$f_p$	v (pc/h)
$V_{FF}$	1684	0.90	4	0	1.5	1.2	0.980	1.00	1909
$V_{RF}$	87	0.90	4	0	1.5	1.2	0.980	1.00	99
$V_{FR}$	403	0.90	4	0	1.5	1.2	0.980	1.00	457
$V_{RR}$	22	0.90	4	0	1.5	1.2	0.980	1.00	25
$V_{NW}$	1934							V =	2490
$V_W$	556								
VR	0.223								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, $N_{WL}$	2 lc				Minimum weaving lane changes, $LC_{MIN}$	556 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, $LC_W$	861 lc/h			
Minimum RF lane changes, $LC_{RF}$	1 lc/pc				Non-weaving lane changes, $LC_{NW}$	428 lc/h			
Minimum FR lane changes, $LC_{FR}$	1 lc/pc				Total lane changes, $LC_{ALL}$	1289 lc/h			
Minimum RR lane changes, $LC_{RR}$	lc/pc				Non-weaving vehicle index, $I_{NW}$	650			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	2490 pc/h				Weaving intensity factor, W	0.253			
Weaving segment capacity, $c_w$	5941 veh/h				Weaving segment speed, S	51.8 mph			
Weaving segment v/c ratio	0.411				Average weaving speed, $S_W$	50.9 mph			
Weaving segment density, D	16.0 pc/mi/ln				Average non-weaving speed, $S_{NW}$	52.0 mph			
Level of Service, LOS	B				Maximum weaving length, $L_{MAX}$	4776 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

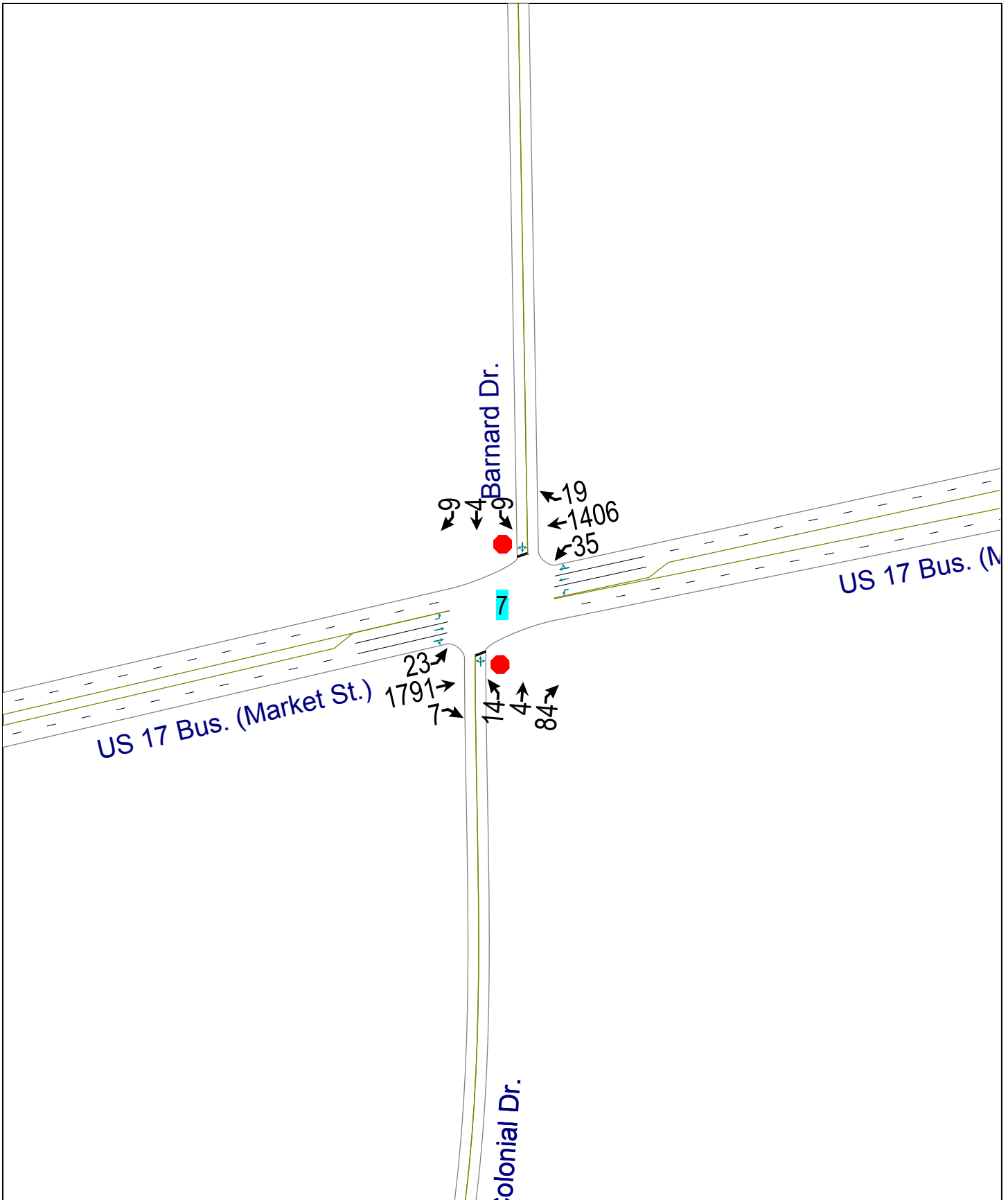
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 2TUDI			
Analysis Time Period	PM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1120ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	2134	0.90	4	0	1.5	1.2	0.980	1.00	2419
V <sub>RF</sub>	79	0.90	4	0	1.5	1.2	0.980	1.00	90
V <sub>FR</sub>	451	0.90	4	0	1.5	1.2	0.980	1.00	511
V <sub>RR</sub>	21	0.90	4	0	1.5	1.2	0.980	1.00	24
V <sub>NW</sub>	2443							V =	3044
V <sub>W</sub>	601								
VR	0.197								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	601 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	906 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	532 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1438 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	821			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	3044 pc/h				Weaving intensity factor, W	0.275			
Weaving segment capacity, c <sub>w</sub>	6003 veh/h				Weaving segment speed, S	50.7 mph			
Weaving segment v/c ratio	0.497				Average weaving speed, S <sub>W</sub>	50.3 mph			
Weaving segment density, D	20.0 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	50.8 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4510 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									



## Build Alternative 7, Quadrant AC

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U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
1/16/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	1395	13	85	1783	9	7	4	35	20	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Flt Permitted	0.950			0.950				0.992			0.978	
Satd. Flow (perm)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		870			861			978			871	
Travel Time (s)		16.9			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1564	0	94	1991	0	0	51	0	0	50	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.0%
ICU Level of Service	C
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
Build Alt. 7 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/27/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑		↗	↑↑			↕			↕	
Volume (veh/h)	9	1395	13	85	1783	9	7	4	35	20	4	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1550	14	94	1981	10	8	4	39	22	4	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (ft)	1010					861						
pX, platoon unblocked	0.52			0.75			0.65	0.65	0.75	0.65	0.65	0.52
vC, conflicting volume	1991			1564			2783	3757	782	3011	3759	996
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1067			1079			911	2413	32	1263	2417	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			80			92	73	95	57	73	96
cM capacity (veh/h)	339			480			94	16	773	52	16	566

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	10	1033	531	94	1321	670	51	51
Volume Left	10	0	0	94	0	0	8	22
Volume Right	0	0	14	0	0	10	39	24
cSH	339	1700	1700	480	1700	1700	126	68
Volume to Capacity	0.03	0.61	0.31	0.20	0.78	0.39	0.41	0.75
Queue Length 95th (ft)	2	0	0	18	0	0	43	86
Control Delay (s)	16.0	0.0	0.0	14.3	0.0	0.0	51.8	145.8
Lane LOS	C			B			F	F
Approach Delay (s)	0.1			0.6			51.8	145.8
Approach LOS							F	F

Intersection Summary

Average Delay	3.1
Intersection Capacity Utilization	69.0%
ICU Level of Service	C
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 7 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 1/16/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1791	7	35	1406	19	14	4	84	9	4	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Flt Permitted	0.950			0.950				0.993			0.980	
Satd. Flow (perm)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		870			861			978			871	
Travel Time (s)		16.9			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1998	0	39	1583	0	0	113	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 7 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 9/27/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	1791	7	35	1406	19	14	4	84	9	4	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	1990	8	39	1562	21	16	4	93	10	4	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1010			861							
pX, platoon unblocked	0.77			0.64			0.75	0.75	0.64	0.75	0.75	0.77
vC, conflicting volume	1583			1998			2916	3706	999	2792	3699	792
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1163			1424			1516	2568	0	1351	2560	136
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			87			62	72	86	79	72	99
cM capacity (veh/h)	460			301			41	16	690	48	16	684

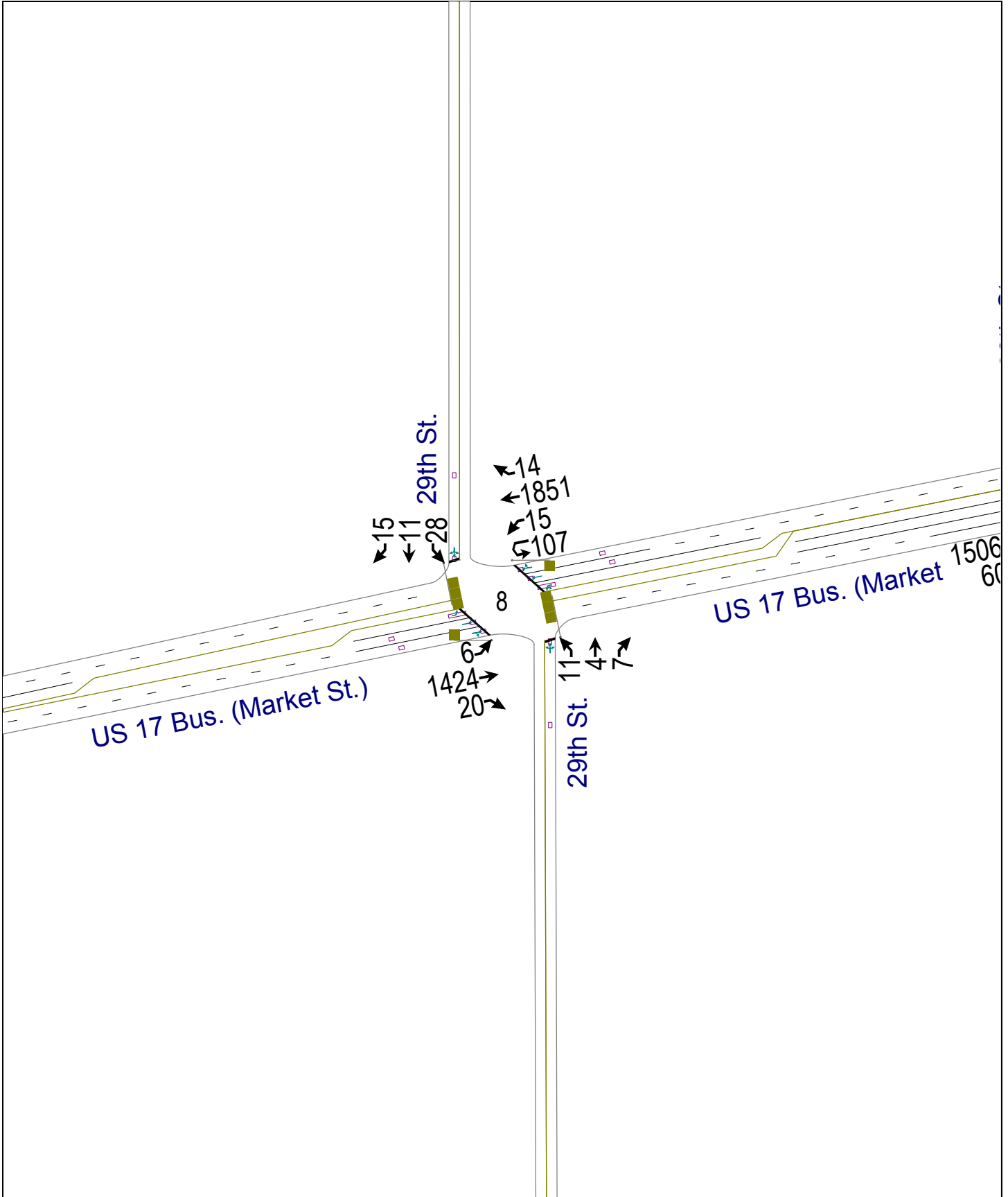
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	26	1327	671	39	1041	542	113	24
Volume Left	26	0	0	39	0	0	16	10
Volume Right	0	0	8	0	0	21	93	10
cSH	460	1700	1700	301	1700	1700	143	49
Volume to Capacity	0.06	0.78	0.39	0.13	0.61	0.32	0.79	0.50
Queue Length 95th (ft)	4	0	0	11	0	0	123	47
Control Delay (s)	13.3	0.0	0.0	18.7	0.0	0.0	88.9	137.0
Lane LOS	B			C			F	F
Approach Delay (s)	0.2			0.4			88.9	137.0
Approach LOS							F	F

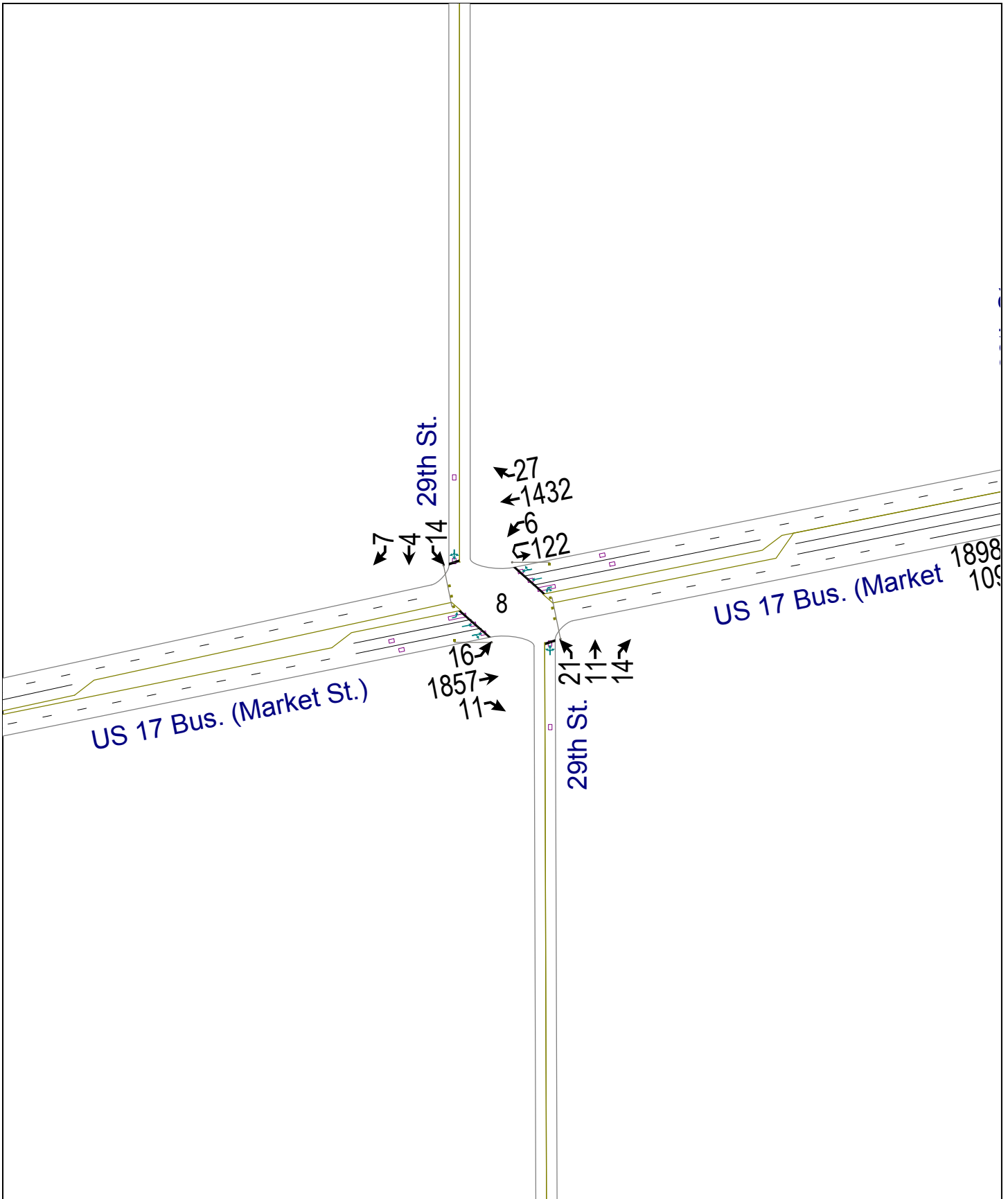
Intersection Summary

Average Delay	3.8
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 7 Quad AC PM Peak

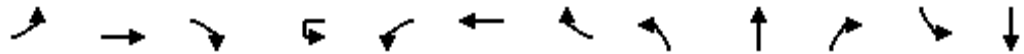






U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
9/27/2012

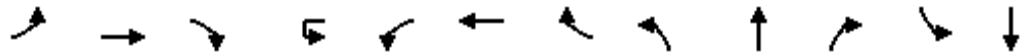


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	6	1424	20	107	15	1851	14	11	4	7	28	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0		225		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3532	0	0	1770	3536	0	0	1736	0	0	1730
Flt Permitted	0.070				0.950				0.976			0.975
Satd. Flow (perm)	130	3532	0	0	1770	3536	0	0	1736	0	0	1730
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			25			25
Link Distance (ft)		861				630			952			799
Travel Time (s)		14.7				10.7			26.0			21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1604	0	0	136	2073	0	0	24	0	0	60
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			0			0
Link Offset(ft)		0				0			48			48
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	71.0	71.0	0.0	21.0	21.0	92.0	0.0	14.0	14.0	0.0	14.0	14.0
Total Split (%)	59.2%	59.2%	0.0%	17.5%	17.5%	76.7%	0.0%	11.7%	11.7%	0.0%	11.7%	11.7%
Maximum Green (s)	64.0	64.0		14.0	14.0	85.0		7.0	7.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	75.8	75.8			14.6	96.4			9.0			9.0
Actuated g/C Ratio	0.63	0.63			0.12	0.80			0.08			0.08
v/c Ratio	0.09	0.72			0.63	0.73			0.18			0.46
Control Delay	12.8	12.5			64.1	4.0			55.7			65.2
Queue Delay	0.0	0.0			0.0	0.1			0.0			0.0

8: US 17 Bus. (Market St.) & 29th St.  
Build Alt. 7 Quad AC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	15
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 7 Quad AC AM Peak



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	12.8	12.5			64.1	4.1			55.7			65.2
LOS	B	B			E	A			E			E
Approach Delay		12.5				7.8			55.7			65.2
Approach LOS		B				A			E			E
Queue Length 50th (ft)	2	243			96	124			18			45
Queue Length 95th (ft)	m4	270			m126	247			46			92
Internal Link Dist (ft)		781				550			872			719
Turn Bay Length (ft)	100				225							
Base Capacity (vph)	82	2230			236	2841			130			130
Starvation Cap Reductn	0	0			0	61			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.09	0.72			0.58	0.75			0.18			0.46

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 115 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 10.9 Intersection LOS: B  
 Intersection Capacity Utilization 79.9% ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: US 17 Bus. (Market St.) & 29th St.

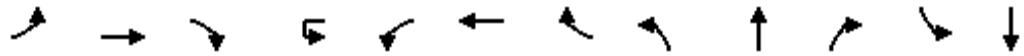




Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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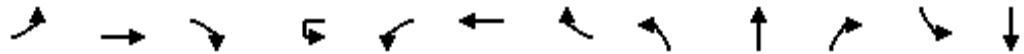
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	16	1857	11	122	6	1432	27	21	11	14	14	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0		225		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3536	0	0	1770	3529	0	0	1745	0	0	1723
Flt Permitted	0.147				0.950				0.978			0.972
Satd. Flow (perm)	274	3536	0	0	1770	3529	0	0	1745	0	0	1723
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			25			25
Link Distance (ft)		861				630			952			799
Travel Time (s)		14.7				10.7			26.0			21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	2075	0	0	143	1621	0	0	51	0	0	28
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			0			0
Link Offset(ft)		0				0			48			48
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	77.0	77.0	0.0	15.0	15.0	92.0	0.0	14.0	14.0	0.0	14.0	14.0
Total Split (%)	64.2%	64.2%	0.0%	12.5%	12.5%	76.7%	0.0%	11.7%	11.7%	0.0%	11.7%	11.7%
Maximum Green (s)	70.0	70.0		8.0	8.0	85.0		7.0	7.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	77.5	77.5			12.8	96.3			9.1			9.0
Actuated g/C Ratio	0.65	0.65			0.11	0.80			0.08			0.08
v/c Ratio	0.10	0.91			0.76	0.57			0.39			0.22
Control Delay	9.6	18.2			79.0	2.7			61.8			56.6
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

8: US 17 Bus. (Market St.) & 29th St.  
Build Alt. 7 Quad AC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	7
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 7 Quad AC PM Peak





Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	9.6	18.2			79.0	2.8			61.8			56.6
LOS	A	B			E	A			E			E
Approach Delay		18.1				9.0			61.8			56.6
Approach LOS		B				A			E			E
Queue Length 50th (ft)	4	277			108	73			38			21
Queue Length 95th (ft)	m7	#982			m#215	92			81			52
Internal Link Dist (ft)		781				550			872			719
Turn Bay Length (ft)	100				225							
Base Capacity (vph)	177	2285			189	2832			132			129
Starvation Cap Reductn	0	0			0	99			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.10	0.91			0.76	0.59			0.39			0.22

**Intersection Summary**

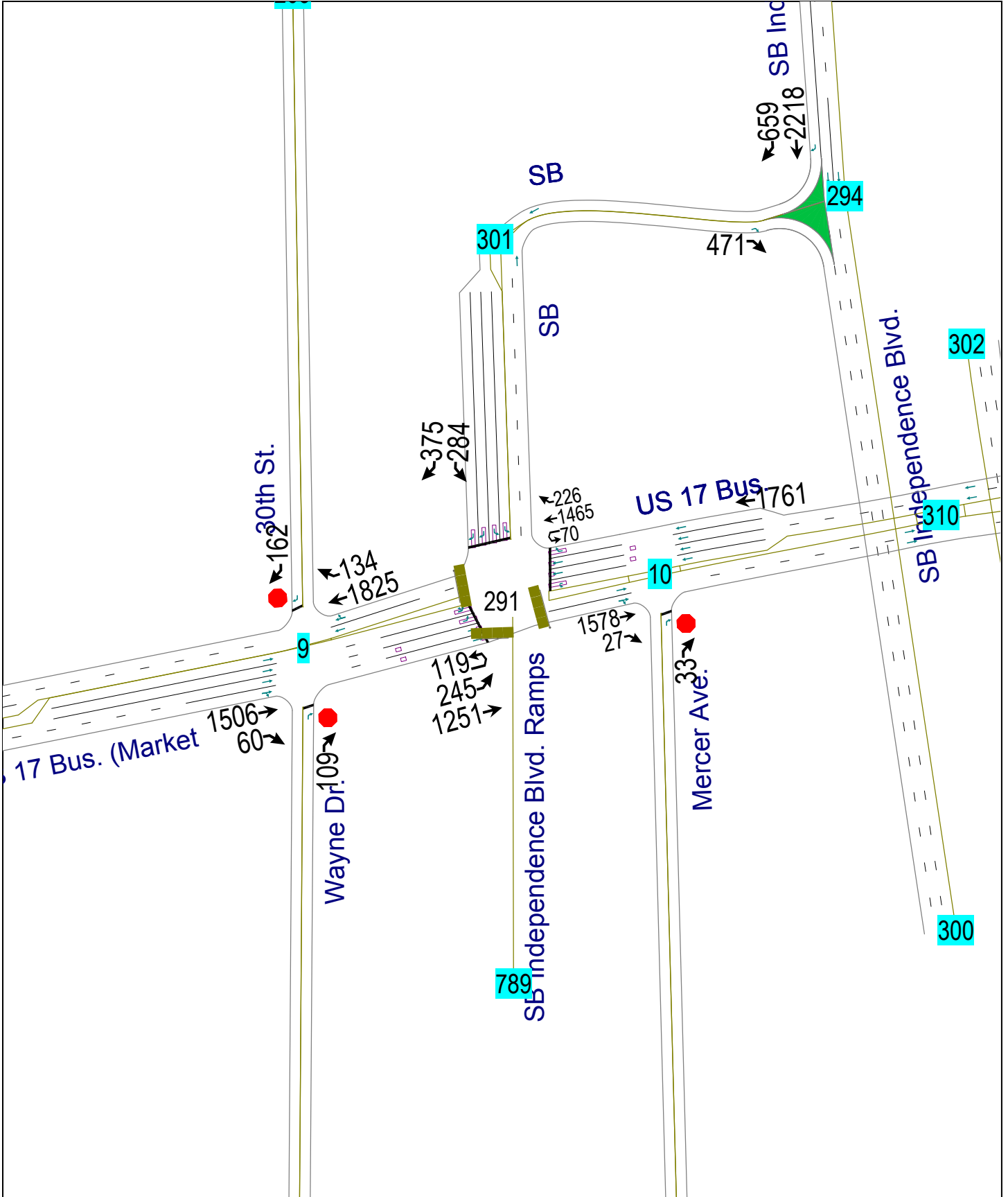
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 119 (99%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 14.9 Intersection LOS: B  
 Intersection Capacity Utilization 77.1% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

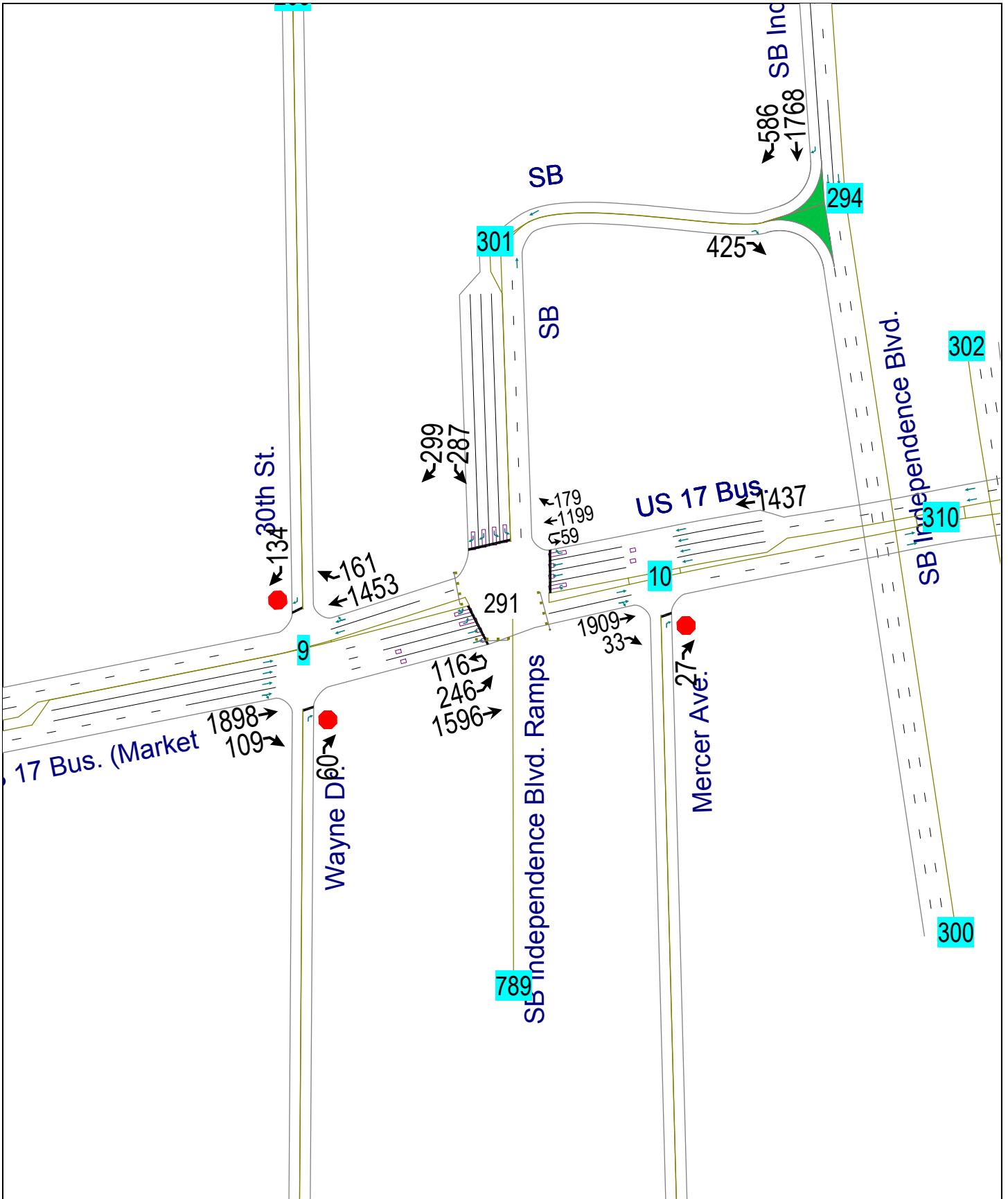
Splits and Phases: 8: US 17 Bus. (Market St.) & 29th St.





Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	





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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↗			↗
Volume (vph)	0	1506	60	0	1825	134	0	0	109	0	0	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	0		0	0		0
Storage Lanes	2		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	6369	0	0	3504	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	6369	0	0	3504	0	0	0	1611	0	0	1611
Link Speed (mph)		40			40			25				25
Link Distance (ft)		630			230			873				738
Travel Time (s)		10.7			3.9			23.8				20.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1740	0	0	2177	0	0	0	121	0	0	180
Enter Blocked Intersection	No	Yes	Yes	No	Yes	Yes	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	71.4%
ICU Level of Service	C
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 7 Quad AC AM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↗			↗
Volume (veh/h)	0	1506	60	0	1825	134	0	0	109	0	0	162
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1673	67	0	2028	149	0	0	121	0	0	180
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		630			230							
pX, platoon unblocked	0.59						0.59	0.59		0.59	0.59	0.59
vC, conflicting volume	2177			1740			2901	3883	452	2642	3842	1088
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1595			1740			2830	4507	452	2389	4437	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	78	100	100	72
cM capacity (veh/h)	238			358			3	1	555	8	1	636

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1	SB 1
Volume Total	478	478	478	306	1352	825	121	180
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	67	0	149	121	180
cSH	1700	1700	1700	1700	1700	1700	555	636
Volume to Capacity	0.28	0.28	0.28	0.18	0.80	0.49	0.22	0.28
Queue Length 95th (ft)	0	0	0	0	0	0	21	29
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	13.3	12.9
Lane LOS							B	B
Approach Delay (s)	0.0				0.0		13.3	12.9
Approach LOS							B	B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization	71.4%		ICU Level of Service C
Analysis Period (min)		15	

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 7 Quad AC AM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↗			↗
Volume (vph)	0	1898	109	0	1453	161	0	0	60	0	0	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	0		0	0		0	0		0
Storage Lanes	2		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	6357	0	0	3486	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	6357	0	0	3486	0	0	0	1611	0	0	1611
Link Speed (mph)		40			40			25				25
Link Distance (ft)		630			230			873				738
Travel Time (s)		10.7			3.9			23.8				20.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2230	0	0	1793	0	0	0	67	0	0	149
Enter Blocked Intersection	No	Yes	Yes	No	Yes	Yes	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.3%
ICU Level of Service	B
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 7 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑			↑↑				↗			↗
Volume (veh/h)	0	1898	109	0	1453	161	0	0	60	0	0	134
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2109	121	0	1614	179	0	0	67	0	0	149
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		630			230							
pX, platoon unblocked	0.70						0.70	0.70		0.70	0.70	0.70
vC, conflicting volume	1793			2230			3126	3963	588	2298	3934	897
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1277			2230			3179	4375	588	1997	4333	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	85	100	100	80
cM capacity (veh/h)	378			230			2	1	452	21	1	759

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1	SB 1
Volume Total	603	603	603	422	1076	717	67	149
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	121	0	179	67	149
cSH	1700	1700	1700	1700	1700	1700	452	759
Volume to Capacity	0.35	0.35	0.35	0.25	0.63	0.42	0.15	0.20
Queue Length 95th (ft)	0	0	0	0	0	0	13	18
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	14.3	10.9
Lane LOS							B	B
Approach Delay (s)	0.0				0.0		14.3	10.9
Approach LOS							B	B

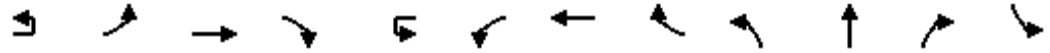
Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization	60.3%		ICU Level of Service B
Analysis Period (min)		15	

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 7 Quad AC PM Peak



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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔↔	↑↑		↔		↑↑	↔				↔↔
Volume (vph)	119	245	1251	0	70	0	1465	226	0	0	0	284
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	0		0	275
Storage Lanes		2		0		1		1	0		0	1
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	0	3433	3539	0	1752	0	3505	1568	0	0	0	3400
Flt Permitted		0.950			0.950							0.950
Satd. Flow (perm)	0	3433	3539	0	1752	0	3505	1568	0	0	0	3400
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			45		
Link Distance (ft)			230				181			431		
Travel Time (s)			3.9				3.1			6.5		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	0%	3%	3%	0%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	404	1390	0	78	0	1628	251	0	0	0	316
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Right	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				24			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot	Prot			Prot			pm+ov				Prot
Protected Phases	5	5	2		1		6	4				4
Permitted Phases								6				
Detector Phase	5	5	2		1		6	4				4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0		7.0		12.0	7.0				7.0
Minimum Split (s)	14.0	14.0	19.0		14.0		19.0	14.0				14.0
Total Split (s)	22.0	22.0	75.0	0.0	17.0	0.0	70.0	28.0	0.0	0.0	0.0	28.0
Total Split (%)	18.3%	18.3%	62.5%	0.0%	14.2%	0.0%	58.3%	23.3%	0.0%	0.0%	0.0%	23.3%
Maximum Green (s)	15.0	15.0	68.0		10.0		63.0	21.0				21.0
Yellow Time (s)	5.0	5.0	5.0		5.0		5.0	5.0				5.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	2.0				2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	2.0	5.0	2.0	5.0	5.0	2.0	2.0	2.0	5.0
Lead/Lag	Lag	Lag	Lag		Lead		Lead					
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes					
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0				3.0
Recall Mode	None	None	C-Max		None		C-Max	None				None
Act Effct Green (s)		17.0	74.3		11.2		65.7	93.0				22.3
Actuated g/C Ratio		0.14	0.62		0.09		0.55	0.78				0.19
v/c Ratio		0.83	0.63		0.48		0.85	0.21				0.50
Control Delay		47.3	4.9		69.8		16.8	3.0				46.7
Queue Delay		0.0	0.0		0.0		0.0	0.0				0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps  
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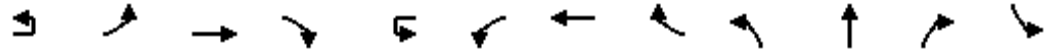
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Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	375
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		275
Storage Lanes		2
Taper Length (ft)		25
Satd. Flow (prot)	0	2760
Flt Permitted		
Satd. Flow (perm)	0	2760
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	408	
Travel Time (s)	11.1	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	3%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	417
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		custom
Protected Phases		
Permitted Phases		4
Detector Phase		4
Switch Phase		
Minimum Initial (s)		7.0
Minimum Split (s)		14.0
Total Split (s)	0.0	28.0
Total Split (%)	0.0%	23.3%
Maximum Green (s)		21.0
Yellow Time (s)		5.0
All-Red Time (s)		2.0
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		3.0
Recall Mode		None
Act Effct Green (s)		22.3
Actuated g/C Ratio		0.19
v/c Ratio		0.81
Control Delay		60.3
Queue Delay		0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps  
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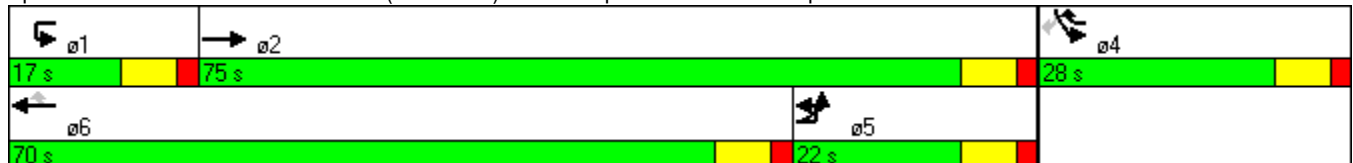


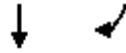
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		47.3	4.9		69.8		16.8	3.0				46.7
LOS		D	A		E		B	A				D
Approach Delay			14.5				17.2					
Approach LOS			B				B					
Queue Length 50th (ft)		161	68		60		254	28				113
Queue Length 95th (ft)		#235	77		m94		344	55				159
Internal Link Dist (ft)			150				101			351		
Turn Bay Length (ft)												275
Base Capacity (vph)		486	2191		175		1919	1211				652
Starvation Cap Reductn		0	0		0		0	0				0
Spillback Cap Reductn		0	0		0		0	0				0
Storage Cap Reductn		0	0		0		0	0				0
Reduced v/c Ratio		0.83	0.63		0.45		0.85	0.21				0.48

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 5 (4%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.85  
 Intersection Signal Delay: 22.2 Intersection LOS: C  
 Intersection Capacity Utilization 76.5% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps

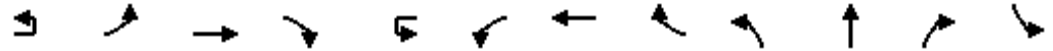




Lane Group	SBT	SBR
Total Delay		60.3
LOS		E
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		176
Queue Length 95th (ft)		#253
Internal Link Dist (ft)	328	
Turn Bay Length (ft)		275
Base Capacity (vph)		529
Starvation Cap Reductn		0
Spillback Cap Reductn		0
Storage Cap Reductn		0
Reduced v/c Ratio		0.79
<b>Intersection Summary</b>		

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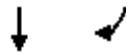


Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↔↔	↑↑		↔		↑↑	↔				↔↔
Volume (vph)	116	246	1596	0	59	0	1199	179	0	0	0	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	0		0	275
Storage Lanes		2		0		1		1	0		0	1
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	0	3433	3539	0	1752	0	3505	1568	0	0	0	3400
Flt Permitted		0.950			0.950							0.950
Satd. Flow (perm)	0	3433	3539	0	1752	0	3505	1568	0	0	0	3400
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			45		
Link Distance (ft)			230				181			431		
Travel Time (s)			3.9				3.1			6.5		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	0%	3%	3%	0%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	402	1773	0	66	0	1332	199	0	0	0	319
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				24			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot	Prot			Prot			pm+ov				Prot
Protected Phases	5	5	2		1		6	4				4
Permitted Phases								6				
Detector Phase	5	5	2		1		6	4				4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0		7.0		12.0	7.0				7.0
Minimum Split (s)	14.0	14.0	19.0		14.0		19.0	14.0				14.0
Total Split (s)	26.0	26.0	78.0	0.0	15.0	0.0	67.0	27.0	0.0	0.0	0.0	27.0
Total Split (%)	21.7%	21.7%	65.0%	0.0%	12.5%	0.0%	55.8%	22.5%	0.0%	0.0%	0.0%	22.5%
Maximum Green (s)	19.0	19.0	71.0		8.0		60.0	20.0				20.0
Yellow Time (s)	5.0	5.0	5.0		5.0		5.0	5.0				5.0
All-Red Time (s)	2.0	2.0	2.0		2.0		2.0	2.0				2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	2.0	5.0	2.0	5.0	5.0	2.0	2.0	2.0	5.0
Lead/Lag	Lag	Lag	Lag		Lead		Lead					
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes					
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0				3.0
Recall Mode	None	None	C-Max		None		C-Max	None				None
Act Effct Green (s)		21.0	77.6		9.9		63.7	89.0				20.3
Actuated g/C Ratio		0.18	0.65		0.08		0.53	0.74				0.17
v/c Ratio		0.67	0.77		0.46		0.72	0.17				0.55
Control Delay		32.9	3.5		69.2		14.2	3.4				49.4
Queue Delay		0.0	0.2		0.0		0.0	0.0				0.0

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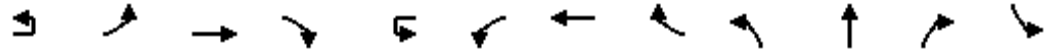


Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	299
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		275
Storage Lanes		2
Taper Length (ft)		25
Satd. Flow (prot)	0	2760
Flt Permitted		
Satd. Flow (perm)	0	2760
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	408	
Travel Time (s)	11.1	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	3%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	332
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		custom
Protected Phases		
Permitted Phases		4
Detector Phase		4
Switch Phase		
Minimum Initial (s)		7.0
Minimum Split (s)		14.0
Total Split (s)	0.0	27.0
Total Split (%)	0.0%	22.5%
Maximum Green (s)		20.0
Yellow Time (s)		5.0
All-Red Time (s)		2.0
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		3.0
Recall Mode		None
Act Effct Green (s)		20.3
Actuated g/C Ratio		0.17
v/c Ratio		0.71
Control Delay		55.9
Queue Delay		0.0

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay		32.9	3.7		69.2		14.2	3.4				49.4
LOS		C	A		E		B	A				D
Approach Delay			9.1				15.2					
Approach LOS			A				B					
Queue Length 50th (ft)		142	59		47		246	24				115
Queue Length 95th (ft)		m160	64		m92		298	45				162
Internal Link Dist (ft)			150				101			351		
Turn Bay Length (ft)												275
Base Capacity (vph)		601	2290		147		1861	1157				623
Starvation Cap Reductn		0	70		0		0	0				0
Spillback Cap Reductn		0	0		0		0	0				0
Storage Cap Reductn		0	0		0		0	0				0
Reduced v/c Ratio		0.67	0.80		0.45		0.72	0.17				0.51

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 13 (11%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 17.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 69.8%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps



291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps  
 Build Alt. 7 Quad AC PM Peak



Lane Group	SBT	SBR
Total Delay		55.9
LOS		E
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		136
Queue Length 95th (ft)		193
Internal Link Dist (ft)	328	
Turn Bay Length (ft)		275
Base Capacity (vph)		506
Starvation Cap Reductn		0
Spillback Cap Reductn		0
Storage Cap Reductn		0
Reduced v/c Ratio		0.66
<b>Intersection Summary</b>		



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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑		↗
Volume (vph)	1578	27	0	1761	0	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		0	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3529	0	0	6408	0	1611
Flt Permitted						
Satd. Flow (perm)	3529	0	0	6408	0	1611
Link Speed (mph)	40			40	25	
Link Distance (ft)	181			324	909	
Travel Time (s)	3.1			5.5	24.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1783	0	0	1957	0	37
Enter Blocked Intersection	Yes	Yes	No	Yes	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	6			6	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	54.5%
ICU Level of Service	A
Analysis Period (min)	15

10: US 17 Bus. (Market St.) & Mercer Ave.  
 Build Alt. 7 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑		↗
Volume (veh/h)	1578	27	0	1761	0	33
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1753	30	0	1957	0	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	181			847		
pX, platoon unblocked			0.74	0.74	0.74	
vC, conflicting volume			1783	2258	892	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1358	1998	154	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	100	94	
cM capacity (veh/h)			372	39	640	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	1169	614	489	489	489	489	37
Volume Left	0	0	0	0	0	0	0
Volume Right	0	30	0	0	0	0	37
cSH	1700	1700	1700	1700	1700	1700	640
Volume to Capacity	0.69	0.36	0.29	0.29	0.29	0.29	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.0
Lane LOS							B
Approach Delay (s)	0.0		0.0				11.0
Approach LOS							B

Intersection Summary			
Average Delay			0.1
Intersection Capacity Utilization	54.5%		ICU Level of Service A
Analysis Period (min)	15		

10: US 17 Bus. (Market St.) & Mercer Ave.  
 Build Alt. 7 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑		↗
Volume (vph)	1909	33	0	1437	0	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		0	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	3529	0	0	6408	0	1611
Flt Permitted						
Satd. Flow (perm)	3529	0	0	6408	0	1611
Link Speed (mph)	40			40	25	
Link Distance (ft)	181			324	909	
Travel Time (s)	3.1			5.5	24.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2158	0	0	1597	0	30
Enter Blocked Intersection	Yes	Yes	No	Yes	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	6			6	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	63.8%
ICU Level of Service	B
Analysis Period (min)	15

10: US 17 Bus. (Market St.) & Mercer Ave.  
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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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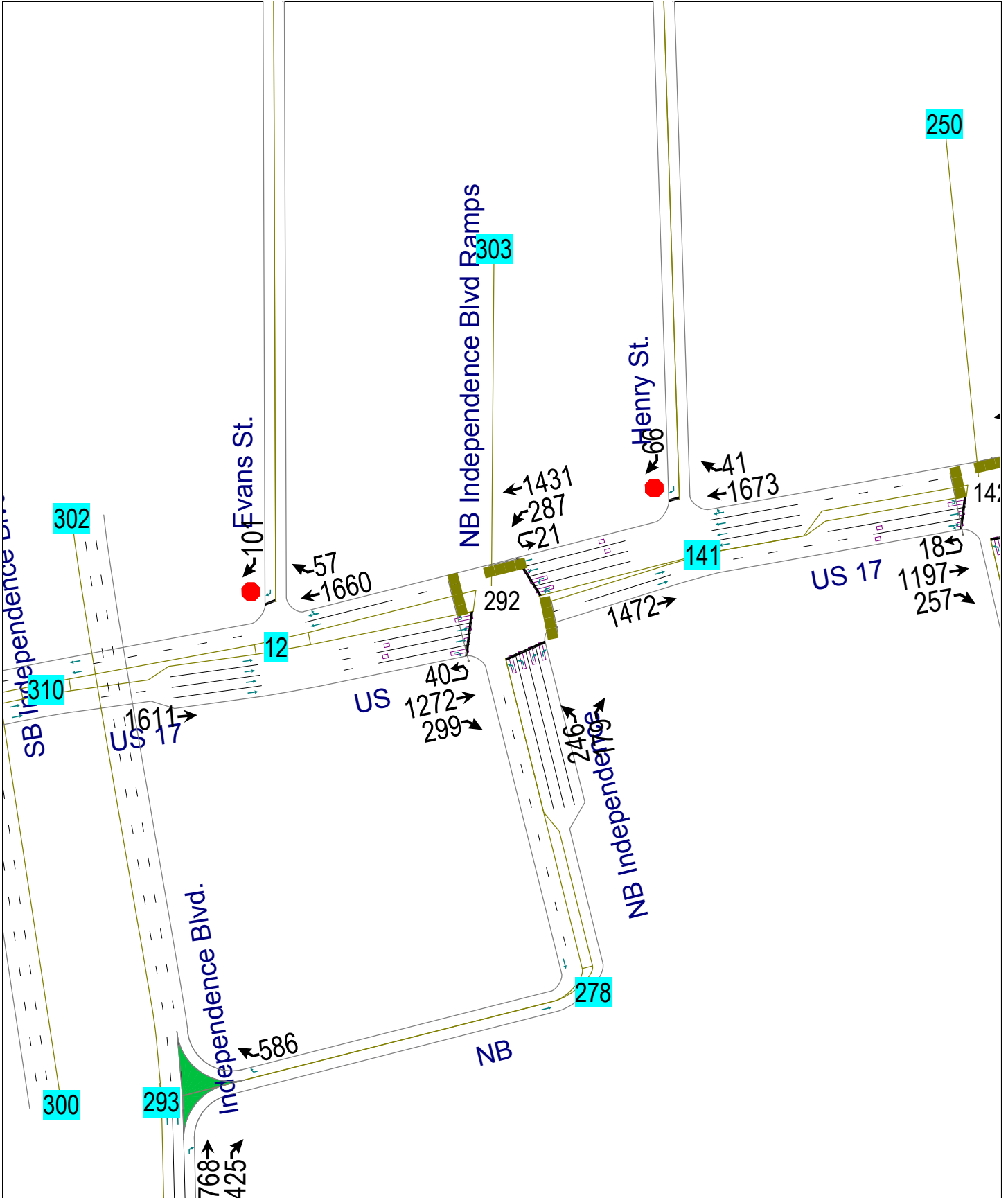


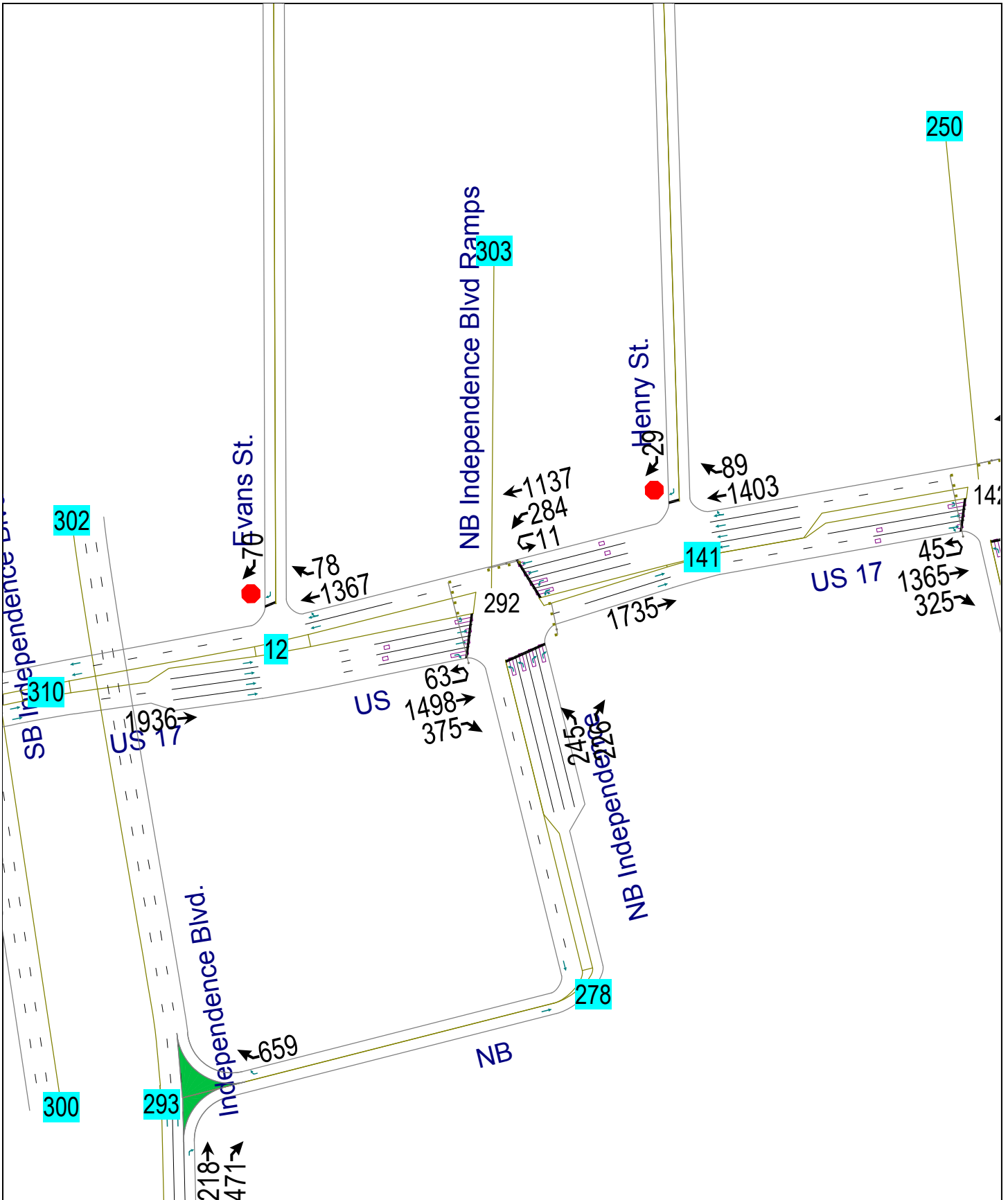
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑↑↑		↗
Volume (veh/h)	1909	33	0	1437	0	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2121	37	0	1597	0	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	181			847		
pX, platoon unblocked				0.62	0.62	0.62
vC, conflicting volume				2158	2539	1079
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1638	2254	0
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	96
cM capacity (veh/h)				242	22	671

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	1414	744	399	399	399	399	30
Volume Left	0	0	0	0	0	0	0
Volume Right	0	37	0	0	0	0	30
cSH	1700	1700	1700	1700	1700	1700	671
Volume to Capacity	0.83	0.44	0.23	0.23	0.23	0.23	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.6
Lane LOS							B
Approach Delay (s)	0.0		0.0				10.6
Approach LOS							B

Intersection Summary			
Average Delay			0.1
Intersection Capacity Utilization	63.8%		ICU Level of Service B
Analysis Period (min)	15		

10: US 17 Bus. (Market St.) & Mercer Ave.  
 Build Alt. 7 Quad AC PM Peak





U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↑
Volume (vph)	0	1611	1660	57	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	6346	3487	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	6346	3487	0	0	1580
Link Speed (mph)		40	40		25	
Link Distance (ft)		263	260		894	
Travel Time (s)		4.5	4.4		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1790	1907	0	0	112
Enter Blocked Intersection	No	Yes	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.6%
ICU Level of Service	B
Analysis Period (min)	15

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 7 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (veh/h)	0	1611	1660	57	0	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1790	1844	63	0	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		768	260			
pX, platoon unblocked	0.72				0.72	0.72
vC, conflicting volume	1908				2324	954
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1490				2065	171
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	81
cM capacity (veh/h)	320				33	605

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1
Volume Total	448	448	448	448	1230	678	112
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	63	112
cSH	1700	1700	1700	1700	1700	1700	605
Volume to Capacity	0.26	0.26	0.26	0.26	0.72	0.40	0.19
Queue Length 95th (ft)	0	0	0	0	0	0	17
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.3
Lane LOS							B
Approach Delay (s)	0.0				0.0		12.3
Approach LOS							B

Intersection Summary							
Average Delay			0.4				
Intersection Capacity Utilization			60.6%		ICU Level of Service		B
Analysis Period (min)			15				

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 7 Quad AC AM Peak



U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (vph)	0	1936	1367	78	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	6346	3477	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	6346	3477	0	0	1580
Link Speed (mph)		40	40		25	
Link Distance (ft)		263	260		894	
Travel Time (s)		4.5	4.4		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	4%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2151	1606	0	0	78
Enter Blocked Intersection	No	Yes	Yes	Yes	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
ICU Level of Service	A
Analysis Period (min)	15

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 7 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (veh/h)	0	1936	1367	78	0	70
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2151	1519	87	0	78
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		768	260			
pX, platoon unblocked	0.81				0.81	0.81
vC, conflicting volume	1606				2100	803
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1277				1888	285
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	86
cM capacity (veh/h)	432				49	571

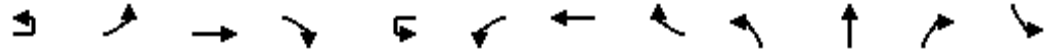
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1
Volume Total	538	538	538	538	1013	593	78
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	87	78
cSH	1700	1700	1700	1700	1700	1700	571
Volume to Capacity	0.32	0.32	0.32	0.32	0.60	0.35	0.14
Queue Length 95th (ft)	0	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.3
Lane LOS							B
Approach Delay (s)	0.0				0.0		12.3
Approach LOS							B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		51.3%	ICU Level of Service A
Analysis Period (min)		15	

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 7 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	40	0	1272	299	21	287	1431	0	246	0	179	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	175		175	0
Storage Lanes		0		0		0		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			260				232			453		
Travel Time (s)			4.4				4.0			12.4		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	0	1413	332	0	342	1590	0	273	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				36			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	14.0	0.0	74.0	22.0	24.0	24.0	84.0	0.0	22.0	0.0	22.0	0.0
Total Split (%)	11.7%	0.0%	61.7%	18.3%	20.0%	20.0%	70.0%	0.0%	18.3%	0.0%	18.3%	0.0%
Maximum Green (s)	7.0		67.0	15.0	17.0	17.0	77.0		15.0		15.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lag		Lead	Lead	Lead					
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	9.0		71.3	92.2			17.8		83.0		15.8	
Actuated g/C Ratio	0.08		0.59	0.77			0.15		0.69		0.13	
v/c Ratio	0.34		0.68	0.28			0.68		0.66		0.61	
Control Delay	50.8		13.3	3.5			59.7		9.3		55.2	
Queue Delay	0.0		0.1	0.0			0.0		0.2		0.0	

292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
 Build Alt. 7 Quad AC AM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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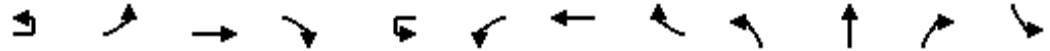


Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	397	
Travel Time (s)	10.8	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
 Build Alt. 7 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	50.8		13.4	3.5		59.7	9.5		55.2		54.5	
LOS	D		B	A		E	A		E		D	
Approach Delay			12.4				18.4					
Approach LOS			B				B					
Queue Length 50th (ft)	31		178	33		127	453		103		82	
Queue Length 95th (ft)	m56		300	52		175	213		148		125	
Internal Link Dist (ft)			180				152			373		
Turn Bay Length (ft)									175		175	
Base Capacity (vph)	131		2084	1220		538	2423		482		391	
Starvation Cap Reductn	0		0	0		0	209		0		0	
Spillback Cap Reductn	0		47	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.34		0.69	0.27		0.64	0.72		0.57		0.51	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 20.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 64.1%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps



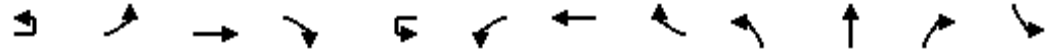
292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
 Build Alt. 7 Quad AC AM Peak



Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	317	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	63	0	1498	375	11	284	1137	0	245	0	226	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	175		175	0
Storage Lanes		0		0		0		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			260				232			453		
Travel Time (s)			4.4				4.0			12.4		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	0	1664	417	0	328	1263	0	272	0	251	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				36			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	15.0	0.0	76.0	22.0	22.0	22.0	83.0	0.0	22.0	0.0	22.0	0.0
Total Split (%)	12.5%	0.0%	63.3%	18.3%	18.3%	18.3%	69.2%	0.0%	18.3%	0.0%	18.3%	0.0%
Maximum Green (s)	8.0		69.0	15.0	15.0	15.0	76.0		15.0		15.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lead		Lag	Lag	Lead					
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	9.8		72.2	93.5		16.5	81.7		16.3		16.3	
Actuated g/C Ratio	0.08		0.60	0.78		0.14	0.68		0.14		0.14	
v/c Ratio	0.49		0.79	0.34		0.70	0.53		0.59		0.67	
Control Delay	52.5		18.4	5.6		56.9	7.1		54.2		58.7	
Queue Delay	0.0		0.4	0.0		0.0	0.1		0.0		0.0	

292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
Build Alt. 7 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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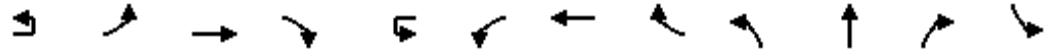
Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	397	
Travel Time (s)	10.8	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	52.5		18.8	5.6		56.9	7.2		54.2		58.7	
LOS	D		B	A		E	A		D		E	
Approach Delay			17.3				17.5					
Approach LOS			B				B					
Queue Length 50th (ft)	51		339	99		129	178		102		105	
Queue Length 95th (ft)	m73		385	m135		m178	202		148		156	
Internal Link Dist (ft)			180				152			373		
Turn Bay Length (ft)									175		175	
Base Capacity (vph)	146		2110	1218		482	2387		482		391	
Starvation Cap Reductn	0		0	0		0	279		0		0	
Spillback Cap Reductn	0		116	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.48		0.83	0.34		0.68	0.60		0.56		0.64	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 4 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 22.2 Intersection LOS: C  
 Intersection Capacity Utilization 70.2% ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps



292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps  
 Build Alt. 7 Quad AC PM Peak



Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	317	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (vph)	0	1472	1673	41	0	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	6320	0	0	1596
Flt Permitted						
Satd. Flow (perm)	0	3505	6320	0	0	1596
Link Speed (mph)		40	40		25	
Link Distance (ft)		232	332		767	
Travel Time (s)		4.0	5.7		20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1636	1905	0	0	73
Enter Blocked Intersection	No	Yes	Yes	Yes	No	No
Lane Alignment	Left	Left	Right	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		24	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.0%
Analysis Period (min)	15
	ICU Level of Service A

141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 7 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (veh/h)	0	1472	1673	41	0	66
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1636	1859	46	0	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		232	332			
pX, platoon unblocked					0.72	
vC, conflicting volume	1904				2699	488
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1904				2583	488
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	86
cM capacity (veh/h)	304				15	523

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	818	818	531	531	531	311	73
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	46	73
cSH	1700	1700	1700	1700	1700	1700	523
Volume to Capacity	0.48	0.48	0.31	0.31	0.31	0.18	0.14
Queue Length 95th (ft)	0	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	13.0
Lane LOS							B
Approach Delay (s)	0.0		0.0				13.0
Approach LOS							B

Intersection Summary							
Average Delay			0.3				
Intersection Capacity Utilization			44.0%		ICU Level of Service		A
Analysis Period (min)			15				

141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 7 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (vph)	0	1735	1403	89	0	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	0
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	6289	0	0	1596
Flt Permitted						
Satd. Flow (perm)	0	3505	6289	0	0	1596
Link Speed (mph)		40	40		25	
Link Distance (ft)		232	332		767	
Travel Time (s)		4.0	5.7		20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1928	1658	0	0	32
Enter Blocked Intersection	No	Yes	Yes	Yes	No	No
Lane Alignment	Left	Left	Right	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		0	0		24	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
Analysis Period (min)	15
	ICU Level of Service A

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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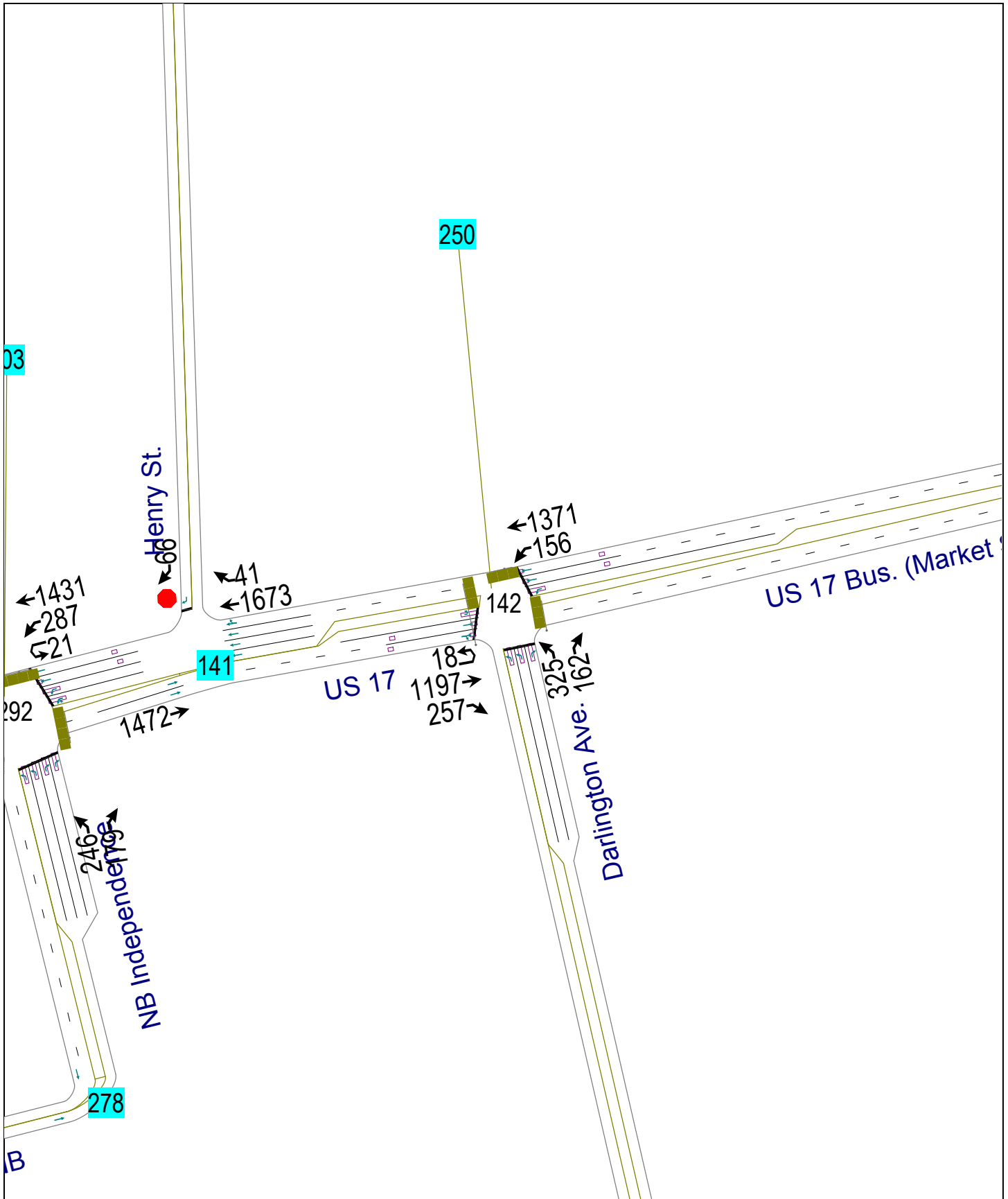


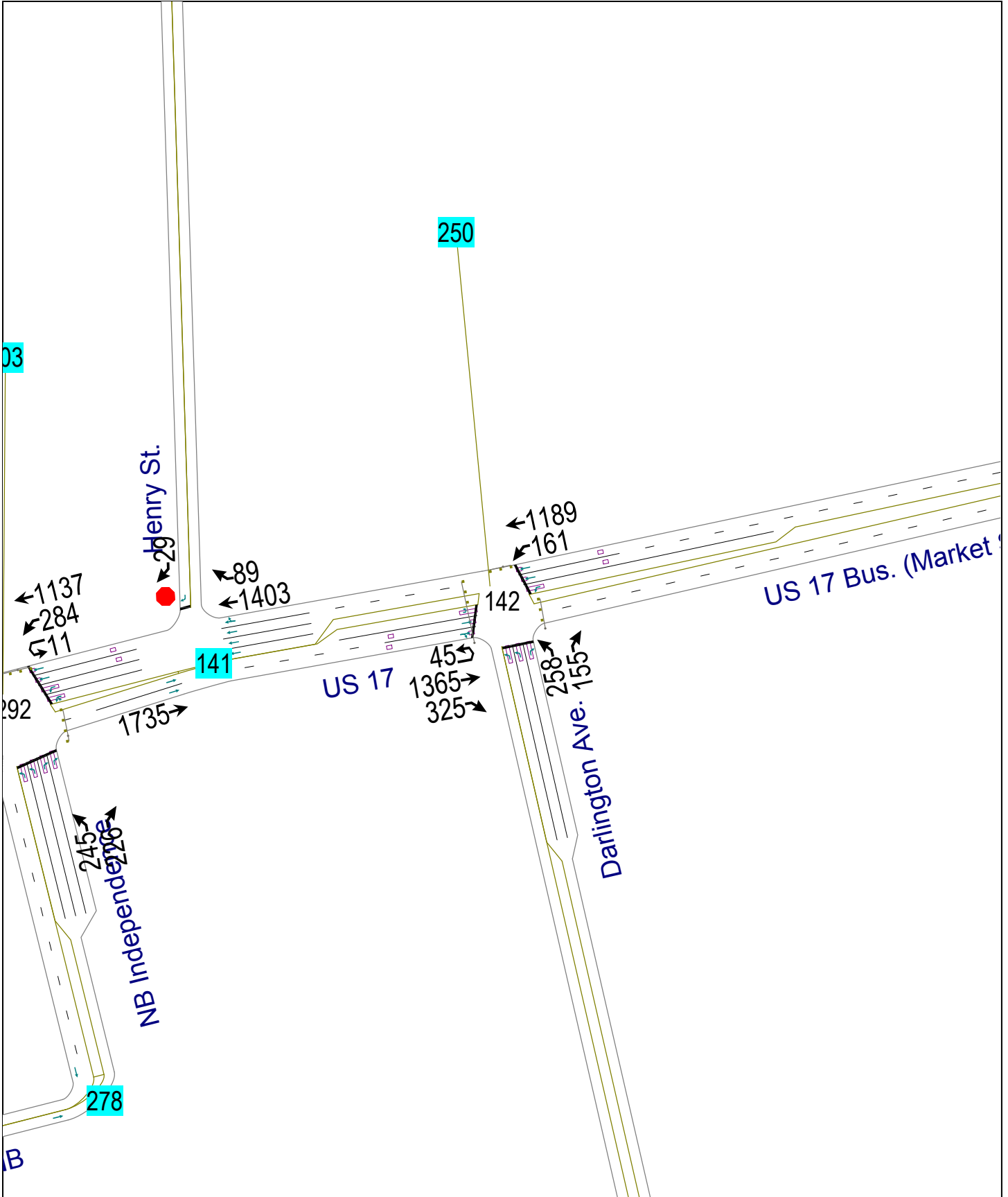
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (veh/h)	0	1735	1403	89	0	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1928	1559	99	0	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		232	332			
pX, platoon unblocked					0.62	
vC, conflicting volume	1658				2572	439
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1658				2306	439
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	380				20	563

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	964	964	445	445	445	322	32
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	99	32
cSH	1700	1700	1700	1700	1700	1700	563
Volume to Capacity	0.57	0.57	0.26	0.26	0.26	0.19	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.8
Lane LOS							B
Approach Delay (s)	0.0		0.0				11.8
Approach LOS							B

Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			51.3%		ICU Level of Service		A
Analysis Period (min)			15				

141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 7 Quad AC PM Peak

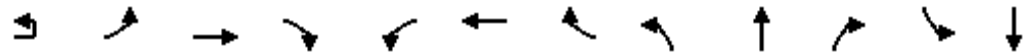






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Synchro 7 - Report Lanes, Volumes, Timings

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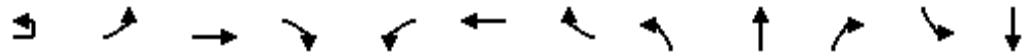


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	18	0	1197	257	156	1371	0	325	0	162	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		150		0	275		0	225		225	0	
Storage Lanes		1		0	1		0	1		1	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	1752	0	3410	0	1752	3505	0	3433	0	1583	0	0
Flt Permitted	0.950				0.950			0.950				
Satd. Flow (perm)	1752	0	3410	0	1752	3505	0	3433	0	1583	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			30
Link Distance (ft)			332			692			740			419
Travel Time (s)			5.7			11.8			20.2			9.5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	0%	2%	0%	2%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	0	1616	0	173	1523	0	361	0	180	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	R NA	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot				Prot			Prot		custom		
Protected Phases	5		2		1	6		8		1		
Permitted Phases										8		
Detector Phase	5		2		1	6		8		1		
Switch Phase												
Minimum Initial (s)	7.0		12.0		7.0	12.0		7.0		7.0		
Minimum Split (s)	14.0		19.0		14.0	19.0		14.0		14.0		
Total Split (s)	14.0	0.0	75.0	0.0	23.0	84.0	0.0	22.0	0.0	23.0	0.0	0.0
Total Split (%)	11.7%	0.0%	62.5%	0.0%	19.2%	70.0%	0.0%	18.3%	0.0%	19.2%	0.0%	0.0%
Maximum Green (s)	7.0		68.0		16.0	77.0		15.0		16.0		
Yellow Time (s)	5.0		5.0		5.0	5.0		5.0		5.0		
All-Red Time (s)	2.0		2.0		2.0	2.0		2.0		2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	2.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0	2.0
Lead/Lag	Lag		Lag		Lead	Lead				Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes				Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0		3.0		
Recall Mode	None		C-Max		None	C-Max		None		None		
Act Effct Green (s)	9.0		71.7		16.7	87.7		16.7		38.3		
Actuated g/C Ratio	0.08		0.60		0.14	0.73		0.14		0.32		
v/c Ratio	0.15		0.79		0.71	0.59		0.76		0.36		
Control Delay	43.8		12.7		65.6	9.9		60.7		33.2		
Queue Delay	0.0		0.0		0.0	0.0		0.0		0.0		

142: US 17 Bus. (Market St.) &  
Build Alt. 7 Quad AC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

142: US 17 Bus. (Market St.) &  
 Build Alt. 7 Quad AC AM Peak



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	43.8		12.7		65.6	9.9		60.7		33.2		
LOS	D		B		E	A		E		C		
Approach Delay			13.0			15.6						
Approach LOS			B			B						
Queue Length 50th (ft)	14		160		128	206		140		104		
Queue Length 95th (ft)	m22		168		#207	416		193		168		
Internal Link Dist (ft)			252			612			660			339
Turn Bay Length (ft)	150				275			225		225		
Base Capacity (vph)	131		2036		263	2562		486		523		
Starvation Cap Reductn	0		0		0	0		0		0		
Spillback Cap Reductn	0		0		0	31		0		0		
Storage Cap Reductn	0		0		0	0		0		0		
Reduced v/c Ratio	0.15		0.79		0.66	0.60		0.74		0.34		

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 19.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 70.9%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 142: US 17 Bus. (Market St.) &

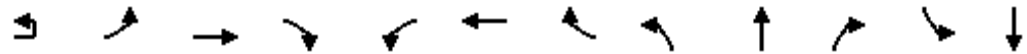




Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Synchro 7 - Report Lanes, Volumes, Timings

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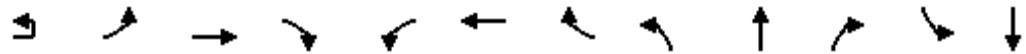


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕↔		↕	↕↕		↕↕		↕		
Volume (vph)	45	0	1365	325	161	1189	0	258	0	155	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		150		0	275		0	225		225	0	
Storage Lanes		1		0	1		0	1		1	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	1752	0	3403	0	1752	3505	0	3433	0	1583	0	0
Flt Permitted	0.950				0.950			0.950				
Satd. Flow (perm)	1752	0	3403	0	1752	3505	0	3433	0	1583	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			30
Link Distance (ft)			332			692			740			419
Travel Time (s)			5.7			11.8			20.2			9.5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	0%	2%	0%	2%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	0	1878	0	179	1321	0	287	0	172	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	R NA	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot				Prot			Prot		custom		
Protected Phases	5		2		1	6		8		1		
Permitted Phases										8		
Detector Phase	5		2		1	6		8		1		
Switch Phase												
Minimum Initial (s)	7.0		12.0		7.0	12.0		7.0		7.0		
Minimum Split (s)	14.0		19.0		14.0	19.0		14.0		14.0		
Total Split (s)	14.0	0.0	80.0	0.0	22.0	88.0	0.0	18.0	0.0	22.0	0.0	0.0
Total Split (%)	11.7%	0.0%	66.7%	0.0%	18.3%	73.3%	0.0%	15.0%	0.0%	18.3%	0.0%	0.0%
Maximum Green (s)	7.0		73.0		15.0	81.0		11.0		15.0		
Yellow Time (s)	5.0		5.0		5.0	5.0		5.0		5.0		
All-Red Time (s)	2.0		2.0		2.0	2.0		2.0		2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	2.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0	2.0
Lead/Lag	Lag		Lead		Lag	Lead				Lag		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes				Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0		3.0		
Recall Mode	None		C-Max		None	C-Max		None		None		
Act Effct Green (s)	9.0		75.6		16.3	85.7		13.1		34.4		
Actuated g/C Ratio	0.08		0.63		0.14	0.71		0.11		0.29		
v/c Ratio	0.38		0.88		0.75	0.53		0.77		0.38		
Control Delay	62.5		9.5		69.7	9.3		66.3		37.0		
Queue Delay	0.0		0.0		0.0	0.0		0.0		0.0		

142: US 17 Bus. (Market St.) &  
Build Alt. 7 Quad AC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

142: US 17 Bus. (Market St.) &  
 Build Alt. 7 Quad AC PM Peak

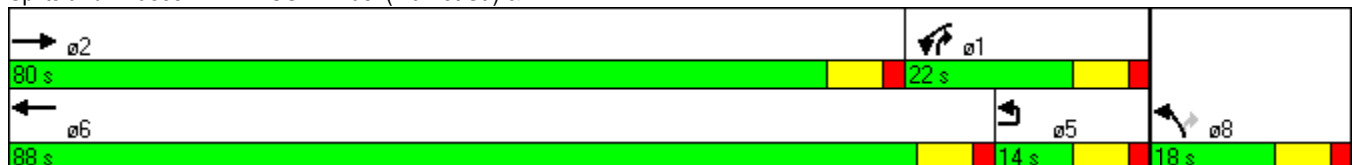


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	62.5		9.5		69.7	9.3		66.3		37.0		
LOS	E		A		E	A		E		D		
Approach Delay			10.8			16.5						
Approach LOS			B			B						
Queue Length 50th (ft)	41		130		134	240		113		106		
Queue Length 95th (ft)	m55		143		#235	292		#174		171		
Internal Link Dist (ft)			252			612			660			339
Turn Bay Length (ft)	150				275			225		225		
Base Capacity (vph)	131		2143		248	2503		375		450		
Starvation Cap Reductn	0		0		0	0		0		0		
Spillback Cap Reductn	0		0		0	0		0		0		
Storage Cap Reductn	0		0		0	0		0		0		
Reduced v/c Ratio	0.38		0.88		0.72	0.53		0.77		0.38		

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 7 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 18.3 Intersection LOS: B  
 Intersection Capacity Utilization 76.1% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 142: US 17 Bus. (Market St.) &





Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	



Intersection: 4: Darlington Ave. & Independence Blvd.

Movement	WB
Directions Served	R
Maximum Queue (ft)	480
Average Queue (ft)	267
95th Queue (ft)	466
Link Distance (ft)	967
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: US 17 Bus. (Market St.) & Forest Hills Dr.

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	357	348	51	248	162	184	110	236
Average Queue (ft)	178	195	8	90	77	90	47	88
95th Queue (ft)	333	347	33	176	162	187	90	177
Link Distance (ft)	987	987			520	520		890
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			300	350			350	
Storage Blk Time (%)		1						
Queuing Penalty (veh)		0						

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	22	29	175	556	264
Average Queue (ft)	4	2	50	260	163
95th Queue (ft)	18	12	94	491	291
Link Distance (ft)		330		917	811
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300		300		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	20	346	353	151	159	308	66	112
Average Queue (ft)	1	187	199	53	60	85	26	40
95th Queue (ft)	7	290	309	116	136	191	57	85
Link Distance (ft)		719	719		514	514	900	747
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			225				
Storage Blk Time (%)		18						
Queuing Penalty (veh)		1						

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	EB	EB	WB	NB	SB
Directions Served	T	T	TR	TR	R	R
Maximum Queue (ft)	119	72	48	18	324	174
Average Queue (ft)	15	8	2	1	97	68
95th Queue (ft)	64	40	16	6	231	122
Link Distance (ft)			514	145	802	687
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	250	250				
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 10: US 17 Bus. (Market St.) & Mercer Ave.

Movement	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	123	258	292	125	48
Average Queue (ft)	4	99	137	33	18
95th Queue (ft)	41	220	266	123	44
Link Distance (ft)		272	272		859
Upstream Blk Time (%)		0	0		
Queuing Penalty (veh)		1	3		
Storage Bay Dist (ft)	100			100	
Storage Blk Time (%)		5	8	0	
Queuing Penalty (veh)		20	33	0	

Intersection: 12: US 17 Bus. (Market St.) & Evans St.

Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	52	124
Average Queue (ft)	3	56
95th Queue (ft)	20	104
Link Distance (ft)	212	839
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: US 17 Bus. (Market St.) & Barclay Hills Dr.

Movement	SB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	11
95th Queue (ft)	33
Link Distance (ft)	554
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 141: US 17 Bus. (Market St.) & Henry St.

Movement	WB	SB
Directions Served	TR	R
Maximum Queue (ft)	222	158
Average Queue (ft)	12	62
95th Queue (ft)	85	120
Link Distance (ft)	277	701
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

**Intersection: 142: US 17 Bus. (Market St.) &**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	U	T	TR	L	T	T	L	L	R
Maximum Queue (ft)	43	251	264	299	360	355	249	224	244
Average Queue (ft)	14	156	171	116	167	200	120	122	91
95th Queue (ft)	37	220	233	229	303	336	187	184	167
Link Distance (ft)		277	277		623	623		688	
Upstream Blk Time (%)			0						
Queuing Penalty (veh)			0						
Storage Bay Dist (ft)	150			275			225		225
Storage Blk Time (%)		8		0	1		0	1	0
Queuing Penalty (veh)		1		0	1		0	3	0

**Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB	SB
Directions Served	UL	L	T	T	U	T	T	R	L	L	R	R
Maximum Queue (ft)	253	238	158	211	109	157	176	137	108	132	149	146
Average Queue (ft)	172	167	93	129	43	147	156	60	61	74	94	91
95th Queue (ft)	263	258	153	213	87	172	168	114	109	122	138	144
Link Distance (ft)	145	145	145	145	82	82	82	82		319		
Upstream Blk Time (%)	30	27	1	4	4	31	34	3				
Queuing Penalty (veh)	123	110	2	16	17	137	148	15				
Storage Bay Dist (ft)									275		275	275
Storage Blk Time (%)												
Queuing Penalty (veh)												

**Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	100	194	250	110	195	221	180	216	151	133	129	169
Average Queue (ft)	34	139	165	40	110	130	89	130	68	81	59	62
95th Queue (ft)	76	190	235	78	188	229	169	233	121	129	106	116
Link Distance (ft)	170	170	170	170	138	138	138	138		356		
Upstream Blk Time (%)		2	6		5	15	1	4				
Queuing Penalty (veh)		7	24		21	67	6	16				
Storage Bay Dist (ft)									175		175	175
Storage Blk Time (%)												1
Queuing Penalty (veh)												1

Intersection: 4: Darlington Ave. & Independence Blvd.

Movement	WB
Directions Served	R
Maximum Queue (ft)	982
Average Queue (ft)	599
95th Queue (ft)	1105
Link Distance (ft)	967
Upstream Blk Time (%)	17
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: US 17 Bus. (Market St.) & Forest Hills Dr.

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	333	320	51	182	189	232	109	218
Average Queue (ft)	211	215	14	101	62	95	35	87
95th Queue (ft)	341	320	42	159	148	201	79	171
Link Distance (ft)	987	987			520	520		890
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			300	350			350	
Storage Blk Time (%)		1						
Queuing Penalty (veh)		1						

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	44	48	45	304	68
Average Queue (ft)	19	2	13	130	17
95th Queue (ft)	38	16	40	240	44
Link Distance (ft)		330		917	811
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300		300		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	26	527	608	194	161	215	91	67
Average Queue (ft)	2	308	315	82	34	43	41	19
95th Queue (ft)	11	480	476	165	105	127	83	53
Link Distance (ft)		719	719		514	514	900	747
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			225				
Storage Blk Time (%)		27						
Queuing Penalty (veh)		4						

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	EB	NB	SB
Directions Served	T	TR	R	R
Maximum Queue (ft)	94	133	132	194
Average Queue (ft)	5	10	36	53
95th Queue (ft)	34	60	87	114
Link Distance (ft)	514	514	802	687
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10: US 17 Bus. (Market St.) & Mercer Ave.

Movement	WB	WB	WB	NB
Directions Served	T	T	T	R
Maximum Queue (ft)	160	208	120	47
Average Queue (ft)	64	79	8	18
95th Queue (ft)	141	158	57	42
Link Distance (ft)	272	272		859
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			100	
Storage Blk Time (%)	3	5	0	
Queuing Penalty (veh)	10	17	0	

Intersection: 12: US 17 Bus. (Market St.) & Evans St.

Movement	EB	EB	EB	EB	SB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	124	167	202	125	91
Average Queue (ft)	4	45	63	24	36
95th Queue (ft)	41	130	156	103	68
Link Distance (ft)		212	212		839
Upstream Blk Time (%)			0		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)	100			100	
Storage Blk Time (%)		2	3	0	
Queuing Penalty (veh)		10	15	0	

Intersection: 15: US 17 Bus. (Market St.) & Barclay Hills Dr.

Movement	SB
Directions Served	R
Maximum Queue (ft)	29
Average Queue (ft)	8
95th Queue (ft)	29
Link Distance (ft)	554
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 141: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	WB	WB	SB
Directions Served	T	T	T	TR	R
Maximum Queue (ft)	25	32	39	69	74
Average Queue (ft)	1	2	3	4	20
95th Queue (ft)	8	13	19	27	50
Link Distance (ft)	138	138		277	701
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			100		
Storage Blk Time (%)					
Queuing Penalty (veh)					

**Intersection: 142: US 17 Bus. (Market St.) &**

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	U	T	TR	L	T	T	L	L	R
Maximum Queue (ft)	107	231	328	232	289	295	246	225	161
Average Queue (ft)	36	132	167	131	140	140	103	115	88
95th Queue (ft)	81	209	250	227	247	242	188	175	154
Link Distance (ft)		277	277		623	623		688	
Upstream Blk Time (%)			0						
Queuing Penalty (veh)			3						
Storage Bay Dist (ft)	150			275			225		225
Storage Blk Time (%)		3			0		0	0	
Queuing Penalty (veh)		1			0		1	1	

**Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB	SB
Directions Served	UL	L	T	T	U	T	T	R	L	L	R	R
Maximum Queue (ft)	211	190	239	245	88	188	180	118	117	152	161	191
Average Queue (ft)	112	108	126	159	48	153	155	47	73	94	84	84
95th Queue (ft)	181	179	203	245	84	174	167	101	122	145	135	136
Link Distance (ft)	145	145	145	145	82	82	82	82		319		
Upstream Blk Time (%)	4	3	3	10	3	30	35	2				
Queuing Penalty (veh)	19	16	16	48	10	108	127	6				
Storage Bay Dist (ft)									275		275	275
Storage Blk Time (%)												
Queuing Penalty (veh)												

**Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd Ramps**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	168	257	262	203	209	230	184	215	134	260	167	168
Average Queue (ft)	63	233	240	115	117	147	76	90	71	91	73	72
95th Queue (ft)	136	280	268	188	177	234	142	170	117	163	126	129
Link Distance (ft)	170	170	170	170	138	138	138	138		356		
Upstream Blk Time (%)	0	17	23	1	5	20	1	2				
Queuing Penalty (veh)	0	84	109	5	20	71	2	9				
Storage Bay Dist (ft)									175		175	175
Storage Blk Time (%)										1	0	0
Queuing Penalty (veh)										2	0	0



# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 7 AC Quadrant
Project Description	U-4434 Independence Boulevard Extension		
<b>45</b>		<b>46</b>	
Independence Blvd. SB - to US 17 Bus.		Independence Blvd. NB - from US 17 Bus.	
Merge/Diverge	Diverge	Merge/Diverge	Merge
No. of lanes on Freeway	2	No. of lanes on Freeway	2
Freeway FFS	60 mph	Freeway FFS	60 mph
Freeway Volume (AM/PM)	2877 2354	Freeway Volume (AM/PM)	1768 2218
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	15 mph
Ramp Volume (AM/PM)	659 586	Ramp Volume (AM/PM)	586 659
No. Lanes on Ramp	1	No. Lanes on Ramp	1
Accel/Decel Distance 1	800 ft	Accel/Decel Distance 1	1440 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	N/A ft
Adjacent Upstream	Yes	Adjacent Upstream	Yes
Off/On	On	Off/On	Off
Distance	3590 ft	Distance	90 ft
Truck %	4%	Truck %	3%
Ramp Volume (AM/PM)	1628 1103	Ramp Volume (AM/PM)	425 471
Adjacent Downstream	Yes	Adjacent Downstream	Yes
Off/On	On - N/A	Off/On	Off
Distance	N/A ft	Distance	4930 ft
Truck %	N/A	Truck %	4%
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	1103 1628
Peak Hour Factor	0.90	Peak Hour Factor	0.90
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	1.00
Freeway Truck %	4%	Freeway Truck %	4%
Ramp Truck %	3%	Ramp Truck %	3%
<b>47</b>		<b>48</b>	
Independence Blvd. SB - from US 17 Bus.		Independence Blvd. NB - to Darlington	
Merge/Diverge	Merge	Merge/Diverge	Diverge
No. of lanes on Freeway	2	No. of lanes on Freeway	0
Freeway FFS	60 mph	Freeway FFS	0 mph
Freeway Volume (AM/PM)	2213 1771	Freeway Volume (AM/PM)	0 0
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	0 mph
Ramp Volume (AM/PM)	471 425	Ramp Volume (AM/PM)	0 0
No. Lanes on Ramp	1	No. Lanes on Ramp	0
Accel/Decel Distance 1	1440 ft	Accel/Decel Distance 1	0 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	0 ft
Adjacent Upstream	Yes	Adjacent Upstream	Yes
Off/On	Off	Off/On	On
Distance	90 ft	Distance	0 ft
Truck %	3%	Truck %	0
Ramp Volume (AM/PM)	659 586	Ramp Volume (AM/PM)	0 0
Adjacent Downstream	No	Adjacent Downstream	Yes
Off/On	N/A	Off/On	On
Distance	N/A ft	Distance	0 ft
Truck %	N/A	Truck %	0
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	0 0
Peak Hour Factor	0.90	Peak Hour Factor	0.00
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	0.00
Freeway Truck %	4%	Freeway Truck %	0%
Ramp Truck %	3%	Ramp Truck %	0%
<b>48</b>			
Independence Blvd. NB - to Darlington			
Merge/Diverge	Diverge	Merge/Diverge	Diverge
No. of lanes on Freeway	2	No. of lanes on Freeway	0
Freeway FFS	60 mph	Freeway FFS	0 mph
Freeway Volume (AM/PM)	2205 2695	Freeway Volume (AM/PM)	0 0
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	0 mph
Ramp Volume (AM/PM)	99 133	Ramp Volume (AM/PM)	0 0
No. Lanes on Ramp	1	No. Lanes on Ramp	0
Accel/Decel Distance 1	800 ft	Accel/Decel Distance 1	0 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	0 ft
Adjacent Upstream	No	Adjacent Upstream	Yes
Off/On	N/A	Off/On	On
Distance	N/A ft	Distance	0 ft
Truck %	N/A	Truck %	0
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	0 0
Adjacent Downstream	Yes	Adjacent Downstream	Yes
Off/On	On - N/A	Off/On	On
Distance	N/A ft	Distance	0 ft
Truck %	N/A	Truck %	0
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	0 0
Peak Hour Factor	0.90	Peak Hour Factor	0.00
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	0.00
Freeway Truck %	4%	Freeway Truck %	0%
Ramp Truck %	2%	Ramp Truck %	0%

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 7 AC Quadrant
Project Description	U-4434 Independence Boulevard Extension		

<div style="border: 1px solid black; width: 50px; height: 20px; margin: 0 auto; margin-bottom: 5px;">49</div> <p>Independence Blvd. NB - Darlington to Market</p> <p>Sides (One or Two)                    One</p> <p>No. of Lanes                                3</p> <p>Weaving Length, L<sub>s</sub>                    1720    ft</p> <p>Multi-Lane FFS                            60        mph</p> <p>Min. Speed (Def. = 15)                15        mph</p> <p>Segment Type                              Multi-Lane</p> <p>Terrain                                        Level</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">AM Peak</td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">→</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: center;">1684</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: center;">87</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">↙</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: center;">403</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">→</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: center;">22</td> <td style="text-align: center;">4 %</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">PM Peak</td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">→</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: center;">2134</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: center;">79</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">↙</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: center;">451</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">→</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: center;">20</td> <td style="text-align: center;">4 %</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>Peak Hour Factor</td> <td style="text-align: center;">0.90</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Driver Pop. 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# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

### General Information

### Site Information

Analyst URS

Date Performed 2012

Agency or Company

Analysis Year 2040 Build - Alt 7 AC Quadrant

Project Description

U-4434 Independence Boulevard Extension

<div style="text-align: right; margin-bottom: 10px;"><b>49</b></div> <p>Independence Blvd. NB - Darlington to Market  <u>Interchange</u>                      <u>No.</u>                      Darlington Ave.                      1                      Market St.                              1</p> <p style="font-size: small;">Note: multi-lane only 0.67 mile long                      Interchange Density                      3.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Note: freeway only 3.5 miles long                      Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>
<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - ANALYSIS NOTES

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 7 AC Quadrant
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV %	Freeway Truck%			
	FR = DS ramp HV %	Off Ramp Truck %			
	RF = US ramp HV %	On Ramp Truck %			
	RR = DS ramp HV %	Off Ramp Truck %			

Level of Service Standards - Freeways	Level of Service Standards - Signalized Intersections
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004	LOS D or better for overall intersection required
	LOS D or better for individual movements recommended
	If not LOS D for individual movement - v/c ratio must be less than 0.85

### Assumed Improvements

TIP No.	Description
U-3338	SR 1175 (Kerr Avenue) - widening, including new interchange at US 74

### General Analysis Notes

- ▶ Interchange/Ramp Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

### Design Specific Analysis Notes

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

### Locations where LOS D or better not achieved

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 7 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Acceleration Lane Length, $L_A$	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Deceleration Lane Length $L_D$	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 3590 ft	Freeway Volume, $V_F$	$L_{down} =$ ft
$V_u =$ 1628 veh/h	Ramp Volume, $V_R$	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	
	Ramp Free-Flow Speed, $S_{FR}$	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2877	0.90	Level	4	0	0.980	1.00	3261
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	1628	0.90	Level	4	0	0.980	1.00	1845
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
(Equation 13-6 or 13-7)

$L_{EQ} =$  using Equation (Exhibit 13-6)

$P_{FM} =$  pc/h

$V_{12} =$  pc/h (Equation 13-14 or 13-17)

$V_3$  or  $V_{av34}$  pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
(Equation 13-12 or 13-13)

$L_{EQ} =$  1.000 using Equation (Exhibit 13-7)

$P_{FD} =$  3261 pc/h

$V_{12} =$  0 pc/h (Equation 13-14 or 13-17)

$V_3$  or  $V_{av34}$  0 pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
$V_F$	3261	Exhibit 13-8	4600 No
$V_{FO} = V_F - V_R$	2518	Exhibit 13-8	4600 No
$V_R$	743	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$	3261	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$  (pc/mi/ln)

LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$  25.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

### Speed Determination

$M_S =$  (Exhibit 13-11)

$S_R =$  mph (Exhibit 13-11)

$S_0 =$  mph (Exhibit 13-11)

$S =$  mph (Exhibit 13-13)

### Speed Determination

$D_s =$  0.755 (Exhibit 13-12)

$S_R =$  46.4 mph (Exhibit 13-12)

$S_0 =$  N/A mph (Exhibit 13-12)

$S =$  46.4 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 7 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 3590 ft V <sub>u</sub> = 1103 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> : 800 Freeway Volume, V <sub>F</sub> : 2354 Ramp Volume, V <sub>R</sub> : 586 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
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### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2354	0.90	Level	4	0	0.980	1.00	2668
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	1103	0.90	Level	4	0	0.980	1.00	1250
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 2668 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2668	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2007	Exhibit 13-8	4600 No
V <sub>R</sub>	661	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2668	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 20.0 (pc/mi/ln)  
 LOS = B (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>s</sub> = 0.747 (Exhibit 13-12)  
 S<sub>R</sub> = 46.5 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 46.5 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 7 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1768	$L_{down} =$ ft
$V_u =$ 425 veh/h	Ramp Volume, $V_R$	586	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1768	0.90	Level	4	0	0.980	1.00	2004
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	425	0.90	Level	3	0	0.985	1.00	479
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
(Equation 13-6 or 13-7)

$L_{EQ} =$  (Equation 13-6 or 13-7)

$P_{FM} =$  1.000 using Equation (Exhibit 13-6)

$V_{12} =$  2004 pc/h

$V_3$  or  $V_{av34} =$  0 pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
(Equation 13-12 or 13-13)

$L_{EQ} =$  (Equation 13-12 or 13-13)

$P_{FD} =$  using Equation (Exhibit 13-7)

$V_{12} =$  pc/h

$V_3$  or  $V_{av34} =$  pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2665	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2665	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$  16.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$  (pc/mi/ln)

LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$  0.334 (Exhibit 13-11)

$S_R =$  54.0 mph (Exhibit 13-11)

$S_0 =$  N/A mph (Exhibit 13-11)

$S =$  54.0 mph (Exhibit 13-13)

### Speed Determination

$D_s =$  (Exhibit 13-12)

$S_R =$  mph (Exhibit 13-12)

$S_0 =$  mph (Exhibit 13-12)

$S =$  mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 7 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2218	$L_{down} =$ ft
$V_u =$ 471 veh/h	Ramp Volume, $V_R$	659	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2218	0.90	Level	4	0	0.980	1.00	2514
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	471	0.90	Level	3	0	0.985	1.00	531
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2514 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3257	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3257	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	
$D_R =$	21.5 (pc/mi/ln)
LOS =	C (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$	(pc/mi/ln)
LOS =	(Exhibit 13-2)

### Speed Determination

$M_S =$	0.379 (Exhibit 13-11)
$S_R =$	53.2 mph (Exhibit 13-11)
$S_0 =$	N/A mph (Exhibit 13-11)
$S =$	53.2 mph (Exhibit 13-13)

### Speed Determination

$D_s =$	(Exhibit 13-12)
$S_R =$	mph (Exhibit 13-12)
$S_0 =$	mph (Exhibit 13-12)
$S =$	mph (Exhibit 13-13)





## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 7 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1771	$L_{down} =$ ft
$V_u =$ 586 veh/h	Ramp Volume, $V_R$	425	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1771	0.90	Level	4	0	0.980	1.00	2007
Ramp	425	0.90	Level	3	0	0.985	1.00	479
UpStream	586	0.90	Level	3	0	0.985	1.00	661
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$ (Equation 13-6 or 13-7)	
$P_{FM} =$ 1.000 using Equation (Exhibit 13-6)	
$V_{12} =$ 2007 pc/h	
$V_3$ or $V_{av34} =$ 0 pc/h (Equation 13-14 or 13-17)	
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$ (Equation 13-12 or 13-13)	
$P_{FD} =$ using Equation (Exhibit 13-7)	
$V_{12} =$ pc/h	
$V_3$ or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)	
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2486	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2486	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
$D_R =$ 15.6 (pc/mi/ln)
LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)
LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.325 (Exhibit 13-11)
$S_R =$ 54.2 mph (Exhibit 13-11)
$S_0 =$ N/A mph (Exhibit 13-11)
$S =$ 54.2 mph (Exhibit 13-13)

### Speed Determination

$D_s =$ (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)

<b>RAMPS AND RAMP JUNCTIONS WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst		URS			Freeway/Dir of Travel		Independence Blvd NB		
Agency or Company					Junction		to Darlington Ave		
Date Performed		2013			Jurisdiction		Segment #48		
Analysis Time Period		AM Peak			Analysis Year		2040 Build - Alt 7 AC Quadrant		
Project Description U-4434 Independence Boulevard Extension									
<b>Inputs</b>									
Upstream Adj Ramp		Number of Lanes, N					Downstream Adj Ramp		
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, $L_A$					<input type="checkbox"/> Yes <input type="checkbox"/> On		
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length $L_D$					<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
$L_{up} =$ ft		Freeway Volume, $V_F$					$L_{down} =$ ft		
$V_u =$ veh/h		Ramp Volume, $V_R$					$V_D =$ veh/h		
		Freeway Free-Flow Speed, $S_{FF}$							
		Ramp Free-Flow Speed, $S_{FR}$							
<b>Conversion to pc/h Under Base Conditions</b>									
(pc/h)	$V$ (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	2205	0.90	Level	4	0	0.980	1.00	2499	
Ramp	99	0.90	Level	2	0	0.990	1.00	111	
UpStream									
DownStream									
<b>Merge Areas</b>					<b>Diverge Areas</b>				
<b>Estimation of <math>v_{12}</math></b>					<b>Estimation of <math>v_{12}</math></b>				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
$L_{EQ} =$ using Equation (Exhibit 13-6)					$L_{EQ} =$ 1.000 using Equation (Exhibit 13-7)				
$P_{FM} =$ pc/h					$P_{FD} =$ 2499 pc/h				
$V_{12} =$ pc/h (Equation 13-14 or 13-17)					$V_{12} =$ 0 pc/h (Equation 13-14 or 13-17)				
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No					Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No					Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				
<b>Capacity Checks</b>					<b>Capacity Checks</b>				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
$V_{FO}$		Exhibit 13-8			$V_F$	2499	Exhibit 13-8	4600	No
					$V_{FO} = V_F - V_R$	2388	Exhibit 13-8	4600	No
					$V_R$	111	Exhibit 13-10	1800	No
<b>Flow Entering Merge Influence Area</b>					<b>Flow Entering Diverge Influence Area</b>				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
$V_{R12}$		Exhibit 13-8			$V_{12}$	2499	Exhibit 13-8	4400:All	No
<b>Level of Service Determination (if not F)</b>					<b>Level of Service Determination (if not F)</b>				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 18.5 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)				
<b>Speed Determination</b>					<b>Speed Determination</b>				
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.698 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 47.4 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ N/A mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 47.4 mph (Exhibit 13-13)				

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	to Darlington
Date Performed	2013	Jurisdiction	Segment #48
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 7 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =      ft V <sub>u</sub> =      veh/h	Number of Lanes, N      2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 800 Freeway Volume, V <sub>F</sub> 2695 Ramp Volume, V <sub>R</sub> 133 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =      ft V <sub>D</sub> =      veh/h
--	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2695	0.90	Level	4	0	0.980	1.00	3054
Ramp	133	0.90	Level	2	0	0.990	1.00	149
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 L<sub>EQ</sub> = (Equation 13-6 or 13-7)  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 L<sub>EQ</sub> = (Equation 13-12 or 13-13)  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 3054 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	3054	Exhibit 13-8 4600	No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2905	Exhibit 13-8 4600	No
V <sub>R</sub>	149	Exhibit 13-10 1800	No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3054	Exhibit 13-8 4400:All	No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 23.3 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.701 (Exhibit 13-12)  
 S<sub>R</sub> = 47.4 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 47.4 mph (Exhibit 13-13)

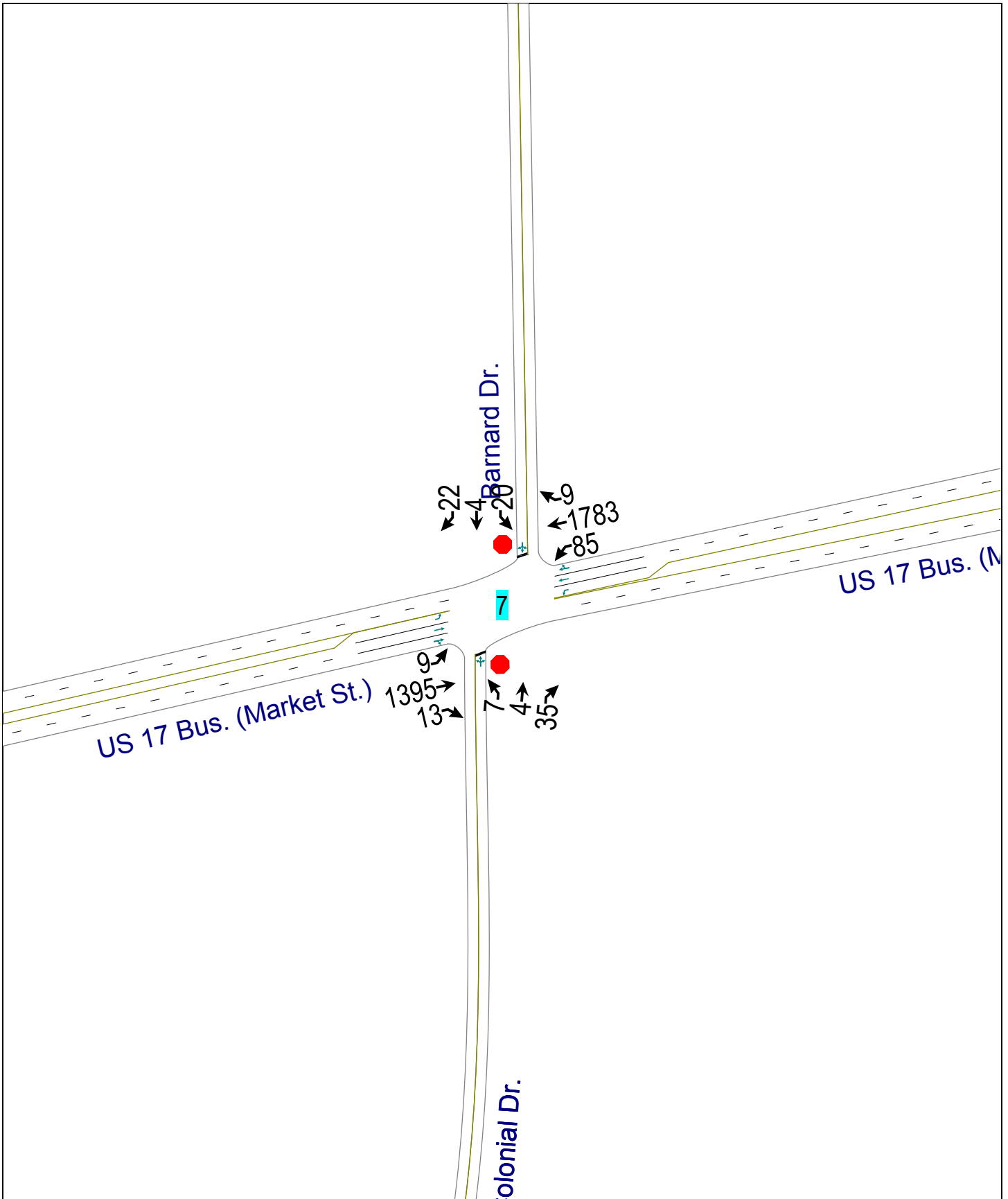
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 7 AC Quadrant			
Analysis Time Period	AM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1720ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	1684	0.90	4	0	1.5	1.2	0.980	1.00	1909
V <sub>RF</sub>	87	0.90	4	0	1.5	1.2	0.980	1.00	99
V <sub>FR</sub>	403	0.90	4	0	1.5	1.2	0.980	1.00	457
V <sub>RR</sub>	22	0.90	4	0	1.5	1.2	0.980	1.00	25
V <sub>NW</sub>	1934							V =	2490
V <sub>W</sub>	556								
VR	0.223								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	556 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	957 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	753 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1710 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	998			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	2490 pc/h				Weaving intensity factor, W	0.225			
Weaving segment capacity, c <sub>w</sub>	6076 veh/h				Weaving segment speed, S	52.0 mph			
Weaving segment v/c ratio	0.402				Average weaving speed, S <sub>W</sub>	51.7 mph			
Weaving segment density, D	16.0 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	52.0 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4776 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

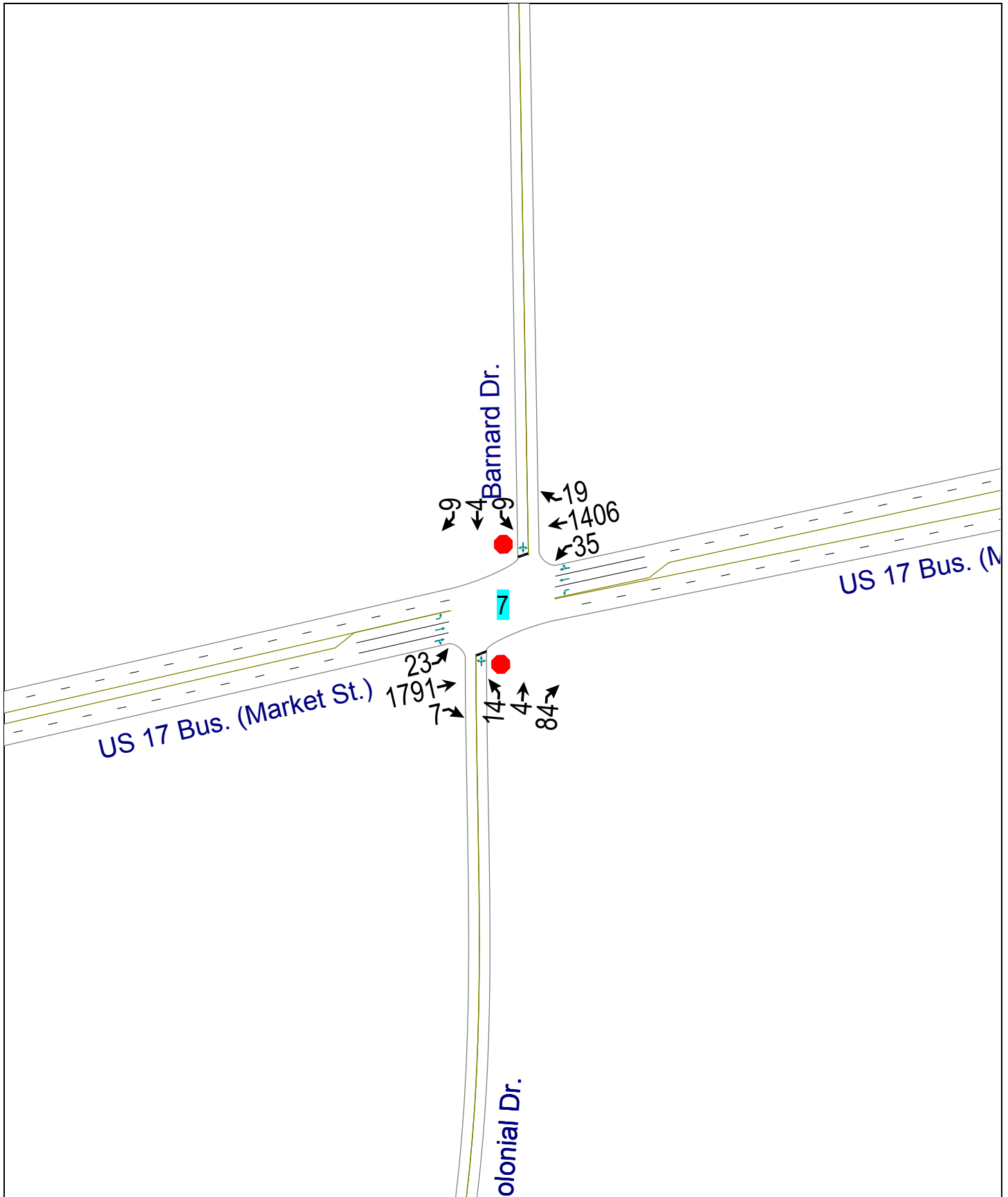
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 7 AC Quadrant			
Analysis Time Period	PM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1720ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	2134	0.90	4	0	1.5	1.2	0.980	1.00	2419
V <sub>RF</sub>	79	0.90	4	0	1.5	1.2	0.980	1.00	90
V <sub>FR</sub>	451	0.90	4	0	1.5	1.2	0.980	1.00	511
V <sub>RR</sub>	21	0.90	4	0	1.5	1.2	0.980	1.00	24
V <sub>NW</sub>	2443							V =	3044
V <sub>W</sub>	601								
VR	0.197								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	601 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	1002 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	858 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1860 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	1261			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	3044 pc/h				Weaving intensity factor, W	0.240			
Weaving segment capacity, c <sub>w</sub>	6138 veh/h				Weaving segment speed, S	50.9 mph			
Weaving segment v/c ratio	0.486				Average weaving speed, S <sub>W</sub>	51.3 mph			
Weaving segment density, D	19.9 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	50.8 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4510 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

## Build Alternative 7, Quadrant BC

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U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 1/16/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	1395	13	85	1783	9	7	4	35	20	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Flt Permitted	0.950			0.950				0.992			0.978	
Satd. Flow (perm)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		818			861			978			871	
Travel Time (s)		15.9			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1564	0	94	1991	0	0	51	0	0	50	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.0%
ICU Level of Service	C
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 7 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	1395	13	85	1783	9	7	4	35	20	4	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1550	14	94	1981	10	8	4	39	22	4	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (ft)	1010					861						
pX, platoon unblocked	0.52			0.70			0.67	0.67	0.70	0.67	0.67	0.52
vC, conflicting volume	1991			1564			2783	3757	782	3011	3759	996
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1067			948			667	2116	0	1006	2119	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			81			95	83	95	76	83	96
cM capacity (veh/h)	339			504			162	27	759	91	26	566

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	10	1033	531	94	1321	670	51	51
Volume Left	10	0	0	94	0	0	8	22
Volume Right	0	0	14	0	0	10	39	24
cSH	339	1700	1700	504	1700	1700	191	112
Volume to Capacity	0.03	0.61	0.31	0.19	0.78	0.39	0.27	0.45
Queue Length 95th (ft)	2	0	0	17	0	0	26	50
Control Delay (s)	16.0	0.0	0.0	13.8	0.0	0.0	30.5	61.4
Lane LOS	C			B			D	F
Approach Delay (s)	0.1			0.6			30.5	61.4
Approach LOS							D	F

Intersection Summary

Average Delay	1.6
Intersection Capacity Utilization	69.0%
ICU Level of Service	C
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 7 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1791	7	35	1406	19	14	4	84	9	4	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Flt Permitted	0.950			0.950				0.993			0.980	
Satd. Flow (perm)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		818			861			978			871	
Travel Time (s)		15.9			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1998	0	39	1583	0	0	113	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 7 Quad BC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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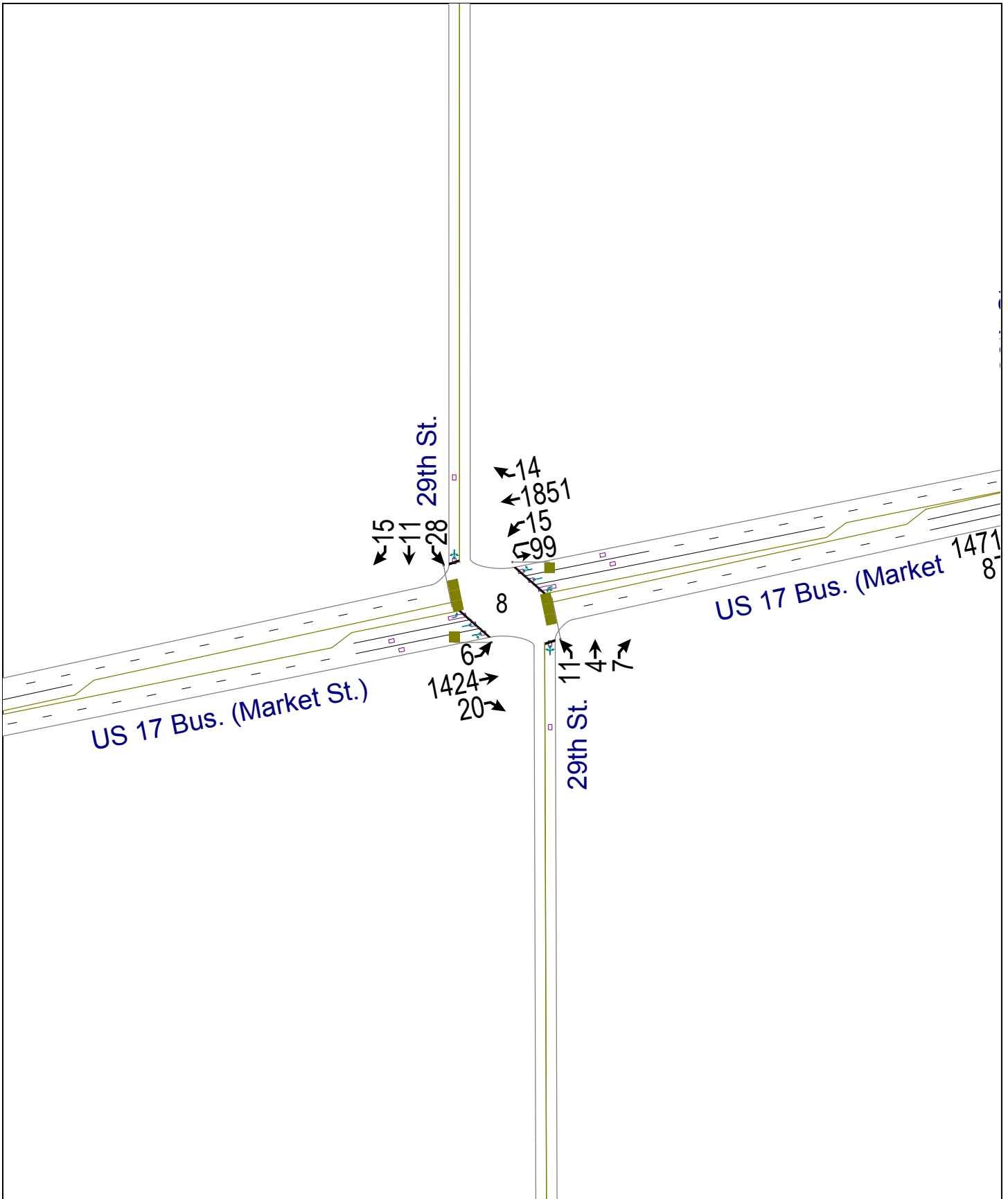
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	1791	7	35	1406	19	14	4	84	9	4	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	1990	8	39	1562	21	16	4	93	10	4	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (ft)	1010					861						
pX, platoon unblocked	0.77			0.58			0.69	0.69	0.58	0.69	0.69	0.77
vC, conflicting volume	1583			1998			2916	3706	999	2792	3699	792
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1163			1266			1391	2532	0	1212	2523	136
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			88			67	71	85	82	72	99
cM capacity (veh/h)	460			315			47	16	627	55	16	684

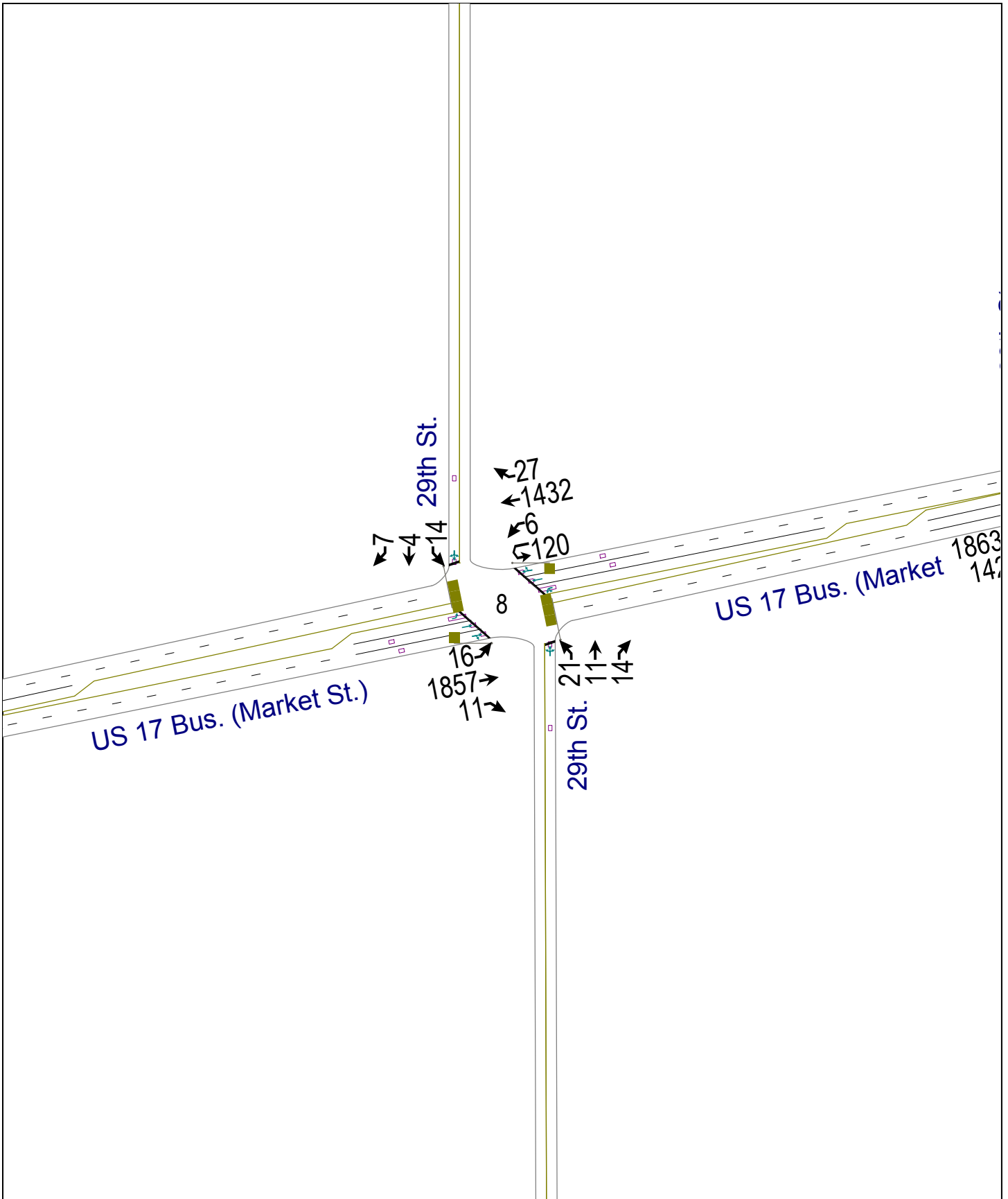
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	26	1327	671	39	1041	542	113	24
Volume Left	26	0	0	39	0	0	16	10
Volume Right	0	0	8	0	0	21	93	10
cSH	460	1700	1700	315	1700	1700	148	51
Volume to Capacity	0.06	0.78	0.39	0.12	0.61	0.32	0.76	0.48
Queue Length 95th (ft)	4	0	0	10	0	0	117	45
Control Delay (s)	13.3	0.0	0.0	18.0	0.0	0.0	81.9	128.1
Lane LOS	B			C			F	F
Approach Delay (s)	0.2			0.4			81.9	128.1
Approach LOS							F	F

**Intersection Summary**

Average Delay	3.6
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 7 Quad BC PM Peak

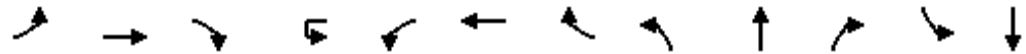






U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	6	1424	20	99	15	1851	14	11	4	7	28	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0		300		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3532	0	0	1770	3536	0	0	1736	0	0	1730
Flt Permitted	0.069				0.950				0.976			0.975
Satd. Flow (perm)	129	3532	0	0	1770	3536	0	0	1736	0	0	1730
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			25			25
Link Distance (ft)		861				630			952			799
Travel Time (s)		14.7				10.7			26.0			21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1604	0	0	127	2073	0	0	24	0	0	60
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			0			0
Link Offset(ft)		0				0			48			48
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	72.0	72.0	0.0	20.0	20.0	92.0	0.0	14.0	14.0	0.0	14.0	14.0
Total Split (%)	60.0%	60.0%	0.0%	16.7%	16.7%	76.7%	0.0%	11.7%	11.7%	0.0%	11.7%	11.7%
Maximum Green (s)	65.0	65.0		13.0	13.0	85.0		7.0	7.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	76.5	76.5			13.9	96.4			9.0			9.0
Actuated g/C Ratio	0.64	0.64			0.12	0.80			0.08			0.08
v/c Ratio	0.09	0.71			0.62	0.73			0.18			0.46
Control Delay	6.8	6.4			64.2	5.2			55.7			65.2
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 7 Quad BC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	15
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 7 Quad BC AM Peak

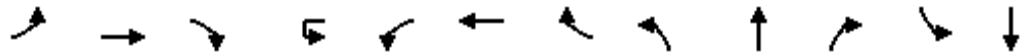




Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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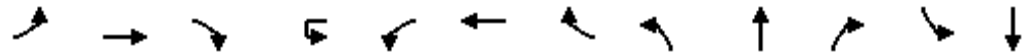


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	16	1857	11	120	6	1432	27	21	11	14	14	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0		300		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3536	0	0	1770	3529	0	0	1745	0	0	1723
Flt Permitted	0.146				0.950				0.978			0.972
Satd. Flow (perm)	272	3536	0	0	1770	3529	0	0	1745	0	0	1723
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			25			25
Link Distance (ft)		861				630			952			799
Travel Time (s)		14.7				10.7			26.0			21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	2075	0	0	140	1621	0	0	51	0	0	28
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			0			0
Link Offset(ft)		0				0			48			48
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	77.0	77.0	0.0	15.0	15.0	92.0	0.0	14.0	14.0	0.0	14.0	14.0
Total Split (%)	64.2%	64.2%	0.0%	12.5%	12.5%	76.7%	0.0%	11.7%	11.7%	0.0%	11.7%	11.7%
Maximum Green (s)	70.0	70.0		8.0	8.0	85.0		7.0	7.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	77.8	77.8			12.5	96.3			9.1			9.0
Actuated g/C Ratio	0.65	0.65			0.10	0.80			0.08			0.08
v/c Ratio	0.10	0.90			0.76	0.57			0.39			0.22
Control Delay	5.3	13.5			81.9	4.2			61.8			56.6
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

8: US 17 Bus. (Market St.) & 29th St.  
Build Alt. 7 Quad BC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	7
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 7 Quad BC PM Peak



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	5.3	13.5			81.9	4.2			61.8			56.6
LOS	A	B			F	A			E			E
Approach Delay		13.4				10.4			61.8			56.6
Approach LOS		B				B			E			E
Queue Length 50th (ft)	2	791			114	127			38			21
Queue Length 95th (ft)	m3	#982			m#241	167			81			52
Internal Link Dist (ft)		781				550			872			719
Turn Bay Length (ft)	100				300							
Base Capacity (vph)	176	2294			184	2832			132			129
Starvation Cap Reductn	0	0			0	0			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.10	0.90			0.76	0.57			0.39			0.22

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 99 (83%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 13.0 Intersection LOS: B  
 Intersection Capacity Utilization 77.0% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

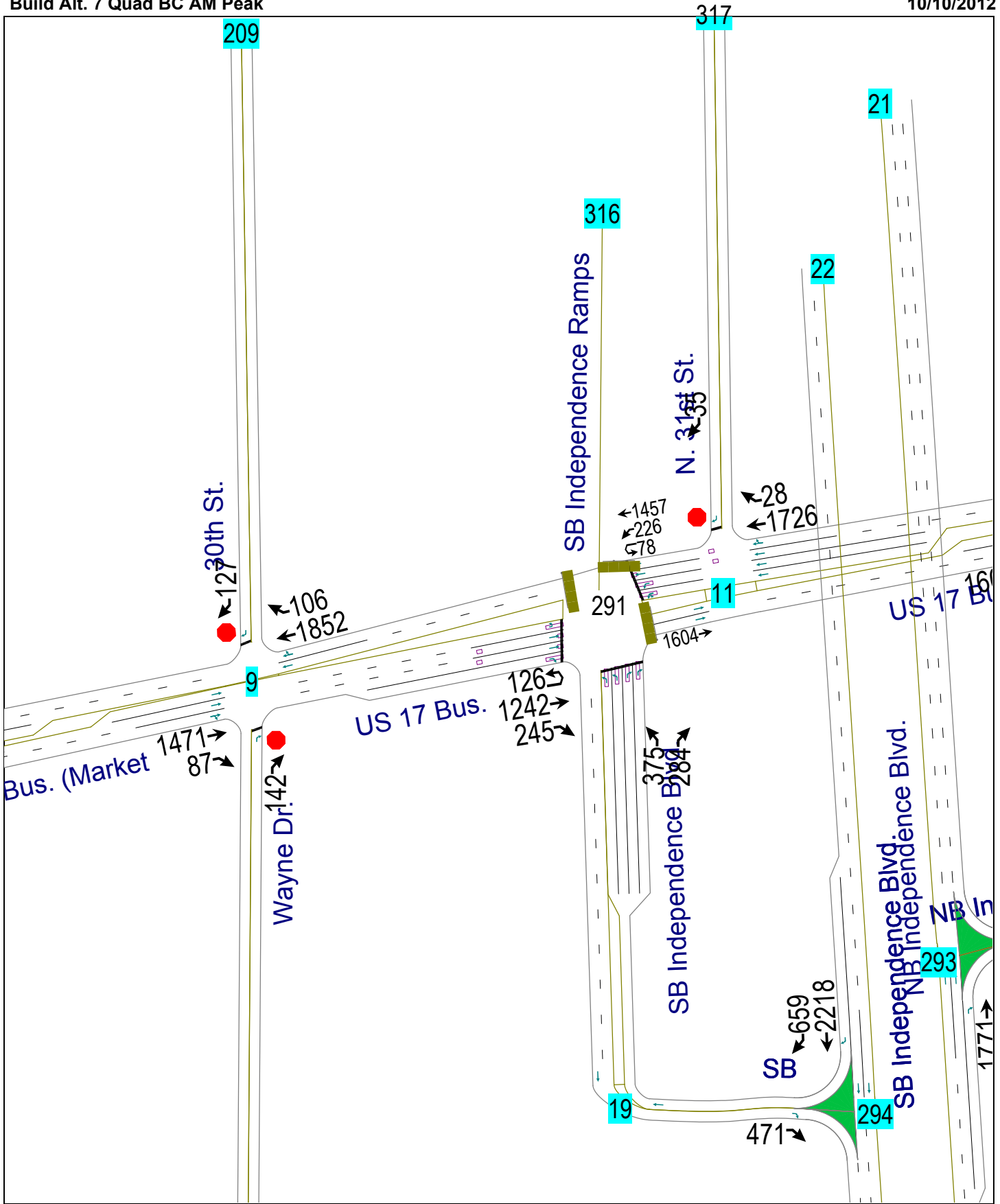
Splits and Phases: 8: US 17 Bus. (Market St.) & 29th St.





Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	







U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↑			↑
Volume (vph)	0	1471	87	0	1852	106	0	0	142	0	0	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	300		0	0		0	0		0
Storage Lanes	1		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	5045	0	0	3511	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	5045	0	0	3511	0	0	0	1611	0	0	1611
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			416			873			738	
Travel Time (s)		10.7			7.1			23.8			20.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	0%	2%	2%	0%	0%	2%	0%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1731	0	0	2176	0	0	0	158	0	0	141
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.1%
ICU Level of Service	C
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 7 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↑			↑
Volume (veh/h)	0	1471	87	0	1852	106	0	0	142	0	0	127
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1634	97	0	2058	118	0	0	158	0	0	141
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	630			416								
pX, platoon unblocked	0.62			0.73			0.75	0.75	0.73	0.75	0.75	0.62
vC, conflicting volume	2176			1731			2853	3858	593	2819	3848	1088
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1663			686			623	1957	0	579	1943	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	80	100	100	79
cM capacity (veh/h)	242			666			223	49	787	243	50	669
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>EB 3</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	<b>SB 1</b>					
Volume Total	654	654	424	1372	804	158	141					
Volume Left	0	0	0	0	0	0	0					
Volume Right	0	0	97	0	118	158	141					
cSH	1700	1700	1700	1700	1700	787	669					
Volume to Capacity	0.38	0.38	0.25	0.81	0.47	0.20	0.21					
Queue Length 95th (ft)	0	0	0	0	0	19	20					
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.7	11.8					
Lane LOS						B	B					
Approach Delay (s)	0.0			0.0		10.7	11.8					
Approach LOS						B	B					
<b>Intersection Summary</b>												
Average Delay			0.8									
Intersection Capacity Utilization			69.1%	ICU Level of Service		C						
Analysis Period (min)			15									

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 7 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↗			↗
Volume (vph)	0	1863	142	0	1479	127	0	0	87	0	0	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	300		0	0		0	0		0
Storage Lanes	1		0	0		0	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	5029	0	0	3497	0	0	0	1611	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	5029	0	0	3497	0	0	0	1611	0	0	1611
Link Speed (mph)		40			40			25				25
Link Distance (ft)		630			416			873				738
Travel Time (s)		10.7			7.1			23.8				20.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	0%	2%	2%	0%	0%	2%	0%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2228	0	0	1784	0	0	0	97	0	0	118
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.2%
ICU Level of Service	B
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 7 Quad BC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑				↑			↑
Volume (veh/h)	0	1863	142	0	1479	127	0	0	87	0	0	106
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2070	158	0	1643	141	0	0	97	0	0	118
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		630			416							
pX, platoon unblocked	0.74			0.50			0.63	0.63	0.50	0.63	0.63	0.74
vC, conflicting volume	1784			2228			3088	3933	769	2501	3942	892
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1362			0			109	1451	0	0	1464	160
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	82	100	100	81
cM capacity (veh/h)	379			819			443	83	543	532	82	636

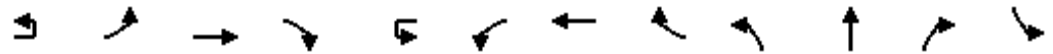
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	828	828	572	1096	689	97	118
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	158	0	141	97	118
cSH	1700	1700	1700	1700	1700	543	636
Volume to Capacity	0.49	0.49	0.34	0.64	0.41	0.18	0.19
Queue Length 95th (ft)	0	0	0	0	0	16	17
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.1	11.9
Lane LOS						B	B
Approach Delay (s)	0.0			0.0		13.1	11.9
Approach LOS						B	B

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		58.2%	ICU Level of Service B
Analysis Period (min)		15	

9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 7 Quad BC PM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	126	0	1242	245	78	226	1457	0	375	0	284	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		225		0		0	250		250	0
Storage Lanes		0		1		2		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1770	0	3539	1583	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1770	0	3539	1583	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			416				130			573		
Travel Time (s)			7.1				2.2			15.6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	2%	2%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	140	0	1380	272	0	338	1619	0	417	0	316	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				44			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	21.0	0.0	71.0	26.0	23.0	23.0	73.0	0.0	26.0	0.0	26.0	0.0
Total Split (%)	17.5%	0.0%	59.2%	21.7%	19.2%	19.2%	60.8%	0.0%	21.7%	0.0%	21.7%	0.0%
Maximum Green (s)	14.0		64.0	19.0	16.0	16.0	66.0		19.0		19.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lag		Lead	Lead	Lead					
Lead-Lag Optimize?	Yes						Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	16.0		67.7	92.8			17.2		68.9		20.1	
Actuated g/C Ratio	0.13		0.56	0.77			0.14		0.57		0.17	
v/c Ratio	0.59		0.69	0.22			0.69		0.80		0.73	
Control Delay	41.8		7.7	1.7			59.9		20.3		55.5	
Queue Delay	0.0		0.0	0.0			0.0		0.2		0.0	

291: US 17 Bus. (Market St.) &  
Build Alt. 7 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

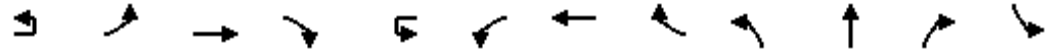
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Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	446	
Travel Time (s)	12.2	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

291: US 17 Bus. (Market St.) &  
 Build Alt. 7 Quad BC AM Peak



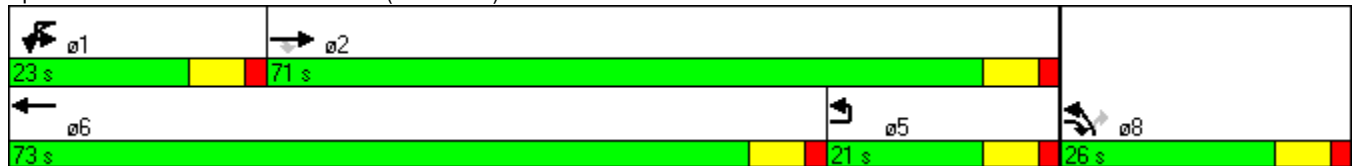


Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	41.8		7.7	1.7		59.9	20.4		55.5		55.0	
LOS	D		A	A		E	C		E		E	
Approach Delay			9.5				27.2					
Approach LOS			A				C					
Queue Length 50th (ft)	105		88	17		127	332		158		131	
Queue Length 95th (ft)	m145		107	22		179	473		214		185	
Internal Link Dist (ft)			336				50			493		
Turn Bay Length (ft)				225					250		250	
Base Capacity (vph)	236		1996	1236		510	2012		595		483	
Starvation Cap Reductn	0		0	0		0	42		0		0	
Spillback Cap Reductn	0		0	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.59		0.69	0.22		0.66	0.82		0.70		0.65	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 110 (92%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 24.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 69.6%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) &

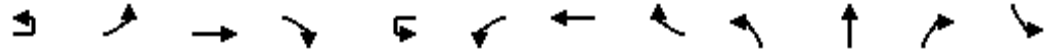




Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	366	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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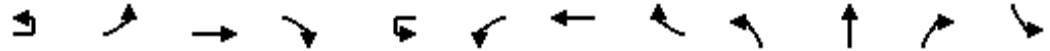
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	116	0	1588	246	61	179	1191	0	299	0	287	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		225		0		0	250		250	0
Storage Lanes		0		1		2		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1770	0	3539	1583	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1770	0	3539	1583	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			416				130			573		
Travel Time (s)			7.1				2.2			15.6		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	0%	2%	2%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	129	0	1764	273	0	267	1323	0	332	0	319	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				42			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	21.0	0.0	78.0	24.0	18.0	18.0	75.0	0.0	24.0	0.0	24.0	0.0
Total Split (%)	17.5%	0.0%	65.0%	20.0%	15.0%	15.0%	62.5%	0.0%	20.0%	0.0%	20.0%	0.0%
Maximum Green (s)	14.0		71.0	17.0	11.0	11.0	68.0		17.0		17.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lag		Lead	Lead	Lead					
Lead-Lag Optimize?	Yes						Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	16.0		73.7	97.0			13.0	70.6	18.4		18.4	
Actuated g/C Ratio	0.13		0.61	0.81			0.11	0.59	0.15		0.15	
v/c Ratio	0.55		0.81	0.21			0.73	0.64	0.64		0.76	
Control Delay	37.4		5.9	1.1			68.6	10.3	53.7		60.8	
Queue Delay	0.0		0.0	0.0			0.0	0.0	0.0		0.0	

291: US 17 Bus. (Market St.) &  
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Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	446	
Travel Time (s)	12.2	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

291: US 17 Bus. (Market St.) &  
 Build Alt. 7 Quad BC PM Peak



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	37.4		5.9	1.1		68.6	10.3		53.7		60.8	
LOS	D		A	A		E	B		D		E	
Approach Delay			7.2				20.1					
Approach LOS			A				C					
Queue Length 50th (ft)	91		61	15		96	200		125		135	
Queue Length 95th (ft)	m104		67	m17		#148	217		174		192	
Internal Link Dist (ft)			336				50			493		
Turn Bay Length (ft)				225					250		250	
Base Capacity (vph)	236		2173	1289		368	2064		538		437	
Starvation Cap Reductn	0		0	0		0	0		0		0	
Spillback Cap Reductn	0		0	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.55		0.81	0.21		0.73	0.64		0.62		0.73	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 117 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.81  
 Intersection Signal Delay: 19.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 73.3%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) &





Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	366	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (vph)	0	1604	1726	28	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3539	6395	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	6395	0	0	1611
Link Speed (mph)		40	40		25	
Link Distance (ft)		130	453		658	
Travel Time (s)		2.2	7.7		17.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1782	1949	0	0	39
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.7%
ICU Level of Service	A
Analysis Period (min)	15

11: US 17 Bus. (Market St.) & N. 31st St.  
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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (veh/h)	0	1604	1726	28	0	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1782	1918	31	0	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		130	698			
pX, platoon unblocked					0.72	
vC, conflicting volume	1949				2824	495
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1949				2755	495
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	93
cM capacity (veh/h)	304				12	520

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	891	891	548	548	548	305	39
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	31	39
cSH	1700	1700	1700	1700	1700	1700	520
Volume to Capacity	0.52	0.52	0.32	0.32	0.32	0.18	0.07
Queue Length 95th (ft)	0	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.5
Lane LOS							B
Approach Delay (s)	0.0		0.0				12.5
Approach LOS							B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		47.7%	ICU Level of Service A
Analysis Period (min)		15	

11: US 17 Bus. (Market St.) & N. 31st St.  
 Build Alt. 7 Quad BC AM Peak



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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (vph)	0	1936	1403	34	0	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3539	6382	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	3539	6382	0	0	1611
Link Speed (mph)		40	40		25	
Link Distance (ft)		130	453		658	
Travel Time (s)		2.2	7.7		17.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2151	1597	0	0	31
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Right	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	56.8%
ICU Level of Service	B
Analysis Period (min)	15

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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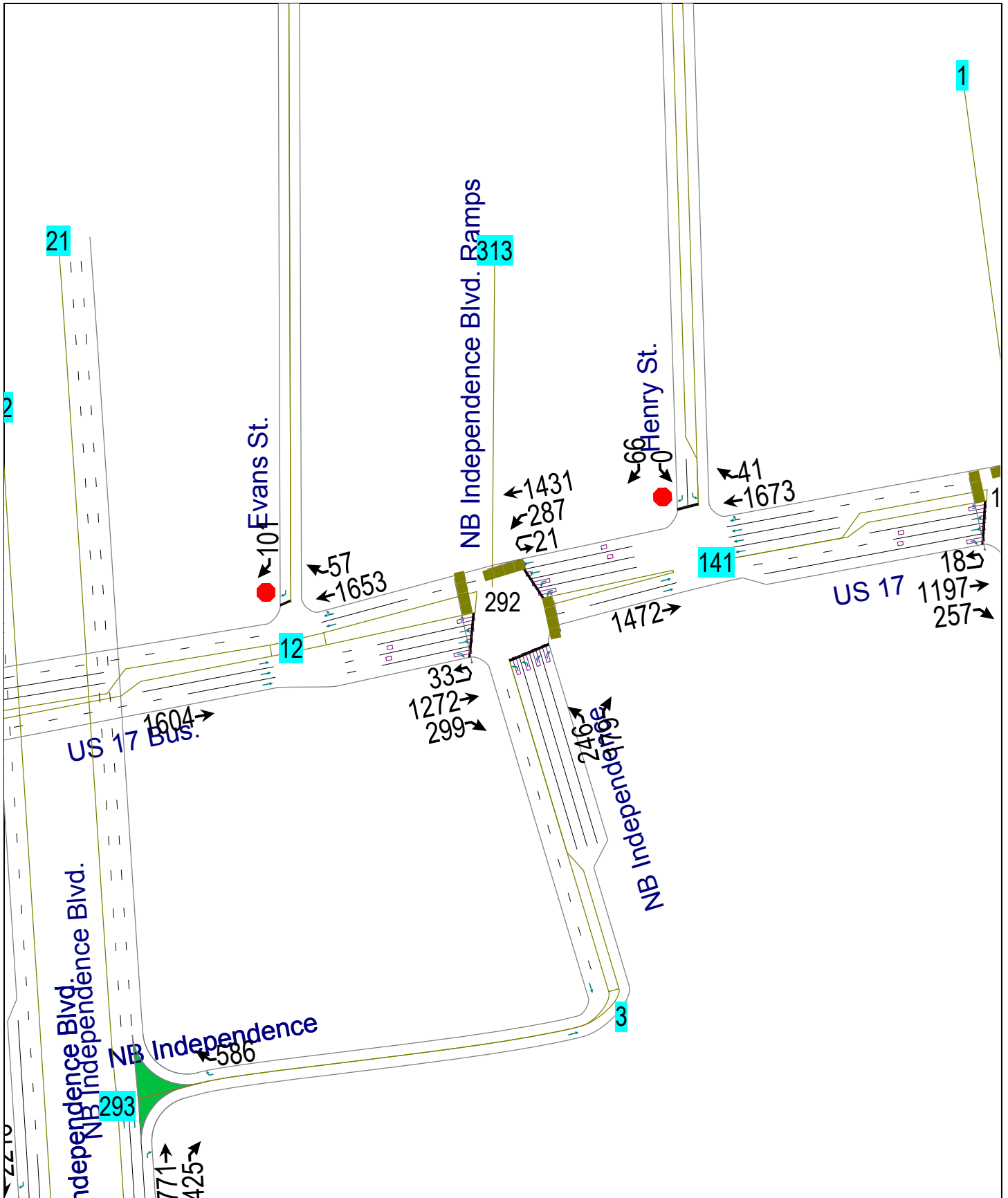


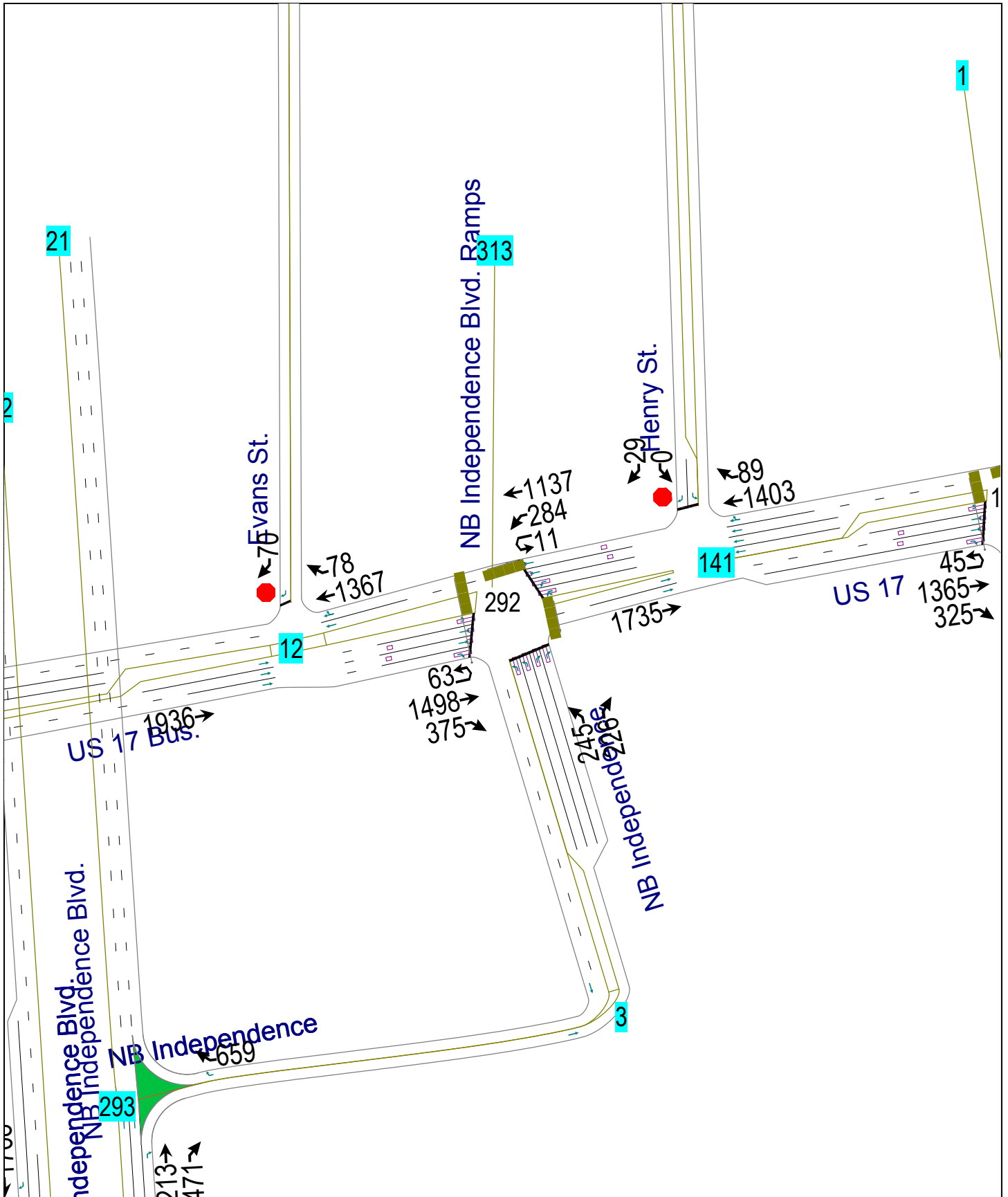
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑			↗
Volume (veh/h)	0	1936	1403	34	0	28
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2151	1559	38	0	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		130	698			
pX, platoon unblocked					0.60	
vC, conflicting volume	1597				2653	409
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1597				2426	409
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	416				17	592

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1
Volume Total	1076	1076	445	445	445	260	31
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	38	31
cSH	1700	1700	1700	1700	1700	1700	592
Volume to Capacity	0.63	0.63	0.26	0.26	0.26	0.15	0.05
Queue Length 95th (ft)	0	0	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.4
Lane LOS							B
Approach Delay (s)	0.0		0.0				11.4
Approach LOS							B

Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			56.8%		ICU Level of Service		B
Analysis Period (min)			15				

11: US 17 Bus. (Market St.) & N. 31st St.  
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (vph)	0	1604	1653	57	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	5036	3487	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	5036	3487	0	0	1580
Link Speed (mph)		40	40		25	
Link Distance (ft)		453	245		894	
Travel Time (s)		7.7	4.2		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1782	1900	0	0	112
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	60.4%
ICU Level of Service	B
Analysis Period (min)	15

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 7 Quad BC AM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (veh/h)	0	1604	1653	57	0	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1782	1837	63	0	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		583	245			
pX, platoon unblocked	0.73				0.85	0.73
vC, conflicting volume	1900				2462	950
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1500				749	204
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	81
cM capacity (veh/h)	332				298	584
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	594	594	594	1224	676	112
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	63	112
cSH	1700	1700	1700	1700	1700	584
Volume to Capacity	0.35	0.35	0.35	0.72	0.40	0.19
Queue Length 95th (ft)	0	0	0	0	0	18
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.6
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.6
Approach LOS						B
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			60.4%		ICU Level of Service	B
Analysis Period (min)			15			

12: US 17 Bus. (Market St.) & Evans St.  
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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (vph)	0	1936	1367	78	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	5036	3477	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	5036	3477	0	0	1580
Link Speed (mph)		40	40		25	
Link Distance (ft)		453	245		894	
Travel Time (s)		7.7	4.2		24.4	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	2151	1606	0	0	78
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
Analysis Period (min)	15
	ICU Level of Service A

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 7 Quad BC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (veh/h)	0	1936	1367	78	0	70
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2151	1519	87	0	78
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		583	245			
pX, platoon unblocked	0.81				0.76	0.81
vC, conflicting volume	1606				2279	803
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1277				256	286
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	86
cM capacity (veh/h)	445				544	571

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	717	717	717	1013	593	78
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	87	78
cSH	1700	1700	1700	1700	1700	571
Volume to Capacity	0.42	0.42	0.42	0.60	0.35	0.14
Queue Length 95th (ft)	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.3
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.3
Approach LOS						B

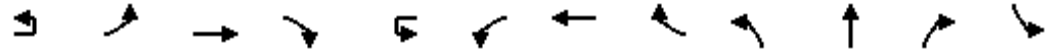
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			51.3%		ICU Level of Service	A
Analysis Period (min)			15			

12: US 17 Bus. (Market St.) & Evans St.  
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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	33	0	1272	299	21	287	1431	0	246	0	179	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	225		225	0
Storage Lanes		1		0		2		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			245				245			487		
Travel Time (s)			4.2				4.2			13.3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	0	1413	332	0	342	1590	0	273	0	199	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				36			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	14.0	0.0	74.0	22.0	24.0	24.0	84.0	0.0	22.0	0.0	22.0	0.0
Total Split (%)	11.7%	0.0%	61.7%	18.3%	20.0%	20.0%	70.0%	0.0%	18.3%	0.0%	18.3%	0.0%
Maximum Green (s)	7.0		67.0	15.0	17.0	17.0	77.0		15.0		15.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lead		Lag	Lag	Lead					
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	9.0		71.3	92.2			17.8	85.8	15.8		15.8	
Actuated g/C Ratio	0.08		0.59	0.77			0.15	0.72	0.13		0.13	
v/c Ratio	0.28		0.68	0.28			0.68	0.63	0.61		0.55	
Control Delay	52.4		13.0	4.3			51.0	7.2	55.2		54.5	
Queue Delay	0.0		0.1	0.0			0.0	0.1	0.0		0.0	

292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
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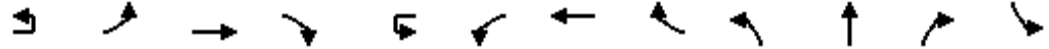
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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	397	
Travel Time (s)	10.8	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
 Build Alt. 7 Quad BC AM Peak



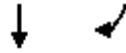
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	52.4		13.0	4.3		51.0	7.4		55.2		54.5	
LOS	D		B	A		D	A		E		D	
Approach Delay			12.2				15.1					
Approach LOS			B				B					
Queue Length 50th (ft)	29		192	47		132	285		103		82	
Queue Length 95th (ft)	m42		275	103		184	243		148		125	
Internal Link Dist (ft)			165				165			407		
Turn Bay Length (ft)									225		225	
Base Capacity (vph)	131		2084	1193		538	2505		482		391	
Starvation Cap Reductn	0		0	0		0	198		0		0	
Spillback Cap Reductn	0		45	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.28		0.69	0.28		0.64	0.69		0.57		0.51	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 105 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 18.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 64.1%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps

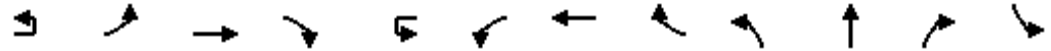




Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	317	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
<b>Intersection Summary</b>		

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	63	0	1498	375	11	284	1137	0	245	0	226	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0		0		0	225		225	0
Storage Lanes		1		0		2		0	1		2	0
Taper Length (ft)		25		25		25		25	25		25	25
Satd. Flow (prot)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Flt Permitted	0.950					0.950			0.950			
Satd. Flow (perm)	1752	0	3505	1568	0	3400	3505	0	3400	0	2760	0
Right Turn on Red				No				No			No	
Satd. Flow (RTOR)												
Link Speed (mph)			40				40			25		
Link Distance (ft)			245				245			487		
Travel Time (s)			4.2				4.2			13.3		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	3%	0%	3%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	0	1664	417	0	328	1263	0	272	0	251	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left
Median Width(ft)			36				36			24		
Link Offset(ft)			0				0			0		
Crosswalk Width(ft)			16				16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	9	15		9	15		9	15
Turn Type	Prot			pm+ov	Prot	Prot			Prot		custom	
Protected Phases	5		2	8	1	1	6		8			
Permitted Phases				2							8	
Detector Phase	5		2	8	1	1	6		8		8	
Switch Phase												
Minimum Initial (s)	7.0		12.0	7.0	7.0	7.0	12.0		7.0		7.0	
Minimum Split (s)	14.0		19.0	14.0	14.0	14.0	19.0		14.0		14.0	
Total Split (s)	15.0	0.0	76.0	22.0	22.0	22.0	83.0	0.0	22.0	0.0	22.0	0.0
Total Split (%)	12.5%	0.0%	63.3%	18.3%	18.3%	18.3%	69.2%	0.0%	18.3%	0.0%	18.3%	0.0%
Maximum Green (s)	8.0		69.0	15.0	15.0	15.0	76.0		15.0		15.0	
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0	
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0	2.0		2.0		2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0
Lead/Lag	Lag		Lag		Lead	Lead	Lead					
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes					
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0		3.0		3.0	
Recall Mode	None		C-Max	None	None	None	C-Max		None		None	
Act Effct Green (s)	9.8		72.2	93.5			16.5	81.7	16.3		16.3	
Actuated g/C Ratio	0.08		0.60	0.78			0.14	0.68	0.14		0.14	
v/c Ratio	0.49		0.79	0.34			0.70	0.53	0.59		0.67	
Control Delay	50.0		11.8	1.2			62.6	6.5	54.2		58.7	
Queue Delay	0.0		0.2	0.0			0.0	0.1	0.0		0.0	

292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
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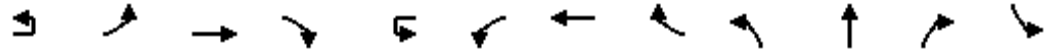


Lane Group	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		0
Taper Length (ft)		25
Satd. Flow (prot)	0	0
Flt Permitted		
Satd. Flow (perm)	0	0
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	25	
Link Distance (ft)	397	
Travel Time (s)	10.8	
Peak Hour Factor	0.90	0.90
Heavy Vehicles (%)	0%	0%
Shared Lane Traffic (%)		
Lane Group Flow (vph)	0	0
Enter Blocked Intersection	No	No
Lane Alignment	Left	Right
Median Width(ft)	24	
Link Offset(ft)	0	
Crosswalk Width(ft)	16	
Two way Left Turn Lane		
Headway Factor	1.00	1.00
Turning Speed (mph)		9
Turn Type		
Protected Phases		
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)		
Minimum Split (s)		
Total Split (s)	0.0	0.0
Total Split (%)	0.0%	0.0%
Maximum Green (s)		
Yellow Time (s)		
All-Red Time (s)		
Lost Time Adjust (s)	-2.0	-2.0
Total Lost Time (s)	2.0	2.0
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)		
Recall Mode		
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		

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Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Total Delay	50.0		12.0	1.2		62.6	6.6		54.2		58.7	
LOS	D		B	A		E	A		D		E	
Approach Delay			11.1				18.1					
Approach LOS			B				B					
Queue Length 50th (ft)	52		362	12		119	136		102		105	
Queue Length 95th (ft)	m65		366	m24		167	154		148		156	
Internal Link Dist (ft)			165				165			407		
Turn Bay Length (ft)									225		225	
Base Capacity (vph)	146		2110	1231		482	2387		482		391	
Starvation Cap Reductn	0		72	0		0	264		0		0	
Spillback Cap Reductn	0		24	0		0	0		0		0	
Storage Cap Reductn	0		0	0		0	0		0		0	
Reduced v/c Ratio	0.48		0.82	0.34		0.68	0.59		0.56		0.64	

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 12 (10%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 19.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 70.2%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps



292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
 Build Alt. 7 Quad BC PM Peak



Lane Group	SBT	SBR
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (ft)		
Queue Length 95th (ft)		
Internal Link Dist (ft)	317	
Turn Bay Length (ft)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
<b>Intersection Summary</b>		



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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑		↘	↗
Volume (vph)	0	1472	1673	41	0	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	50	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	6320	0	1900	1568
Flt Permitted						
Satd. Flow (perm)	0	3505	6320	0	1900	1568
Link Speed (mph)		40	40		25	
Link Distance (ft)		245	338		767	
Travel Time (s)		4.2	5.8		20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1636	1905	0	0	73
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		24	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	44.0%
ICU Level of Service	A
Analysis Period (min)	15

141: US 17 Bus. (Market St.) & Henry St.  
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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑		↘	↗
Volume (veh/h)	0	1472	1673	41	0	66
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1636	1859	46	0	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		245	338			
pX, platoon unblocked					0.70	
vC, conflicting volume	1904				2699	488
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1904				2573	488
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	86
cM capacity (veh/h)	317				15	523

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1	SB 2
Volume Total	818	818	531	531	531	311	0	73
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	46	0	73
cSH	1700	1700	1700	1700	1700	1700	1700	523
Volume to Capacity	0.48	0.48	0.31	0.31	0.31	0.18	0.00	0.14
Queue Length 95th (ft)	0	0	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0
Lane LOS							A	B
Approach Delay (s)	0.0		0.0				13.0	
Approach LOS							B	

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		44.0%	ICU Level of Service A
Analysis Period (min)		15	

141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 7 Quad BC AM Peak

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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑		↙	↘
Volume (vph)	0	1735	1403	89	0	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	50	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	3505	6289	0	1900	1568
Flt Permitted						
Satd. Flow (perm)	0	3505	6289	0	1900	1568
Link Speed (mph)		40	40		25	
Link Distance (ft)		245	338		767	
Travel Time (s)		4.2	5.8		20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1928	1658	0	0	32
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		24	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.3%
ICU Level of Service	A
Analysis Period (min)	15

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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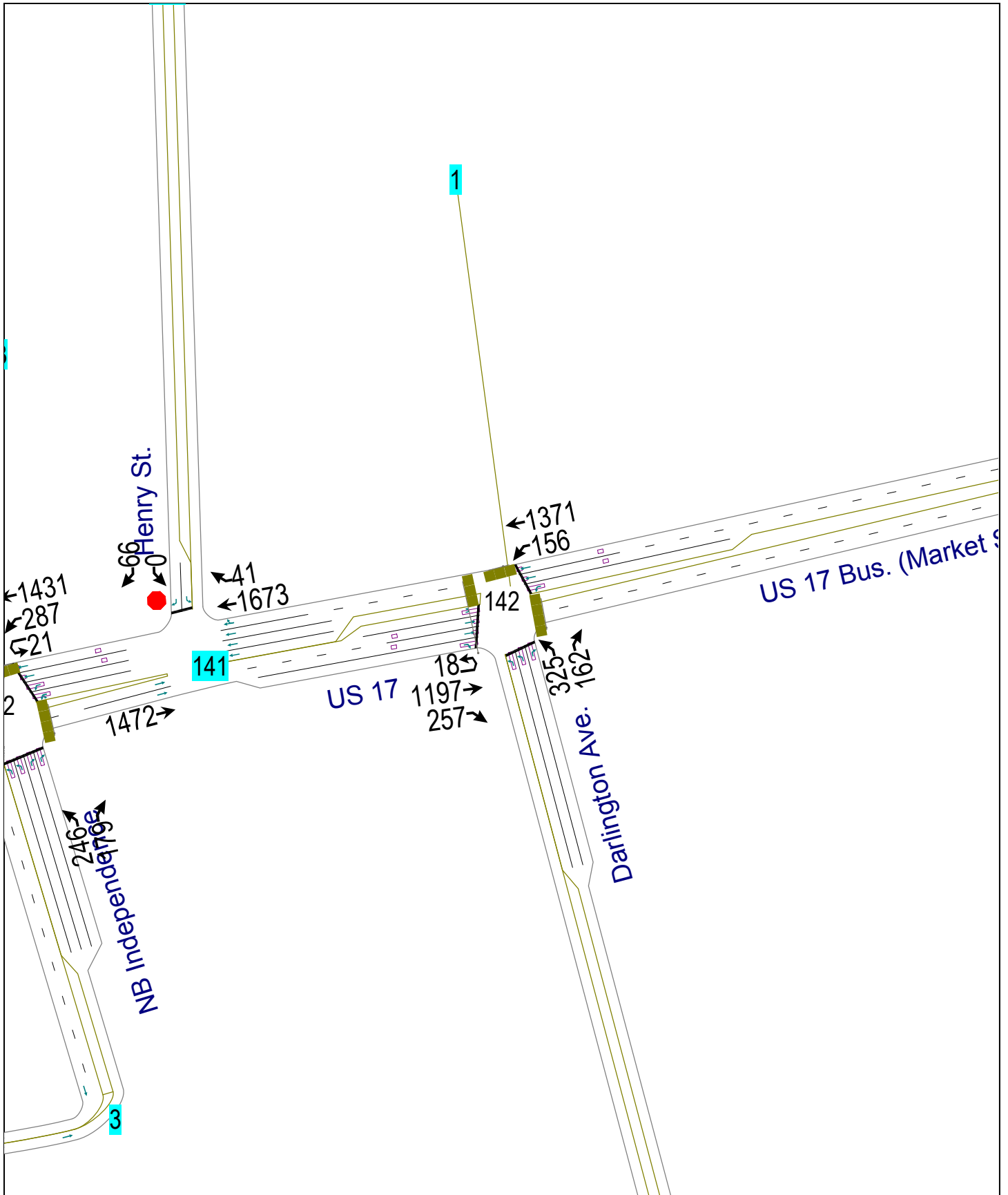


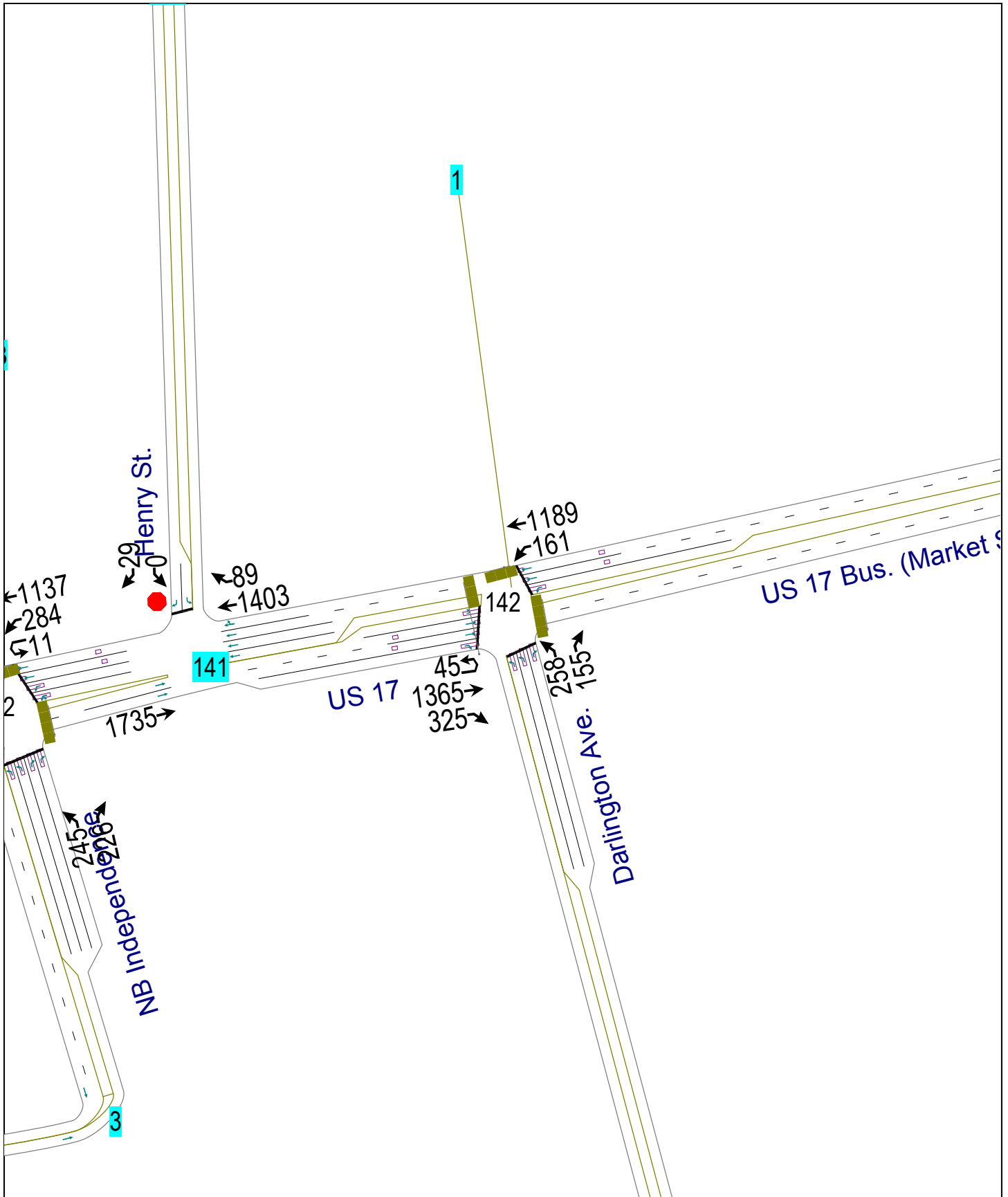
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑↑		↘	↗
Volume (veh/h)	0	1735	1403	89	0	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1928	1559	99	0	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		245	338			
pX, platoon unblocked					0.63	
vC, conflicting volume	1658				2572	439
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1658				2317	439
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	394				20	563

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	SB 1	SB 2
Volume Total	964	964	445	445	445	322	0	32
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	99	0	32
cSH	1700	1700	1700	1700	1700	1700	1700	563
Volume to Capacity	0.57	0.57	0.26	0.26	0.26	0.19	0.00	0.06
Queue Length 95th (ft)	0	0	0	0	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8
Lane LOS							A	B
Approach Delay (s)	0.0		0.0				11.8	
Approach LOS							B	

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		51.3%	ICU Level of Service A
Analysis Period (min)		15	

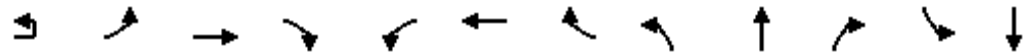
141: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 7 Quad BC PM Peak





U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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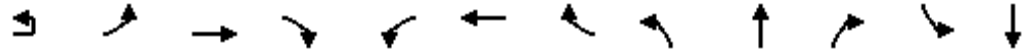
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↑	↗	↖	↑↑		↖↗		↗		
Volume (vph)	18	0	1197	257	156	1371	0	325	0	162	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		125		250	225		0	250		250	0	
Storage Lanes		1		1	1		0	1		1	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	1752	0	3505	1568	1752	3505	0	3433	0	1583	0	0
Flt Permitted	0.950				0.950			0.950				
Satd. Flow (perm)	1752	0	3505	1568	1752	3505	0	3433	0	1583	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			30
Link Distance (ft)			338			689			817			480
Travel Time (s)			5.8			11.7			22.3			10.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	0%	2%	0%	2%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	20	0	1330	286	173	1523	0	361	0	180	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	R NA	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot			Perm	Prot			Prot		custom		
Protected Phases	5		2		1	6		8				
Permitted Phases				2						8		
Detector Phase	5		2	2	1	6		8		8		
Switch Phase												
Minimum Initial (s)	7.0		12.0	12.0	7.0	12.0		7.0		7.0		
Minimum Split (s)	14.0		19.0	19.0	14.0	19.0		14.0		14.0		
Total Split (s)	14.0	0.0	67.0	67.0	25.0	78.0	0.0	28.0	0.0	28.0	0.0	0.0
Total Split (%)	11.7%	0.0%	55.8%	55.8%	20.8%	65.0%	0.0%	23.3%	0.0%	23.3%	0.0%	0.0%
Maximum Green (s)	7.0		60.0	60.0	18.0	71.0		21.0		21.0		
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0		5.0		5.0		
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0		2.0		2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0	2.0
Lead/Lag	Lag		Lead	Lead	Lag	Lead						
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0		3.0		
Recall Mode	None		C-Max	C-Max	None	C-Max		None		None		
Act Effct Green (s)	9.0		67.3	67.3	17.7	84.4		20.0		20.0		
Actuated g/C Ratio	0.08		0.56	0.56	0.15	0.70		0.17		0.17		
v/c Ratio	0.15		0.68	0.33	0.67	0.62		0.63		0.68		
Control Delay	59.6		9.0	5.8	61.3	12.4		51.4		60.3		
Queue Delay	0.0		0.2	0.0	0.0	0.0		0.0		0.0		

142: US 17 Bus. (Market St.) &  
Build Alt. 7 Quad BC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

142: US 17 Bus. (Market St.) &  
 Build Alt. 7 Quad BC AM Peak



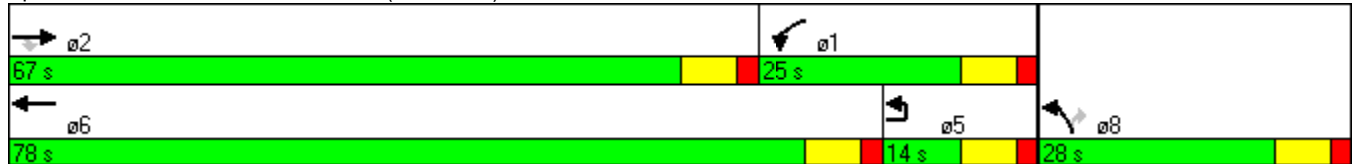


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	59.6		9.2	5.8	61.3	12.4		51.4		60.3		
LOS	E		A	A	E	B		D		E		
Approach Delay			9.2			17.4						
Approach LOS			A			B						
Queue Length 50th (ft)	17		231	39	127	244		134		131		
Queue Length 95th (ft)	m25		382	80	202	488		181		207		
Internal Link Dist (ft)			258			609			737			400
Turn Bay Length (ft)	125			250	225			250		250		
Base Capacity (vph)	131		1966	880	292	2465		658		303		
Starvation Cap Reductn	0		125	0	0	0		0		0		
Spillback Cap Reductn	0		0	0	0	0		0		0		
Storage Cap Reductn	0		0	0	0	0		0		0		
Reduced v/c Ratio	0.15		0.72	0.33	0.59	0.62		0.55		0.59		

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 119 (99%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 19.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 64.7%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 142: US 17 Bus. (Market St.) &



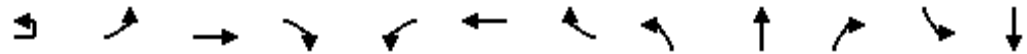
142: US 17 Bus. (Market St.) &  
 Build Alt. 7 Quad BC AM Peak



Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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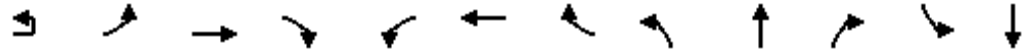


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	45	0	1365	325	161	1189	0	258	0	155	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		125		250	225		0	250		250	0	
Storage Lanes		1		1	1		0	1		1	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	1752	0	3505	1568	1752	3505	0	3433	0	1583	0	0
Flt Permitted	0.950				0.950			0.950				
Satd. Flow (perm)	1752	0	3505	1568	1752	3505	0	3433	0	1583	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			30
Link Distance (ft)			338			689			817			480
Travel Time (s)			5.8			11.7			22.3			10.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	0%	3%	3%	3%	3%	0%	2%	0%	2%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	0	1517	361	179	1321	0	287	0	172	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	R NA	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot			Perm	Prot			Prot		custom		
Protected Phases	5		2		1	6		8				
Permitted Phases				2						8		
Detector Phase	5		2	2	1	6		8		8		
Switch Phase												
Minimum Initial (s)	7.0		12.0	12.0	7.0	12.0		7.0		7.0		
Minimum Split (s)	14.0		19.0	19.0	14.0	19.0		14.0		14.0		
Total Split (s)	14.0	0.0	69.0	69.0	25.0	80.0	0.0	26.0	0.0	26.0	0.0	0.0
Total Split (%)	11.7%	0.0%	57.5%	57.5%	20.8%	66.7%	0.0%	21.7%	0.0%	21.7%	0.0%	0.0%
Maximum Green (s)	7.0		62.0	62.0	18.0	73.0		19.0		19.0		
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0		5.0		5.0		
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0		2.0		2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	2.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	5.0	2.0	2.0
Lead/Lag	Lag		Lag	Lag	Lead	Lead						
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0		3.0		
Recall Mode	None		C-Max	C-Max	None	C-Max		None		None		
Act Effct Green (s)	9.0		68.5	68.5	17.9	80.2		18.6		18.6		
Actuated g/C Ratio	0.08		0.57	0.57	0.15	0.67		0.16		0.16		
v/c Ratio	0.38		0.76	0.40	0.69	0.56		0.54		0.70		
Control Delay	47.3		13.2	10.8	62.0	12.9		50.3		63.4		
Queue Delay	0.0		0.4	0.0	0.0	0.0		0.0		0.0		

142: US 17 Bus. (Market St.) &  
Build Alt. 7 Quad BC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

142: US 17 Bus. (Market St.) &  
 Build Alt. 7 Quad BC PM Peak



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	47.3		13.6	10.8	62.0	12.9		50.3		63.4		
LOS	D		B	B	E	B		D		E		
Approach Delay			14.0			18.7						
Approach LOS			B			B						
Queue Length 50th (ft)	37		171	77	131	296		105		126		
Queue Length 95th (ft)	m47		266	m104	208	366		148		202		
Internal Link Dist (ft)			258			609			737			400
Turn Bay Length (ft)	125			250	225			250		250		
Base Capacity (vph)	131		2001	895	292	2343		601		277		
Starvation Cap Reductn	0		145	0	0	0		0		0		
Spillback Cap Reductn	0		0	0	0	0		0		0		
Storage Cap Reductn	0		0	0	0	0		0		0		
Reduced v/c Ratio	0.38		0.82	0.40	0.61	0.56		0.48		0.62		

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 14 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 20.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 65.7%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 142: US 17 Bus. (Market St.) &



142: US 17 Bus. (Market St.) &  
 Build Alt. 7 Quad BC PM Peak



Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection: 4: Darlington Ave. & NB Independence Blvd.

Movement	WB
Directions Served	R
Maximum Queue (ft)	204
Average Queue (ft)	108
95th Queue (ft)	215
Link Distance (ft)	967
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: US 17 Bus. (Market St.) & Forest Hills Dr.

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	T	T	R	L	T	T	LR
Maximum Queue (ft)	433	462	53	180	400	426	305
Average Queue (ft)	229	243	11	76	226	261	145
95th Queue (ft)	397	405	36	130	362	371	236
Link Distance (ft)	988	988			918	918	889
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			300	300			
Storage Blk Time (%)		3			1		
Queuing Penalty (veh)		1			1		

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	65	171	172	217
Average Queue (ft)	8	55	62	74
95th Queue (ft)	33	82	131	171
Link Distance (ft)			916	811
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	300	300		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	23	167	234	177	222	218	48	240
Average Queue (ft)	1	69	105	52	57	79	20	77
95th Queue (ft)	7	136	206	117	144	166	49	170
Link Distance (ft)		719	719		516	516	900	747
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	100			300				
Storage Blk Time (%)		4						
Queuing Penalty (veh)		0						

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	NB	SB
Directions Served	TR	R	R
Maximum Queue (ft)	30	198	142
Average Queue (ft)	2	73	70
95th Queue (ft)	12	139	128
Link Distance (ft)	516	813	689
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: US 17 Bus. (Market St.) & N. 31st St.

Movement	WB	WB	WB	WB	SB
Directions Served	T	T	T	TR	R
Maximum Queue (ft)	158	223	355	395	244
Average Queue (ft)	59	73	173	186	110
95th Queue (ft)	134	154	303	323	228
Link Distance (ft)			390	390	583
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				1	
Storage Bay Dist (ft)	200	200			
Storage Blk Time (%)			4		
Queuing Penalty (veh)			37		



Intersection: 12: US 17 Bus. (Market St.) & Evans St.

Movement	EB	EB	WB	SB
Directions Served	T	T	TR	R
Maximum Queue (ft)	20	42	31	132
Average Queue (ft)	1	2	1	49
95th Queue (ft)	6	17	10	104
Link Distance (ft)	390	390	156	838
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 15: US 17 Bus. (Market St.) & Barclay Hills Dr.

Movement	SB
Directions Served	R
Maximum Queue (ft)	29
Average Queue (ft)	12
95th Queue (ft)	34
Link Distance (ft)	554
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 141: US 17 Bus. (Market St.) & Henry St.

Movement	WB	WB	WB	WB	SB
Directions Served	T	T	T	TR	R
Maximum Queue (ft)	31	72	122	162	88
Average Queue (ft)	2	8	13	26	33
95th Queue (ft)	15	43	61	98	62
Link Distance (ft)			282	282	700
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	125	125			
Storage Blk Time (%)			0		10
Queuing Penalty (veh)			1		0

Intersection: 142: US 17 Bus. (Market St.) &

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	U	T	T	R	L	T	T	L	L	R
Maximum Queue (ft)	40	216	202	154	249	519	368	242	193	220
Average Queue (ft)	8	97	115	60	101	214	178	115	105	120
95th Queue (ft)	25	157	177	125	170	363	287	197	177	213
Link Distance (ft)		282	282			619	619		754	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	125			250	225			250		250
Storage Blk Time (%)		1				2		0		
Queuing Penalty (veh)		0				4		0		

Intersection: 291: US 17 Bus. (Market St.) &

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	210	243	273	250	68	76	81	80	196	198	106	141
Average Queue (ft)	96	152	206	57	62	62	75	75	89	97	48	68
95th Queue (ft)	179	236	279	187	75	71	90	82	145	150	86	111
Link Distance (ft)	313	313	313		63	63	63	63		467		
Upstream Blk Time (%)					45	52	30	32				
Queuing Penalty (veh)					196	230	130	142				
Storage Bay Dist (ft)				225					250		250	250
Storage Blk Time (%)			3	0								
Queuing Penalty (veh)			6	0								

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	83	235	246	174	146	144	159	154	159	152	90	131
Average Queue (ft)	17	128	155	66	103	108	84	82	84	78	50	71
95th Queue (ft)	46	205	233	133	150	156	160	167	142	126	89	116
Link Distance (ft)	156	156	156	156	138	138	138	138		390		
Upstream Blk Time (%)		5	11	0	2	6	2	4				
Queuing Penalty (veh)		20	45	1	9	26	9	16				
Storage Bay Dist (ft)									225		225	225
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 4: Darlington Ave. & NB Independence Blvd.

Movement	WB
Directions Served	R
Maximum Queue (ft)	1003
Average Queue (ft)	927
95th Queue (ft)	1112
Link Distance (ft)	967
Upstream Blk Time (%)	76
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: US 17 Bus. (Market St.) & Forest Hills Dr.

Movement	EB	EB	EB	WB	WB	WB	NB
Directions Served	T	T	R	L	T	T	LR
Maximum Queue (ft)	418	416	325	226	275	353	235
Average Queue (ft)	253	281	19	116	121	163	133
95th Queue (ft)	392	422	117	189	254	313	215
Link Distance (ft)	988	988			918	918	889
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			300	300			
Storage Blk Time (%)		5					
Queuing Penalty (veh)		3					

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	L	TR	LTR	LTR
Maximum Queue (ft)	45	444	419	109	16	333	67
Average Queue (ft)	18	43	55	26	1	114	22
95th Queue (ft)	42	214	230	64	5	248	53
Link Distance (ft)		918	918		719	916	811
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	300			300			
Storage Blk Time (%)		0					
Queuing Penalty (veh)		0					

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	124	765	769	154	164	242	91	66
Average Queue (ft)	5	388	449	76	67	80	41	21
95th Queue (ft)	42	775	826	156	167	187	86	51
Link Distance (ft)		719	719		516	516	900	747
Upstream Blk Time (%)		2	3					
Queuing Penalty (veh)		16	24					
Storage Bay Dist (ft)	100			300				
Storage Blk Time (%)		29						
Queuing Penalty (veh)		5						

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	EB	WB	NB	SB
Directions Served	T	TR	TR	R	R
Maximum Queue (ft)	68	84	20	149	113
Average Queue (ft)	2	5	1	62	55
95th Queue (ft)	23	35	7	120	102
Link Distance (ft)	516	516	313	813	689
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 10: US 17 Bus. (Market St.) & N. 31st St.

Movement	WB	WB	WB	WB	SB
Directions Served	T	T	T	TR	R
Maximum Queue (ft)	111	103	203	306	51
Average Queue (ft)	43	46	61	73	21
95th Queue (ft)	102	102	162	192	46
Link Distance (ft)			390	390	583
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	200			
Storage Blk Time (%)			0		
Queuing Penalty (veh)			1		

Intersection: 12: US 17 Bus. (Market St.) & Evans St.

Movement	EB	EB	SB
Directions Served	T	T	R
Maximum Queue (ft)	58	276	69
Average Queue (ft)	4	19	34
95th Queue (ft)	26	110	67
Link Distance (ft)	390	390	838
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: US 17 Bus. (Market St.) & Barclay Hills Dr.

Movement	SB
Directions Served	R
Maximum Queue (ft)	29
Average Queue (ft)	9
95th Queue (ft)	30
Link Distance (ft)	554
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 141: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	WB	WB	WB	WB	SB
Directions Served	T	T	T	T	T	TR	R
Maximum Queue (ft)	248	253	119	107	51	27	50
Average Queue (ft)	11	10	20	30	3	1	17
95th Queue (ft)	88	87	82	90	20	9	44
Link Distance (ft)	138	138			282	282	700
Upstream Blk Time (%)	0	0					
Queuing Penalty (veh)	4	3					
Storage Bay Dist (ft)			125	125			
Storage Blk Time (%)			0	0			1
Queuing Penalty (veh)			0	0			0

**Intersection: 142: US 17 Bus. (Market St.) &**

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	U	T	T	R	L	T	T	L	L	R
Maximum Queue (ft)	149	366	350	274	249	254	266	157	155	219
Average Queue (ft)	36	188	194	135	121	154	136	89	82	122
95th Queue (ft)	108	299	291	244	221	267	257	140	128	208
Link Distance (ft)		282	282			619	619		754	
Upstream Blk Time (%)		4	2	0						
Queuing Penalty (veh)		32	16	0						
Storage Bay Dist (ft)	125			250	225			250		250
Storage Blk Time (%)	2	18	3	1		1				
Queuing Penalty (veh)	17	8	10	6		2				

**Intersection: 291: US 17 Bus. (Market St.) &**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	236	283	310	250	103	78	130	78	146	154	144	191
Average Queue (ft)	73	165	212	49	64	61	69	70	91	93	72	103
95th Queue (ft)	168	254	286	162	88	81	108	98	135	149	126	166
Link Distance (ft)	313	313	313		63	63	63	63		467		
Upstream Blk Time (%)			0		53	56	22	21				
Queuing Penalty (veh)			1		189	199	78	76				
Storage Bay Dist (ft)				225					250		250	250
Storage Blk Time (%)			2	0								
Queuing Penalty (veh)			6	0								

**Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps**

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	U	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	105	244	236	116	146	154	156	161	176	176	157	193
Average Queue (ft)	46	132	167	59	108	119	83	91	93	86	75	97
95th Queue (ft)	91	220	240	111	161	166	152	166	147	156	136	156
Link Distance (ft)	156	156	156	156	138	138	138	138		390		
Upstream Blk Time (%)		4	9		12	22	1	1				
Queuing Penalty (veh)		21	45		43	79	3	4				
Storage Bay Dist (ft)									225		225	225
Storage Blk Time (%)												
Queuing Penalty (veh)												

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information			Site Information					
Analyst		URS	Date Performed		2013			
Agency or Company			Analysis Year		2040 Build - Alt 7 BC Quadrant			
Project Description			U-4434 Independence Boulevard Extension					
<b>45</b>			<b>46</b>			<b>47</b>		
Independence Blvd. SB - to US 17 Bus.			Independence Blvd. NB - from US 17 Bus.			Independence Blvd. SB - from US 17 Bus.		
Merge/Diverge	Diverge		Merge/Diverge	Merge		Merge/Diverge	Merge	
No. of lanes on Freeway	2		No. of lanes on Freeway	2		No. of lanes on Freeway	2	
Freeway FFS	60	mph	Freeway FFS	60	mph	Freeway FFS	60	mph
Freeway Volume (AM/PM)	2877	2354	Freeway Volume (AM/PM)	1768	2218	Freeway Volume (AM/PM)	2213	1771
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	15	mph	Ramp FFS	15	mph	Ramp FFS	15	mph
Ramp Volume (AM/PM)	659	586	Ramp Volume (AM/PM)	586	659	Ramp Volume (AM/PM)	471	425
No. Lanes on Ramp	1		No. Lanes on Ramp	1		No. Lanes on Ramp	1	
Accel/Decel Distance 1	800	ft	Accel/Decel Distance 1	1440	ft	Accel/Decel Distance 1	1440	ft
Accel/Decel Distance 2	N/A		Accel/Decel Distance 2	N/A		Accel/Decel Distance 2	N/A	
Adjacent Upstream	Yes		Adjacent Upstream	Yes		Adjacent Upstream	Yes	
Off/On	On		Off/On	Off		Off/On	Off	
Distance	4590	ft	Distance	90	ft	Distance	90	ft
Truck %	4%		Truck %	3%		Truck %	3%	
Ramp Volume (AM/PM)	1628	1103	Ramp Volume (AM/PM)	425	471	Ramp Volume (AM/PM)	659	586
Adjacent Downstream	Yes		Adjacent Downstream	Yes		Adjacent Downstream	No	
Off/On	On - N/A		Off/On	Off		Off/On	N/A	
Distance	N/A		Distance	4930	ft	Distance	N/A	
Truck %	N/A		Truck %	4%		Truck %	N/A	
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	1103	1628	Ramp Volume (AM/PM)	N/A	N/A
Peak Hour Factor	0.90		Peak Hour Factor	0.90		Peak Hour Factor	0.90	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	1.00		Population Adj. Factor	1.00	
Freeway Truck %	4%		Freeway Truck %	4%		Freeway Truck %	4%	
Ramp Truck %	3%		Ramp Truck %	3%		Ramp Truck %	3%	
<b>48</b>								
Independence Blvd. NB - to Darlington								
Merge/Diverge	Diverge		Merge/Diverge	Diverge		Merge/Diverge	Diverge	
No. of lanes on Freeway	2		No. of lanes on Freeway	0		No. of lanes on Freeway	0	
Freeway FFS	60	mph	Freeway FFS	0	mph	Freeway FFS	0	mph
Freeway Volume (AM/PM)	2205	2695	Freeway Volume (AM/PM)	0	0	Freeway Volume (AM/PM)	0	0
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	15	mph	Ramp FFS	0	mph	Ramp FFS	0	mph
Ramp Volume (AM/PM)	99	133	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
No. Lanes on Ramp	1		No. Lanes on Ramp	0		No. Lanes on Ramp	0	
Accel/Decel Distance 1	800	ft	Accel/Decel Distance 1	0	ft	Accel/Decel Distance 1	0	ft
Accel/Decel Distance 2	N/A		Accel/Decel Distance 2	0		Accel/Decel Distance 2	0	
Adjacent Upstream	No		Adjacent Upstream	Yes		Adjacent Upstream	Yes	
Off/On	N/A		Off/On	On		Off/On	On	
Distance	N/A		Distance	0	ft	Distance	0	ft
Truck %	N/A		Truck %			Truck %		
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Adjacent Downstream	Yes		Adjacent Downstream	Yes		Adjacent Downstream	Yes	
Off/On	On - N/A		Off/On	On		Off/On	On	
Distance	N/A		Distance	0	ft	Distance	0	ft
Truck %	N/A		Truck %			Truck %		
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Peak Hour Factor	0.90		Peak Hour Factor	0.00		Peak Hour Factor	0.00	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	0.00		Population Adj. Factor	0.00	
Freeway Truck %	4%		Freeway Truck %	0%		Freeway Truck %	0%	
Ramp Truck %	2%		Ramp Truck %	0%		Ramp Truck %	0%	

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

## HIGHWAY CAPACITY SOFTWARE 2010 NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 7 BC Quadrant
Project Description	U-4434 Independence Boulevard Extension		

<p style="text-align: center; font-weight: bold; font-size: 1.2em;">49</p> <p>Independence Blvd. NB - Darlington to Market</p> <p>Sides (One or Two)                    One No. of Lanes                                3 Weaving Length, L<sub>s</sub>                    1720    ft Multi-Lane FFS                            60        mph Min. Speed (Def. = 15)                15        mph Segment Type                               Multi-Lane Terrain    Level</p> <p><b>AM Peak</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">→</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: right;">1684</td> <td style="text-align: center;">Truck</td> <td></td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: right;">87</td> <td style="text-align: center;">4 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: right;">403</td> <td style="text-align: center;">4 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">→</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: right;">22</td> <td style="text-align: center;">4 %</td> <td></td> </tr> </table> <p><b>PM Peak</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">→</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: right;">2134</td> <td style="text-align: center;">Truck</td> <td></td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: right;">79</td> <td style="text-align: center;">4 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: right;">451</td> <td style="text-align: center;">4 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">→</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: right;">20</td> <td style="text-align: center;">4 %</td> <td></td> </tr> </table> <p>Peak Hour Factor                            0.90 Driver Pop. Adj.                                1.00 Maneuver Lns., N<sub>WL</sub>                        2 Interchange Density                        3.00 Min. RF In. chng., LC<sub>RF</sub>                    1 Min. FR In. chng., LC<sub>FR</sub>                    1 Min. RR In. chng., LC<sub>RR</sub>                    N/A 20% of vehicles from Darlington exit onto Market</p>	F	→	F	V <sub>FF</sub>	1684	Truck		F	↘	F	V <sub>RF</sub>	87	4 %		R	↘	R	V <sub>FR</sub>	403	4 %		R	→	R	V <sub>RR</sub>	22	4 %		F	→	F	V <sub>FF</sub>	2134	Truck		F	↘	F	V <sub>RF</sub>	79	4 %		R	↘	R	V <sub>FR</sub>	451	4 %		R	→	R	V <sub>RR</sub>	20	4 %		<p>Sides (One or Two)                    One No. of Lanes                                0 Weaving Length, L<sub>s</sub>                    0        ft Freeway FFS                                0        mph Min. Speed (Def. = 15)                0        mph Segment Type                               Freeway Terrain    Rolling</p> <p><b>AM Peak</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">→</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">Truck</td> <td></td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">→</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> </table> <p><b>PM Peak</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">→</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">Truck</td> <td></td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">→</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> </table> <p>Peak Hour Factor                            0.00 Driver Pop. Adj.                                0.00 Maneuver Lns., N<sub>WL</sub>                        0 Interchange Density                        0.00 Min. RF In. chng., LC<sub>RF</sub>                    0 Min. FR In. chng., LC<sub>FR</sub>                    0 Min. RR In. chng., LC<sub>RR</sub>                    N/A (Place weaving % assumption here)</p>	F	→	F	V <sub>FF</sub>	0	Truck		F	↘	F	V <sub>RF</sub>	0	0 %		R	↘	R	V <sub>FR</sub>	0	0 %		R	→	R	V <sub>RR</sub>	0	0 %		F	→	F	V <sub>FF</sub>	0	Truck		F	↘	F	V <sub>RF</sub>	0	0 %		R	↘	R	V <sub>FR</sub>	0	0 %		R	→	R	V <sub>RR</sub>	0	0 %		<p>Sides (One or Two)                    One No. of Lanes                                0 Weaving Length, L<sub>s</sub>                    0        ft Freeway FFS                                0        mph Min. Speed (Def. = 15)                0        mph Segment Type                               Freeway Terrain    Rolling</p> <p><b>AM Peak</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">→</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">Truck</td> <td></td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">→</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> </table> <p><b>PM Peak</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">→</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>FF</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">Truck</td> <td></td> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">F</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">↘</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> <tr> <td style="text-align: center;">R</td> <td style="text-align: center;">→</td> <td style="text-align: center;">R</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: right;">0</td> <td style="text-align: center;">0 %</td> <td></td> </tr> </table> <p>Peak Hour Factor                            0.00 Driver Pop. 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# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

### General Information

### Site Information

Analyst URS

Date Performed 2012

Agency or Company

Analysis Year 2040 Build - Alt 7 BC Quadrant

Project Description

U-4434 Independence Boulevard Extension

<div style="text-align: right; margin-bottom: 10px;"><b>49</b></div> <p>Independence Blvd. NB - Darlington to Market  <u>Interchange</u>                      <u>No.</u>                      Darlington Ave.                      1                      Market St.                              1</p> <p style="margin-top: 200px;">Note: multi-lane only 0.67 mile long                      Interchange Density                      3.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="margin-top: 200px;">Note: freeway only 3.5 miles long                      Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="margin-top: 200px;">Interchange Density                      0.00 int/mi</p>
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**HIGHWAY CAPACITY SOFTWARE 2010  
NETWORK DATA SUMMARY - ANALYSIS NOTES**

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 7 BC Quadrant
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV %	Freeway Truck%			
	FR = DS ramp HV %	Off Ramp Truck %			
	RF = US ramp HV %	On Ramp Truck %			
	RR = DS ramp HV %	Off Ramp Truck %			

Level of Service Standards - Freeways	Level of Service Standards - Signalized Intersections
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004	LOS D or better for overall intersection required
	LOS D or better for individual movements recommended
	If not LOS D for individual movement - v/c ratio must be less than 0.85

**Assumed Improvements**

TIP No.	Description
U-3338	SR 1175 (Kerr Avenue) - widening, including new interchange at US 74

**General Analysis Notes**

- ▶ Interchange/Ramp Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

**Design Specific Analysis Notes**

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

**Locations where LOS D or better not achieved**

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**



## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 7 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 4590 ft V <sub>u</sub> = 1103 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> : 800 Freeway Volume, V <sub>F</sub> : 2354 Ramp Volume, V <sub>R</sub> : 586 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2354	0.90	Level	4	0	0.980	1.00	2668
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	1103	0.90	Level	4	0	0.980	1.00	1250
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 2668 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2668	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2007	Exhibit 13-8	4600 No
V <sub>R</sub>	661	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2668	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 20.0 (pc/mi/ln)  
 LOS = B (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.747 (Exhibit 13-12)  
 S<sub>R</sub> = 46.5 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 46.5 mph (Exhibit 13-13)



## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 7 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2218	$L_{down} =$ ft
$V_u =$ 471 veh/h	Ramp Volume, $V_R$	659	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2218	0.90	Level	4	0	0.980	1.00	2514
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	471	0.90	Level	3	0	0.985	1.00	531
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2514 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3257	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3257	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	
$D_R =$	21.5 (pc/mi/ln)
LOS =	C (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$	(pc/mi/ln)
LOS =	(Exhibit 13-2)

### Speed Determination

$M_S =$	0.379 (Exhibit 13-11)
$S_R =$	53.2 mph (Exhibit 13-11)
$S_0 =$	N/A mph (Exhibit 13-11)
$S =$	53.2 mph (Exhibit 13-13)

### Speed Determination

$D_s =$	(Exhibit 13-12)
$S_R =$	mph (Exhibit 13-12)
$S_0 =$	mph (Exhibit 13-12)
$S =$	mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 7 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2213	$L_{down} =$ ft
$V_u =$ 659 veh/h	Ramp Volume, $V_R$	471	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2213	0.90	Level	4	0	0.980	1.00	2508
Ramp	471	0.90	Level	3	0	0.985	1.00	531
UpStream	659	0.90	Level	3	0	0.985	1.00	743
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
(Equation 13-6 or 13-7)

$L_{EQ} =$  1.000 using Equation (Exhibit 13-6)

$P_{FM} =$  1.000 using Equation (Exhibit 13-6)

$V_{12} =$  2508 pc/h

$V_3$  or  $V_{av34} =$  0 pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
(Equation 13-12 or 13-13)

$L_{EQ} =$  using Equation (Exhibit 13-7)

$P_{FD} =$  using Equation (Exhibit 13-7)

$V_{12} =$  pc/h

$V_3$  or  $V_{av34} =$  pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3039	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
$V_{R12}$	3039	Exhibit 13-8	4600:All	No	$V_{12}$	Exhibit 13-8	

### Level of Service Determination (if not F)

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$  19.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$  (pc/mi/ln)

LOS = (Exhibit 13-2)

### Speed Determination

### Speed Determination

$M_S =$  0.359 (Exhibit 13-11)

$S_R =$  53.5 mph (Exhibit 13-11)

$S_0 =$  N/A mph (Exhibit 13-11)

$S =$  53.5 mph (Exhibit 13-13)

$D_s =$  (Exhibit 13-12)

$S_R =$  mph (Exhibit 13-12)

$S_0 =$  mph (Exhibit 13-12)

$S =$  mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 7 BC Quadrant
Project Description U-4434 Independence Boulevard Extension			

Inputs			
Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1771	$L_{down} =$ ft
$V_u =$ 586 veh/h	Ramp Volume, $V_R$	425	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1771	0.90	Level	4	0	0.980	1.00	2007
Ramp	425	0.90	Level	3	0	0.985	1.00	479
UpStream	586	0.90	Level	3	0	0.985	1.00	661
DownStream								

Merge Areas					Diverge Areas				
<b>Estimation of <math>v_{12}</math></b>					<b>Estimation of <math>v_{12}</math></b>				
$V_{12} = V_F (P_{FM})$					$V_{12} = V_R + (V_F - V_R)P_{FD}$				
$L_{EQ} =$ (Equation 13-6 or 13-7)					$L_{EQ} =$ (Equation 13-12 or 13-13)				
$P_{FM} =$ 1.000 using Equation (Exhibit 13-6)					$P_{FD} =$ using Equation (Exhibit 13-7)				
$V_{12} =$ 2007 pc/h					$V_{12} =$ pc/h				
$V_3$ or $V_{av34} =$ 0 pc/h (Equation 13-14 or 13-17)					$V_3$ or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)				
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				

Capacity Checks				Capacity Checks			
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2486	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area			
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
$V_{R12}$	2486	Exhibit 13-8	4600:All	No	$V_{12}$	Exhibit 13-8	

Level of Service Determination (if not F)				Level of Service Determination (if not F)			
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$			
$D_R =$ 15.6 (pc/mi/ln)				$D_R =$ (pc/mi/ln)			
LOS = B (Exhibit 13-2)				LOS = (Exhibit 13-2)			

Speed Determination		Speed Determination	
$M_S =$ 0.325 (Exhibit 13-11)		$D_s =$ (Exhibit 13-12)	
$S_R =$ 54.2 mph (Exhibit 13-11)		$S_R =$ mph (Exhibit 13-12)	
$S_0 =$ N/A mph (Exhibit 13-11)		$S_0 =$ mph (Exhibit 13-12)	
$S =$ 54.2 mph (Exhibit 13-13)		$S =$ mph (Exhibit 13-13)	



## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	to Darlington Ave
Date Performed	2013	Jurisdiction	Segment #48
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 7 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> =      ft  V <sub>u</sub> =      veh/h	Number of Lanes, N      2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 800 Freeway Volume, V <sub>F</sub> 2205 Ramp Volume, V <sub>R</sub> 99 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> =      ft  V <sub>D</sub> =      veh/h
--	--	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2205	0.90	Level	4	0	0.980	1.00	2499
Ramp	99	0.90	Level	2	0	0.990	1.00	111
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 2499 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2499	Exhibit 13-8 4600	No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2388	Exhibit 13-8 4600	No
V <sub>R</sub>	111	Exhibit 13-10 1800	No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2499	Exhibit 13-8 4400:All	No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 18.5 (pc/mi/ln)  
 LOS = B (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.698 (Exhibit 13-12)  
 S<sub>R</sub> = 47.4 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 47.4 mph (Exhibit 13-13)

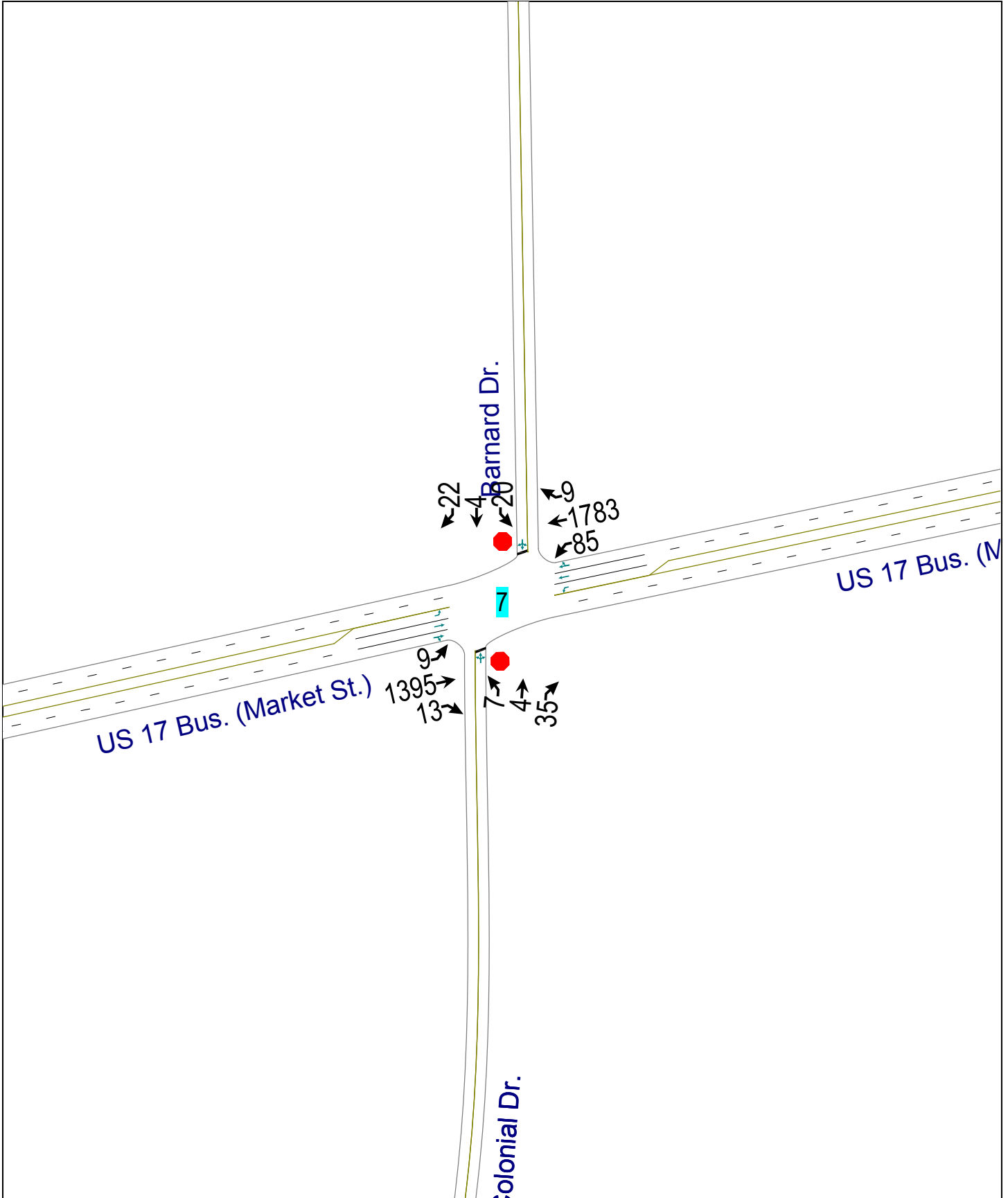


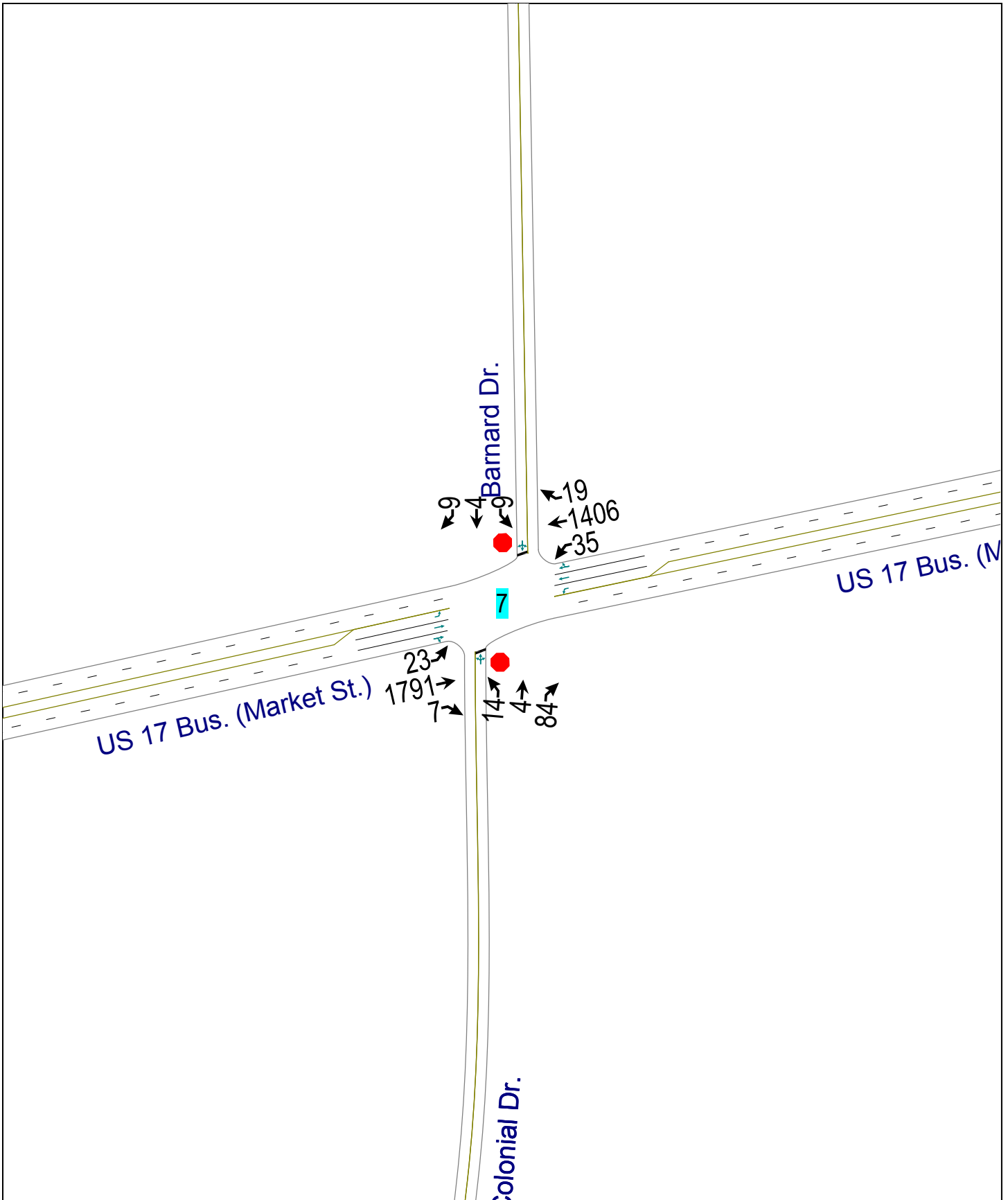
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 7 BC Quadrant			
Analysis Time Period	AM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1720ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	1684	0.90	4	0	1.5	1.2	0.980	1.00	1909
V <sub>RF</sub>	87	0.90	4	0	1.5	1.2	0.980	1.00	99
V <sub>FR</sub>	403	0.90	4	0	1.5	1.2	0.980	1.00	457
V <sub>RR</sub>	22	0.90	4	0	1.5	1.2	0.980	1.00	25
V <sub>NW</sub>	1934							V =	2490
V <sub>W</sub>	556								
VR	0.223								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	556 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	957 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	753 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1710 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	998			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	2490 pc/h				Weaving intensity factor, W	0.225			
Weaving segment capacity, c <sub>w</sub>	6076 veh/h				Weaving segment speed, S	52.0 mph			
Weaving segment v/c ratio	0.402				Average weaving speed, S <sub>W</sub>	51.7 mph			
Weaving segment density, D	16.0 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	52.0 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4776 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 7 BC Quadrant			
Analysis Time Period	PM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1720ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	2134	0.90	4	0	1.5	1.2	0.980	1.00	2419
V <sub>RF</sub>	79	0.90	4	0	1.5	1.2	0.980	1.00	90
V <sub>FR</sub>	451	0.90	4	0	1.5	1.2	0.980	1.00	511
V <sub>RR</sub>	21	0.90	4	0	1.5	1.2	0.980	1.00	24
V <sub>NW</sub>	2443							V =	3044
V <sub>W</sub>	601								
VR	0.197								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	601 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	1002 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	858 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1860 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	1261			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	3044 pc/h				Weaving intensity factor, W	0.240			
Weaving segment capacity, c <sub>w</sub>	6138 veh/h				Weaving segment speed, S	50.9 mph			
Weaving segment v/c ratio	0.486				Average weaving speed, S <sub>W</sub>	51.3 mph			
Weaving segment density, D	19.9 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	50.8 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4510 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

## Build Alternative 7, Tight Urban Diamond

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U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 11/28/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	1395	13	85	1783	9	7	4	35	20	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Flt Permitted	0.950			0.950				0.992			0.978	
Satd. Flow (perm)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		785			861			978			871	
Travel Time (s)		15.3			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1564	0	94	1991	0	0	51	0	0	50	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.0%
ICU Level of Service	C
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 7 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 11/28/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	1395	13	85	1783	9	7	4	35	20	4	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1550	14	94	1981	10	8	4	39	22	4	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1991			1564			2783	3757	782	3011	3759	996
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1991			1564			2783	3757	782	3011	3759	996
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			77			0	0	88	0	0	90
cM capacity (veh/h)	285			418			0	3	337	0	3	243

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	10	1033	531	94	1321	670	51	51
Volume Left	10	0	0	94	0	0	8	22
Volume Right	0	0	14	0	0	10	39	24
cSH	285	1700	1700	418	1700	1700	0	0
Volume to Capacity	0.04	0.61	0.31	0.23	0.78	0.39	Err	Err
Queue Length 95th (ft)	3	0	0	21	0	0	Err	Err
Control Delay (s)	18.1	0.0	0.0	16.1	0.0	0.0	Err	Err
Lane LOS	C			C			F	F
Approach Delay (s)	0.1			0.7			Err	Err
Approach LOS							F	F

Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1791	7	35	1406	19	14	4	84	9	4	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Flt Permitted	0.950			0.950				0.993			0.980	
Satd. Flow (perm)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		785			861			978			871	
Travel Time (s)		15.3			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1998	0	39	1583	0	0	113	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 7 TUDI PM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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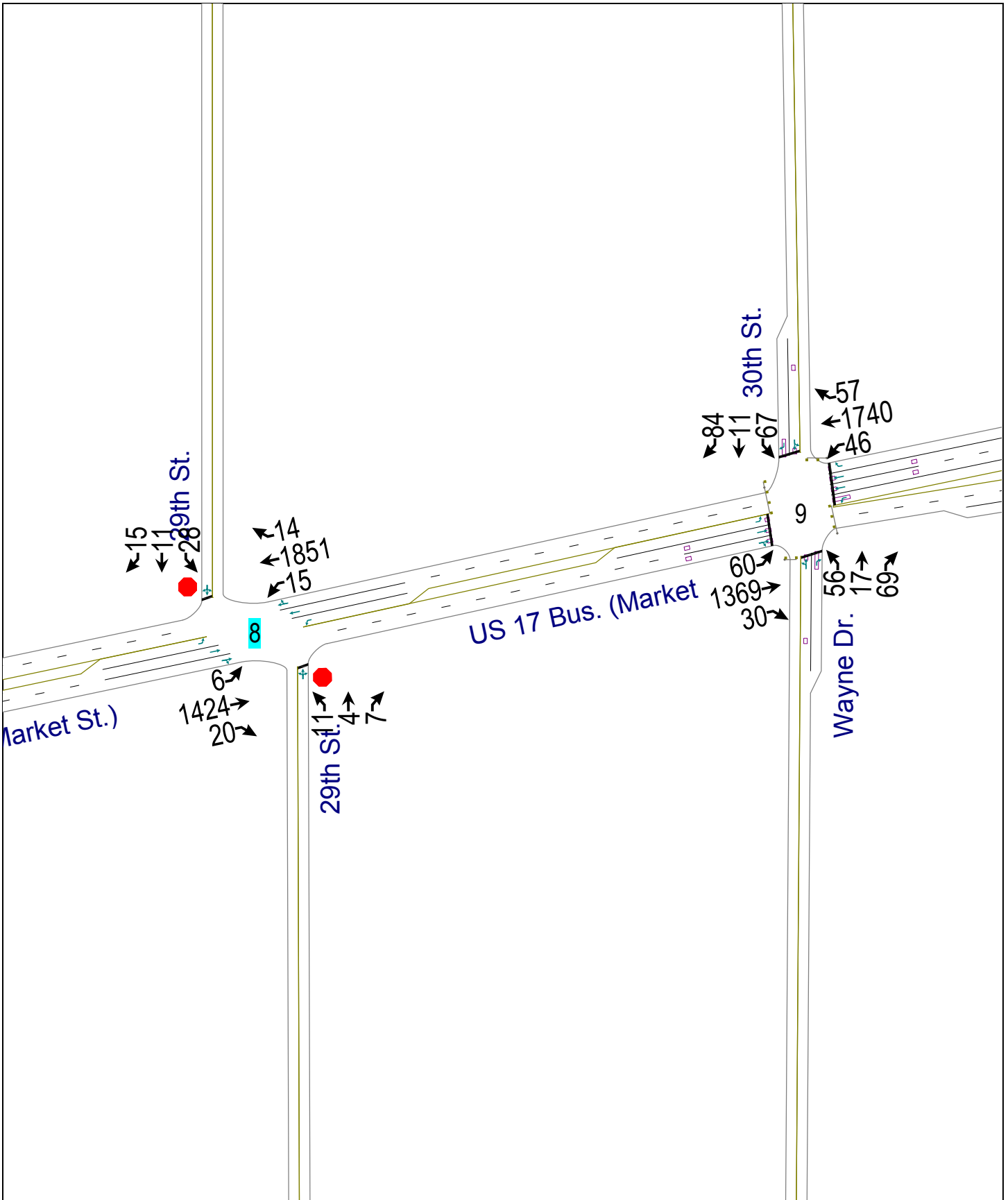
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	1791	7	35	1406	19	14	4	84	9	4	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	1990	8	39	1562	21	16	4	93	10	4	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1583			1998			2916	3706	999	2792	3699	792
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1583			1998			2916	3706	999	2792	3699	792
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			86			0	0	61	0	0	97
cM capacity (veh/h)	411			284			0	4	242	0	4	332

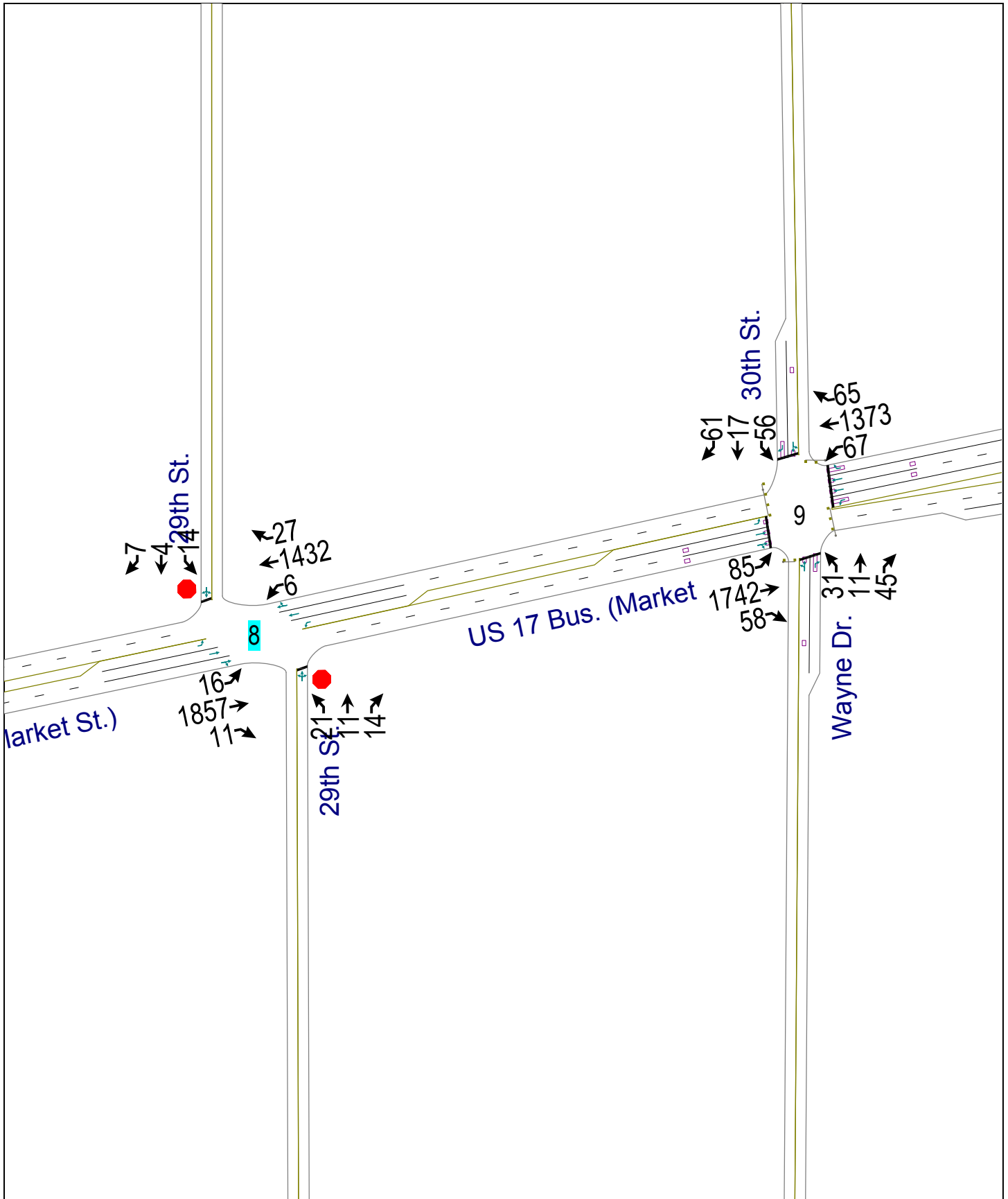
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	26	1327	671	39	1041	542	113	24
Volume Left	26	0	0	39	0	0	16	10
Volume Right	0	0	8	0	0	21	93	10
cSH	411	1700	1700	284	1700	1700	0	0
Volume to Capacity	0.06	0.78	0.39	0.14	0.61	0.32	Err	Err
Queue Length 95th (ft)	5	0	0	12	0	0	Err	Err
Control Delay (s)	14.3	0.0	0.0	19.7	0.0	0.0	Err	Err
Lane LOS	B			C			F	F
Approach Delay (s)	0.2			0.5			Err	Err
Approach LOS							F	F

Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization		62.9%	ICU Level of Service B
Analysis Period (min)		15	

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	1424	20	15	1851	14	11	4	7	28	11	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3532	0	1770	3536	0	0	1736	0	0	1730	0
Flt Permitted	0.950			0.950				0.976			0.975	
Satd. Flow (perm)	1770	3532	0	1770	3536	0	0	1736	0	0	1730	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		861			630			952			799	
Travel Time (s)		14.7			10.7			26.0			21.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1604	0	17	2073	0	0	24	0	0	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			48			48	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.1%
ICU Level of Service	B
Analysis Period (min)	15

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 7 TUDI AM Peak

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	1424	20	15	1851	14	11	4	7	28	11	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	1582	22	17	2057	16	12	4	8	31	12	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					630							
pX, platoon unblocked	0.56						0.56	0.56		0.56	0.56	0.56
vC, conflicting volume	2072			1604			2691	3712	802	2912	3716	1036
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1339			1604			2447	4275	802	2843	4281	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			0	0	98	0	0	97
cM capacity (veh/h)	285			404			0	1	327	0	1	604

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	7	1055	550	17	1371	701	24	60
Volume Left	7	0	0	17	0	0	12	31
Volume Right	0	0	22	0	0	16	8	17
cSH	285	1700	1700	404	1700	1700	0	0
Volume to Capacity	0.02	0.62	0.32	0.04	0.81	0.41	Err	Err
Queue Length 95th (ft)	2	0	0	3	0	0	Err	Err
Control Delay (s)	17.9	0.0	0.0	14.3	0.0	0.0	Err	Err
Lane LOS	C			B			F	F
Approach Delay (s)	0.1			0.1			Err	Err
Approach LOS							F	F

Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization		62.1%	ICU Level of Service
Analysis Period (min)		15	B

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	1857	11	6	1432	27	21	11	14	14	4	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3529	0	0	1745	0	0	1723	0
Flt Permitted	0.950			0.950				0.978			0.972	
Satd. Flow (perm)	1770	3536	0	1770	3529	0	0	1745	0	0	1723	0
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		861			630			952			799	
Travel Time (s)		14.7			10.7			26.0			21.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	2075	0	7	1621	0	0	51	0	0	28	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			48			48	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.7%
ICU Level of Service	B
Analysis Period (min)	15

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 7 TUDI PM Peak

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	1857	11	6	1432	27	21	11	14	14	4	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	2063	12	7	1591	30	23	12	16	16	4	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					630							
pX, platoon unblocked	0.73						0.73	0.73		0.73	0.73	0.73
vC, conflicting volume	1621			2076			2924	3739	1038	2708	3731	811
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1119			2076			2896	4009	1038	2602	3996	14
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			0	0	93	0	0	99
cM capacity (veh/h)	454			264			0	2	228	0	2	777

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	18	1376	700	7	1061	560	51	28
Volume Left	18	0	0	7	0	0	23	16
Volume Right	0	0	12	0	0	30	16	8
cSH	454	1700	1700	264	1700	1700	0	0
Volume to Capacity	0.04	0.81	0.41	0.03	0.62	0.33	Err	Err
Queue Length 95th (ft)	3	0	0	2	0	0	Err	Err
Control Delay (s)	13.2	0.0	0.0	19.0	0.0	0.0	Err	Err
Lane LOS	B			C			F	F
Approach Delay (s)	0.1			0.1			Err	Err
Approach LOS							F	F






















Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization		61.7%	ICU Level of Service B
Analysis Period (min)		15	

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 7 TUDI PM Peak

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	1369	30	46	1740	57	56	17	69	67	11	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	200		300	0		125	0		125
Storage Lanes	1		0	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3529	0	1770	3539	1583	0	1794	1583	0	1786	1583
Flt Permitted	0.950			0.950				0.695			0.694	
Satd. Flow (perm)	1770	3529	0	1770	3539	1583	0	1295	1583	0	1293	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			537			873			738	
Travel Time (s)		10.7			9.2			23.8			20.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	1554	0	51	1933	63	0	81	77	0	86	93
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			6			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Perm		pm+ov	Perm		pm+ov
Protected Phases	5	2		1	6			8	1		4	5
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	1	4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	15.0	86.0	0.0	14.0	85.0	85.0	20.0	20.0	14.0	20.0	20.0	15.0
Total Split (%)	12.5%	71.7%	0.0%	11.7%	70.8%	70.8%	16.7%	16.7%	11.7%	16.7%	16.7%	12.5%
Maximum Green (s)	8.0	79.0		7.0	78.0	78.0	13.0	13.0	7.0	13.0	13.0	8.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead		Lag	Lag	Lag			Lag			Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	9.9	89.2		9.0	84.5	84.5		13.4	24.6		13.4	25.5
Actuated g/C Ratio	0.08	0.74		0.08	0.70	0.70		0.11	0.20		0.11	0.21
v/c Ratio	0.46	0.59		0.38	0.78	0.06		0.56	0.24		0.59	0.28
Control Delay	63.0	10.7		52.1	9.6	5.2		65.3	39.4		67.4	39.6
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0	0.0		0.0	0.0

9: US 17 Bus. (Market St.) & 30th St.  
Build Alt. 7 TUDI AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	63.0	10.7		52.1	9.8	5.2		65.3	39.4		67.4	39.6
LOS	E	B		D	A	A		E	D		E	D
Approach Delay		12.9			10.7			52.7			53.0	
Approach LOS		B			B			D			D	
Queue Length 50th (ft)	50	335		39	297	11		59	48		63	58
Queue Length 95th (ft)	99	403		m58	352	m18		113	91		119	105
Internal Link Dist (ft)		550			457			793			658	
Turn Bay Length (ft)	175			200		300			125			125
Base Capacity (vph)	149	2624		133	2492	1115		162	324		162	338
Starvation Cap Reductn	0	0		0	88	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.45	0.59		0.38	0.80	0.06		0.50	0.24		0.53	0.28

**Intersection Summary**






















Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 15.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 72.3%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: US 17 Bus. (Market St.) & 30th St.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1742	58	67	1373	65	31	11	45	56	17	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	200		300	0		125	0		125
Storage Lanes	1		0	1		1	0		1	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3522	0	1770	3539	1583	0	1796	1583	0	1794	1583
Flt Permitted	0.950			0.950				0.722			0.746	
Satd. Flow (perm)	1770	3522	0	1770	3539	1583	0	1345	1583	0	1390	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			537			873			738	
Travel Time (s)		10.7			9.2			23.8			20.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	2000	0	74	1526	72	0	46	50	0	81	68
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			6			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot			Prot		Perm	Perm		pm+ov	Perm		pm+ov
Protected Phases	5	2		1	6			8	1		4	5
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	1	4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	19.0		14.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	17.0	87.0	0.0	14.0	84.0	84.0	19.0	19.0	14.0	19.0	19.0	17.0
Total Split (%)	14.2%	72.5%	0.0%	11.7%	70.0%	70.0%	15.8%	15.8%	11.7%	15.8%	15.8%	14.2%
Maximum Green (s)	10.0	80.0		7.0	77.0	77.0	12.0	12.0	7.0	12.0	12.0	10.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead		Lag	Lead	Lead			Lag			Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	11.4	90.0		9.0	83.7	83.7		12.6	23.8		12.6	26.3
Actuated g/C Ratio	0.10	0.75		0.08	0.70	0.70		0.10	0.20		0.10	0.22
v/c Ratio	0.56	0.76		0.56	0.62	0.07		0.32	0.16		0.55	0.20
Control Delay	64.8	14.3		69.1	6.1	4.1		55.5	38.2		65.4	37.0
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0	0.0		0.0	0.0

9: US 17 Bus. (Market St.) & 30th St.  
Build Alt. 7 TUDI PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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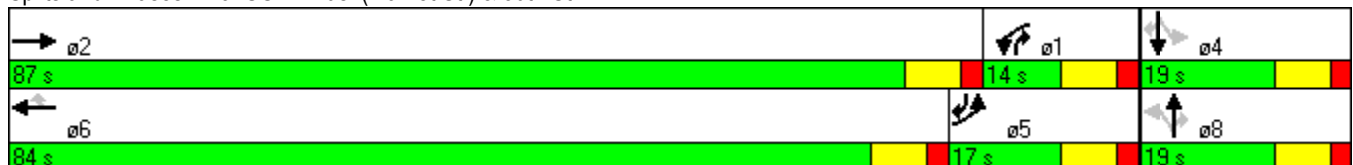


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	64.8	14.3		69.1	6.2	4.1		55.5	38.2		65.4	37.0
LOS	E	B		E	A	A		E	D		E	D
Approach Delay		16.6			8.9			46.5			52.4	
Approach LOS		B			A			D			D	
Queue Length 50th (ft)	70	542		61	161	14		33	31		60	41
Queue Length 95th (ft)	127	655		m#116	186	m23		72	66		113	80
Internal Link Dist (ft)		550			457			793			658	
Turn Bay Length (ft)	175			200		300			125			125
Base Capacity (vph)	177	2641		133	2470	1105		157	314		162	354
Starvation Cap Reductn	0	0		0	123	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.53	0.76		0.56	0.65	0.07		0.29	0.16		0.50	0.19

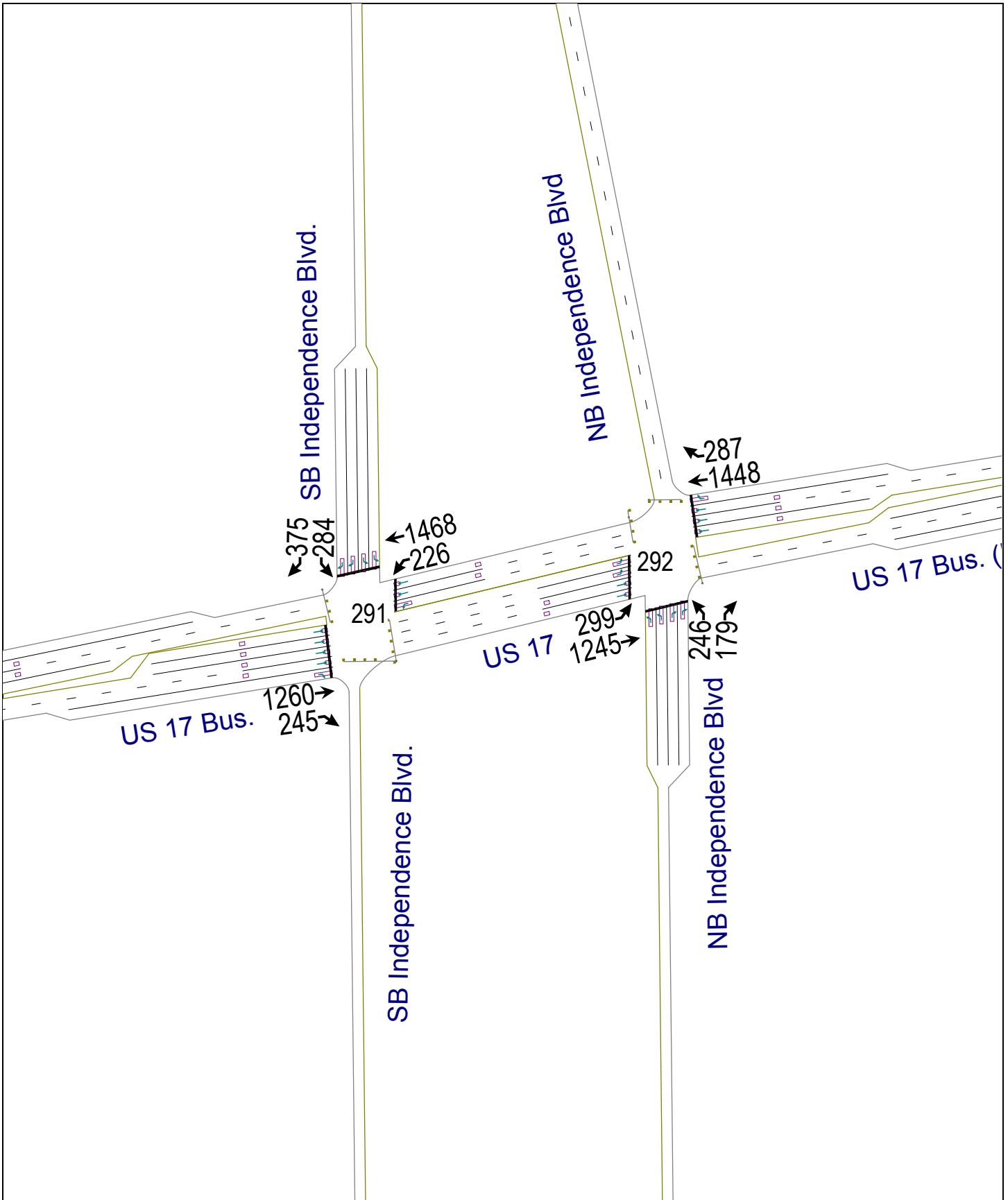
Intersection Summary

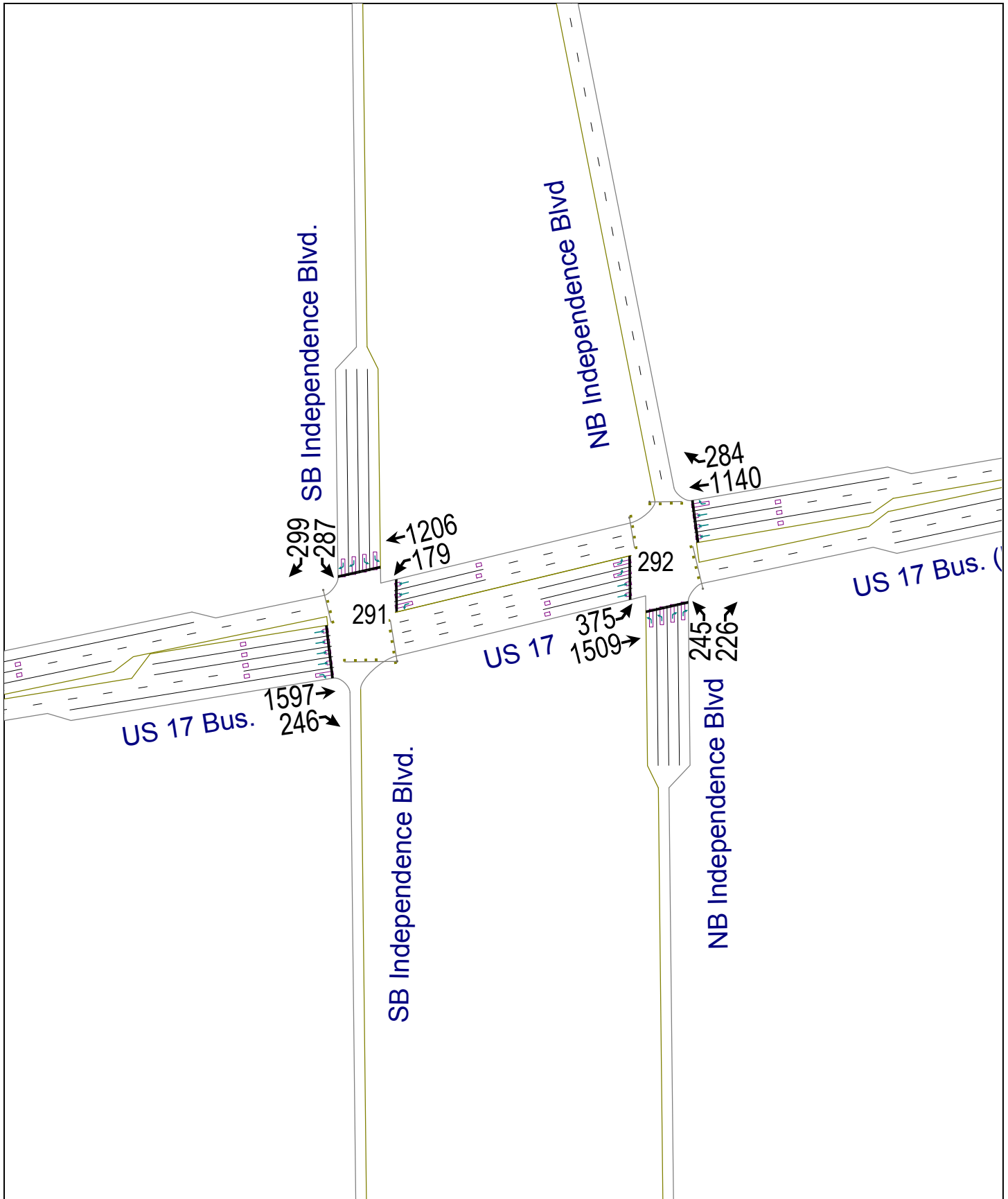
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 94 (78%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76  
 Intersection Signal Delay: 15.4 Intersection LOS: B  
 Intersection Capacity Utilization 79.0% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: US 17 Bus. (Market St.) & 30th St.



9: US 17 Bus. (Market St.) & 30th St.  
 Build Alt. 7 TUDI PM Peak







U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↖↗		↗↖
Volume (vph)	0	1260	245	226	1468	0	0	0	0	284	0	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		300	0		0	0		0	225		225
Storage Lanes	2		1	0		0	0		0	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	6408	1583	1752	3505	0	0	0	0	3400	0	2760
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1752	3505	0	0	0	0	3400	0	2760
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			30				45
Link Distance (ft)		537			327			881				961
Travel Time (s)		9.2			5.6			20.0				14.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	3%	3%	0%	0%	0%	0%	3%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1400	272	251	1631	0	0	0	0	316	0	417
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Right
Median Width(ft)		12			12			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	Prot						Prot		custom
Protected Phases		2		1	6					4		4
Permitted Phases			2									
Detector Phase		2	2	1	6					4		4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0		7.0
Minimum Split (s)		19.0	19.0	14.0	19.0					14.0		14.0
Total Split (s)	0.0	49.0	49.0	36.0	85.0	0.0	0.0	0.0	0.0	35.0	0.0	35.0
Total Split (%)	0.0%	40.8%	40.8%	30.0%	70.8%	0.0%	0.0%	0.0%	0.0%	29.2%	0.0%	29.2%
Maximum Green (s)		42.0	42.0	29.0	78.0					28.0		28.0
Yellow Time (s)		5.0	5.0	5.0	5.0					5.0		5.0
All-Red Time (s)		2.0	2.0	2.0	2.0					2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	5.0	2.0	5.0
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		C-Max	C-Max	None	C-Max					None		None
Act Effct Green (s)		48.8	48.8	31.0	84.8					25.2		25.2
Actuated g/C Ratio		0.41	0.41	0.26	0.71					0.21		0.21
v/c Ratio		0.54	0.42	0.55	0.66					0.44		0.72
Control Delay		20.8	21.1	31.3	6.8					42.7		51.3
Queue Delay		0.0	0.0	2.5	0.1					0.0		0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd.  
Build Alt. 7 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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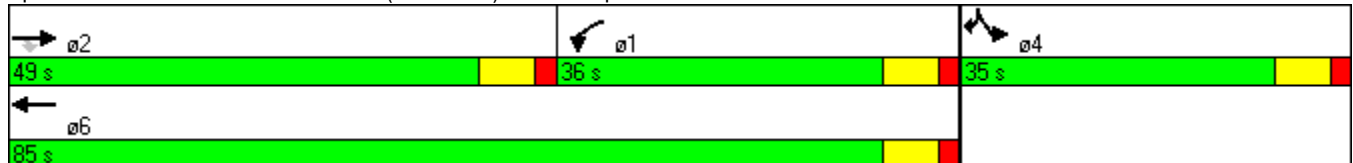


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		20.8	21.1	33.8	6.9					42.7		51.3
LOS		C	C	C	A					D		D
Approach Delay		20.9			10.5							
Approach LOS		C			B							
Queue Length 50th (ft)		126	85	161	120					110		172
Queue Length 95th (ft)		187	154	241	151					147		223
Internal Link Dist (ft)		457			247			801			881	
Turn Bay Length (ft)			300							225		225
Base Capacity (vph)		2608	644	453	2478					850		690
Starvation Cap Reductn		0	0	107	152					0		0
Spillback Cap Reductn		63	0	0	14					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.55	0.42	0.73	0.70					0.37		0.60

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 106 (88%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 20.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 62.0%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd.



291: US 17 Bus. (Market St.) & SB Independence Blvd.  
 Build Alt. 7 TUDI AM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑					↖↗		↗↖
Volume (vph)	0	1597	246	179	1206	0	0	0	0	287	0	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		300	0		0	0		0	225		225
Storage Lanes	2		1	0		0	0		0	1		2
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	6408	1583	1752	3505	0	0	0	0	3400	0	2760
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	6408	1583	1752	3505	0	0	0	0	3400	0	2760
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			30				45
Link Distance (ft)		537			327			881				961
Travel Time (s)		9.2			5.6			20.0				14.6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	3%	3%	0%	0%	0%	0%	3%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1774	273	199	1340	0	0	0	0	319	0	332
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Right
Median Width(ft)		12			12			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type			Perm	Prot						Prot		custom
Protected Phases		2		1	6					4		4
Permitted Phases			2									
Detector Phase		2	2	1	6					4		4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	12.0					7.0		7.0
Minimum Split (s)		19.0	19.0	14.0	19.0					14.0		14.0
Total Split (s)	0.0	57.0	57.0	32.0	89.0	0.0	0.0	0.0	0.0	31.0	0.0	31.0
Total Split (%)	0.0%	47.5%	47.5%	26.7%	74.2%	0.0%	0.0%	0.0%	0.0%	25.8%	0.0%	25.8%
Maximum Green (s)		50.0	50.0	25.0	82.0					24.0		24.0
Yellow Time (s)		5.0	5.0	5.0	5.0					5.0		5.0
All-Red Time (s)		2.0	2.0	2.0	2.0					2.0		2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	5.0	2.0	5.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode		C-Max	C-Max	None	C-Max					None		None
Act Effct Green (s)		62.7	62.7	20.8	88.4					21.6		21.6
Actuated g/C Ratio		0.52	0.52	0.17	0.74					0.18		0.18
v/c Ratio		0.53	0.33	0.66	0.52					0.52		0.67
Control Delay		11.1	9.9	74.2	1.8					47.2		52.5
Queue Delay		0.1	0.0	0.8	0.1					0.0		0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd.  
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U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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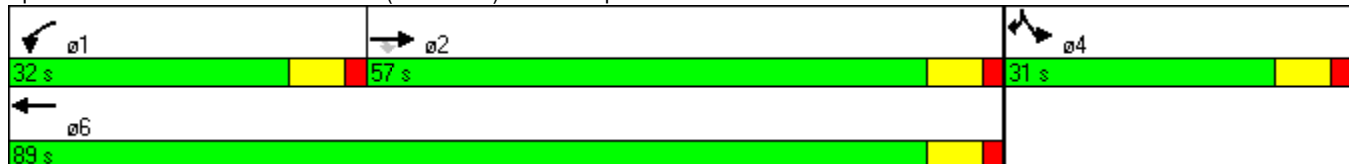


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		11.2	9.9	75.0	2.0					47.2		52.5
LOS		B	A	E	A					D		D
Approach Delay		11.0			11.4							
Approach LOS		B			B							
Queue Length 50th (ft)		168	67	158	29					116		137
Queue Length 95th (ft)		267	m145	212	33					155		184
Internal Link Dist (ft)		457			247			801			881	
Turn Bay Length (ft)			300							225		225
Base Capacity (vph)		3347	827	394	2583					737		598
Starvation Cap Reductn		534	0	52	307					0		0
Spillback Cap Reductn		161	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.63	0.33	0.58	0.59					0.43		0.56

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 8 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 17.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 58.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd.



291: US 17 Bus. (Market St.) & SB Independence Blvd.  
 Build Alt. 7 TUDI PM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘	↑↑			↑↑↑	↗	↗↘		↗↘			
Volume (vph)	299	1245	0	0	1448	287	246	0	179	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		225	175		175	0		0
Storage Lanes	0		0	1		1	1		2	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	0	0	5036	1568	3400	0	2760	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3400	3505	0	0	5036	1568	3400	0	2760	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			45				30
Link Distance (ft)		327			626			920				889
Travel Time (s)		5.6			10.7			13.9				20.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	0%	0%	3%	3%	3%	0%	3%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	332	1383	0	0	1609	319	273	0	199	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8		8			
Permitted Phases						6						
Detector Phase	5	2			6	6	8		8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0		7.0			
Minimum Split (s)	14.0	19.0			19.0	19.0	14.0		14.0			
Total Split (s)	29.0	96.0	0.0	0.0	67.0	67.0	24.0	0.0	24.0	0.0	0.0	0.0
Total Split (%)	24.2%	80.0%	0.0%	0.0%	55.8%	55.8%	20.0%	0.0%	20.0%	0.0%	0.0%	0.0%
Maximum Green (s)	22.0	89.0			60.0	60.0	17.0		17.0			
Yellow Time (s)	5.0	5.0			5.0	5.0	5.0		5.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0			
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	2.0	5.0	5.0	5.0	2.0	5.0	2.0	2.0	2.0
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Recall Mode	None	C-Max			C-Max	C-Max	None		None			
Act Effct Green (s)	18.9	93.5			69.6	69.6	16.5		16.5			
Actuated g/C Ratio	0.16	0.78			0.58	0.58	0.14		0.14			
v/c Ratio	0.62	0.51			0.55	0.35	0.58		0.52			
Control Delay	62.8	6.5			6.5	6.0	53.5		52.9			
Queue Delay	0.0	0.8			0.2	0.0	0.0		0.0			

292: US 17 Bus. (Market St.) & NB Independence Blvd  
Build Alt. 7 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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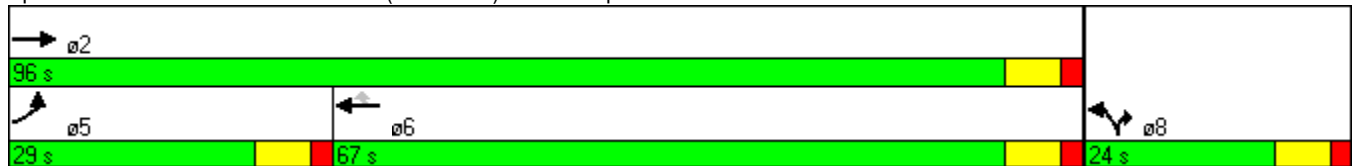


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	62.8	7.3			6.8	6.0	53.5		52.9			
LOS	E	A			A	A	D		D			
Approach Delay		18.1			6.6							
Approach LOS		B			A							
Queue Length 50th (ft)	111	107			116	63	103		82			
Queue Length 95th (ft)	146	152			197	m91	145		122			
Internal Link Dist (ft)		247			546			840			809	
Turn Bay Length (ft)						225	175		175			
Base Capacity (vph)	680	2731			2921	909	538		437			
Starvation Cap Reductn	0	946			487	0	0		0			
Spillback Cap Reductn	0	6			50	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.49	0.77			0.66	0.35	0.51		0.46			

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 6 (5%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.62  
 Intersection Signal Delay: 16.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 62.0%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd



292: US 17 Bus. (Market St.) & NB Independence Blvd  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑			↑↑↑	↖	↖↗		↖↗			
Volume (vph)	375	1509	0	0	1140	284	245	0	226	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		225	175		175	0		0
Storage Lanes	0		0	1		1	1		2	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	3400	3505	0	0	5036	1568	3400	0	2760	0	0	0
Flt Permitted	0.950						0.950					
Satd. Flow (perm)	3400	3505	0	0	5036	1568	3400	0	2760	0	0	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			45				30
Link Distance (ft)		327			626			920				889
Travel Time (s)		5.6			10.7			13.9				20.2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	0%	0%	3%	3%	3%	0%	3%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	417	1677	0	0	1267	316	272	0	251	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	R NA	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot					Perm	Prot		custom			
Protected Phases	5	2			6		8		8			
Permitted Phases						6						
Detector Phase	5	2			6	6	8		8			
Switch Phase												
Minimum Initial (s)	7.0	12.0			12.0	12.0	7.0		7.0			
Minimum Split (s)	14.0	19.0			19.0	19.0	14.0		14.0			
Total Split (s)	33.0	94.0	0.0	0.0	61.0	61.0	26.0	0.0	26.0	0.0	0.0	0.0
Total Split (%)	27.5%	78.3%	0.0%	0.0%	50.8%	50.8%	21.7%	0.0%	21.7%	0.0%	0.0%	0.0%
Maximum Green (s)	26.0	87.0			54.0	54.0	19.0		19.0			
Yellow Time (s)	5.0	5.0			5.0	5.0	5.0		5.0			
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0			
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	2.0	5.0	5.0	5.0	2.0	5.0	2.0	2.0	2.0
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Recall Mode	None	C-Max			C-Max	C-Max	None		None			
Act Effct Green (s)	28.0	92.2			59.2	59.2	17.8		17.8			
Actuated g/C Ratio	0.23	0.77			0.49	0.49	0.15		0.15			
v/c Ratio	0.53	0.62			0.51	0.41	0.54		0.62			
Control Delay	32.7	5.4			7.6	7.4	51.1		54.3			
Queue Delay	1.4	0.2			0.0	0.0	0.0		0.0			

292: US 17 Bus. (Market St.) & NB Independence Blvd  
Build Alt. 7 TUDI PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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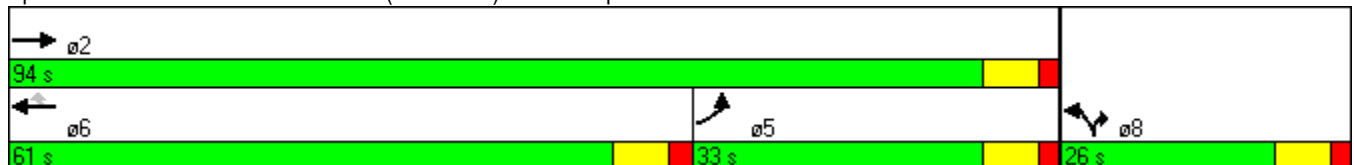


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	34.1	5.6			7.6	7.4	51.1		54.3			
LOS	C	A			A	A	D		D			
Approach Delay		11.3			7.6							
Approach LOS		B			A							
Queue Length 50th (ft)	146	173			81	56	101		104			
Queue Length 95th (ft)	205	247			136	108	142		149			
Internal Link Dist (ft)		247			546			840			809	
Turn Bay Length (ft)						225	175		175			
Base Capacity (vph)	793	2694			2486	774	595		483			
Starvation Cap Reductn	204	265			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.71	0.69			0.51	0.41	0.46		0.52			

Intersection Summary

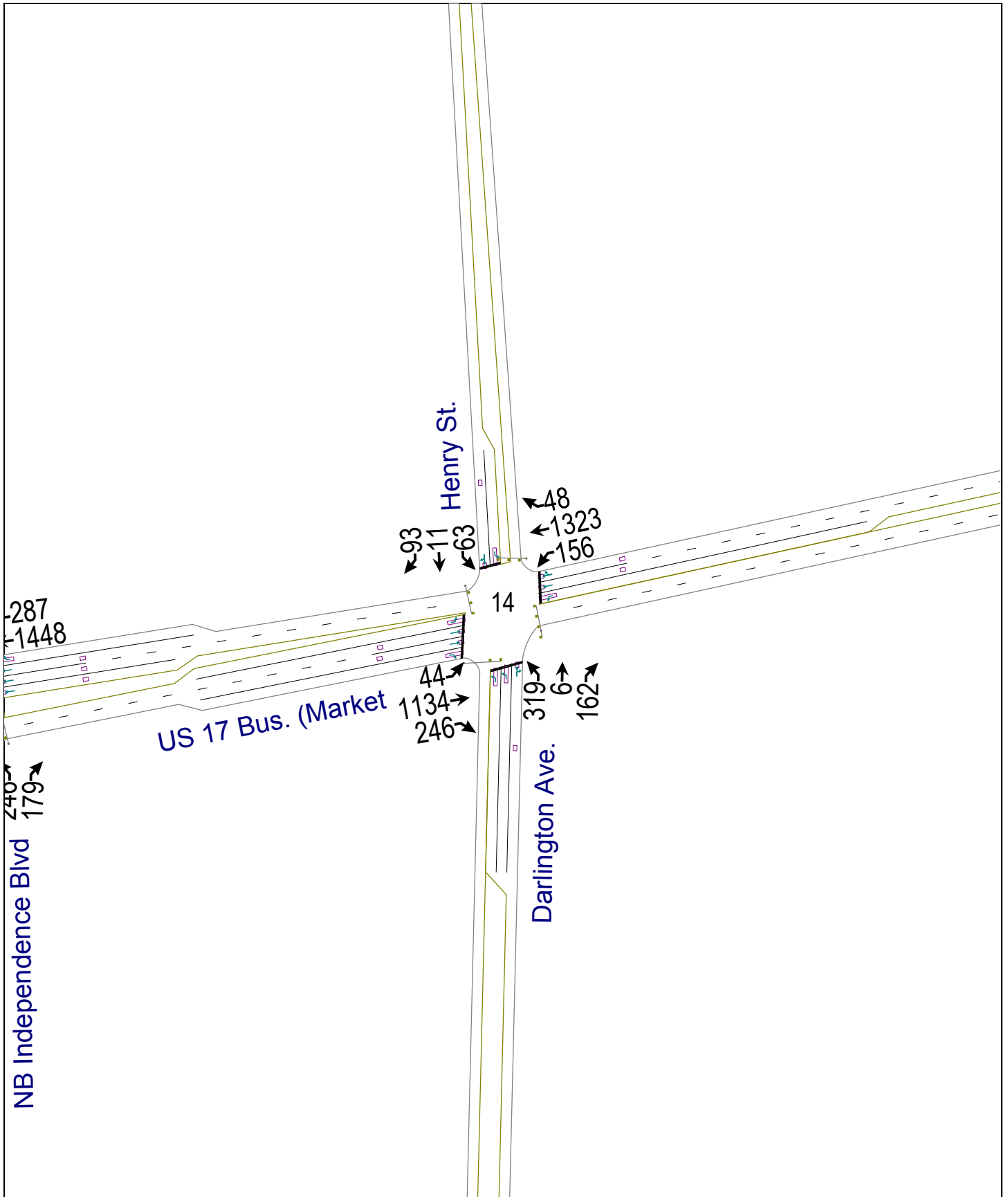
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.62  
 Intersection Signal Delay: 15.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 58.0%  
 ICU Level of Service B  
 Analysis Period (min) 15

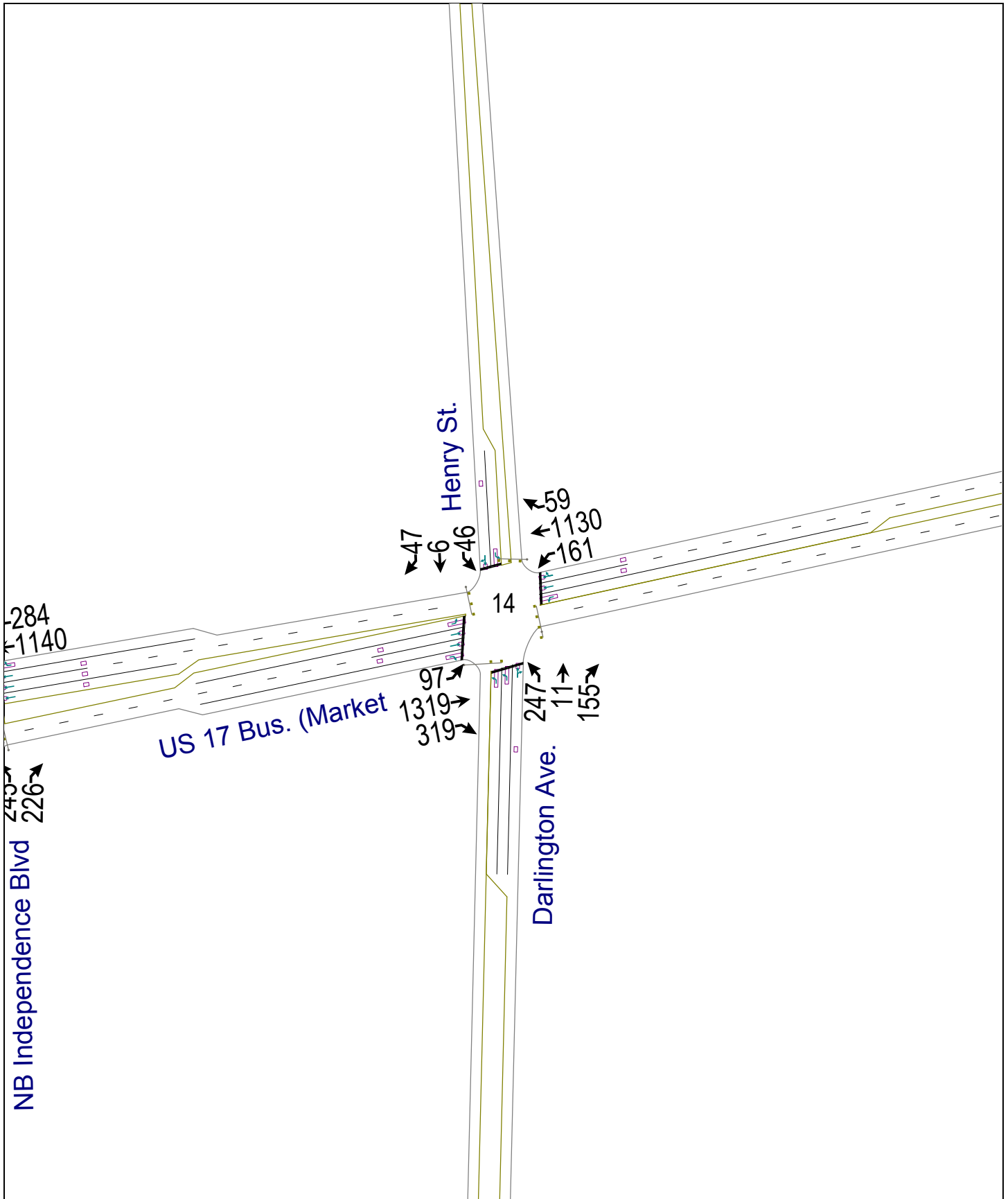
Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd



292: US 17 Bus. (Market St.) & NB Independence Blvd  
 Build Alt. 7 TUDI PM Peak







U-4434 Independence Blvd.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	1134	246	156	1323	48	319	6	162	63	11	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	375		0	225		0	125		0
Storage Lanes	1		1	1		0	2		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3505	1568	1752	3487	0	3433	1595	0	1752	1597	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	3505	1568	1752	3487	0	3433	1595	0	1752	1597	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		626			1024			915			767	
Travel Time (s)		10.7			17.5			25.0			20.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	1260	273	173	1523	0	354	187	0	70	115	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		12			-6			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot			Split			Split		
Protected Phases	5	2	8	1	6		8	8		4	4	
Permitted Phases			2									
Detector Phase	5	2	8	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	58.0	24.0	21.0	65.0	0.0	24.0	24.0	0.0	17.0	17.0	0.0
Total Split (%)	11.7%	48.3%	20.0%	17.5%	54.2%	0.0%	20.0%	20.0%	0.0%	14.2%	14.2%	0.0%
Maximum Green (s)	7.0	51.0	17.0	14.0	58.0		17.0	17.0		10.0	10.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lead		Lag	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	None	None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	54.3	77.7	15.5	63.6		18.4	18.4		11.8	11.8	
Actuated g/C Ratio	0.08	0.45	0.65	0.13	0.53		0.15	0.15		0.10	0.10	
v/c Ratio	0.37	0.79	0.27	0.77	0.82		0.67	0.76		0.41	0.73	
Control Delay	58.5	12.1	1.1	72.4	29.5		54.8	69.2		58.4	79.1	
Queue Delay	0.0	0.3	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

14: US 17 Bus. (Market St.) & Henry St.  
Build Alt. 7 TUDI AM Peak

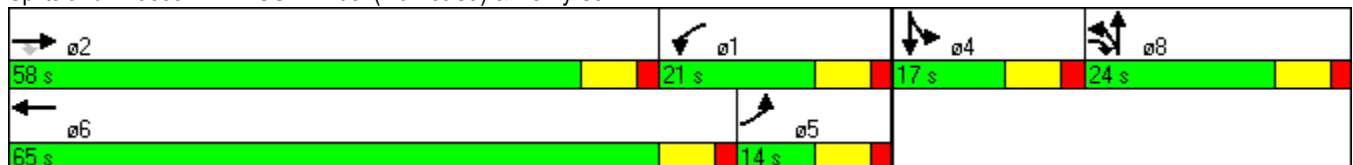


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	58.5	12.4	1.1	72.4	29.5		54.8	69.2		58.4	79.1	
LOS	E	B	A	E	C		D	E		E	E	
Approach Delay		11.9			33.9			59.8			71.2	
Approach LOS		B			C			E			E	
Queue Length 50th (ft)	41	299	2	131	534		134	140		52	88	
Queue Length 95th (ft)	m82	213	10	#236	645		186	#246		100	#179	
Internal Link Dist (ft)		546			944			835			687	
Turn Bay Length (ft)	300		300	375			225			125		
Base Capacity (vph)	131	1587	1010	234	1849		544	253		175	160	
Starvation Cap Reductn	0	58	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.37	0.82	0.27	0.74	0.82		0.65	0.74		0.40	0.72	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 114 (95%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 30.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 76.8%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: US 17 Bus. (Market St.) & Henry St.



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	97	1319	319	161	1130	59	247	11	155	46	6	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	375		0	225		0	125		0
Storage Lanes	1		1	1		0	2		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1752	3505	1568	1752	3480	0	3433	1602	0	1752	1601	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1752	3505	1568	1752	3480	0	3433	1602	0	1752	1601	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		40			40			25				25
Link Distance (ft)		626			1024			915				767
Travel Time (s)		10.7			17.5			25.0				20.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	108	1466	354	179	1322	0	274	184	0	51	59	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24				24
Link Offset(ft)		12			-6			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		pm+ov	Prot			Split			Split		
Protected Phases	5	2	8	1	6		8	8		4	4	
Permitted Phases			2									
Detector Phase	5	2	8	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0	14.0	14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	19.0	62.0	23.0	21.0	64.0	0.0	23.0	23.0	0.0	14.0	14.0	0.0
Total Split (%)	15.8%	51.7%	19.2%	17.5%	53.3%	0.0%	19.2%	19.2%	0.0%	11.7%	11.7%	0.0%
Maximum Green (s)	12.0	55.0	16.0	14.0	57.0		16.0	16.0		7.0	7.0	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max	None	None	C-Max		None	None		None	None	
Act Effct Green (s)	14.0	60.7	79.2	15.6	62.3		17.5	17.5		9.0	9.0	
Actuated g/C Ratio	0.12	0.51	0.66	0.13	0.52		0.15	0.15		0.08	0.08	
v/c Ratio	0.53	0.83	0.34	0.79	0.73		0.55	0.79		0.39	0.49	
Control Delay	53.0	24.9	5.6	74.6	26.4		52.0	73.0		62.1	67.8	
Queue Delay	0.0	0.7	0.0	0.0	0.0		0.0	0.0		0.0	0.0	

14: US 17 Bus. (Market St.) & Henry St.  
Build Alt. 7 TUDI PM Peak

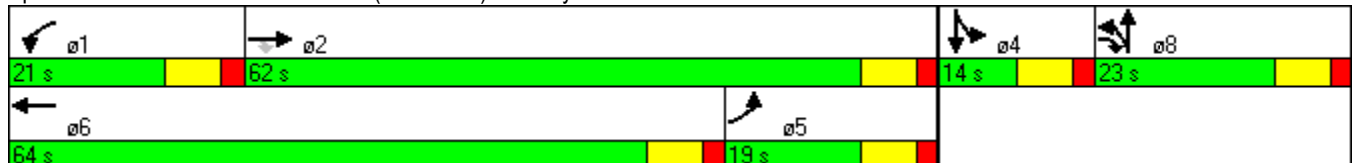


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	53.0	25.6	5.6	74.6	26.4		52.0	73.0		62.1	67.8	
LOS	D	C	A	E	C		D	E		E	E	
Approach Delay		23.5			32.2			60.4			65.2	
Approach LOS		C			C			E			E	
Queue Length 50th (ft)	74	241	38	136	428		102	139		38	45	
Queue Length 95th (ft)	m128	475	124	#247	521		147	#250		81	90	
Internal Link Dist (ft)		546			944			835			687	
Turn Bay Length (ft)	300		300	375			225			125		
Base Capacity (vph)	204	1774	1042	234	1806		515	240		131	120	
Starvation Cap Reductn	0	96	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.53	0.87	0.34	0.76	0.73		0.53	0.77		0.39	0.49	

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 32.1 Intersection LOS: C  
 Intersection Capacity Utilization 78.0% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: US 17 Bus. (Market St.) & Henry St.



Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	WB	WB	WB	NB	SB
Directions Served	L	L	T	TR	LTR	LTR
Maximum Queue (ft)	23	124	738	730	932	827
Average Queue (ft)	8	81	178	177	563	576
95th Queue (ft)	24	84	628	626	1025	952
Link Distance (ft)			716	716	917	812
Upstream Blk Time (%)			1	1	22	33
Queuing Penalty (veh)			11	6	0	0
Storage Bay Dist (ft)	100	100				
Storage Blk Time (%)		33				
Queuing Penalty (veh)		294				

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	WB	WB	WB	NB	SB
Directions Served	L	L	T	TR	LTR	LTR
Maximum Queue (ft)	1	25	145	223	242	768
Average Queue (ft)	0	1	8	9	164	490
95th Queue (ft)	1	8	54	77	250	840
Link Distance (ft)			515	515	906	753
Upstream Blk Time (%)						28
Queuing Penalty (veh)						0
Storage Bay Dist (ft)	100	100				
Storage Blk Time (%)			0			
Queuing Penalty (veh)			0			

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	LT	R
Maximum Queue (ft)	199	368	403	113	401	377	31	90	87	156	105
Average Queue (ft)	49	166	205	37	180	191	6	37	39	56	44
95th Queue (ft)	116	289	343	78	304	307	25	75	85	119	86
Link Distance (ft)		515	515		444	444		819		667	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	175			200			300		125		125
Storage Blk Time (%)		3			2	0				1	0
Queuing Penalty (veh)		2			1	0				1	0

Intersection: 14: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	L	TR	L	TR
Maximum Queue (ft)	84	313	386	325	399	501	586	231	249	350	149	194
Average Queue (ft)	25	118	114	35	168	324	359	111	127	156	48	82
95th Queue (ft)	60	226	233	142	339	433	490	187	223	270	112	160
Link Distance (ft)		517	517			978	978			833		720
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			300	375			225	225		125	
Storage Blk Time (%)		0	0			2		0	0	3	0	5
Queuing Penalty (veh)		0	1			2		0	0	9	0	3

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	L	L	R	R
Maximum Queue (ft)	87	224	451	468	324	280	198	208	139	160	197	218
Average Queue (ft)	28	68	206	232	118	115	102	119	88	95	117	114
95th Queue (ft)	69	164	380	396	266	204	159	171	136	149	183	185
Link Distance (ft)			444	444		254	254	254		911		
Upstream Blk Time (%)			1	2		0						
Queuing Penalty (veh)			11	12		2						
Storage Bay Dist (ft)	200	200			300				225		225	225
Storage Blk Time (%)			8	3	0							0
Queuing Penalty (veh)			50	7	0							0

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	R	L	L	R	R
Maximum Queue (ft)	230	220	157	209	224	265	245	244	199	216	126	128
Average Queue (ft)	105	127	64	92	37	144	151	84	86	94	60	62
95th Queue (ft)	176	188	111	154	110	255	237	184	161	160	110	111
Link Distance (ft)	254	254	254	254		517	517			864		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			225	175		175	175
Storage Blk Time (%)						2	1	0	1	1		
Queuing Penalty (veh)						9	2	0	2	3		

Network Summary

Network wide Queuing Penalty: 429



Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	66	124	932	327
Average Queue (ft)	14	56	820	156
95th Queue (ft)	39	82	1099	327
Link Distance (ft)			917	812
Upstream Blk Time (%)			66	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	100	100		
Storage Blk Time (%)		14		
Queuing Penalty (veh)		97		

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	23	26	910	456
Average Queue (ft)	1	1	584	365
95th Queue (ft)	8	8	994	511
Link Distance (ft)			906	753
Upstream Blk Time (%)			19	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	100	100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: US 17 Bus. (Market St.) & 30th St.

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	LT	R
Maximum Queue (ft)	199	499	489	172	247	264	52	66	149	170	150
Average Queue (ft)	73	244	272	54	124	133	14	29	37	62	37
95th Queue (ft)	165	409	434	119	220	225	43	61	94	125	85
Link Distance (ft)		515	515		444	444		819		667	
Upstream Blk Time (%)		0									
Queuing Penalty (veh)		0									
Storage Bay Dist (ft)	175			200			300		125		125
Storage Blk Time (%)	0	7			1				2	5	
Queuing Penalty (veh)	0	6			1				1	3	

Intersection: 14: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	L	TR	L	TR
Maximum Queue (ft)	325	394	468	325	221	474	481	131	248	340	91	108
Average Queue (ft)	71	213	222	106	107	271	320	63	101	140	25	34
95th Queue (ft)	165	323	336	235	192	428	466	119	193	248	57	80
Link Distance (ft)		517	517			978	978			833		720
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			300	375			225	225		125	
Storage Blk Time (%)		1	1	0		0			0	2		0
Queuing Penalty (veh)		1	3	0		1			0	6		0

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd.

Movement	EB	EB	EB	EB	EB	WB	SB	SB	SB	SB
Directions Served	T	T	T	T	R	L	L	L	R	R
Maximum Queue (ft)	53	224	453	446	317	218	223	269	249	169
Average Queue (ft)	20	76	181	218	70	98	99	101	105	100
95th Queue (ft)	52	200	327	342	183	166	169	181	169	156
Link Distance (ft)			444	444		254		911		
Upstream Blk Time (%)			0	0						
Queuing Penalty (veh)			2	2						
Storage Bay Dist (ft)	200	200			300		225		225	225
Storage Blk Time (%)		0	2	1	0		1	1		
Queuing Penalty (veh)		0	13	2	0		5	5		

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	R	L	L	R	R
Maximum Queue (ft)	160	192	160	232	94	223	223	244	145	158	173	173
Average Queue (ft)	108	125	47	80	28	85	102	71	69	80	76	81
95th Queue (ft)	156	176	110	159	68	164	181	178	128	131	132	143
Link Distance (ft)	254	254	254	254		517	517				864	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200			225	175		175	175
Storage Blk Time (%)						0	0	0		0	0	0
Queuing Penalty (veh)						1	0	1		0	0	0

Network Summary

Network wide Queuing Penalty: 150

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information			Site Information					
Analyst		URS	Date Performed		2013			
Agency or Company			Analysis Year		2040 Build - Alt 7 Tight Urban Diamond			
Project Description			U-4434 Independence Boulevard Extension					
<b>45</b>			<b>46</b>			<b>47</b>		
Independence Blvd. SB - to US 17 Bus.			Independence Blvd. NB - from US 17 Bus.			Independence Blvd. SB - from US 17 Bus.		
Merge/Diverge	Diverge		Merge/Diverge	Merge		Merge/Diverge	Merge	
No. of lanes on Freeway	2		No. of lanes on Freeway	2		No. of lanes on Freeway	2	
Freeway FFS	60	mph	Freeway FFS	60	mph	Freeway FFS	60	mph
Freeway Volume (AM/PM)	2877	2354	Freeway Volume (AM/PM)	1768	2218	Freeway Volume (AM/PM)	2213	1771
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	50	mph	Ramp FFS	50	mph	Ramp FFS	50	mph
Ramp Volume (AM/PM)	659	586	Ramp Volume (AM/PM)	586	659	Ramp Volume (AM/PM)	471	425
No. Lanes on Ramp	1		No. Lanes on Ramp	1		No. Lanes on Ramp	1	
Accel/Decel Distance 1	540	ft	Accel/Decel Distance 1	480	ft	Accel/Decel Distance 1	480	ft
Accel/Decel Distance 2	N/A	ft	Accel/Decel Distance 2	N/A	ft	Accel/Decel Distance 2	N/A	ft
Adjacent Upstream	Yes		Adjacent Upstream	Yes		Adjacent Upstream	Yes	
Off/On	On		Off/On	Off		Off/On	Off	
Distance	2590	ft	Distance	2220	ft	Distance	2510	ft
Truck %	4%		Truck %	3%		Truck %	3%	
Ramp Volume (AM/PM)	1628	1103	Ramp Volume (AM/PM)	425	471	Ramp Volume (AM/PM)	659	586
Adjacent Downstream	Yes		Adjacent Downstream	Yes		Adjacent Downstream	No	
Off/On	On - N/A		Off/On	Off		Off/On	N/A	
Distance	N/A	ft	Distance	3310	ft	Distance	N/A	ft
Truck %	N/A		Truck %	4%		Truck %	N/A	
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	1103	1628	Ramp Volume (AM/PM)	N/A	N/A
Peak Hour Factor	0.90		Peak Hour Factor	0.90		Peak Hour Factor	0.90	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	1.00		Population Adj. Factor	1.00	
Freeway Truck %	4%		Freeway Truck %	4%		Freeway Truck %	4%	
Ramp Truck %	3%		Ramp Truck %	3%		Ramp Truck %	3%	
<b>48</b>								
Independence Blvd. NB - to Darlington								
Merge/Diverge	Diverge		Merge/Diverge	Diverge		Merge/Diverge	Diverge	
No. of lanes on Freeway	2		No. of lanes on Freeway	0		No. of lanes on Freeway	0	
Freeway FFS	60	mph	Freeway FFS	0	mph	Freeway FFS	0	mph
Freeway Volume (AM/PM)	2205	2695	Freeway Volume (AM/PM)	0	0	Freeway Volume (AM/PM)	0	0
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	15	mph	Ramp FFS	0	mph	Ramp FFS	0	mph
Ramp Volume (AM/PM)	99	133	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
No. Lanes on Ramp	1		No. Lanes on Ramp	0		No. Lanes on Ramp	0	
Accel/Decel Distance 1	800	ft	Accel/Decel Distance 1	0	ft	Accel/Decel Distance 1	0	ft
Accel/Decel Distance 2	N/A	ft	Accel/Decel Distance 2	0	ft	Accel/Decel Distance 2	0	ft
Adjacent Upstream	No		Adjacent Upstream	Yes		Adjacent Upstream	Yes	
Off/On	N/A		Off/On	On		Off/On	On	
Distance	N/A	ft	Distance	0	ft	Distance	0	ft
Truck %	N/A		Truck %			Truck %		
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Adjacent Downstream	Yes		Adjacent Downstream	Yes		Adjacent Downstream	Yes	
Off/On	On - N/A		Off/On	On		Off/On	On	
Distance	N/A	ft	Distance	0	ft	Distance	0	ft
Truck %	N/A		Truck %			Truck %		
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Peak Hour Factor	0.90		Peak Hour Factor	0.00		Peak Hour Factor	0.00	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	0.00		Population Adj. Factor	0.00	
Freeway Truck %	4%		Freeway Truck %	0%		Freeway Truck %	0%	
Ramp Truck %	2%		Ramp Truck %	0%		Ramp Truck %	0%	

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 7 Tight Urban Diamond
Project Description	U-4434 Independence Boulevard Extension		

49																																			
Independence Blvd. NB - Darlington to Market																																			
Sides (One or Two)	One	Sides (One or Two)																																	
No. of Lanes	3	No. of Lanes																																	
Weaving Length, L <sub>s</sub>	1720 ft	Weaving Length, L <sub>s</sub>																																	
Multi-Lane FFS	60 mph	Freeway FFS																																	
Min. Speed (Def. = 15)	15 mph	Min. Speed (Def. = 15)																																	
Segment Type	Multi-Lane	Segment Type																																	
Terrain	Level	Terrain																																	
		Freeway Rolling																																	
		Freeway Rolling																																	
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;"></td> <td style="width: 33%;"></td> </tr> <tr> <td style="text-align: center;">AM Peak</td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td style="text-align: center;">F V<sub>FF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>↘</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>↗</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>R →</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td></td> <td style="text-align: center;">1684</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td></td> <td style="text-align: center;">87</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td></td> <td style="text-align: center;">403</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td></td> <td style="text-align: center;">22</td> <td style="text-align: center;">4 %</td> </tr> <tr> <td colspan="3" style="text-align: center;">(Place weaving % assumption here)</td> </tr> </table>						AM Peak	Vol	Truck	F →	F V <sub>FF</sub>	0	↘	V <sub>RF</sub>	0	↗	V <sub>FR</sub>	0	R →	V <sub>RR</sub>	0		1684	4 %		87	4 %		403	4 %		22	4 %	(Place weaving % assumption here)		
AM Peak	Vol	Truck																																	
F →	F V <sub>FF</sub>	0																																	
↘	V <sub>RF</sub>	0																																	
↗	V <sub>FR</sub>	0																																	
R →	V <sub>RR</sub>	0																																	
	1684	4 %																																	
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PM Peak	Vol	Truck																																	
F →	F V <sub>FF</sub>	0																																	
↘	V <sub>RF</sub>	0																																	
↗	V <sub>FR</sub>	0																																	
R →	V <sub>RR</sub>	0																																	
	2134	4 %																																	
	79	4 %																																	
	451	4 %																																	
	20	4 %																																	
(Place weaving % assumption here)																																			
Peak Hour Factor	0.90	Peak Hour Factor																																	
Driver Pop. Adj.	1.00	Driver Pop. Adj.																																	
Maneuver Lns., N <sub>WL</sub>	2	Maneuver Lns., N <sub>WL</sub>																																	
Interchange Density	3.00	Interchange Density																																	
Min. RF In. chng., LC <sub>RF</sub>	1	Min. RF In. chng., LC <sub>RF</sub>																																	
Min. FR In. chng., LC <sub>FR</sub>	1	Min. FR In. chng., LC <sub>FR</sub>																																	
Min. RR In. chng., LC <sub>RR</sub>	N/A	Min. RR In. chng., LC <sub>RR</sub>																																	
20% of vehicles from Darlington exit onto Market																																			

Sides (One or Two)	One	Sides (One or Two)																																	
No. of Lanes	0	No. of Lanes																																	
Weaving Length, L <sub>s</sub>	0 ft	Weaving Length, L <sub>s</sub>																																	
Freeway FFS	0 mph	Freeway FFS																																	
Min. Speed (Def. = 15)	0 mph	Min. Speed (Def. = 15)																																	
Segment Type	Freeway	Segment Type																																	
Terrain	Rolling	Terrain																																	
		Freeway Rolling																																	
		Freeway Rolling																																	
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;"></td> <td style="width: 33%;"></td> </tr> <tr> <td style="text-align: center;">AM Peak</td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td style="text-align: center;">F V<sub>FF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>↘</td> <td style="text-align: center;">V<sub>RF</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>↗</td> <td style="text-align: center;">V<sub>FR</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td>R →</td> <td style="text-align: center;">V<sub>RR</sub></td> <td style="text-align: center;">0</td> </tr> <tr> <td></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td colspan="3" style="text-align: center;">(Place weaving % assumption here)</td> </tr> </table>						AM Peak	Vol	Truck	F →	F V <sub>FF</sub>	0	↘	V <sub>RF</sub>	0	↗	V <sub>FR</sub>	0	R →	V <sub>RR</sub>	0		0	0 %		0	0 %		0	0 %		0	0 %	(Place weaving % assumption here)		
AM Peak	Vol	Truck																																	
F →	F V <sub>FF</sub>	0																																	
↘	V <sub>RF</sub>	0																																	
↗	V <sub>FR</sub>	0																																	
R →	V <sub>RR</sub>	0																																	
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PM Peak	Vol	Truck																																	
F →	F V <sub>FF</sub>	0																																	
↘	V <sub>RF</sub>	0																																	
↗	V <sub>FR</sub>	0																																	
R →	V <sub>RR</sub>	0																																	
	0	0 %																																	
	0	0 %																																	
	0	0 %																																	
	0	0 %																																	
(Place weaving % assumption here)																																			
Peak Hour Factor	0.00	Peak Hour Factor																																	
Driver Pop. Adj.	0.00	Driver Pop. Adj.																																	
Maneuver Lns., N <sub>WL</sub>	0	Maneuver Lns., N <sub>WL</sub>																																	
Interchange Density	0.00	Interchange Density																																	
Min. RF In. chng., LC <sub>RF</sub>	0	Min. RF In. chng., LC <sub>RF</sub>																																	
Min. FR In. chng., LC <sub>FR</sub>	0	Min. FR In. chng., LC <sub>FR</sub>																																	
Min. RR In. chng., LC <sub>RR</sub>	N/A	Min. RR In. chng., LC <sub>RR</sub>																																	
(Place weaving % assumption here)																																			

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 7 Tight Urban Diamond
Project Description		U-4434 Independence Boulevard Extension	

<div style="text-align: right; margin-bottom: 10px;"><b>49</b></div> <p>Independence Blvd. NB - Darlington to Market  <u>Interchange</u>                      <u>No.</u>                      Darlington Ave.                      1                      Market St.                              1</p> <p style="font-size: small;">Note: multi-lane only 0.67 mile long                      Interchange Density                      3.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Note: freeway only 3.5 miles long                      Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>
<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>

**HIGHWAY CAPACITY SOFTWARE 2010  
NETWORK DATA SUMMARY - ANALYSIS NOTES**

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 7 Tight Urban Diamond
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV %	Freeway Truck%			
	FR = DS ramp HV %	Off Ramp Truck %			
	RF = US ramp HV %	On Ramp Truck %			
	RR = DS ramp HV %	Off Ramp Truck %			

Level of Service Standards - Freeways	Level of Service Standards - Signalized Intersections
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004	LOS D or better for overall intersection required
	LOS D or better for individual movements recommended
	If not LOS D for individual movement - v/c ratio must be less than 0.85

**Assumed Improvements**

TIP No.	Description
U-3338	SR 1175 (Kerr Avenue) - widening, including new interchange at US 74

**General Analysis Notes**

- ▶ Interchange/Ramp Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

**Design Specific Analysis Notes**

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

**Locations where LOS D or better not achieved**

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Build 7 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 2590 ft V <sub>u</sub> = 1628 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : Deceleration Lane Length L <sub>D</sub> : 540 Freeway Volume, V <sub>F</sub> : 2877 Ramp Volume, V <sub>R</sub> : 659 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 50.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2877	0.90	Level	4	0	0.980	1.00	3261
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	1628	0.90	Level	4	0	0.980	1.00	1845
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 3261 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	3261	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2518	Exhibit 13-8	4600 No
V <sub>R</sub>	743	Exhibit 13-10	2100 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3261	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 27.4 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>s</sub> = 0.300 (Exhibit 13-12)  
 S<sub>R</sub> = 54.6 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 54.6 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Build 7 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 2590 ft V <sub>u</sub> = 1103 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : Deceleration Lane Length L <sub>D</sub> : 540 Freeway Volume, V <sub>F</sub> : 2354 Ramp Volume, V <sub>R</sub> : 586 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 50.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2354	0.90	Level	4	0	0.980	1.00	2668
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	1103	0.90	Level	4	0	0.980	1.00	1250
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 2668 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2668	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2007	Exhibit 13-8	4600 No
V <sub>R</sub>	661	Exhibit 13-10	2100 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2668	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 22.3 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>s</sub> = 0.292 (Exhibit 13-12)  
 S<sub>R</sub> = 54.7 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 54.7 mph (Exhibit 13-13)



## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Build 7 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, L <sub>A</sub>	480	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Deceleration Lane Length L <sub>D</sub>		<input type="checkbox"/> No <input checked="" type="checkbox"/> Off
L <sub>up</sub> = ft	Freeway Volume, V <sub>F</sub>	1768	L <sub>down</sub> = 3310 ft
V <sub>u</sub> = veh/h	Ramp Volume, V <sub>R</sub>	586	V <sub>D</sub> = 1103 veh/h
	Freeway Free-Flow Speed, S <sub>FF</sub>	60.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	50.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1768	0.90	Level	4	0	0.980	1.00	2004
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream								
DownStream	1103	0.90	Level	4	0	0.980	1.00	1250

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$ <p>L<sub>EQ</sub> = (Equation 13-6 or 13-7)</p> <p>P<sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)</p> <p>V<sub>12</sub> = 2004 pc/h</p> <p>V<sub>3</sub> or V<sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17)</p> <p>Is V<sub>3</sub> or V<sub>av34</sub> &gt; 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Is V<sub>3</sub> or V<sub>av34</sub> &gt; 1.5 * V<sub>12</sub>/2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)</p>	$V_{12} = V_R + (V_F - V_R)P_{FD}$ <p>L<sub>EQ</sub> = (Equation 13-12 or 13-13)</p> <p>P<sub>FD</sub> = using Equation (Exhibit 13-7)</p> <p>V<sub>12</sub> = pc/h</p> <p>V<sub>3</sub> or V<sub>av34</sub> = pc/h (Equation 13-14 or 13-17)</p> <p>Is V<sub>3</sub> or V<sub>av34</sub> &gt; 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Is V<sub>3</sub> or V<sub>av34</sub> &gt; 1.5 * V<sub>12</sub>/2 <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)</p>
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### Capacity Checks

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V <sub>FO</sub>	2665	Exhibit 13-8	No	V <sub>F</sub>		Exhibit 13-8	
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8	
				V <sub>R</sub>		Exhibit 13-10	

### Flow Entering Merge Influence Area

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V <sub>R12</sub>	2665	Exhibit 13-8	4600:All	No	V <sub>12</sub>	Exhibit 13-8	

### Level of Service Determination (if not F)

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ <p>D<sub>R</sub> = 22.9 (pc/mi/ln)</p> <p>LOS = C (Exhibit 13-2)</p>	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ <p>D<sub>R</sub> = (pc/mi/ln)</p> <p>LOS = (Exhibit 13-2)</p>
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### Speed Determination

### Speed Determination

<p>M<sub>S</sub> = 0.329 (Exhibit 13-11)</p> <p>S<sub>R</sub> = 54.1 mph (Exhibit 13-11)</p> <p>S<sub>0</sub> = N/A mph (Exhibit 13-11)</p> <p>S = 54.1 mph (Exhibit 13-13)</p>	<p>D<sub>s</sub> = (Exhibit 13-12)</p> <p>S<sub>R</sub> = mph (Exhibit 13-12)</p> <p>S<sub>0</sub> = mph (Exhibit 13-12)</p> <p>S = mph (Exhibit 13-13)</p>
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Build 7 TUDI
Project Description U-4434 Independence Boulevard Extension			

Inputs			
Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	480	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input type="checkbox"/> No <input checked="" type="checkbox"/> Off
$L_{up} =$ ft	Freeway Volume, $V_F$	2218	$L_{down} =$ 3310 ft
$V_u =$ veh/h	Ramp Volume, $V_R$	659	$V_D =$ 1628 veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	50.0	

Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2218	0.90	Level	4	0	0.980	1.00	2514
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream								
DownStream	1628	0.90	Level	4	0	0.980	1.00	1845

Merge Areas					Diverge Areas				
Estimation of $v_{12}$					Estimation of $v_{12}$				
$V_{12} = V_F (P_{FM})$					$V_{12} = V_R + (V_F - V_R)P_{FD}$				
$L_{EQ} =$ (Equation 13-6 or 13-7)					$L_{EQ} =$ (Equation 13-12 or 13-13)				
$P_{FM} =$ 1.000 using Equation (Exhibit 13-6)					$P_{FD} =$ using Equation (Exhibit 13-7)				
$V_{12} =$ 2514 pc/h					$V_{12} =$ pc/h				
$V_3$ or $V_{av34}$ 0 pc/h (Equation 13-14 or 13-17)					$V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17)				
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)				

Capacity Checks				Capacity Checks			
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3257	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area			
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
$V_{R12}$	3257	Exhibit 13-8	4600:All	No	$V_{12}$	Exhibit 13-8	

Level of Service Determination (if not F)				Level of Service Determination (if not F)			
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$			
$D_R =$ 27.5 (pc/mi/ln)				$D_R =$ (pc/mi/ln)			
LOS = C (Exhibit 13-2)				LOS = (Exhibit 13-2)			

Speed Determination		Speed Determination	
$M_S =$ 0.374 (Exhibit 13-11)		$D_s =$ (Exhibit 13-12)	
$S_R =$ 53.3 mph (Exhibit 13-11)		$S_R =$ mph (Exhibit 13-12)	
$S_0 =$ N/A mph (Exhibit 13-11)		$S_0 =$ mph (Exhibit 13-12)	
$S =$ 53.3 mph (Exhibit 13-13)		$S =$ mph (Exhibit 13-13)	

### RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Build 7 TUDI

Project Description U-4434 Independence Boulevard Extension

#### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : 480 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> : 2213 Ramp Volume, V <sub>R</sub> : 471 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 50.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
L <sub>up</sub> = 2510 ft V <sub>u</sub> = 659 veh/h		

#### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF × f <sub>HV</sub> × f <sub>p</sub>
Freeway	2213	0.90	Level	4	0	0.980	1.00	2508
Ramp	471	0.90	Level	3	0	0.985	1.00	531
UpStream	659	0.90	Level	3	0	0.985	1.00	743
DownStream								

#### Merge Areas

#### Diverge Areas

#### Estimation of v<sub>12</sub>

#### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)  
 V<sub>12</sub> = 2508 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = using Equation (Exhibit 13-7)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> = pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

#### Capacity Checks

#### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V <sub>FO</sub>	3039	Exhibit 13-8	No	V <sub>F</sub>		Exhibit 13-8	
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8	
				V <sub>R</sub>		Exhibit 13-10	

#### Flow Entering Merge Influence Area

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V <sub>R12</sub>	3039	Exhibit 13-8	4600:All	No	V <sub>12</sub>	Exhibit 13-8	

#### Level of Service Determination (if not F)

#### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = 25.9 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

#### Speed Determination

#### Speed Determination

M<sub>S</sub> = 0.354 (Exhibit 13-11)  
 S<sub>R</sub> = 53.6 mph (Exhibit 13-11)  
 S<sub>0</sub> = N/A mph (Exhibit 13-11)  
 S = 53.6 mph (Exhibit 13-13)

D<sub>s</sub> = (Exhibit 13-12)  
 S<sub>R</sub> = mph (Exhibit 13-12)  
 S<sub>0</sub> = mph (Exhibit 13-12)  
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	URS			Freeway/Dir of Travel	Independence Blvd SB				
Agency or Company				Junction	from US 17 Business				
Date Performed	2012			Jurisdiction	Segment #47				
Analysis Time Period	PM Peak			Analysis Year	2040 Build - Build 7 TUDI				
Project Description U-4434 Independence Boulevard Extension									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			2		Downstream Adj Ramp		
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> On	Acceleration Lane Length, L <sub>A</sub>			480		<input type="checkbox"/> Yes <input type="checkbox"/> On		
<input type="checkbox"/> No	<input checked="" type="checkbox"/> Off	Deceleration Lane Length L <sub>D</sub>					<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		
L <sub>up</sub> =	2510 ft		Freeway Volume, V <sub>F</sub>			1771		L <sub>down</sub> =	
V <sub>u</sub> =	586 veh/h		Ramp Volume, V <sub>R</sub>			425		ft	
			Freeway Free-Flow Speed, S <sub>FF</sub>			60.0		V <sub>D</sub> =	
			Ramp Free-Flow Speed, S <sub>FR</sub>			50.0		veh/h	
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	1771	0.90	Level	4	0	0.980	1.00	2007	
Ramp	425	0.90	Level	3	0	0.985	1.00	479	
UpStream	586	0.90	Level	3	0	0.985	1.00	661	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v <sub>12</sub>					Estimation of v <sub>12</sub>				
$V_{12} = V_F (P_{FM})$ L <sub>EQ</sub> = (Equation 13-6 or 13-7) P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 2007 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L <sub>EQ</sub> = (Equation 13-12 or 13-13) P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> = pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V <sub>FO</sub>	2486	Exhibit 13-8		No	V <sub>F</sub>		Exhibit 13-8		
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8		
					V <sub>R</sub>		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V <sub>R12</sub>	2486	Exhibit 13-8	4600:All	No	V <sub>12</sub>		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 21.6 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M <sub>S</sub> =	0.320 (Exhibit 13-11)				D <sub>S</sub> =	(Exhibit 13-12)			
S <sub>R</sub> =	54.2 mph (Exhibit 13-11)				S <sub>R</sub> =	mph (Exhibit 13-12)			
S <sub>0</sub> =	N/A mph (Exhibit 13-11)				S <sub>0</sub> =	mph (Exhibit 13-12)			
S =	54.2 mph (Exhibit 13-13)				S =	mph (Exhibit 13-13)			

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	to Darlington Ave
Date Performed	2013	Jurisdiction	Segment #48
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 7 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> =      ft  V <sub>u</sub> =      veh/h	Number of Lanes, N      2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 800 Freeway Volume, V <sub>F</sub> 2205 Ramp Volume, V <sub>R</sub> 99 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> =      ft  V <sub>D</sub> =      veh/h
--	--	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2205	0.90	Level	4	0	0.980	1.00	2499
Ramp	99	0.90	Level	2	0	0.990	1.00	111
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
(Equation 13-6 or 13-7)

L<sub>EQ</sub> =      using Equation (Exhibit 13-6)

P<sub>FM</sub> =      pc/h

V<sub>12</sub> =      pc/h (Equation 13-14 or 13-17)

V<sub>3</sub> or V<sub>av34</sub>      pc/h (Equation 13-14 or 13-17)

Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?    Yes    No

Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2    Yes    No

If Yes, V<sub>12a</sub> =      pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
(Equation 13-12 or 13-13)

L<sub>EQ</sub> =      using Equation (Exhibit 13-7)

P<sub>FD</sub> =      1.000

V<sub>12</sub> =      2499 pc/h

V<sub>3</sub> or V<sub>av34</sub>      0 pc/h (Equation 13-14 or 13-17)

Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?    Yes    No

Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2    Yes    No

If Yes, V<sub>12a</sub> =      pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2499	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2388	Exhibit 13-8	4600 No
V <sub>R</sub>	111	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2499	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D<sub>R</sub> =      (pc/mi/ln)

LOS =      (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D<sub>R</sub> =      18.5 (pc/mi/ln)

LOS =      B (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> =      (Exhibit 13-11)

S<sub>R</sub> =      mph (Exhibit 13-11)

S<sub>0</sub> =      mph (Exhibit 13-11)

S =      mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> =      0.698 (Exhibit 13-12)

S<sub>R</sub> =      47.4 mph (Exhibit 13-12)

S<sub>0</sub> =      N/A mph (Exhibit 13-12)

S =      47.4 mph (Exhibit 13-13)



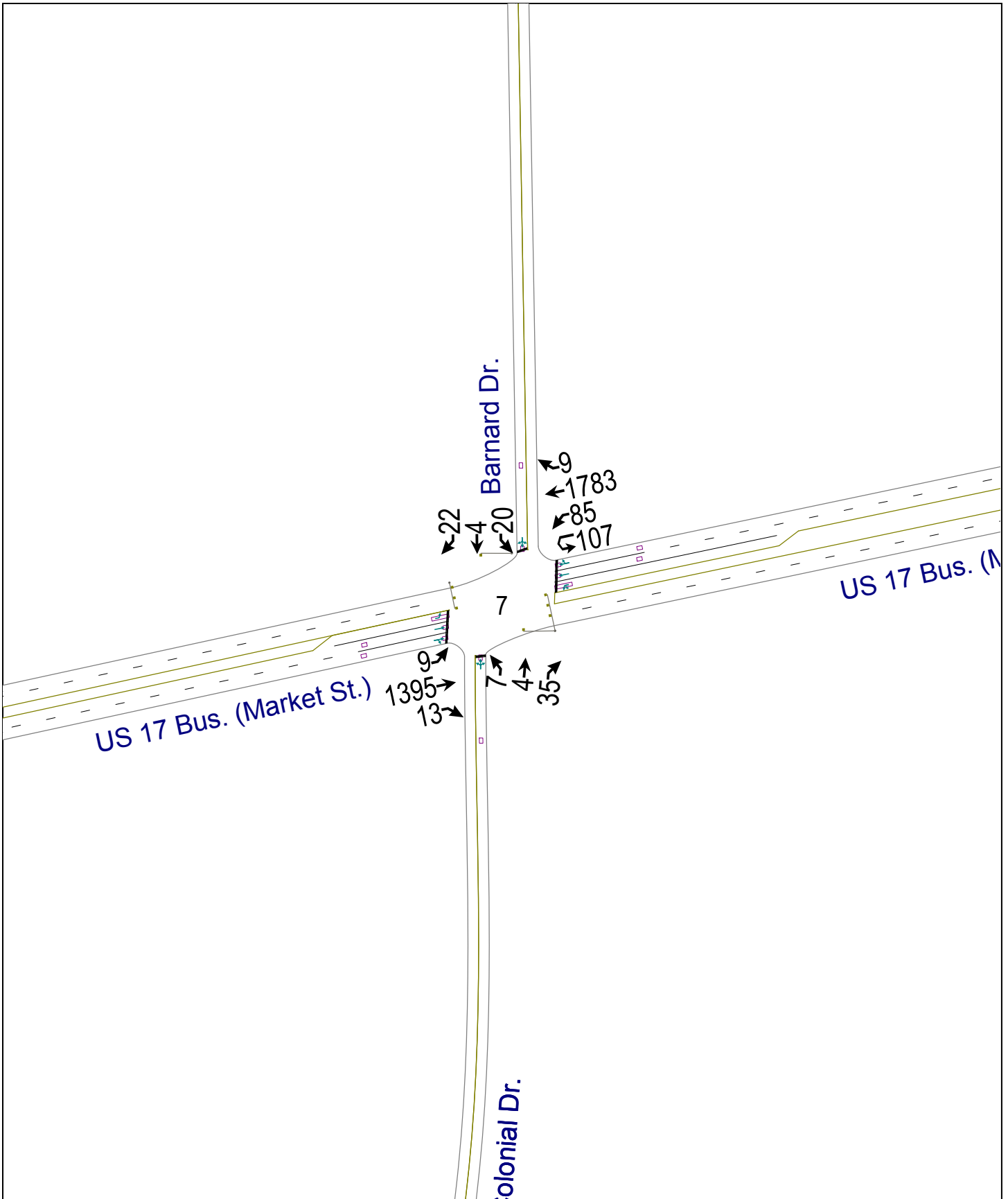
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 7 TUDI			
Analysis Time Period	AM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1080ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	1684	0.90	4	0	1.5	1.2	0.980	1.00	1909
V <sub>RF</sub>	87	0.90	4	0	1.5	1.2	0.980	1.00	99
V <sub>FR</sub>	403	0.90	4	0	1.5	1.2	0.980	1.00	457
V <sub>RR</sub>	22	0.90	4	0	1.5	1.2	0.980	1.00	25
V <sub>NW</sub>	1934							V =	2490
V <sub>W</sub>	556								
VR	0.223								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	556 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	853 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	406 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1259 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	627			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	2490 pc/h				Weaving intensity factor, W	0.255			
Weaving segment capacity, c <sub>w</sub>	5932 veh/h				Weaving segment speed, S	51.7 mph			
Weaving segment v/c ratio	0.412				Average weaving speed, S <sub>W</sub>	50.9 mph			
Weaving segment density, D	16.0 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	52.0 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4776 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

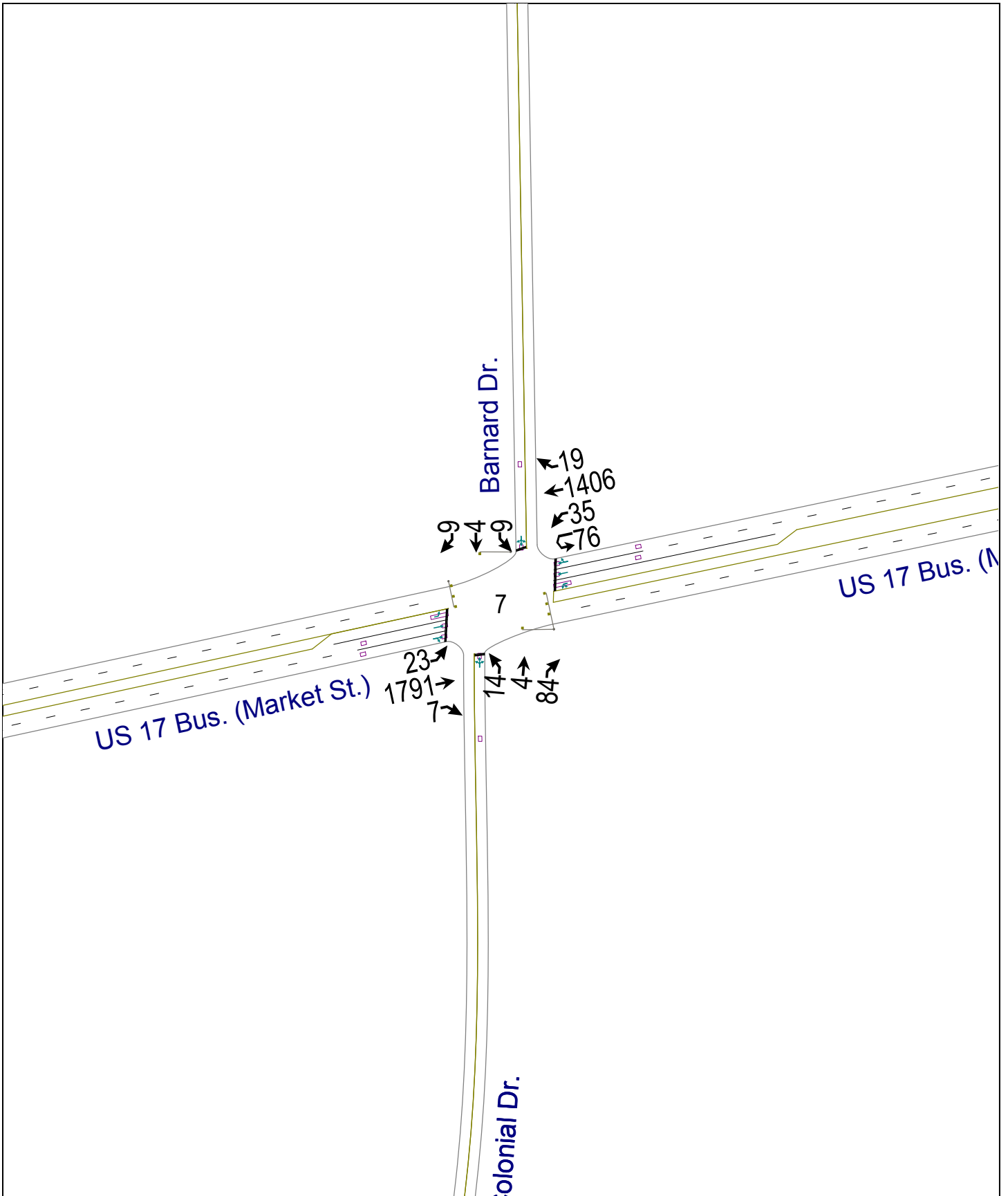
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 7 TUDI			
Analysis Time Period	PM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/ Multilane Highways			
Weaving number of lanes, N	3				Freeway minimum speed, $S_{MIN}$	15			
Weaving segment length, $L_S$	1080ft				Freeway maximum capacity, $C_{IFL}$	2300			
Freeway free-flow speed, FFS	60 mph				Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	$E_T$	$E_R$	$f_{HV}$	$f_p$	v (pc/h)
$V_{FF}$	2134	0.90	4	0	1.5	1.2	0.980	1.00	2419
$V_{RF}$	79	0.90	4	0	1.5	1.2	0.980	1.00	90
$V_{FR}$	451	0.90	4	0	1.5	1.2	0.980	1.00	511
$V_{RR}$	21	0.90	4	0	1.5	1.2	0.980	1.00	24
$V_{NW}$	2443							V =	3044
$V_W$	601								
VR	0.197								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, $N_{WL}$	2 lc				Minimum weaving lane changes, $LC_{MIN}$	601 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, $LC_W$	898 lc/h			
Minimum RF lane changes, $LC_{RF}$	1 lc/pc				Non-weaving lane changes, $LC_{NW}$	511 lc/h			
Minimum FR lane changes, $LC_{FR}$	1 lc/pc				Total lane changes, $LC_{ALL}$	1409 lc/h			
Minimum RR lane changes, $LC_{RR}$	lc/pc				Non-weaving vehicle index, $I_{NW}$	792			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	3044 pc/h				Weaving intensity factor, W	0.279			
Weaving segment capacity, $c_w$	5994 veh/h				Weaving segment speed, S	50.7 mph			
Weaving segment v/c ratio	0.498				Average weaving speed, $S_W$	50.2 mph			
Weaving segment density, D	20.0 pc/mi/ln				Average non-weaving speed, $S_{NW}$	50.8 mph			
Level of Service, LOS	B				Maximum weaving length, $L_{MAX}$	4510 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									



## Build Alternative 8, Quadrant AC

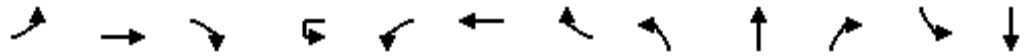
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U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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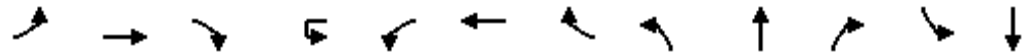


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	9	1395	13	107	85	1783	9	7	4	35	20	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0		250		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3536	0	0	1770	3536	0	0	1658	0	0	1703
Flt Permitted	0.084				0.950				0.992			0.978
Satd. Flow (perm)	156	3536	0	0	1770	3536	0	0	1658	0	0	1703
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		35				35			25			25
Link Distance (ft)		772				861			978			871
Travel Time (s)		15.0				16.8			26.7			23.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1564	0	0	213	1991	0	0	51	0	0	50
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		12				24			0			0
Link Offset(ft)		0				0			-30			-30
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	67.0	67.0	0.0	25.0	25.0	92.0	0.0	14.0	14.0	0.0	14.0	14.0
Total Split (%)	55.8%	55.8%	0.0%	20.8%	20.8%	76.7%	0.0%	11.7%	11.7%	0.0%	11.7%	11.7%
Maximum Green (s)	60.0	60.0		18.0	18.0	85.0		7.0	7.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	68.7	68.7			18.9	93.6			9.0			9.0
Actuated g/C Ratio	0.57	0.57			0.16	0.78			0.08			0.08
v/c Ratio	0.11	0.77			0.77	0.72			0.41			0.39
Control Delay	19.1	25.5			68.1	2.8			63.5			62.4
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

7: US 17 Bus. (Market St.) & Barnard Dr.  
Build Alt. 8 Quad AC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	22
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 8 Quad AC AM Peak



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	19.1	25.5			68.1	2.8			63.5			62.4
LOS	B	C			E	A			E			E
Approach Delay		25.5				9.1			63.5			62.4
Approach LOS		C				A			E			E
Queue Length 50th (ft)	4	533			144	76			38			38
Queue Length 95th (ft)	16	642			m174	86			81			80
Internal Link Dist (ft)		692				781			898			791
Turn Bay Length (ft)	125				250							
Base Capacity (vph)	90	2025			295	2758			124			128
Starvation Cap Reductn	0	0			0	0			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.11	0.77			0.72	0.72			0.41			0.39

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 52 (43%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 17.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 78.2%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: US 17 Bus. (Market St.) & Barnard Dr.



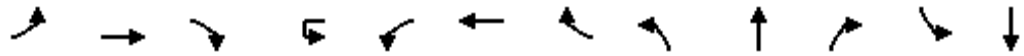


Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	



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Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	23	1791	7	76	35	1406	19	14	4	84	9	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0		250		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3536	0	0	1770	3532	0	0	1644	0	0	1723
Flt Permitted	0.144				0.950				0.993			0.980
Satd. Flow (perm)	268	3536	0	0	1770	3532	0	0	1644	0	0	1723
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		35				35			25			25
Link Distance (ft)		772				861			978			871
Travel Time (s)		15.0				16.8			26.7			23.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1998	0	0	123	1583	0	0	113	0	0	24
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		12				24			0			0
Link Offset(ft)		0				0			-30			-30
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	77.0	77.0	0.0	14.0	14.0	91.0	0.0	15.0	15.0	0.0	14.0	14.0
Total Split (%)	64.2%	64.2%	0.0%	11.7%	11.7%	75.8%	0.0%	12.5%	12.5%	0.0%	11.7%	11.7%
Maximum Green (s)	70.0	70.0		7.0	7.0	84.0		8.0	8.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	74.1	74.1			11.3	90.3			11.3			9.0
Actuated g/C Ratio	0.62	0.62			0.09	0.75			0.09			0.08
v/c Ratio	0.16	0.92			0.74	0.60			0.73			0.19
Control Delay	13.6	28.8			67.5	13.7			80.4			55.8
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

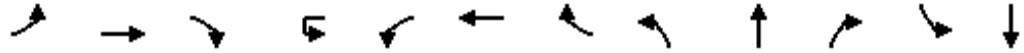
7: US 17 Bus. (Market St.) & Barnard Dr.  
Build Alt. 8 Quad AC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	9
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	13.6	28.8			67.5	13.7			80.4			55.8
LOS	B	C			E	B			F			E
Approach Delay		28.6				17.6			80.4			55.8
Approach LOS		C				B			F			E
Queue Length 50th (ft)	8	705			90	490			88			18
Queue Length 95th (ft)	25	#933			m#159	609			#193			46
Internal Link Dist (ft)		692				781			898			791
Turn Bay Length (ft)	125				250							
Base Capacity (vph)	165	2183			166	2659			154			129
Starvation Cap Reductn	0	0			0	0			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.16	0.92			0.74	0.60			0.73			0.19

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 69 (58%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 25.4 Intersection LOS: C  
 Intersection Capacity Utilization 74.8% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

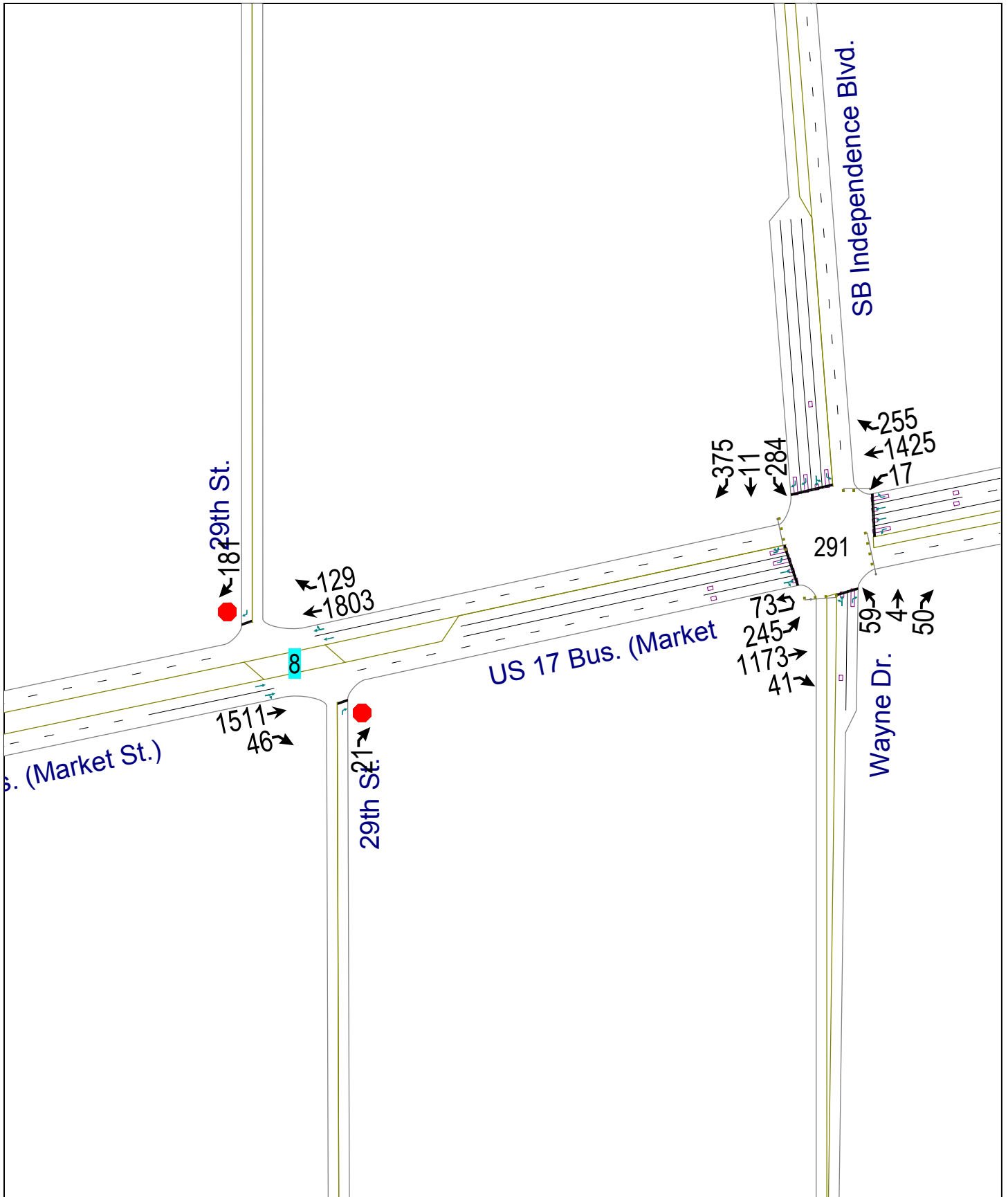
Splits and Phases: 7: US 17 Bus. (Market St.) & Barnard Dr.

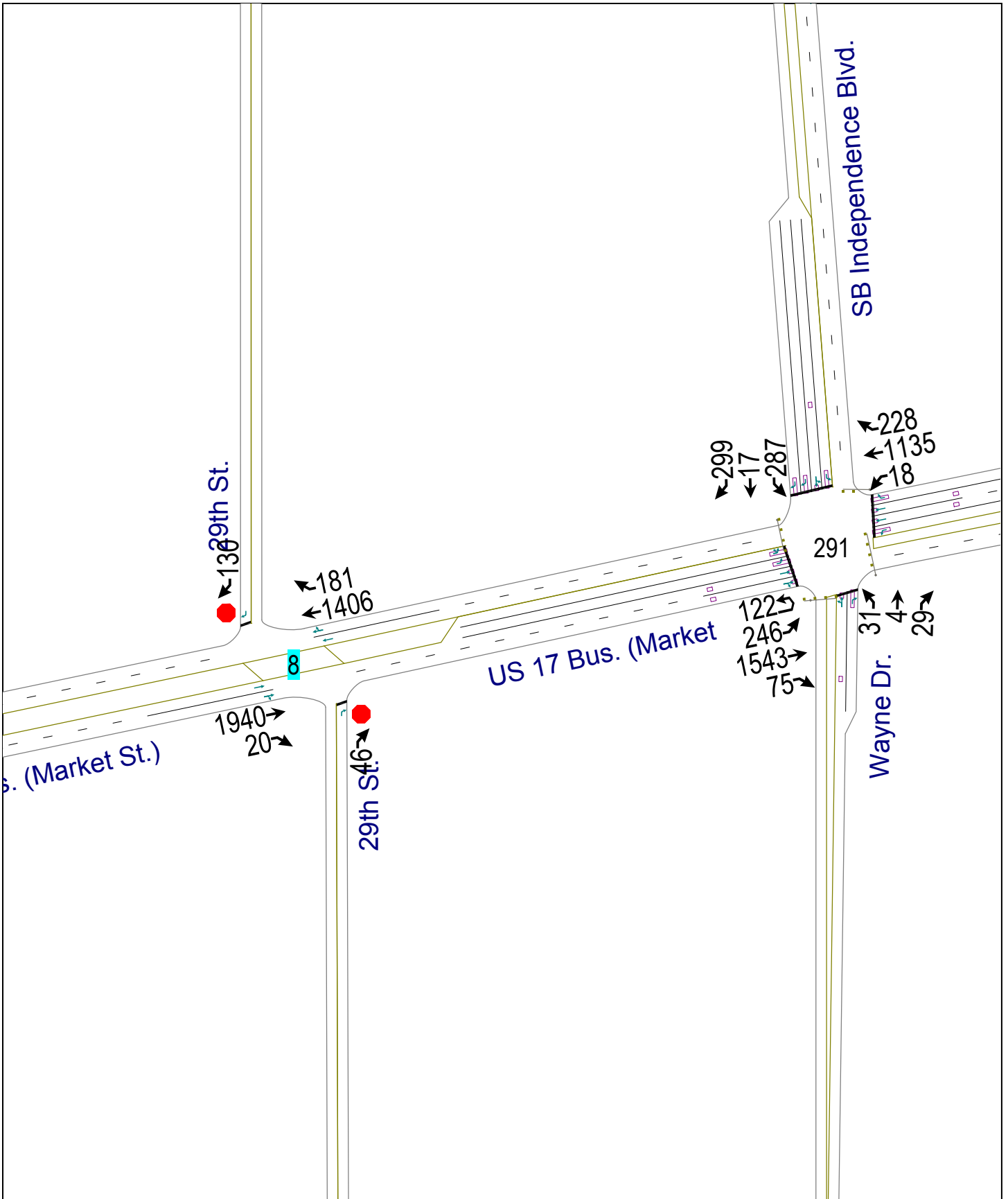


7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 8 Quad AC PM Peak



Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	





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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (vph)	0	1511	46	0	1803	129	0	0	21	0	0	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3525	0	0	3504	0	0	0	1611	0	0	1596
Flt Permitted												
Satd. Flow (perm)	0	3525	0	0	3504	0	0	0	1611	0	0	1596
Link Speed (mph)		40			40			25				25
Link Distance (ft)		861			621			952				799
Travel Time (s)		14.7			10.6			26.0				21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	0%	2%	2%	0%	0%	2%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1730	0	0	2146	0	0	0	23	0	0	201
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0				0
Link Offset(ft)		0			0			48				48
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	71.8%
Analysis Period (min)	15
	ICU Level of Service C

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 Quad AC AM Peak

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 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (veh/h)	0	1511	46	0	1803	129	0	0	21	0	0	181
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1679	51	0	2003	143	0	0	23	0	0	201
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		861			621							
pX, platoon unblocked	0.56			0.61			0.75	0.75	0.61	0.75	0.75	0.56
vC, conflicting volume	2147			1730			2907	3851	865	2938	3805	1073
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1465			933			559	1820	0	600	1758	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	96	100	100	67
cM capacity (veh/h)	260			456			207	59	666	281	64	601

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1119	611	1336	811	23	201
Volume Left	0	0	0	0	0	0
Volume Right	0	51	0	143	23	201
cSH	1700	1700	1700	1700	666	601
Volume to Capacity	0.66	0.36	0.79	0.48	0.04	0.33
Queue Length 95th (ft)	0	0	0	0	3	37
Control Delay (s)	0.0	0.0	0.0	0.0	10.6	14.0
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		10.6	14.0
Approach LOS					B	B

Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			71.8%		ICU Level of Service	C
Analysis Period (min)			15			

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 Quad AC AM Peak



U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 11/28/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (vph)	0	1940	20	0	1406	181	0	0	46	0	0	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3532	0	0	3479	0	0	0	1611	0	0	1596
Flt Permitted												
Satd. Flow (perm)	0	3532	0	0	3479	0	0	0	1611	0	0	1596
Link Speed (mph)		40			40			25				25
Link Distance (ft)		861			621			952				799
Travel Time (s)		14.7			10.6			26.0				21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	0%	2%	2%	0%	0%	2%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2178	0	0	1763	0	0	0	51	0	0	144
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			0				0
Link Offset(ft)		0			0			48				48
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	64.3%
Analysis Period (min)	15
	ICU Level of Service C

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

URS  
 11/28/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (veh/h)	0	1940	20	0	1406	181	0	0	46	0	0	130
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2156	22	0	1562	201	0	0	51	0	0	144
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		861			621							
pX, platoon unblocked	0.68			0.44			0.59	0.59	0.44	0.59	0.59	0.68
vC, conflicting volume	1763			2178			3092	3930	1089	2792	3841	882
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1193			1119			768	2176	0	263	2026	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	89	100	100	80
cM capacity (veh/h)	405			276			141	28	474	358	35	740

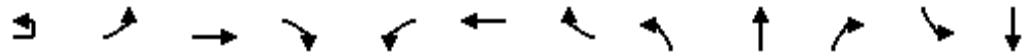
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1437	741	1041	722	51	144
Volume Left	0	0	0	0	0	0
Volume Right	0	22	0	201	51	144
cSH	1700	1700	1700	1700	474	740
Volume to Capacity	0.85	0.44	0.61	0.42	0.11	0.20
Queue Length 95th (ft)	0	0	0	0	9	18
Control Delay (s)	0.0	0.0	0.0	0.0	13.5	11.0
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		13.5	11.0
Approach LOS					B	B

Intersection Summary		
Average Delay		0.6
Intersection Capacity Utilization	64.3%	ICU Level of Service C
Analysis Period (min)		15

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 Quad AC PM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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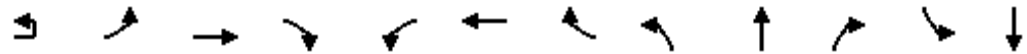


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	73	245	1173	41	17	1425	255	59	4	50	284	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		375		0	200		400	0		125	300	
Storage Lanes		2		0	1		1	0		1	1	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	3433	3522	0	1752	3505	1568	0	1779	1583	1665	1675
Flt Permitted		0.950			0.188				0.955		0.950	0.956
Satd. Flow (perm)	0	3433	3522	0	347	3505	1568	0	1779	1583	1665	1675
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			25
Link Distance (ft)			621			915			873			655
Travel Time (s)			10.6			15.6			23.8			17.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)											48%	
Lane Group Flow (vph)	0	353	1349	0	19	1583	283	0	70	56	164	164
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)			24			24			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot			Perm		pm+ov	Split		Perm	Split	
Protected Phases	5	5	2			6	4	8	8		4	4
Permitted Phases					6		6			8		
Detector Phase	5	5	2		6	6	4	8	8	8	4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0		12.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	14.0	19.0		19.0	19.0	14.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	18.0	18.0	81.0	0.0	63.0	63.0	25.0	14.0	14.0	14.0	25.0	25.0
Total Split (%)	15.0%	15.0%	67.5%	0.0%	52.5%	52.5%	20.8%	11.7%	11.7%	11.7%	20.8%	20.8%
Maximum Green (s)	11.0	11.0	74.0		56.0	56.0	18.0	7.0	7.0	7.0	18.0	18.0
Yellow Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead			Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)		13.8	78.8		60.0	60.0	85.0		9.0	9.0	20.0	20.0
Actuated g/C Ratio		0.12	0.66		0.50	0.50	0.71		0.08	0.08	0.17	0.17
v/c Ratio		0.89	0.58		0.11	0.90	0.25		0.53	0.47	0.59	0.59
Control Delay		59.4	20.0		13.5	26.0	4.4		68.3	66.8	55.9	55.7
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps  
Build Alt. 8 Quad AC AM Peak

Lane Group	SBR
Lane Configurations	FF
Volume (vph)	375
Ideal Flow (vphpl)	1900
Storage Length (ft)	300
Storage Lanes	2
Taper Length (ft)	25
Satd. Flow (prot)	2760
Flt Permitted	
Satd. Flow (perm)	2760
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	417
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Detector Phase	4
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	25.0
Total Split (%)	20.8%
Maximum Green (s)	18.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Act Effct Green (s)	20.0
Actuated g/C Ratio	0.17
v/c Ratio	0.91
Control Delay	73.6
Queue Delay	0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps  
 Build Alt. 8 Quad AC AM Peak



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		59.4	20.0		13.5	26.0	4.4		68.3	66.8	55.9	55.7
LOS		E	C		B	C	A		E	E	E	E
Approach Delay			28.2			22.6			67.6			65.8
Approach LOS			C			C			E			E
Queue Length 50th (ft)		130	541		5	452	56		53	42	125	125
Queue Length 95th (ft)		m#222	620		m11	#757	73		103	87	203	203
Internal Link Dist (ft)			541			835			793			575
Turn Bay Length (ft)		375			200		400			125	300	
Base Capacity (vph)		396	2313		174	1751	1111		133	119	278	279
Starvation Cap Reductn		0	0		0	0	0		0	0	0	0
Spillback Cap Reductn		0	0		0	0	0		0	0	0	0
Storage Cap Reductn		0	0		0	0	0		0	0	0	0
Reduced v/c Ratio		0.89	0.58		0.11	0.90	0.25		0.53	0.47	0.59	0.59

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 4 (3%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 33.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 84.1%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps

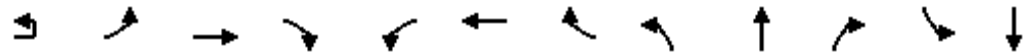




Lane Group	SBR
Total Delay	73.6
LOS	E
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	182
Queue Length 95th (ft)	#284
Internal Link Dist (ft)	
Turn Bay Length (ft)	300
Base Capacity (vph)	460
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.91
Intersection Summary	

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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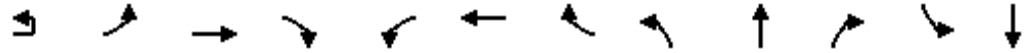
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	122	246	1543	75	18	1135	228	31	4	29	287	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		375		0	200		400	0		125	300	
Storage Lanes		2		0	1		1	0		1	1	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	3433	3514	0	1752	3505	1568	0	1783	1583	1665	1679
Flt Permitted		0.950			0.086				0.957		0.950	0.958
Satd. Flow (perm)	0	3433	3514	0	159	3505	1568	0	1783	1583	1665	1679
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			25
Link Distance (ft)			621			915			873			655
Travel Time (s)			10.6			15.6			23.8			17.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)											47%	
Lane Group Flow (vph)	0	409	1797	0	20	1261	253	0	38	32	169	169
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)			24			24			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot			Perm		pm+ov	Split		Perm	Split	
Protected Phases	5	5	2			6	4	8	8		4	4
Permitted Phases					6		6			8		
Detector Phase	5	5	2		6	6	4	8	8	8	4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0		12.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	14.0	19.0		19.0	19.0	14.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	24.0	24.0	81.0	0.0	57.0	57.0	25.0	14.0	14.0	14.0	25.0	25.0
Total Split (%)	20.0%	20.0%	67.5%	0.0%	47.5%	47.5%	20.8%	11.7%	11.7%	11.7%	20.8%	20.8%
Maximum Green (s)	17.0	17.0	74.0		50.0	50.0	18.0	7.0	7.0	7.0	18.0	18.0
Yellow Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead			Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max		C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)		18.5	79.4		55.9	55.9	80.3		9.0	9.0	19.4	19.4
Actuated g/C Ratio		0.15	0.66		0.47	0.47	0.67		0.08	0.08	0.16	0.16
v/c Ratio		0.77	0.77		0.27	0.77	0.24		0.28	0.27	0.63	0.62
Control Delay		59.2	7.7		21.6	19.5	4.5		58.3	58.5	57.9	57.6
Queue Delay		0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps  
Build Alt. 8 Quad AC PM Peak

Lane Group	SBR
Lane Configurations	FF
Volume (vph)	299
Ideal Flow (vphpl)	1900
Storage Length (ft)	300
Storage Lanes	2
Taper Length (ft)	25
Satd. Flow (prot)	2760
Flt Permitted	
Satd. Flow (perm)	2760
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	332
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Detector Phase	4
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	25.0
Total Split (%)	20.8%
Maximum Green (s)	18.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Act Effct Green (s)	19.4
Actuated g/C Ratio	0.16
v/c Ratio	0.74
Control Delay	58.9
Queue Delay	0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps  
 Build Alt. 8 Quad AC PM Peak






Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		59.2	7.7		21.6	19.5	4.5		58.3	58.5	57.9	57.6
LOS		E	A		C	B	A		E	E	E	E
Approach Delay			17.3			17.1			58.4			58.3
Approach LOS			B			B			E			E
Queue Length 50th (ft)		144	375		5	338	46		28	24	129	129
Queue Length 95th (ft)		m168	477		m15	474	66		65	57	208	208
Internal Link Dist (ft)			541			835			793			575
Turn Bay Length (ft)		375			200		400			125	300	
Base Capacity (vph)		544	2325		74	1632	1057		134	119	278	280
Starvation Cap Reductn		0	0		0	0	0		0	0	0	0
Spillback Cap Reductn		0	0		0	0	0		0	0	0	0
Storage Cap Reductn		0	0		0	0	0		0	0	0	0
Reduced v/c Ratio		0.75	0.77		0.27	0.77	0.24		0.28	0.27	0.61	0.60

**Intersection Summary**

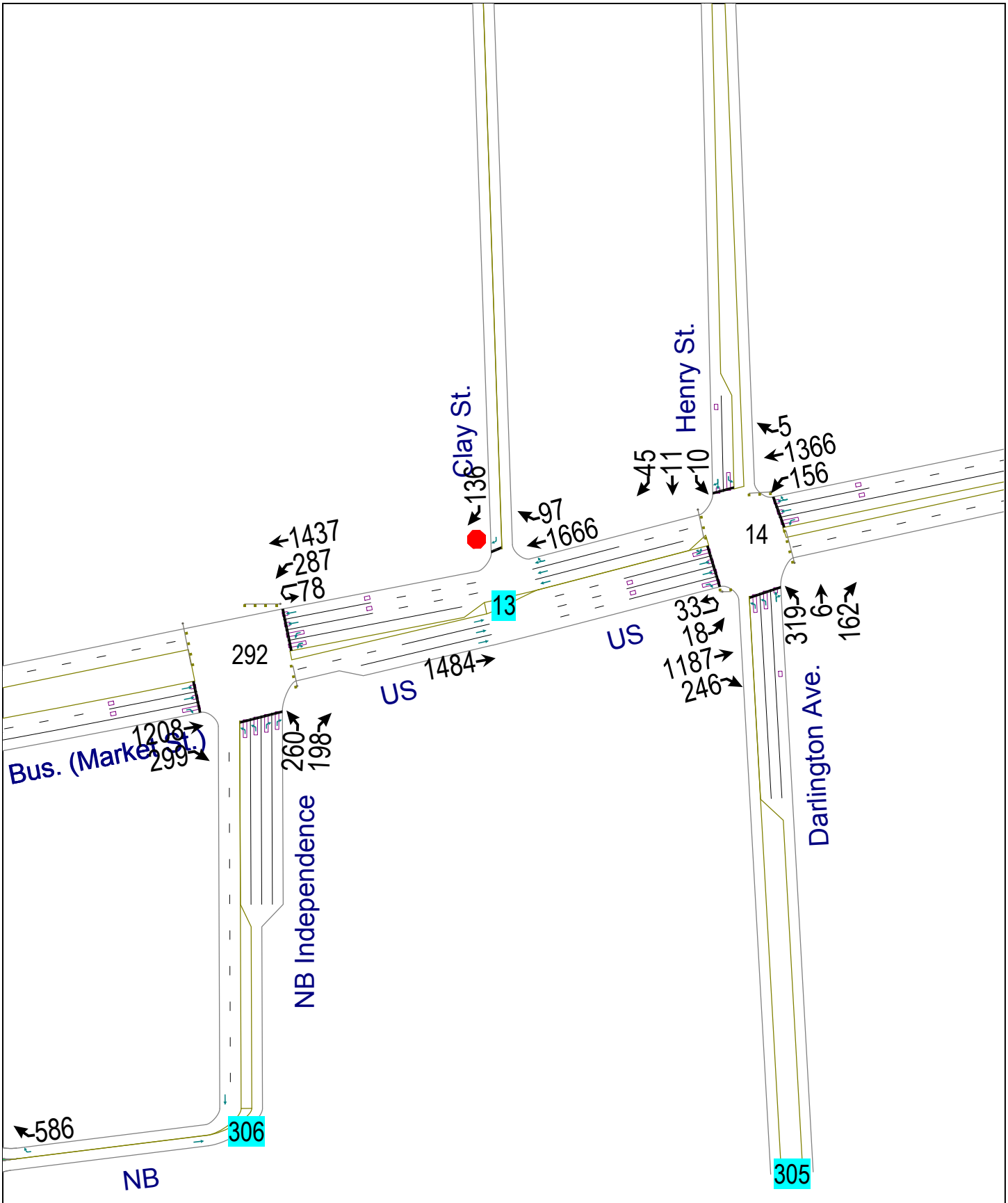
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 4 (3%), Referenced to phase 2:EBT and 6:WBTL, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 24.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 82.6%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

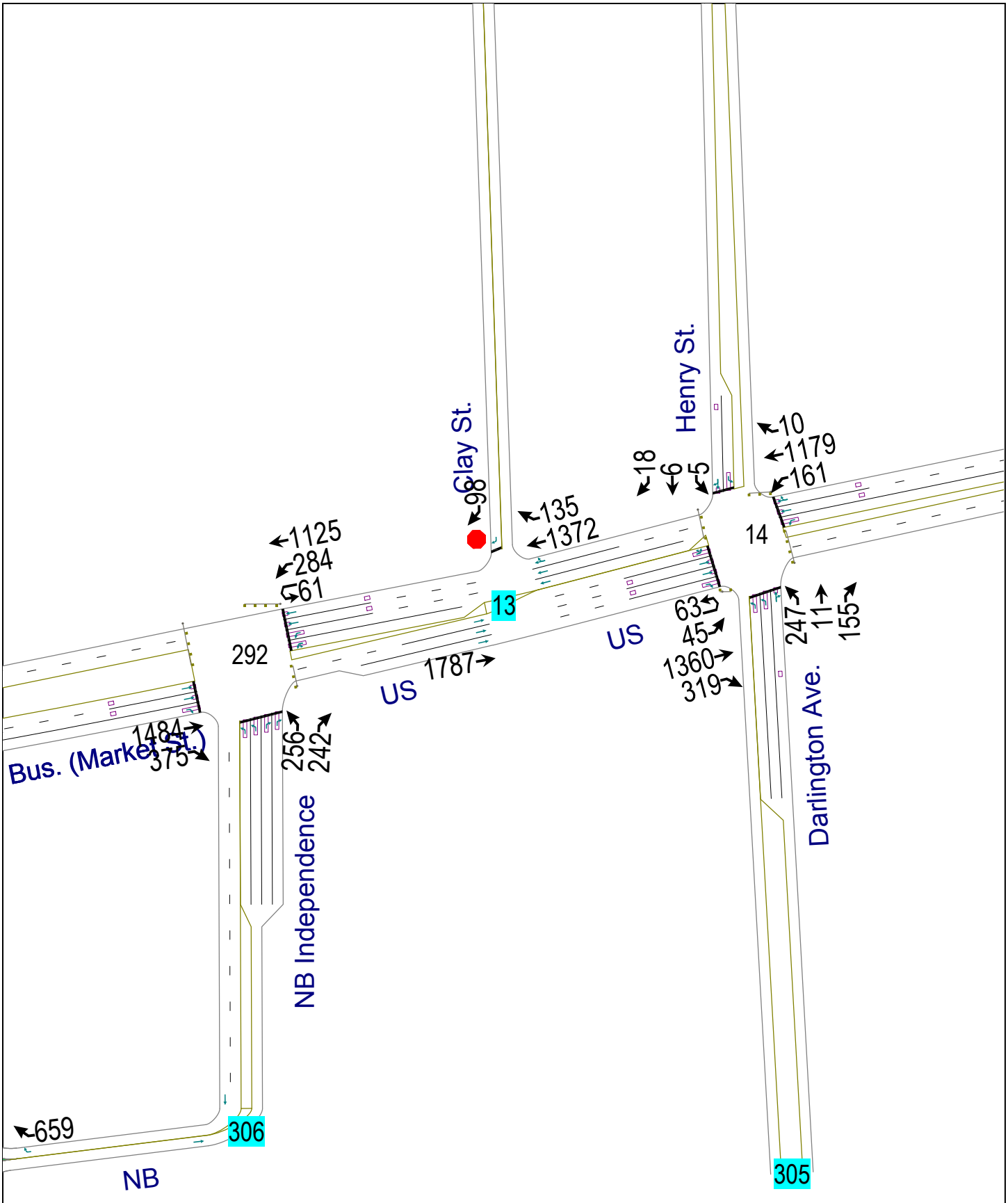
Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps





Lane Group	SBR
Total Delay	58.9
LOS	E
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	139
Queue Length 95th (ft)	197
Internal Link Dist (ft)	
Turn Bay Length (ft)	300
Base Capacity (vph)	460
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.72
Intersection Summary	





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Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↘↘	↑↑	↘↘	↘↘
Volume (vph)	1208	299	78	287	1437	260	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250		200		200	200
Storage Lanes		1		1		1	2
Taper Length (ft)		25		25		25	25
Satd. Flow (prot)	3505	1568	0	3400	3505	3400	2760
Flt Permitted				0.950		0.950	
Satd. Flow (perm)	3505	1568	0	3400	3505	3400	2760
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	40				40	25	
Link Distance (ft)	915				290	536	
Travel Time (s)	15.6				4.9	14.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1342	332	0	406	1597	289	220
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	36				36	24	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Turn Type		pm+ov	Prot	Prot			Perm
Protected Phases	2	8	1	1	6	8	
Permitted Phases		2					8
Detector Phase	2	8	1	1	6	8	8
Switch Phase							
Minimum Initial (s)	12.0	7.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	19.0	14.0	14.0	14.0	19.0	14.0	14.0
Total Split (s)	70.0	23.0	27.0	27.0	97.0	23.0	23.0
Total Split (%)	58.3%	19.2%	22.5%	22.5%	80.8%	19.2%	19.2%
Maximum Green (s)	63.0	16.0	20.0	20.0	90.0	16.0	16.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	None	None	None	C-Max	None	None
Act Effct Green (s)	66.4	88.0		22.0	93.4	16.6	16.6
Actuated g/C Ratio	0.55	0.73		0.18	0.78	0.14	0.14
v/c Ratio	0.69	0.29		0.65	0.59	0.61	0.58
Control Delay	14.3	3.5		50.4	4.6	54.5	54.5
Queue Delay	0.0	0.0		0.0	0.6	0.0	0.0

292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
Build Alt. 8 Quad AC AM Peak

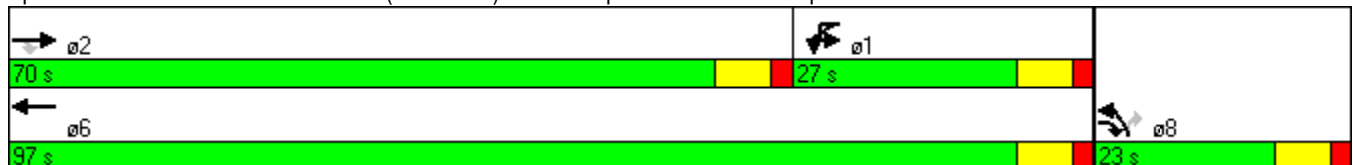


Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Total Delay	14.4	3.5		50.4	5.3	54.5	54.5
LOS	B	A		D	A	D	D
Approach Delay	12.2				14.4	54.5	
Approach LOS	B				B	D	
Queue Length 50th (ft)	213	58		158	83	108	90
Queue Length 95th (ft)	244	48		211	111	155	136
Internal Link Dist (ft)	835				210	456	
Turn Bay Length (ft)		250		200		200	200
Base Capacity (vph)	1940	1142		623	2728	510	414
Starvation Cap Reductn	0	0		0	679	0	0
Spillback Cap Reductn	18	0		0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0
Reduced v/c Ratio	0.70	0.29		0.65	0.78	0.57	0.53

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 117 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 18.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 63.7%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps



292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
 Build Alt. 8 Quad AC AM Peak

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Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↘↘	↑↑	↘↘	↘↘
Volume (vph)	1484	375	61	284	1125	256	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250		200		200	200
Storage Lanes		1		1		1	2
Taper Length (ft)		25		25		25	25
Satd. Flow (prot)	3505	1568	0	3400	3505	3400	2760
Flt Permitted				0.950		0.950	
Satd. Flow (perm)	3505	1568	0	3400	3505	3400	2760
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	40				40	25	
Link Distance (ft)	915				290	536	
Travel Time (s)	15.6				4.9	14.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1649	417	0	384	1250	284	269
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	36				36	24	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Turn Type		pm+ov	Prot	Prot			Perm
Protected Phases	2	8	1	1	6	8	
Permitted Phases		2					8
Detector Phase	2	8	1	1	6	8	8
Switch Phase							
Minimum Initial (s)	12.0	7.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	19.0	14.0	14.0	14.0	19.0	14.0	14.0
Total Split (s)	75.0	22.0	23.0	23.0	98.0	22.0	22.0
Total Split (%)	62.5%	18.3%	19.2%	19.2%	81.7%	18.3%	18.3%
Maximum Green (s)	68.0	15.0	16.0	16.0	91.0	15.0	15.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	None	None	None	C-Max	None	None
Act Effct Green (s)	70.6	92.0		18.0	93.6	16.4	16.4
Actuated g/C Ratio	0.59	0.77		0.15	0.78	0.14	0.14
v/c Ratio	0.80	0.35		0.75	0.46	0.61	0.71
Control Delay	11.6	2.7		63.2	3.6	54.8	60.7
Queue Delay	0.1	0.0		0.0	0.5	0.0	0.0

292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
Build Alt. 8 Quad AC PM Peak



Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Total Delay	11.7	2.7		63.2	4.1	54.8	60.7
LOS	B	A		E	A	D	E
Approach Delay	9.9				18.0	57.7	
Approach LOS	A				B	E	
Queue Length 50th (ft)	131	51		161	92	107	114
Queue Length 95th (ft)	336	m82		214	105	154	165
Internal Link Dist (ft)	835				210	456	
Turn Bay Length (ft)		250		200		200	200
Base Capacity (vph)	2062	1197		510	2734	482	391
Starvation Cap Reductn	15	0		0	925	0	0
Spillback Cap Reductn	42	0		0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0
Reduced v/c Ratio	0.82	0.35		0.75	0.69	0.59	0.69

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 112 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 19.2  
 Intersection LOS: B  
 Intersection Capacity Utilization 71.8%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps



292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps  
 Build Alt. 8 Quad AC PM Peak



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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↗
Volume (vph)	0	1484	1666	97	0	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	5036	4996	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	5036	4996	0	0	1611
Link Speed (mph)		40	40		25	
Link Distance (ft)		290	295		795	
Travel Time (s)		4.9	5.0		21.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1649	1959	0	0	151
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)		12	0		0	
Link Offset(ft)		0	6		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.4%
ICU Level of Service	A
Analysis Period (min)	15

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↗
Volume (veh/h)	0	1484	1666	97	0	136
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1649	1851	108	0	151
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		290	295			
pX, platoon unblocked	0.68				0.80	0.68
vC, conflicting volume	1959				2455	671
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	765				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	80
cM capacity (veh/h)	583				827	738

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	550	550	550	740	740	478	151
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	108	151
cSH	1700	1700	1700	1700	1700	1700	738
Volume to Capacity	0.32	0.32	0.32	0.44	0.44	0.28	0.20
Queue Length 95th (ft)	0	0	0	0	0	0	19
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Lane LOS							B
Approach Delay (s)	0.0			0.0			11.1
Approach LOS							B

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization	49.4%		ICU Level of Service A
Analysis Period (min)	15		

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 Quad AC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↗
Volume (vph)	0	1787	1372	135	0	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	5036	4970	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	5036	4970	0	0	1611
Link Speed (mph)		40	40		25	
Link Distance (ft)		290	295		795	
Travel Time (s)		4.9	5.0		21.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1986	1674	0	0	109
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)		12	0		0	
Link Offset(ft)		0	6		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.2%
ICU Level of Service	A
Analysis Period (min)	15

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↗
Volume (veh/h)	0	1787	1372	135	0	98
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1986	1524	150	0	109
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		290	295			
pX, platoon unblocked	0.73				0.80	0.73
vC, conflicting volume	1674				2261	583
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	640				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	86
cM capacity (veh/h)	698				819	794

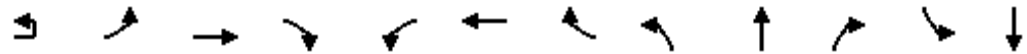
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	662	662	662	610	610	455	109
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	150	109
cSH	1700	1700	1700	1700	1700	1700	794
Volume to Capacity	0.39	0.39	0.39	0.36	0.36	0.27	0.14
Queue Length 95th (ft)	0	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.3
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.3
Approach LOS							B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization	42.2%		ICU Level of Service A
Analysis Period (min)	15		

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 Quad AC PM Peak

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Synchro 7 - Report Lanes, Volumes, Timings

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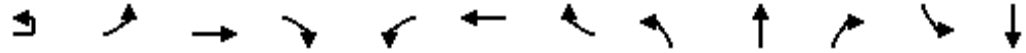


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔	↑↑	↗	↖	↑↓		↖↗	↗		↖	↗
Volume (vph)	33	18	1187	246	156	1366	5	319	6	162	10	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	350		0	225		0	100	
Storage Lanes		0		1	1		0	2		0	1	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	1752	3505	1568	1752	3501	0	3433	1595	0	1752	1621
Flt Permitted		0.950			0.950			0.950			0.950	
Satd. Flow (perm)	0	1752	3505	1568	1752	3501	0	3433	1595	0	1752	1621
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			25
Link Distance (ft)			295			1024			720			767
Travel Time (s)			5.0			17.5			19.6			20.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	57	1319	273	173	1524	0	354	187	0	11	62
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	Left	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			24
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot		pm+ov	Prot			Split				Split
Protected Phases	5	5	2	8	1	6		8	8		4	4
Permitted Phases				2								
Detector Phase	5	5	2	8	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	14.0	14.0	19.0	14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	14.0	14.0	59.0	25.0	22.0	67.0	0.0	25.0	25.0	0.0	14.0	14.0
Total Split (%)	11.7%	11.7%	49.2%	20.8%	18.3%	55.8%	0.0%	20.8%	20.8%	0.0%	11.7%	11.7%
Maximum Green (s)	7.0	7.0	52.0	18.0	15.0	60.0		18.0	18.0		7.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag		Lead	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max	None	None	C-Max		None	None		None	None
Act Effct Green (s)		9.0	58.4	78.6	16.2	68.4		19.2	19.2		9.0	9.0
Actuated g/C Ratio		0.08	0.49	0.66	0.14	0.57		0.16	0.16		0.08	0.08
v/c Ratio		0.44	0.77	0.27	0.73	0.76		0.64	0.73		0.08	0.51
Control Delay		74.6	11.3	2.9	68.2	25.3		53.0	65.3		53.3	68.5
Queue Delay		0.0	0.3	0.0	0.0	0.0		0.0	0.0		0.0	0.0

14: US 17 Bus. (Market St.) & Henry St.  
Build Alt. 8 Quad AC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	45
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

14: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 8 Quad AC AM Peak



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		74.6	11.7	2.9	68.2	25.3		53.0	65.3		53.3	68.5
LOS		E	B	A	E	C		D	E		D	E
Approach Delay			12.4			29.7			57.3			66.2
Approach LOS			B			C			E			E
Queue Length 50th (ft)		45	117	30	129	513		132	138		8	47
Queue Length 95th (ft)		m69	311	44	#224	620		184	#235		28	94
Internal Link Dist (ft)			215			944			640			687
Turn Bay Length (ft)					350			225			100	
Base Capacity (vph)		131	1706	1038	248	1996		572	266		131	122
Starvation Cap Reductn		0	75	0	0	0		0	0		0	0
Spillback Cap Reductn		0	0	0	0	0		0	0		0	0
Storage Cap Reductn		0	0	0	0	0		0	0		0	0
Reduced v/c Ratio		0.44	0.81	0.26	0.70	0.76		0.62	0.70		0.08	0.51

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.77  
 Intersection Signal Delay: 26.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 72.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: US 17 Bus. (Market St.) & Henry St.



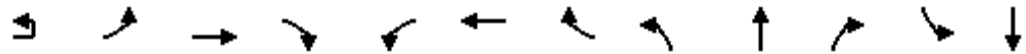


Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
11/28/2012



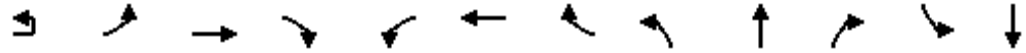
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔	↕	↗	↖	↕		↖	↗		↖	↗
Volume (vph)	63	45	1360	319	161	1179	10	247	11	155	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	350		0	225		0	100	
Storage Lanes		0		1	1		0	2		0	1	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	1752	3505	1568	1752	3501	0	3433	1602	0	1752	1640
Flt Permitted		0.950			0.950			0.950			0.950	
Satd. Flow (perm)	0	1752	3505	1568	1752	3501	0	3433	1602	0	1752	1640
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			25
Link Distance (ft)			295			1024			720			767
Travel Time (s)			5.0			17.5			19.6			20.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	120	1511	354	179	1321	0	274	184	0	6	27
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	Left	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			24
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot		pm+ov	Prot			Split				Split
Protected Phases	5	5	2	8	1	6		8	8		4	4
Permitted Phases				2								
Detector Phase	5	5	2	8	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	14.0	14.0	19.0	14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	20.0	20.0	62.0	23.0	21.0	63.0	0.0	23.0	23.0	0.0	14.0	14.0
Total Split (%)	16.7%	16.7%	51.7%	19.2%	17.5%	52.5%	0.0%	19.2%	19.2%	0.0%	11.7%	11.7%
Maximum Green (s)	13.0	13.0	55.0	16.0	14.0	56.0		16.0	16.0		7.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag		Lead	Lead						
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max	None	None	C-Max		None	None		None	None
Act Effct Green (s)		15.0	62.7	82.7	15.9	63.6		18.0	18.0		9.0	9.0
Actuated g/C Ratio		0.12	0.52	0.69	0.13	0.53		0.15	0.15		0.08	0.08
v/c Ratio		0.55	0.83	0.33	0.77	0.71		0.53	0.76		0.05	0.22
Control Delay		42.8	16.3	4.2	72.6	25.3		51.2	70.0		52.4	56.9
Queue Delay		0.0	0.8	0.0	0.0	0.0		0.0	0.0		0.0	0.0

14: US 17 Bus. (Market St.) & Henry St.  
Build Alt. 8 Quad AC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	18
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

14: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 8 Quad AC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

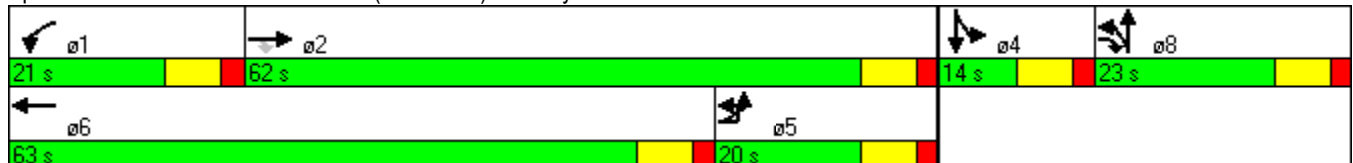


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		42.8	17.1	4.2	72.6	25.3		51.2	70.0		52.4	56.9
LOS		D	B	A	E	C		D	E		D	E
Approach Delay			16.4			30.9			58.8			56.1
Approach LOS			B			C			E			E
Queue Length 50th (ft)		87	498	57	136	434		102	139		4	20
Queue Length 95th (ft)		m114	#645	m81	#247	526		147	#250		19	51
Internal Link Dist (ft)			215			944			640			687
Turn Bay Length (ft)					350			225			100	
Base Capacity (vph)		219	1831	1087	238	1854		530	247		131	123
Starvation Cap Reductn		0	110	0	0	0		0	0		0	0
Spillback Cap Reductn		0	0	0	0	0		0	0		0	0
Storage Cap Reductn		0	0	0	0	0		0	0		0	0
Reduced v/c Ratio		0.55	0.88	0.33	0.75	0.71		0.52	0.74		0.05	0.22

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 9 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 27.1 Intersection LOS: C  
 Intersection Capacity Utilization 72.7% ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: US 17 Bus. (Market St.) & Henry St.



14: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 8 Quad AC PM Peak



Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	44	566	564	241	155	171	136	93
Average Queue (ft)	6	259	273	136	67	91	53	44
95th Queue (ft)	24	435	430	197	126	153	119	91
Link Distance (ft)		702	702		718	718	918	805
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	125			250				
Storage Blk Time (%)		22		0				
Queuing Penalty (veh)		2		0				

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	NB	SB
Directions Served	T	TR	R	R
Maximum Queue (ft)	42	46	64	238
Average Queue (ft)	1	2	14	91
95th Queue (ft)	14	16	44	174
Link Distance (ft)	718	718	900	747
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 13: US 17 Bus. (Market St.) & Clay St.

Movement	WB	WB	WB	SB
Directions Served	T	T	TR	R
Maximum Queue (ft)	118	131	182	147
Average Queue (ft)	11	4	11	61
95th Queue (ft)	63	43	69	111
Link Distance (ft)		196	196	728
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	175			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	UL	T	T	R	L	T	TR	L	L	TR	L	TR
Maximum Queue (ft)	114	239	268	108	374	585	544	177	249	260	24	107
Average Queue (ft)	46	142	151	43	147	318	315	96	112	144	6	45
95th Queue (ft)	98	214	227	85	287	470	452	158	176	236	23	90
Link Distance (ft)	196	196	196	196		989	989			646		711
Upstream Blk Time (%)		1	2									
Queuing Penalty (veh)		4	6									
Storage Bay Dist (ft)					350			225	225		100	
Storage Blk Time (%)						3			0	1		1
Queuing Penalty (veh)						4			0	2		0

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	L	T	TR	L	T	T	R	LT	R	L	LT
Maximum Queue (ft)	276	309	490	534	46	417	433	425	84	102	126	154
Average Queue (ft)	156	165	273	358	9	275	289	79	34	31	74	102
95th Queue (ft)	262	283	433	497	29	393	407	272	72	77	123	160
Link Distance (ft)			494	494		793	793		812			557
Upstream Blk Time (%)			0	0								
Queuing Penalty (veh)			0	3								
Storage Bay Dist (ft)	375	375			200			400		125	300	
Storage Blk Time (%)			0			19	1	0				
Queuing Penalty (veh)			0			3	2	0				

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps

Movement	SB	SB
Directions Served	R	R
Maximum Queue (ft)	132	145
Average Queue (ft)	90	97
95th Queue (ft)	126	141
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	178	182	115	216	237	240	230	130	193	211	122
Average Queue (ft)	114	139	32	157	165	123	133	81	98	60	64
95th Queue (ft)	159	181	84	222	239	203	203	128	162	122	106
Link Distance (ft)	793	793			224	224	224		429		
Upstream Blk Time (%)				1	3	0	0				
Queuing Penalty (veh)				0	20	1	1				
Storage Bay Dist (ft)			250	200				200		200	200
Storage Blk Time (%)				3	6				0	0	
Queuing Penalty (veh)				5	13				0	0	

Intersection: 293: NB Independence Blvd. Ramps & Independence Blvd.

Movement	B306
Directions Served	T
Maximum Queue (ft)	465
Average Queue (ft)	16
95th Queue (ft)	153
Link Distance (ft)	429
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 294: SB Independence Blvd. Ramps & SB Independence Blvd.

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 68

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	149	736	718	274	306	393	160	67
Average Queue (ft)	25	500	495	92	140	191	104	28
95th Queue (ft)	83	774	758	179	262	339	154	53
Link Distance (ft)		702	702		718	718	918	805
Upstream Blk Time (%)		4	3					
Queuing Penalty (veh)		0	0					
Storage Bay Dist (ft)	125			250				
Storage Blk Time (%)	0	31			1			
Queuing Penalty (veh)	0	7			1			

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	48	108
Average Queue (ft)	25	57
95th Queue (ft)	50	97
Link Distance (ft)	900	747
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: US 17 Bus. (Market St.) & Clay St.

Movement	WB	WB	SB
Directions Served	T	TR	R
Maximum Queue (ft)	118	53	148
Average Queue (ft)	24	3	39
95th Queue (ft)	81	20	82
Link Distance (ft)		196	728
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			



Intersection: 14: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	UL	T	T	R	L	T	TR	L	L	TR	L	TR
Maximum Queue (ft)	249	246	245	115	243	393	408	133	151	194	46	81
Average Queue (ft)	84	146	157	47	108	285	276	77	78	119	9	24
95th Queue (ft)	163	233	238	89	195	389	386	127	126	194	30	66
Link Distance (ft)	196	196	196	196		989	989			646		711
Upstream Blk Time (%)	1	1	2									
Queuing Penalty (veh)	4	6	7									
Storage Bay Dist (ft)					350			225	225		100	
Storage Blk Time (%)							1					0
Queuing Penalty (veh)							2					0

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	UL	L	T	TR	L	T	T	R	LT	R	L	LT
Maximum Queue (ft)	221	202	263	388	65	484	672	91	66	62	120	151
Average Queue (ft)	139	129	105	160	13	181	202	43	25	18	73	99
95th Queue (ft)	218	203	189	301	37	325	384	88	56	45	122	138
Link Distance (ft)			494	494		793	793		812			557
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	375	375			200			400		125	300	
Storage Blk Time (%)							4	0				
Queuing Penalty (veh)							1	1				

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd. Ramps

Movement	SB	SB
Directions Served	R	R
Maximum Queue (ft)	168	152
Average Queue (ft)	98	106
95th Queue (ft)	147	146
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd. Ramps

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	379	460	275	217	248	95	154	157	152	102	100
Average Queue (ft)	182	225	90	174	185	52	76	78	92	52	64
95th Queue (ft)	285	347	190	238	262	89	135	137	145	92	100
Link Distance (ft)	793	793			224	224	224		429		
Upstream Blk Time (%)				3	14						
Queuing Penalty (veh)				0	68						
Storage Bay Dist (ft)			250	200				200		200	200
Storage Blk Time (%)		3		14	17						
Queuing Penalty (veh)		9		20	34						

Intersection: 293: NB Independence Blvd. Ramps & Independence Blvd.

Movement	B306
Directions Served	T
Maximum Queue (ft)	573
Average Queue (ft)	19
95th Queue (ft)	189
Link Distance (ft)	429
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 294: SB Independence Blvd. Ramps & SB Independence Blvd.

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 160

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 8 AC Quadrant
Project Description	U-4434 Independence Boulevard Extension		
<b>45</b>		<b>46</b>	
Independence Blvd. SB - to US 17 Bus.		Independence Blvd. NB - from US 17 Bus.	
Merge/Diverge	Diverge	Merge/Diverge	Merge
No. of lanes on Freeway	2	No. of lanes on Freeway	2
Freeway FFS	60 mph	Freeway FFS	60 mph
Freeway Volume (AM/PM)	2877 2354	Freeway Volume (AM/PM)	1768 2218
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	15 mph
Ramp Volume (AM/PM)	659 586	Ramp Volume (AM/PM)	586 659
No. Lanes on Ramp	1	No. Lanes on Ramp	1
Accel/Decel Distance 1	800 ft	Accel/Decel Distance 1	1440 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	N/A ft
Adjacent Upstream	Yes	Adjacent Upstream	Yes
Off/On	On	Off/On	Off
Distance	3380 ft	Distance	90 ft
Truck %	4%	Truck %	3%
Ramp Volume (AM/PM)	1628 1103	Ramp Volume (AM/PM)	425 471
Adjacent Downstream	Yes	Adjacent Downstream	Yes
Off/On	On - N/A	Off/On	Off
Distance	N/A ft	Distance	4930 ft
Truck %	N/A	Truck %	4%
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	1103 1628
Peak Hour Factor	0.90	Peak Hour Factor	0.90
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	1.00
Freeway Truck %	4%	Freeway Truck %	4%
Ramp Truck %	3%	Ramp Truck %	3%
<b>47</b>		<b>48</b>	
Independence Blvd. SB - from US 17 Bus.		Independence Blvd. NB - to Darlington	
Merge/Diverge	Merge	Merge/Diverge	Diverge
No. of lanes on Freeway	2	No. of lanes on Freeway	0
Freeway FFS	60 mph	Freeway FFS	0 mph
Freeway Volume (AM/PM)	2213 1771	Freeway Volume (AM/PM)	0 0
Ramp Side (Left or Right)	Right	Ramp Side (Left or Right)	Right
Ramp FFS	15 mph	Ramp FFS	0 mph
Ramp Volume (AM/PM)	471 425	Ramp Volume (AM/PM)	0 0
No. Lanes on Ramp	1	No. Lanes on Ramp	0
Accel/Decel Distance 1	1440 ft	Accel/Decel Distance 1	0 ft
Accel/Decel Distance 2	N/A ft	Accel/Decel Distance 2	0 ft
Adjacent Upstream	Yes	Adjacent Upstream	Yes
Off/On	Off	Off/On	On
Distance	90 ft	Distance	0 ft
Truck %	3%	Truck %	0
Ramp Volume (AM/PM)	659 586	Ramp Volume (AM/PM)	0 0
Adjacent Downstream	No	Adjacent Downstream	Yes
Off/On	N/A	Off/On	On
Distance	N/A ft	Distance	0 ft
Truck %	N/A	Truck %	0
Ramp Volume (AM/PM)	N/A N/A	Ramp Volume (AM/PM)	0 0
Peak Hour Factor	0.90	Peak Hour Factor	0.00
Terrain	Level	Terrain	Level
Population Adj. Factor	1.00	Population Adj. Factor	0.00
Freeway Truck %	4%	Freeway Truck %	0%
Ramp Truck %	3%	Ramp Truck %	0%

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 8 AC Quadrant
Project Description	U-4434 Independence Boulevard Extension		

<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">49</div> <p>Independence Blvd. NB - Darlington to Market</p> <p>Sides (One or Two)                    One</p> <p>No. of Lanes                                3</p> <p>Weaving Length, L<sub>s</sub>                    1720    ft</p> <p>Multi-Lane FFS                            60        mph</p> <p>Min. Speed (Def. = 15)                15        mph</p> <p>Segment Type                              Multi-Lane</p> <p>Terrain                                        Level</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>AM Peak</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td></tr> <tr><td>F</td><td>→</td><td>F</td><td>V<sub>FF</sub></td><td>1684</td><td>Truck</td></tr> <tr><td></td><td>↘</td><td>F</td><td>V<sub>RF</sub></td><td>87</td><td>4 %</td></tr> <tr><td></td><td>↙</td><td>R</td><td>V<sub>FR</sub></td><td>403</td><td>4 %</td></tr> <tr><td>R</td><td>→</td><td>R</td><td>V<sub>RR</sub></td><td>22</td><td>4 %</td></tr> </table>   <p><b>PM Peak</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td></tr> <tr><td>F</td><td>→</td><td>F</td><td>V<sub>FF</sub></td><td>2134</td><td>Truck</td></tr> <tr><td></td><td>↘</td><td>F</td><td>V<sub>RF</sub></td><td>79</td><td>4 %</td></tr> <tr><td></td><td>↙</td><td>R</td><td>V<sub>FR</sub></td><td>451</td><td>4 %</td></tr> <tr><td>R</td><td>→</td><td>R</td><td>V<sub>RR</sub></td><td>20</td><td>4 %</td></tr> </table> </div> <div style="width: 45%;"> <p>Peak Hour Factor                        0.90</p> <p>Driver Pop. Adj.                         1.00</p> <p>Maneuver Lns., N<sub>WL</sub>                    2</p> <p>Interchange Density                    3.00</p> <p>Min. RF In. chng., LC<sub>RF</sub>                1</p> <p>Min. FR In. chng., LC<sub>FR</sub>                1</p> <p>Min. RR In. chng., LC<sub>RR</sub>                N/A</p> <p style="text-align: center;">20% of vehicles from Darlington exit onto Market</p> </div> </div>							F	→	F	V <sub>FF</sub>	1684	Truck		↘	F	V <sub>RF</sub>	87	4 %		↙	R	V <sub>FR</sub>	403	4 %	R	→	R	V <sub>RR</sub>	22	4 %							F	→	F	V <sub>FF</sub>	2134	Truck		↘	F	V <sub>RF</sub>	79	4 %		↙	R	V <sub>FR</sub>	451	4 %	R	→	R	V <sub>RR</sub>	20	4 %	<p>Sides (One or Two)                    One</p> <p>No. of Lanes                                0</p> <p>Weaving Length, L<sub>s</sub>                    0        ft</p> <p>Freeway FFS                                0        mph</p> <p>Min. 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	↙	R	V <sub>FR</sub>	0	0 %																																																																																																																																																																																	
R	→	R	V <sub>RR</sub>	0	0 %																																																																																																																																																																																	
F	→	F	V <sub>FF</sub>	0	Truck																																																																																																																																																																																	
	↘	F	V <sub>RF</sub>	0	0 %																																																																																																																																																																																	
	↙	R	V <sub>FR</sub>	0	0 %																																																																																																																																																																																	
R	→	R	V <sub>RR</sub>	0	0 %																																																																																																																																																																																	
F	→	F	V <sub>FF</sub>	0	Truck																																																																																																																																																																																	
	↘	F	V <sub>RF</sub>	0	0 %																																																																																																																																																																																	
	↙	R	V <sub>FR</sub>	0	0 %																																																																																																																																																																																	
R	→	R	V <sub>RR</sub>	0	0 %																																																																																																																																																																																	

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 8 AC Quadrant
Project Description		U-4434 Independence Boulevard Extension	

<div style="text-align: right; margin-bottom: 10px;"><b>49</b></div> <p>Independence Blvd. NB - Darlington to Market  <u>Interchange</u>                      <u>No.</u>                      Darlington Ave.                      1                      Market St.                              1</p> <p style="font-size: small; margin-top: 20px;">Note: multi-lane only 0.67 mile long                      Interchange Density                      3.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small; margin-top: 20px;">Note: freeway only 3.5 miles long                      Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small; margin-top: 20px;">Interchange Density                      0.00 int/mi</p>
<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small; margin-top: 20px;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small; margin-top: 20px;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small; margin-top: 20px;">Interchange Density                      0.00 int/mi</p>

**HIGHWAY CAPACITY SOFTWARE 2010  
NETWORK DATA SUMMARY - ANALYSIS NOTES**

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 8 AC Quadrant
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV %	Freeway Truck%			
	FR = DS ramp HV %	Off Ramp Truck %			
	RF = US ramp HV %	On Ramp Truck %			
	RR = DS ramp HV %	Off Ramp Truck %			

Level of Service Standards - Freeways	Level of Service Standards - Signalized Intersections
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004	LOS D or better for overall intersection required
	LOS D or better for individual movements recommended
	If not LOS D for individual movement - v/c ratio must be less than 0.85

**Assumed Improvements**

TIP No.	Description
U-3338	SR 1175 (Kerr Avenue) - widening, including new interchange at US 74

**General Analysis Notes**

- ▶ Interchange/Ramp Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

**Design Specific Analysis Notes**

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

**Locations where LOS D or better not achieved**

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 8 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 3380 ft V <sub>u</sub> = 1628 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : Deceleration Lane Length L <sub>D</sub> : 800 Freeway Volume, V <sub>F</sub> : 2877 Ramp Volume, V <sub>R</sub> : 659 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2877	0.90	Level	4	0	0.980	1.00	3261
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	1628	0.90	Level	4	0	0.980	1.00	1845
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 3261 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	3261	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2518	Exhibit 13-8	4600 No
V <sub>R</sub>	743	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3261	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 25.1 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>s</sub> = 0.755 (Exhibit 13-12)  
 S<sub>R</sub> = 46.4 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 46.4 mph (Exhibit 13-13)





## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 8 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1768	$L_{down} =$ ft
$V_u =$ 425 veh/h	Ramp Volume, $V_R$	586	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1768	0.90	Level	4	0	0.980	1.00	2004
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	425	0.90	Level	3	0	0.985	1.00	479
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
(Equation 13-6 or 13-7)

$L_{EQ} =$  (Equation 13-6 or 13-7)

$P_{FM} =$  1.000 using Equation (Exhibit 13-6)

$V_{12} =$  2004 pc/h

$V_3$  or  $V_{av34} =$  0 pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
(Equation 13-12 or 13-13)

$L_{EQ} =$  (Equation 13-12 or 13-13)

$P_{FD} =$  using Equation (Exhibit 13-7)

$V_{12} =$  pc/h

$V_3$  or  $V_{av34} =$  pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2665	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2665	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$  16.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$  (pc/mi/ln)

LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$  0.334 (Exhibit 13-11)

$S_R =$  54.0 mph (Exhibit 13-11)

$S_0 =$  N/A mph (Exhibit 13-11)

$S =$  54.0 mph (Exhibit 13-13)

### Speed Determination

$D_s =$  (Exhibit 13-12)

$S_R =$  mph (Exhibit 13-12)

$S_0 =$  mph (Exhibit 13-12)

$S =$  mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 8 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2218	$L_{down} =$ ft
$V_u =$ 471 veh/h	Ramp Volume, $V_R$	659	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2218	0.90	Level	4	0	0.980	1.00	2514
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	471	0.90	Level	3	0	0.985	1.00	531
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2514 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3257	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3257	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
$D_R =$ 21.5 (pc/mi/ln)
LOS = C (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)
LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.379 (Exhibit 13-11)
$S_R =$ 53.2 mph (Exhibit 13-11)
$S_0 =$ N/A mph (Exhibit 13-11)
$S =$ 53.2 mph (Exhibit 13-13)

### Speed Determination

$D_s =$ (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 8 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2213	$L_{down} =$ ft
$V_u =$ 659 veh/h	Ramp Volume, $V_R$	471	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2213	0.90	Level	4	0	0.980	1.00	2508
Ramp	471	0.90	Level	3	0	0.985	1.00	531
UpStream	659	0.90	Level	3	0	0.985	1.00	743
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2508 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3039	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3039	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
$D_R =$ 19.9 (pc/mi/ln)
LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)
LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.359 (Exhibit 13-11)
$S_R =$ 53.5 mph (Exhibit 13-11)
$S_0 =$ N/A mph (Exhibit 13-11)
$S =$ 53.5 mph (Exhibit 13-13)

### Speed Determination

$D_s =$ (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 8 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1771	$L_{down} =$ ft
$V_u =$ 586 veh/h	Ramp Volume, $V_R$	425	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1771	0.90	Level	4	0	0.980	1.00	2007
Ramp	425	0.90	Level	3	0	0.985	1.00	479
UpStream	586	0.90	Level	3	0	0.985	1.00	661
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2007 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2486	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2486	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$	
$D_R =$	15.6 (pc/mi/ln)
LOS =	B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$	
$D_R =$	(pc/mi/ln)
LOS =	(Exhibit 13-2)

### Speed Determination

$M_S =$	0.325 (Exhibit 13-11)
$S_R =$	54.2 mph (Exhibit 13-11)
$S_0 =$	N/A mph (Exhibit 13-11)
$S =$	54.2 mph (Exhibit 13-13)

### Speed Determination

$D_s =$	(Exhibit 13-12)
$S_R =$	mph (Exhibit 13-12)
$S_0 =$	mph (Exhibit 13-12)
$S =$	mph (Exhibit 13-13)

<b>RAMPS AND RAMP JUNCTIONS WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst		URS			Freeway/Dir of Travel		Independence Blvd NB		
Agency or Company					Junction		to Darlington Ave		
Date Performed		2013			Jurisdiction		Segment #48		
Analysis Time Period		AM Peak			Analysis Year		2040 Build - Alt 8 AC Quadrant		
Project Description U-4434 Independence Boulevard Extension									
<b>Inputs</b>									
Upstream Adj Ramp		Number of Lanes, N			2			Downstream Adj Ramp	
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L <sub>A</sub>						<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L <sub>D</sub>			800			<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L <sub>up</sub> =      ft		Freeway Volume, V <sub>F</sub>			2205			L <sub>down</sub> =      ft	
V <sub>u</sub> =      veh/h		Ramp Volume, V <sub>R</sub>			99			V <sub>D</sub> =      veh/h	
		Freeway Free-Flow Speed, S <sub>FF</sub>			60.0				
		Ramp Free-Flow Speed, S <sub>FR</sub>			15.0				
<b>Conversion to pc/h Under Base Conditions</b>									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	2205	0.90	Level	4	0	0.980	1.00	2499	
Ramp	99	0.90	Level	2	0	0.990	1.00	111	
UpStream									
DownStream									
<b>Merge Areas</b>					<b>Diverge Areas</b>				
<b>Estimation of v<sub>12</sub></b>					<b>Estimation of v<sub>12</sub></b>				
$V_{12} = V_F (P_{FM})$ L <sub>EQ</sub> = (Equation 13-6 or 13-7) P <sub>FM</sub> = using Equation (Exhibit 13-6) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L <sub>EQ</sub> = (Equation 13-12 or 13-13) P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7) V <sub>12</sub> = 2499 pc/h V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)				
<b>Capacity Checks</b>					<b>Capacity Checks</b>				
Actual		Capacity		LOS F?	Actual		Capacity		LOS F?
V <sub>FO</sub>		Exhibit 13-8			V <sub>F</sub>	2499	Exhibit 13-8	4600	No
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2388	Exhibit 13-8	4600	No
					V <sub>R</sub>	111	Exhibit 13-10	1800	No
<b>Flow Entering Merge Influence Area</b>					<b>Flow Entering Diverge Influence Area</b>				
Actual		Max Desirable		Violation?	Actual		Max Desirable		Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		Exhibit 13-8		4400:All
<b>Level of Service Determination (if not F)</b> $D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)					<b>Level of Service Determination (if not F)</b> $D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 18.5 (pc/mi/ln) LOS = B (Exhibit 13-2)				
<b>Speed Determination</b>					<b>Speed Determination</b>				
M <sub>S</sub> = (Exhibit 13-11)					D <sub>S</sub> = 0.698 (Exhibit 13-12)				
S <sub>R</sub> = mph (Exhibit 13-11)					S <sub>R</sub> = 47.4 mph (Exhibit 13-12)				
S <sub>0</sub> = mph (Exhibit 13-11)					S <sub>0</sub> = N/A mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 47.4 mph (Exhibit 13-13)				

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	to Darlington
Date Performed	2013	Jurisdiction	Segment #48
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 8 AC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> =      ft  V <sub>u</sub> =      veh/h	Number of Lanes, N      2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 800 Freeway Volume, V <sub>F</sub> 2695 Ramp Volume, V <sub>R</sub> 133 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> =      ft  V <sub>D</sub> =      veh/h
--	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2695	0.90	Level	4	0	0.980	1.00	3054
Ramp	133	0.90	Level	2	0	0.990	1.00	149
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 3054 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	3054	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2905	Exhibit 13-8	4600 No
V <sub>R</sub>	149	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3054	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 23.3 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.701 (Exhibit 13-12)  
 S<sub>R</sub> = 47.4 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 47.4 mph (Exhibit 13-13)

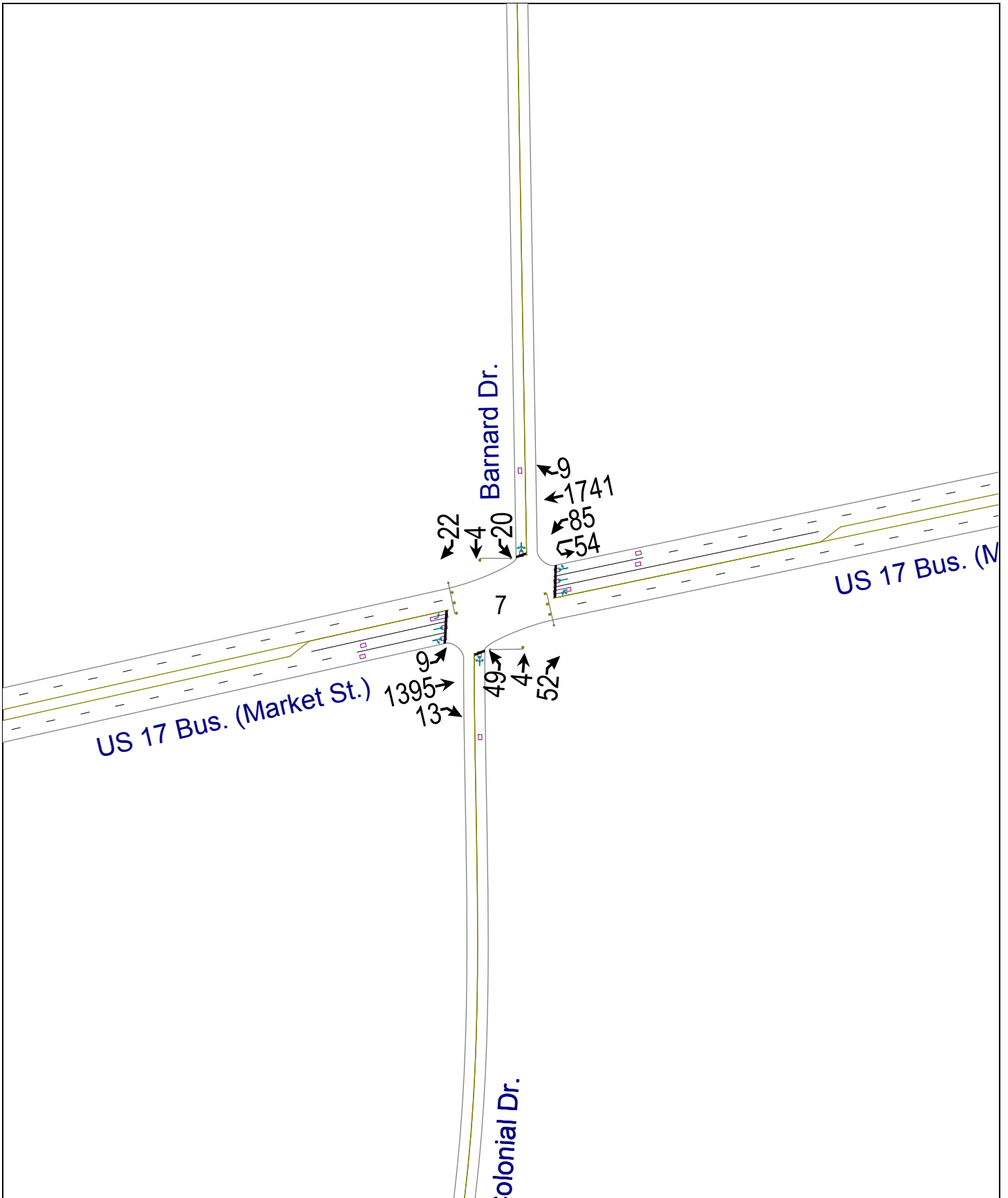
FREEWAY WEAVING WORKSHEET									
General Information					Site Information				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 8 AC Quadrant			
Analysis Time Period	AM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
Inputs									
Weaving configuration	One-Sided				Segment type	C-D Roadway/ Multilane Highways			
Weaving number of lanes, N	3				Freeway minimum speed, $S_{MIN}$	15			
Weaving segment length, $L_S$	1750ft				Freeway maximum capacity, $C_{IFL}$	2300			
Freeway free-flow speed, FFS	60 mph				Terrain type	Level			
Conversions to pc/h Under Base Conditions									
	V (veh/h)	PHF	Truck (%)	RV (%)	$E_T$	$E_R$	$f_{HV}$	$f_p$	v (pc/h)
$V_{FF}$	1684	0.90	4	0	1.5	1.2	0.980	1.00	1909
$V_{RF}$	87	0.90	4	0	1.5	1.2	0.980	1.00	99
$V_{FR}$	403	0.90	4	0	1.5	1.2	0.980	1.00	457
$V_{RR}$	22	0.90	4	0	1.5	1.2	0.980	1.00	25
$V_{NW}$	1934							V =	2490
$V_W$	556								
VR	0.223								
Configuration Characteristics									
Minimum maneuver lanes, $N_{WL}$	2 lc				Minimum weaving lane changes, $LC_{MIN}$	556 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, $LC_W$	961 lc/h			
Minimum RF lane changes, $LC_{RF}$	1 lc/pc				Non-weaving lane changes, $LC_{NW}$	769 lc/h			
Minimum FR lane changes, $LC_{FR}$	1 lc/pc				Total lane changes, $LC_{ALL}$	1730 lc/h			
Minimum RR lane changes, $LC_{RR}$	lc/pc				Non-weaving vehicle index, $I_{NW}$	1015			
Weaving Segment Speed, Density, Level of Service, and Capacity									
Weaving segment flow rate, v	2490 pc/h				Weaving intensity factor, W	0.224			
Weaving segment capacity, $c_w$	6085 veh/h				Weaving segment speed, S	52.0 mph			
Weaving segment v/c ratio	0.401				Average weaving speed, $S_W$	51.8 mph			
Weaving segment density, D	16.0 pc/mi/ln				Average non-weaving speed, $S_{NW}$	52.0 mph			
Level of Service, LOS	B				Maximum weaving length, $L_{MAX}$	4776 ft			
Notes									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

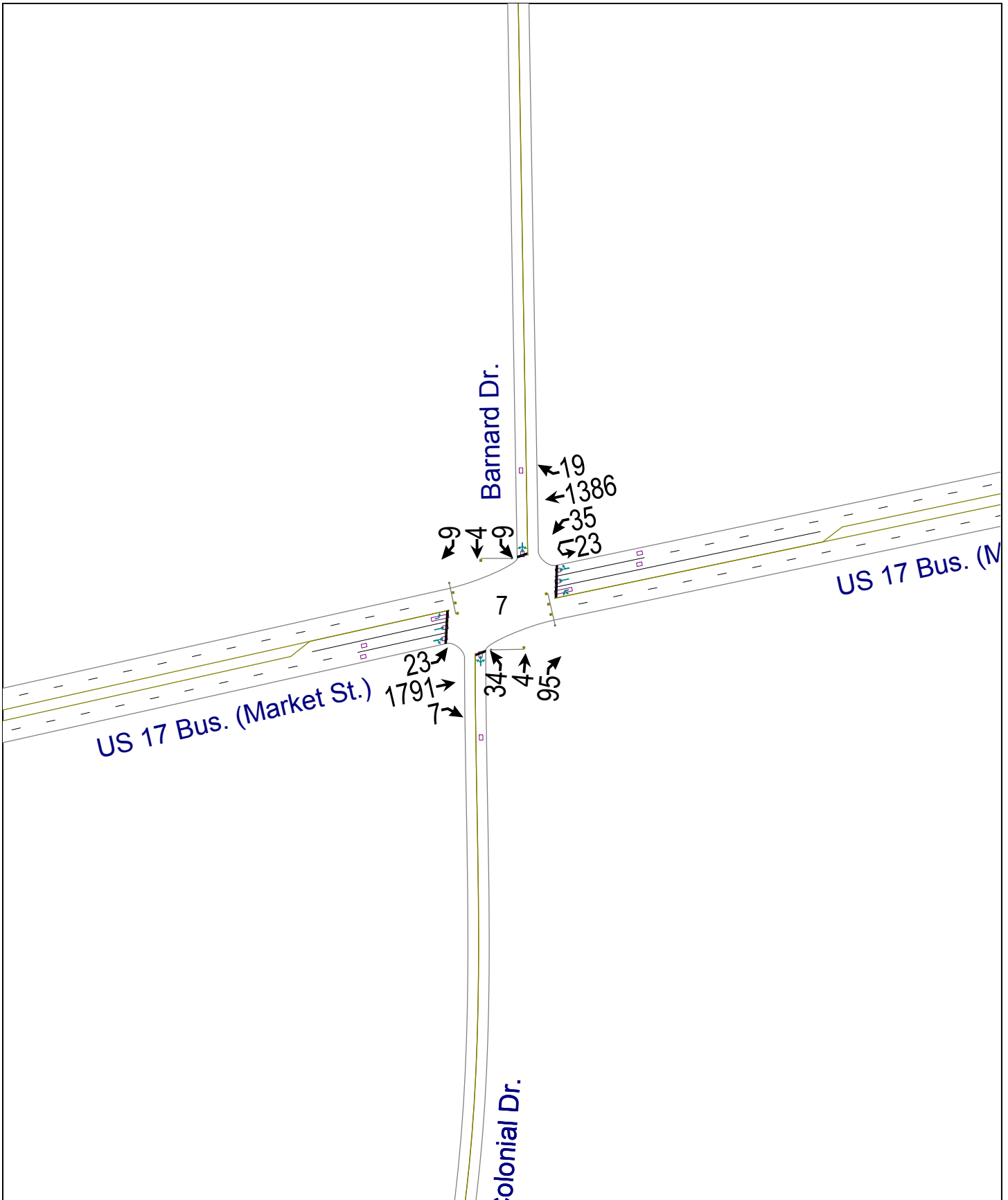
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 8 AC Quadrant			
Analysis Time Period	PM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1750ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	2134	0.90	4	0	1.5	1.2	0.980	1.00	2419
V <sub>RF</sub>	79	0.90	4	0	1.5	1.2	0.980	1.00	90
V <sub>FR</sub>	451	0.90	4	0	1.5	1.2	0.980	1.00	511
V <sub>RR</sub>	21	0.90	4	0	1.5	1.2	0.980	1.00	24
V <sub>NW</sub>	2443							V =	3044
V <sub>W</sub>	601								
VR	0.197								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	601 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	1006 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	874 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1880 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	1283			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	3044 pc/h				Weaving intensity factor, W	0.239			
Weaving segment capacity, c <sub>w</sub>	6144 veh/h				Weaving segment speed, S	50.9 mph			
Weaving segment v/c ratio	0.486				Average weaving speed, S <sub>W</sub>	51.3 mph			
Weaving segment density, D	19.9 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	50.8 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4510 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									



## Build Alternative 8, Quadrant BC

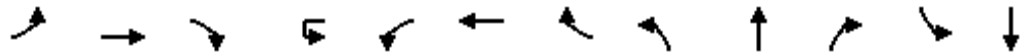
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U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
11/28/2012

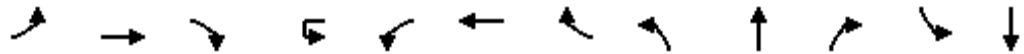


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	9	1395	13	54	85	1741	9	49	4	52	20	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0		300		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3536	0	0	1770	3536	0	0	1696	0	0	1703
Flt Permitted	0.074				0.950				0.977			0.978
Satd. Flow (perm)	138	3536	0	0	1770	3536	0	0	1696	0	0	1703
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		35				35			25			25
Link Distance (ft)		784				861			978			871
Travel Time (s)		15.3				16.8			26.7			23.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1564	0	0	154	1944	0	0	116	0	0	50
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		12				12			0			0
Link Offset(ft)		0				0			-30			-30
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	7.0	10.0		7.0	7.0		7.0	7.0
Minimum Split (s)	17.0	17.0		14.0	14.0	17.0		14.0	14.0		14.0	14.0
Total Split (s)	67.0	67.0	0.0	21.0	21.0	88.0	0.0	18.0	18.0	0.0	14.0	14.0
Total Split (%)	55.8%	55.8%	0.0%	17.5%	17.5%	73.3%	0.0%	15.0%	15.0%	0.0%	11.7%	11.7%
Maximum Green (s)	60.0	60.0		14.0	14.0	81.0		11.0	11.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	66.3	66.3			15.1	86.3			12.5			9.0
Actuated g/C Ratio	0.55	0.55			0.13	0.72			0.10			0.08
v/c Ratio	0.13	0.80			0.69	0.76			0.66			0.39
Control Delay	20.7	27.0			64.2	10.2			69.7			62.4
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

7: US 17 Bus. (Market St.) & Barnard Dr.  
Build Alt. 8 Quad BC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	22
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 8 Quad BC AM Peak



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	20.7	27.0			64.2	10.2			69.7			62.4
LOS	C	C			E	B			E			E
Approach Delay		27.0				14.2			69.7			62.4
Approach LOS		C				B			E			E
Queue Length 50th (ft)	4	533			123	255			87			38
Queue Length 95th (ft)	16	642			m143	327			#161			80
Internal Link Dist (ft)		704				781			898			791
Turn Bay Length (ft)	150				300							
Base Capacity (vph)	76	1953			236	2544			184			128
Starvation Cap Reductn	0	0			0	0			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.13	0.80			0.65	0.76			0.63			0.39

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 15 (13%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 21.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 77.3%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: US 17 Bus. (Market St.) & Barnard Dr.



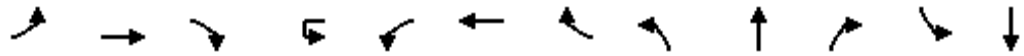


Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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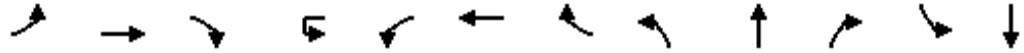


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	23	1791	7	23	35	1386	19	34	4	95	9	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0		300		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3536	0	0	1770	3532	0	0	1660	0	0	1723
Flt Permitted	0.137				0.950				0.987			0.980
Satd. Flow (perm)	255	3536	0	0	1770	3532	0	0	1660	0	0	1723
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		35				35			25			25
Link Distance (ft)		784				861			978			871
Travel Time (s)		15.3				16.8			26.7			23.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1998	0	0	65	1561	0	0	148	0	0	24
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		12				12			0			0
Link Offset(ft)		0				0			-30			-30
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	7.0	10.0		7.0	7.0		7.0	7.0
Minimum Split (s)	17.0	17.0		14.0	14.0	17.0		14.0	14.0		14.0	14.0
Total Split (s)	75.0	75.0	0.0	14.0	14.0	89.0	0.0	17.0	17.0	0.0	14.0	14.0
Total Split (%)	62.5%	62.5%	0.0%	11.7%	11.7%	74.2%	0.0%	14.2%	14.2%	0.0%	11.7%	11.7%
Maximum Green (s)	68.0	68.0		7.0	7.0	82.0		10.0	10.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	76.5	76.5			9.2	88.0			13.6			9.0
Actuated g/C Ratio	0.64	0.64			0.08	0.73			0.11			0.08
v/c Ratio	0.16	0.89			0.48	0.60			0.79			0.19
Control Delay	14.6	26.4			57.6	8.2			80.2			55.8
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

7: US 17 Bus. (Market St.) & Barnard Dr.  
Build Alt. 8 Quad BC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	9
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 8 Quad BC PM Peak



Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	14.6	26.4			57.6	8.2			80.2			55.8
LOS	B	C			E	A			F			E
Approach Delay		26.3				10.2			80.2			55.8
Approach LOS		C				B			F			E
Queue Length 50th (ft)	9	739			52	201			115			18
Queue Length 95th (ft)	27	#958			m70	282			#240			46
Internal Link Dist (ft)		704				781			898			791
Turn Bay Length (ft)	150				300							
Base Capacity (vph)	163	2256			136	2589			188			129
Starvation Cap Reductn	0	0			0	0			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.16	0.89			0.48	0.60			0.79			0.19

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 21 (18%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 21.7  
 Intersection LOS: C  
 Intersection Capacity Utilization 67.1%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

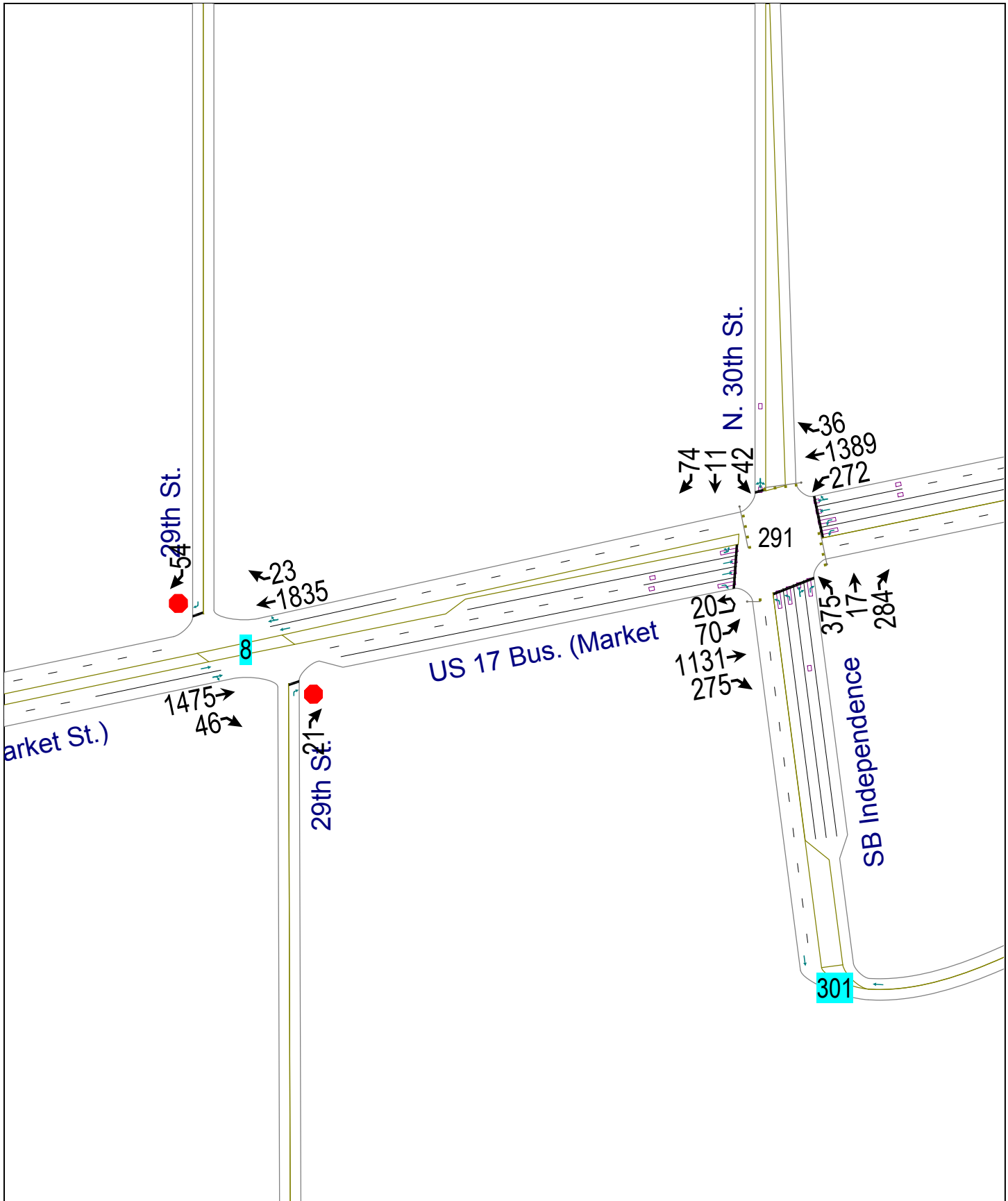
Splits and Phases: 7: US 17 Bus. (Market St.) & Barnard Dr.

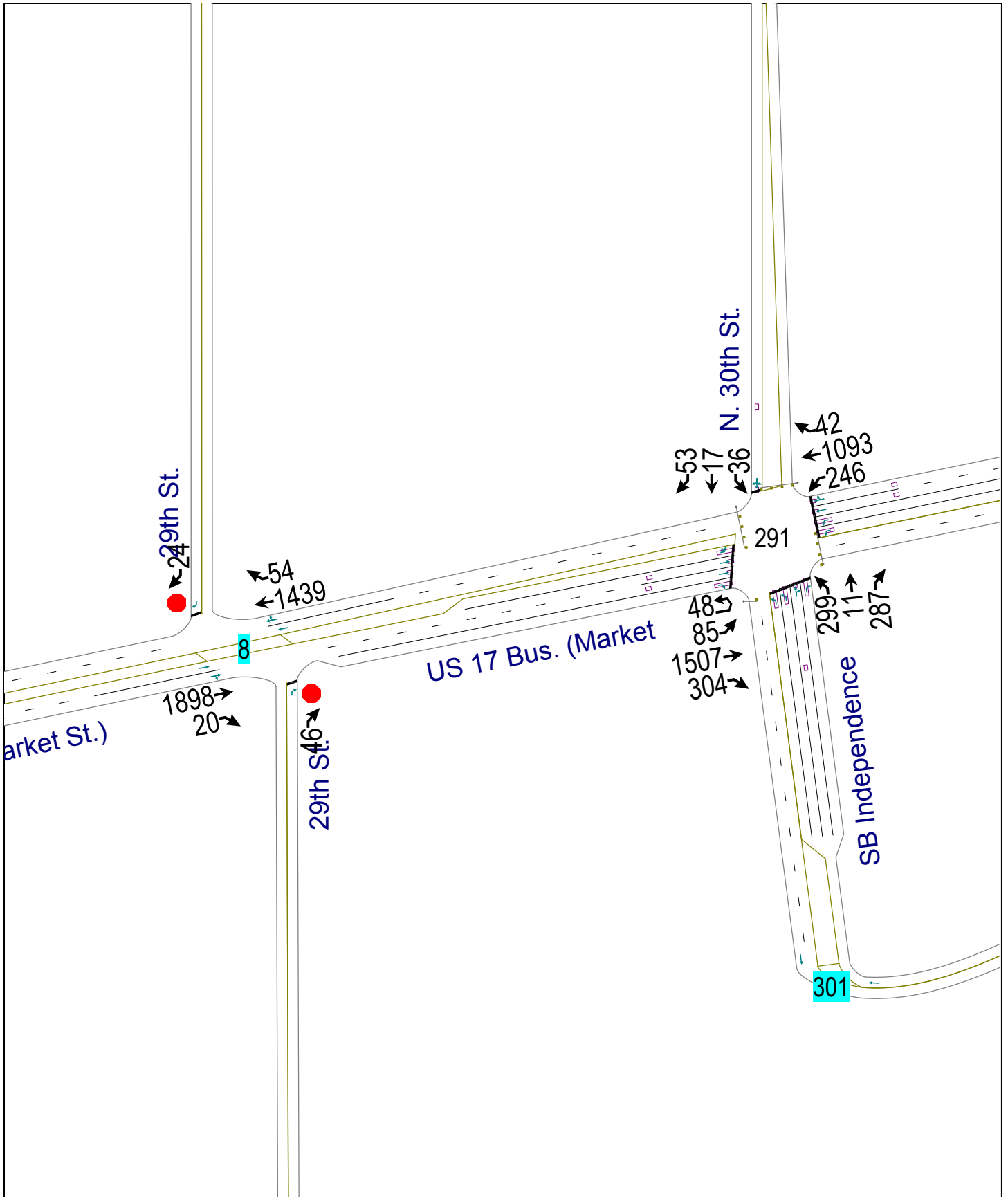


7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 8 Quad BC PM Peak



Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	





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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (vph)	0	1475	46	0	1835	23	0	0	21	0	0	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3522	0	0	3532	0	0	0	1611	0	0	1596
Flt Permitted												
Satd. Flow (perm)	0	3522	0	0	3532	0	0	0	1611	0	0	1596
Link Speed (mph)		40			40			25				25
Link Distance (ft)		861			610			952				799
Travel Time (s)		14.7			10.4			26.0				21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	0%	2%	2%	0%	0%	2%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1690	0	0	2065	0	0	0	23	0	0	60
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0				0
Link Offset(ft)		0			0			48				48
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.5%
Analysis Period (min)	15
	ICU Level of Service B

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (veh/h)	0	1475	46	0	1835	23	0	0	21	0	0	54
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1639	51	0	2039	26	0	0	23	0	0	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		861			610							
pX, platoon unblocked	0.57			0.61			0.77	0.77	0.61	0.77	0.77	0.57
vC, conflicting volume	2064			1690			2744	3729	845	2894	3742	1032
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1355			843			356	1643	0	552	1660	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	96	100	100	90
cM capacity (veh/h)	292			487			400	77	658	310	75	615

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1093	597	1359	705	23	60
Volume Left	0	0	0	0	0	0
Volume Right	0	51	0	26	23	60
cSH	1700	1700	1700	1700	658	615
Volume to Capacity	0.64	0.35	0.80	0.41	0.04	0.10
Queue Length 95th (ft)	0	0	0	0	3	8
Control Delay (s)	0.0	0.0	0.0	0.0	10.7	11.5
Lane LOS					B	B
Approach Delay (s)	0.0		0.0		10.7	11.5
Approach LOS					B	B

Intersection Summary		
Average Delay		0.2
Intersection Capacity Utilization	61.5%	ICU Level of Service
Analysis Period (min)	15	B

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 Quad BC AM Peak



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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (vph)	0	1898	20	0	1439	54	0	0	46	0	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3532	0	0	3522	0	0	0	1611	0	0	1596
Flt Permitted												
Satd. Flow (perm)	0	3532	0	0	3522	0	0	0	1611	0	0	1596
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		861			610			952			799	
Travel Time (s)		14.7			10.4			26.0			21.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	0%	2%	2%	0%	0%	2%	0%	0%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2131	0	0	1659	0	0	0	51	0	0	27
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			48			48	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	63.1%
Analysis Period (min)	15
	ICU Level of Service B

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 Quad BC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑				↑			↑
Volume (veh/h)	0	1898	20	0	1439	54	0	0	46	0	0	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	2109	22	0	1599	60	0	0	51	0	0	27
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		861			610							
pX, platoon unblocked	0.70			0.43			0.58	0.58	0.43	0.58	0.58	0.70
vC, conflicting volume	1659			2131			2946	3779	1066	2734	3760	829
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1083			979			577	2012	0	212	1980	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	89	100	100	96
cM capacity (veh/h)	456			307			226	35	466	378	36	756

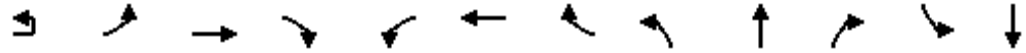
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1406	725	1066	593	51	27
Volume Left	0	0	0	0	0	0
Volume Right	0	22	0	60	51	27
cSH	1700	1700	1700	1700	466	756
Volume to Capacity	0.83	0.43	0.63	0.35	0.11	0.04
Queue Length 95th (ft)	0	0	0	0	9	3
Control Delay (s)	0.0	0.0	0.0	0.0	13.7	9.9
Lane LOS					B	A
Approach Delay (s)	0.0		0.0		13.7	9.9
Approach LOS					B	A

Intersection Summary		
Average Delay		0.2
Intersection Capacity Utilization	63.1%	ICU Level of Service B
Analysis Period (min)		15

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 Quad BC PM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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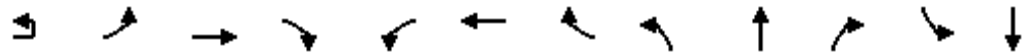


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔	↕	↗	↖	↕	↔	↖	↗	↕	↔	↕
Volume (vph)	20	70	1131	275	272	1389	36	375	17	284	42	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		300		450	400		0	275		275	0	
Storage Lanes		1		1	2		0	2		1	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	1770	3539	1583	3400	3491	0	3400	1519	1490	0	1688
Flt Permitted		0.950			0.950			0.950				0.984
Satd. Flow (perm)	0	1770	3539	1583	3400	3491	0	3400	1519	1490	0	1688
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			25
Link Distance (ft)			610			909			511			738
Travel Time (s)			10.4			15.5			13.9			20.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)										47%		
Lane Group Flow (vph)	0	100	1257	306	302	1583	0	417	168	167	0	141
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot		pm+ov	Prot			Split		pm+ov		Split
Protected Phases	5	5	2	8	1	6		8	8	1	4	4
Permitted Phases				2						8		
Detector Phase	5	5	2	8	1	6		8	8	1	4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	12.0		7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	14.0	19.0	14.0	14.0	19.0		14.0	14.0	14.0	14.0	14.0
Total Split (s)	14.0	14.0	61.0	23.0	18.0	65.0	0.0	23.0	23.0	18.0	18.0	18.0
Total Split (%)	11.7%	11.7%	50.8%	19.2%	15.0%	54.2%	0.0%	19.2%	19.2%	15.0%	15.0%	15.0%
Maximum Green (s)	7.0	7.0	54.0	16.0	11.0	58.0		16.0	16.0	11.0	11.0	11.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag		Lead	Lead					Lead	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes					Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	None	None	C-Max		None	None	None	None	None
Act Effct Green (s)		9.0	56.0	74.0	13.1	60.1		18.0	18.0	36.1		12.9
Actuated g/C Ratio		0.08	0.47	0.62	0.11	0.50		0.15	0.15	0.30		0.11
v/c Ratio		0.75	0.76	0.31	0.81	0.91		0.82	0.74	0.37		0.78
Control Delay		60.5	14.9	3.9	63.3	30.1		63.2	68.5	36.1		80.3
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0

291: US 17 Bus. (Market St.) & N. 30th St.  
Build Alt. 8 Quad BC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	74
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

291: US 17 Bus. (Market St.) & N. 30th St.  
 Build Alt. 8 Quad BC AM Peak

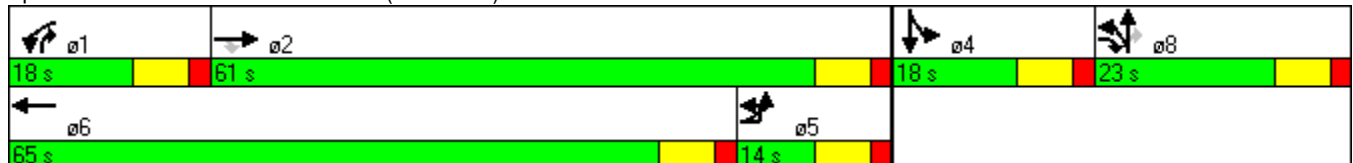


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		60.5	14.9	3.9	63.3	30.1		63.2	68.5	36.1		80.3
LOS		E	B	A	E	C		E	E	D		F
Approach Delay			15.6			35.4			58.4			80.3
Approach LOS			B			D			E			F
Queue Length 50th (ft)		71	107	28	119	526		163	132	107		108
Queue Length 95th (ft)		m94	190	m69	#189	#620		#237	#243	175		#212
Internal Link Dist (ft)			530			829			431			658
Turn Bay Length (ft)		300		450	400			275		275		
Base Capacity (vph)		133	1652	977	371	1749		511	228	449		183
Starvation Cap Reductn		0	0	0	0	0		0	0	0		0
Spillback Cap Reductn		0	0	0	0	0		0	0	0		0
Storage Cap Reductn		0	0	0	0	0		0	0	0		0
Reduced v/c Ratio		0.75	0.76	0.31	0.81	0.91		0.82	0.74	0.37		0.77

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 33.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 75.2%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) & N. 30th St.

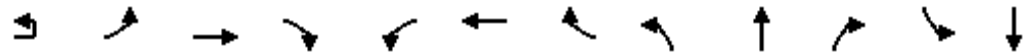




Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

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Synchro 7 - Report Lanes, Volumes, Timings

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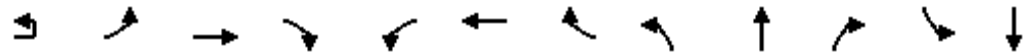
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔	↕	↗	↖	↕	↔	↖	↗	↕	↔	↕
Volume (vph)	48	85	1507	304	246	1093	42	299	11	287	36	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		300		450	400		0	275		275	0	
Storage Lanes		1		1	2		0	2		1	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	1770	3539	1583	3400	3484	0	3400	1509	1490	0	1707
Flt Permitted		0.950			0.950			0.950				0.983
Satd. Flow (perm)	0	1770	3539	1583	3400	3484	0	3400	1509	1490	0	1707
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			25
Link Distance (ft)			610			909			511			738
Travel Time (s)			10.4			15.5			13.9			20.1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)										48%		
Lane Group Flow (vph)	0	147	1674	338	273	1261	0	332	165	166	0	118
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot		pm+ov	Prot			Split		pm+ov		Split
Protected Phases	5	5	2	8	1	6		8	8	1	4	4
Permitted Phases				2						8		
Detector Phase	5	5	2	8	1	6		8	8	1	4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	12.0		7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	14.0	19.0	14.0	14.0	19.0		14.0	14.0	14.0	14.0	14.0
Total Split (s)	22.0	22.0	68.0	21.0	16.0	62.0	0.0	21.0	21.0	16.0	15.0	15.0
Total Split (%)	18.3%	18.3%	56.7%	17.5%	13.3%	51.7%	0.0%	17.5%	17.5%	13.3%	12.5%	12.5%
Maximum Green (s)	15.0	15.0	61.0	14.0	9.0	55.0		14.0	14.0	9.0	8.0	8.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag		Lead	Lead					Lead	
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes					Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	C-Max	None	None	C-Max		None	None	None	None	None
Act Effct Green (s)		17.0	63.0	78.9	11.1	57.1		15.9	15.9	32.0		10.0
Actuated g/C Ratio		0.14	0.52	0.66	0.09	0.48		0.13	0.13	0.27		0.08
v/c Ratio		0.59	0.90	0.32	0.87	0.76		0.74	0.82	0.42		0.83
Control Delay		36.5	15.0	2.1	75.9	21.9		60.6	81.8	40.2		95.4
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0

291: US 17 Bus. (Market St.) & N. 30th St.  
Build Alt. 8 Quad BC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	53
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

291: US 17 Bus. (Market St.) & N. 30th St.  
 Build Alt. 8 Quad BC PM Peak



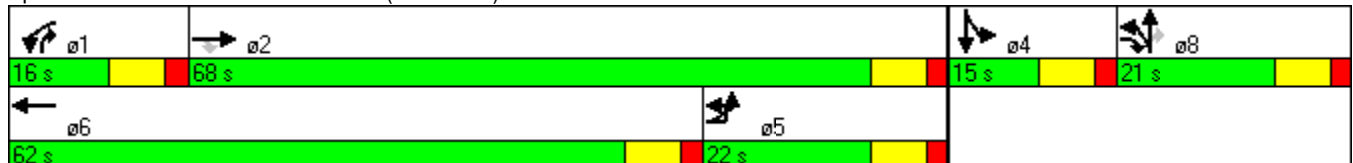


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		36.5	15.0	2.1	75.9	21.9		60.6	81.8	40.2		95.4
LOS		D	B	A	E	C		E	F	D		F
Approach Delay			14.5			31.5			60.8			95.4
Approach LOS			B			C			E			F
Queue Length 50th (ft)		100	263	7	106	335		129	132	111		92
Queue Length 95th (ft)		m116	402	m8	#185	441		180	#258	183		#198
Internal Link Dist (ft)			530			829			431			658
Turn Bay Length (ft)		300		450	400			275		275		
Base Capacity (vph)		251	1858	1042	314	1657		453	201	397		142
Starvation Cap Reductn		0	0	0	0	0		0	0	0		0
Spillback Cap Reductn		0	0	0	0	0		0	0	0		0
Storage Cap Reductn		0	0	0	0	0		0	0	0		0
Reduced v/c Ratio		0.59	0.90	0.32	0.87	0.76		0.73	0.82	0.42		0.83

**Intersection Summary**

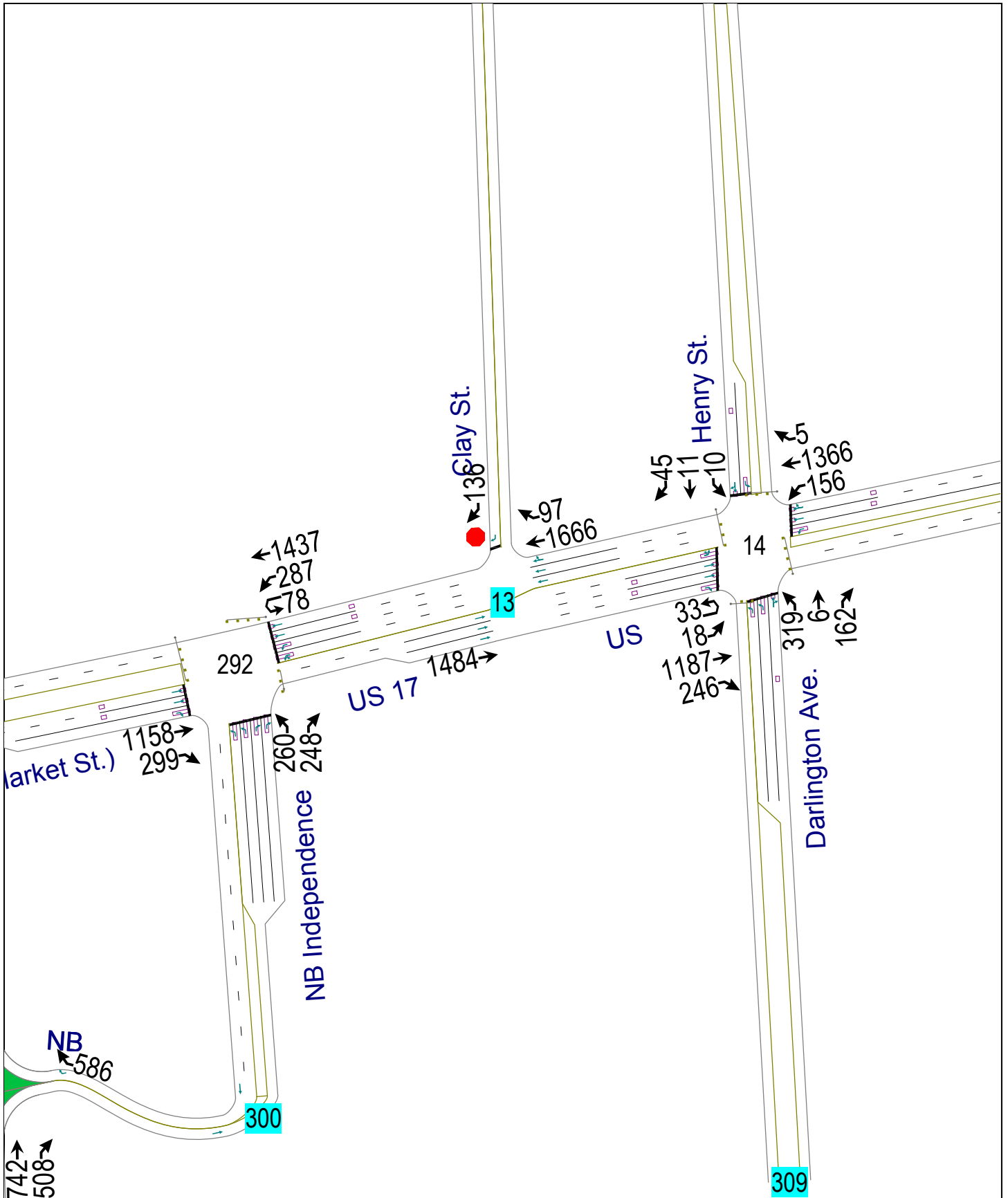
Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 52 (43%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 29.3 Intersection LOS: C  
 Intersection Capacity Utilization 76.4% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

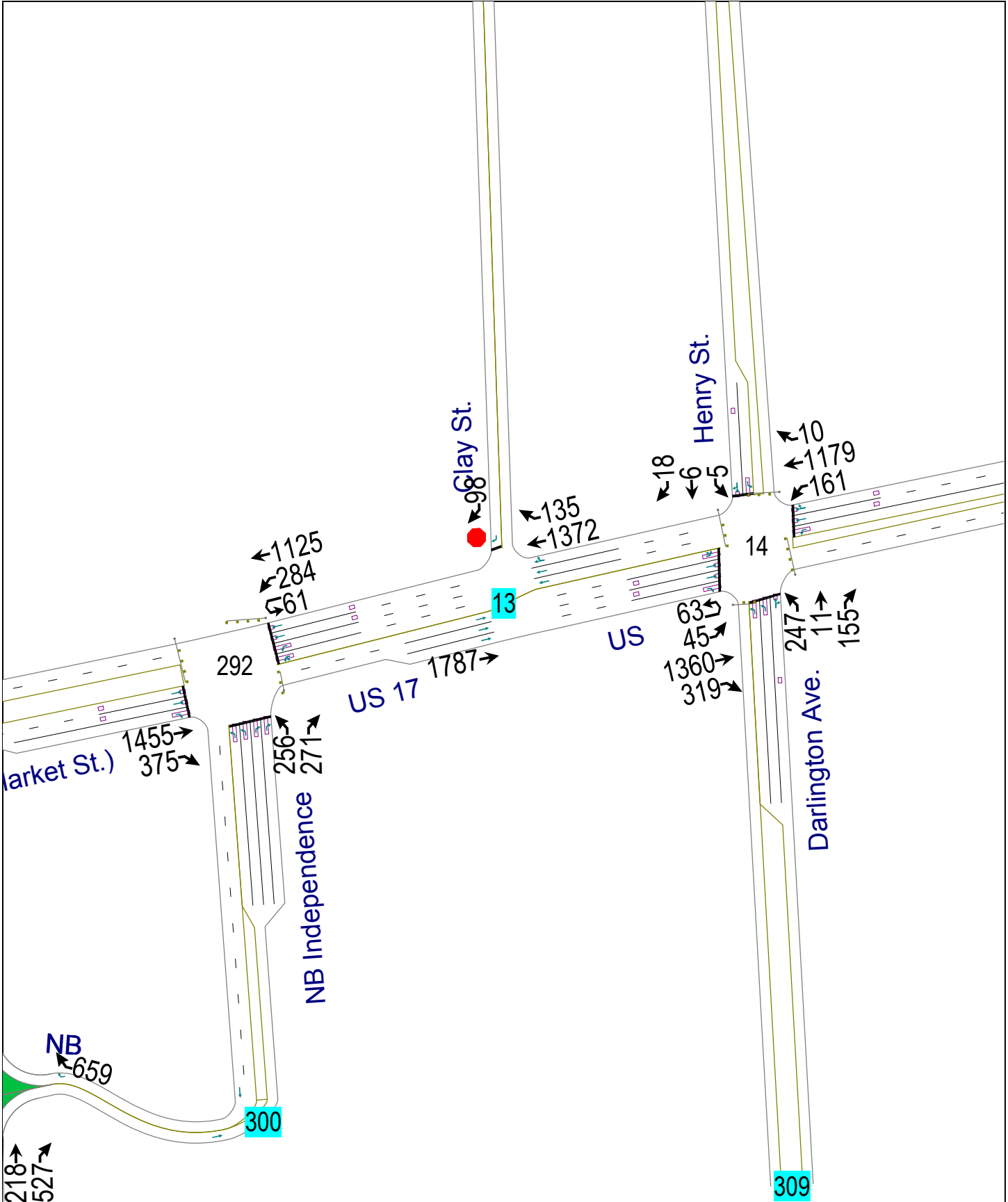
Splits and Phases: 291: US 17 Bus. (Market St.) & N. 30th St.





Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	





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Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↔	↑↑	↔	↔
Volume (vph)	1158	299	78	287	1437	260	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200		0		200	200
Storage Lanes		1		0		1	2
Taper Length (ft)		25		25		25	25
Satd. Flow (prot)	3505	1568	0	3400	3505	3400	2760
Flt Permitted				0.950		0.950	
Satd. Flow (perm)	3505	1568	0	3400	3505	3400	2760
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	40				40	25	
Link Distance (ft)	909				310	514	
Travel Time (s)	15.5				5.3	14.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1287	332	0	406	1597	289	276
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	24				24	24	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Turn Type		pm+ov	Prot	Prot			Perm
Protected Phases	2	8	1	1	6	8	
Permitted Phases		2					8
Detector Phase	2	8	1	1	6	8	8
Switch Phase							
Minimum Initial (s)	12.0	7.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	19.0	14.0	14.0	14.0	19.0	14.0	14.0
Total Split (s)	67.0	26.0	27.0	27.0	94.0	26.0	26.0
Total Split (%)	55.8%	21.7%	22.5%	22.5%	78.3%	21.7%	21.7%
Maximum Green (s)	60.0	19.0	20.0	20.0	87.0	19.0	19.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	None	None	None	C-Max	None	None
Act Effct Green (s)	64.1	88.0		22.0	91.1	18.9	18.9
Actuated g/C Ratio	0.53	0.73		0.18	0.76	0.16	0.16
v/c Ratio	0.69	0.29		0.65	0.60	0.54	0.64
Control Delay	10.6	2.6		40.1	4.8	50.2	54.1
Queue Delay	0.1	0.0		0.0	0.2	0.0	0.0

292: US 17 Bus. (Market St.) & NB Independence Blvd  
Build Alt. 8 Quad BC AM Peak

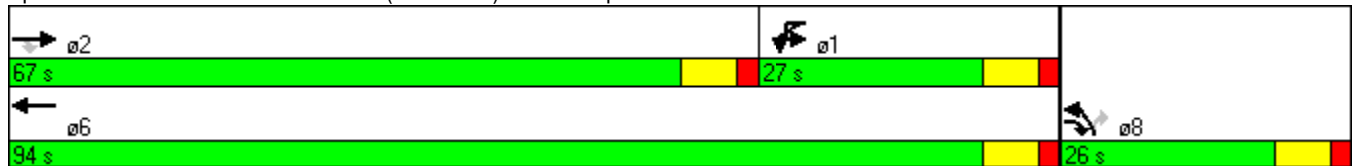


Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Total Delay	10.7	2.6		40.1	5.0	50.2	54.1
LOS	B	A		D	A	D	D
Approach Delay	9.0				12.1	52.1	
Approach LOS	A				B	D	
Queue Length 50th (ft)	126	48		141	76	106	113
Queue Length 95th (ft)	207	m46		193	241	150	163
Internal Link Dist (ft)	829				230	434	
Turn Bay Length (ft)		200				200	200
Base Capacity (vph)	1873	1134		623	2662	595	483
Starvation Cap Reductn	0	0		0	303	0	0
Spillback Cap Reductn	44	0		0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0
Reduced v/c Ratio	0.70	0.29		0.65	0.68	0.49	0.57

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 44 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 16.3  
 Intersection LOS: B  
 Intersection Capacity Utilization 63.6%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↔	↑↑	↔	↔
Volume (vph)	1455	375	61	284	1125	256	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		200		0		200	200
Storage Lanes		1		0		1	2
Taper Length (ft)		25		25		25	25
Satd. Flow (prot)	3505	1568	0	3400	3505	3400	2760
Flt Permitted				0.950		0.950	
Satd. Flow (perm)	3505	1568	0	3400	3505	3400	2760
Right Turn on Red		No					No
Satd. Flow (RTOR)							
Link Speed (mph)	40				40	25	
Link Distance (ft)	909				310	514	
Travel Time (s)	15.5				5.3	14.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1617	417	0	384	1250	284	301
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right
Median Width(ft)	24				24	24	
Link Offset(ft)	0				0	0	
Crosswalk Width(ft)	16				16	16	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	9	15		15	9
Turn Type		pm+ov	Prot	Prot			Perm
Protected Phases	2	8	1	1	6	8	
Permitted Phases		2					8
Detector Phase	2	8	1	1	6	8	8
Switch Phase							
Minimum Initial (s)	12.0	7.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	19.0	14.0	14.0	14.0	19.0	14.0	14.0
Total Split (s)	74.0	23.0	23.0	23.0	97.0	23.0	23.0
Total Split (%)	61.7%	19.2%	19.2%	19.2%	80.8%	19.2%	19.2%
Maximum Green (s)	67.0	16.0	16.0	16.0	90.0	16.0	16.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	None	None	None	C-Max	None	None
Act Effct Green (s)	69.6	92.0		18.0	92.6	17.4	17.4
Actuated g/C Ratio	0.58	0.77		0.15	0.77	0.14	0.14
v/c Ratio	0.80	0.35		0.75	0.46	0.57	0.75
Control Delay	9.0	1.9		46.4	3.7	52.8	61.6
Queue Delay	0.2	0.0		0.0	0.2	0.0	0.0

292: US 17 Bus. (Market St.) & NB Independence Blvd  
Build Alt. 8 Quad BC PM Peak

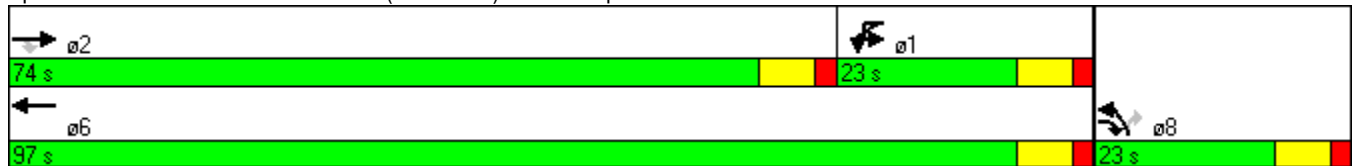


Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Total Delay	9.2	1.9		46.4	3.8	52.8	61.6
LOS	A	A		D	A	D	E
Approach Delay	7.7				13.8	57.3	
Approach LOS	A				B	E	
Queue Length 50th (ft)	143	41		143	58	106	127
Queue Length 95th (ft)	206	m34		192	94	152	182
Internal Link Dist (ft)	829				230	434	
Turn Bay Length (ft)		200				200	200
Base Capacity (vph)	2031	1196		510	2703	510	414
Starvation Cap Reductn	0	0		0	540	0	0
Spillback Cap Reductn	60	0		0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0
Reduced v/c Ratio	0.82	0.35		0.75	0.58	0.56	0.73

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 64 (53%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 16.9 Intersection LOS: B  
 Intersection Capacity Utilization 72.0% ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd





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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑							↑
Volume (vph)	0	1484	0	0	1666	97	0	0	0	0	0	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	0	5036	0	0	4996	0	0	0	0	0	0	1611
Flt Permitted												
Satd. Flow (perm)	0	5036	0	0	4996	0	0	0	0	0	0	1611
Link Speed (mph)		40			40			30				25
Link Distance (ft)		310			291			185				795
Travel Time (s)		5.3			5.0			4.2				21.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1649	0	0	1959	0	0	0	0	0	0	151
Enter Blocked Intersection	No	Yes	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Right	Left	Right	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0				0
Link Offset(ft)		6			6			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop				Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.4%
ICU Level of Service	A
Analysis Period (min)	15

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 Quad BC AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑			↑↑↑							↑
Volume (veh/h)	0	1484	0	0	1666	97	0	0	0	0	0	136
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1649	0	0	1851	108	0	0	0	0	0	151
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		310			291							
pX, platoon unblocked	0.68			0.76			0.80	0.80	0.76	0.80	0.80	0.68
vC, conflicting volume	1959			1649			2417	3608	550	2455	3554	671
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	765			753			0	1368	0	0	1300	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	80
cM capacity (veh/h)	583			659			654	119	830	823	130	738

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	550	550	550	740	740	478	151
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	108	151
cSH	1700	1700	1700	1700	1700	1700	738
Volume to Capacity	0.32	0.32	0.32	0.44	0.44	0.28	0.20
Queue Length 95th (ft)	0	0	0	0	0	0	19
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	11.1
Lane LOS							B
Approach Delay (s)	0.0			0.0			11.1
Approach LOS							B

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization	49.4%		ICU Level of Service A
Analysis Period (min)		15	

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 Quad BC AM Peak

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↗
Volume (vph)	0	1787	1372	135	0	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	5036	4970	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	5036	4970	0	0	1611
Link Speed (mph)		40	40		25	
Link Distance (ft)		310	291		795	
Travel Time (s)		5.3	5.0		21.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1986	1674	0	0	109
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Right	Right	Right	Left	Right
Median Width(ft)		0	0		0	
Link Offset(ft)		6	6		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.2%
ICU Level of Service	A
Analysis Period (min)	15

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 Quad BC PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑			↑
Volume (veh/h)	0	1787	1372	135	0	98
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1986	1524	150	0	109
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		310	291			
pX, platoon unblocked	0.74				0.80	0.74
vC, conflicting volume	1674				2261	583
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	675				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	86
cM capacity (veh/h)	684				824	801

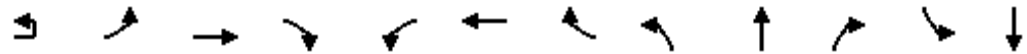
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	662	662	662	610	610	455	109
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	150	109
cSH	1700	1700	1700	1700	1700	1700	801
Volume to Capacity	0.39	0.39	0.39	0.36	0.36	0.27	0.14
Queue Length 95th (ft)	0	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.2
Lane LOS							B
Approach Delay (s)	0.0			0.0			10.2
Approach LOS							B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization	42.2%		ICU Level of Service A
Analysis Period (min)	15		

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 Quad BC PM Peak

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Synchro 7 - Report Lanes, Volumes, Timings

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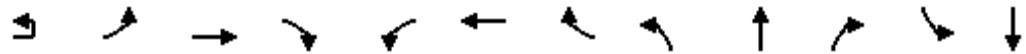


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔	↑↑	↗	↖	↑↓		↖↗	↗		↖	↗
Volume (vph)	33	18	1187	246	156	1366	5	319	6	162	10	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	300		0	225		0	125	
Storage Lanes		0		1	1		0	2		0	1	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	1752	3505	1568	1752	3501	0	3433	1595	0	1752	1621
Flt Permitted		0.950			0.950			0.950			0.950	
Satd. Flow (perm)	0	1752	3505	1568	1752	3501	0	3433	1595	0	1752	1621
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			25
Link Distance (ft)			291			1024			720			767
Travel Time (s)			5.0			17.5			19.6			20.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	57	1319	273	173	1524	0	354	187	0	11	62
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	Right	Left	Right	Left	Left
Median Width(ft)			12			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot		pm+ov	Prot			Split				Split
Protected Phases	5	5	2	8	1	6		8	8		4	4
Permitted Phases				2								
Detector Phase	5	5	2	8	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	14.0	14.0	19.0	14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	14.0	14.0	59.0	25.0	22.0	67.0	0.0	25.0	25.0	0.0	14.0	14.0
Total Split (%)	11.7%	11.7%	49.2%	20.8%	18.3%	55.8%	0.0%	20.8%	20.8%	0.0%	11.7%	11.7%
Maximum Green (s)	7.0	7.0	52.0	18.0	15.0	60.0		18.0	18.0		7.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead		Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max	None	None	C-Max		None	None		None	None
Act Effct Green (s)		9.0	57.6	81.8	17.0	68.4		19.2	19.2		9.0	9.0
Actuated g/C Ratio		0.08	0.48	0.68	0.14	0.57		0.16	0.16		0.08	0.08
v/c Ratio		0.44	0.78	0.26	0.70	0.76		0.64	0.73		0.08	0.51
Control Delay		67.1	16.5	2.4	64.9	25.3		53.0	65.3		53.3	68.5
Queue Delay		0.0	0.4	0.0	0.0	0.0		0.0	0.0		0.0	0.0

14: US 17 Bus. (Market St.) & Henry St.  
Build Alt. 8 Quad BC AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	45
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

14: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 8 Quad BC AM Peak

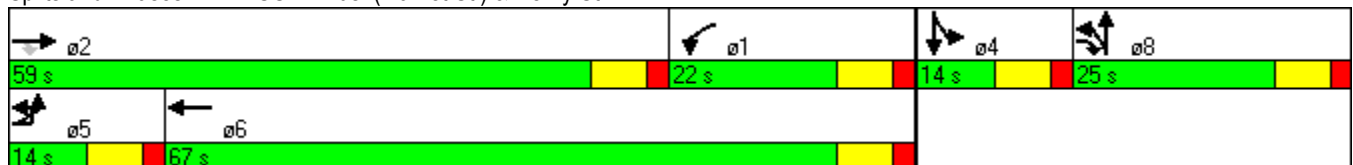


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		67.1	16.8	2.4	64.9	25.3		53.0	65.3		53.3	68.5
LOS		E	B	A	E	C		D	E		D	E
Approach Delay			16.2			29.3			57.3			66.2
Approach LOS			B			C			E			E
Queue Length 50th (ft)		37	411	14	129	513		132	138		8	47
Queue Length 95th (ft)		m62	528	25	#224	620		184	#235		28	94
Internal Link Dist (ft)			211			944			640			687
Turn Bay Length (ft)					300			225			125	
Base Capacity (vph)		131	1682	1066	248	1996		572	266		131	122
Starvation Cap Reductn		0	76	0	0	0		0	0		0	0
Spillback Cap Reductn		0	0	0	0	0		0	0		0	0
Storage Cap Reductn		0	0	0	0	0		0	0		0	0
Reduced v/c Ratio		0.44	0.82	0.26	0.70	0.76		0.62	0.70		0.08	0.51

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 72 (60%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 28.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 72.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: US 17 Bus. (Market St.) & Henry St.



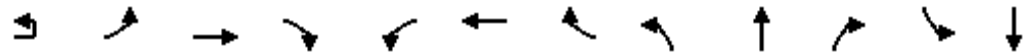


Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

URS  
11/28/2012

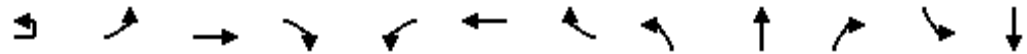


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔	↕	↗	↖	↕		↖	↗		↖	↗
Volume (vph)	63	45	1360	319	161	1179	10	247	11	155	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	300		0	225		0	125	
Storage Lanes		0		1	1		0	2		0	1	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	1752	3505	1568	1752	3501	0	3433	1602	0	1752	1640
Flt Permitted		0.950			0.950			0.950			0.950	
Satd. Flow (perm)	0	1752	3505	1568	1752	3501	0	3433	1602	0	1752	1640
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			25
Link Distance (ft)			291			1024			720			767
Travel Time (s)			5.0			17.5			19.6			20.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	120	1511	354	179	1321	0	274	184	0	6	27
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	Right	Left	Right	Left	Left
Median Width(ft)			12			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot		pm+ov	Prot			Split				Split
Protected Phases	5	5	2	8	1	6		8	8		4	4
Permitted Phases				2								
Detector Phase	5	5	2	8	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	14.0	14.0	19.0	14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	20.0	20.0	62.0	23.0	21.0	63.0	0.0	23.0	23.0	0.0	14.0	14.0
Total Split (%)	16.7%	16.7%	51.7%	19.2%	17.5%	52.5%	0.0%	19.2%	19.2%	0.0%	11.7%	11.7%
Maximum Green (s)	13.0	13.0	55.0	16.0	14.0	56.0		16.0	16.0		7.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead		Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max	None	None	C-Max		None	None		None	None
Act Effct Green (s)		13.7	62.6	85.6	16.0	64.8		18.0	18.0		9.0	9.0
Actuated g/C Ratio		0.11	0.52	0.71	0.13	0.54		0.15	0.15		0.08	0.08
v/c Ratio		0.60	0.83	0.32	0.76	0.70		0.53	0.76		0.05	0.22
Control Delay		63.2	15.2	2.2	71.8	24.5		51.2	70.0		52.4	56.9
Queue Delay		0.0	0.8	0.0	0.0	0.0		0.0	0.0		0.0	0.0

14: US 17 Bus. (Market St.) & Henry St.  
Build Alt. 8 Quad BC PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	18
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

14: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 8 Quad BC PM Peak

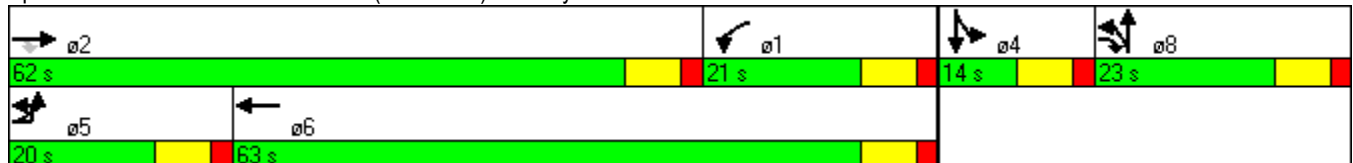


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		63.2	16.0	2.2	71.8	24.5		51.2	70.0		52.4	56.9
LOS		E	B	A	E	C		D	E		D	E
Approach Delay			16.4			30.2			58.8			56.1
Approach LOS			B			C			E			E
Queue Length 50th (ft)		79	531	25	136	434		102	139		4	20
Queue Length 95th (ft)		m108	#602	m37	#247	526		147	#250		19	51
Internal Link Dist (ft)			211			944			640			687
Turn Bay Length (ft)					300			225			125	
Base Capacity (vph)		219	1827	1111	234	1891		530	247		131	123
Starvation Cap Reductn		0	110	0	0	0		0	0		0	0
Spillback Cap Reductn		0	0	0	0	0		0	0		0	0
Storage Cap Reductn		0	0	0	0	0		0	0		0	0
Reduced v/c Ratio		0.55	0.88	0.32	0.76	0.70		0.52	0.74		0.05	0.22

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 101 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 26.8  
 Intersection LOS: C  
 Intersection Capacity Utilization 72.7%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: US 17 Bus. (Market St.) & Henry St.





Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	23	582	569	264	342	376	151	90
Average Queue (ft)	8	286	331	106	235	265	70	37
95th Queue (ft)	24	490	508	194	356	393	124	69
Link Distance (ft)		714	714		716	716	917	812
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	150			300				
Storage Blk Time (%)		19			2			
Queuing Penalty (veh)		2			2			

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	47	90
Average Queue (ft)	16	35
95th Queue (ft)	42	68
Link Distance (ft)	906	753
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: US 17 Bus. (Market St.) & Clay St.

Movement	WB	SB
Directions Served	TR	R
Maximum Queue (ft)	72	158
Average Queue (ft)	4	66
95th Queue (ft)	29	135
Link Distance (ft)	201	730
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 14: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	UL	T	T	R	L	T	TR	L	L	TR	L	TR
Maximum Queue (ft)	66	236	263	113	324	459	486	209	248	299	48	133
Average Queue (ft)	35	131	139	33	140	279	274	122	109	132	9	52
95th Queue (ft)	68	210	214	76	253	414	420	196	187	220	31	90
Link Distance (ft)	201	201	201	201		976	976			654		709
Upstream Blk Time (%)		1	1									
Queuing Penalty (veh)		2	2									
Storage Bay Dist (ft)					300			225	225		125	
Storage Blk Time (%)						4		0	0	1		0
Queuing Penalty (veh)						6		0	0	4		0

Intersection: 291: US 17 Bus. (Market St.) & N. 30th St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	TR	L	L	TR	R
Maximum Queue (ft)	149	392	406	267	292	423	526	544	145	170	124	169
Average Queue (ft)	67	155	214	97	174	186	354	386	88	92	52	73
95th Queue (ft)	128	267	325	194	249	301	485	498	140	149	95	134
Link Distance (ft)		476	476				799	799				419
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			450	400	400			275	275		275
Storage Blk Time (%)		0					2					
Queuing Penalty (veh)		0					6					

Intersection: 291: US 17 Bus. (Market St.) & N. 30th St.

Movement	SB
Directions Served	LTR
Maximum Queue (ft)	234
Average Queue (ft)	96
95th Queue (ft)	181
Link Distance (ft)	678
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	172	182	138	222	201	226	250	173	134	147	147
Average Queue (ft)	85	111	36	135	119	102	108	96	95	77	90
95th Queue (ft)	150	169	96	217	182	188	208	143	134	112	131
Link Distance (ft)	799	799		242	242	242	242		418		
Upstream Blk Time (%)						0	0				
Queuing Penalty (veh)						0	1				
Storage Bay Dist (ft)			200					200		200	200
Storage Blk Time (%)		0									
Queuing Penalty (veh)		0									

Intersection: 293: NB Independence Blvd & Independence Blvd.

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 294: SB Independence Blvd. Ramps & SB Independence Blvd

Movement	B301	B301
Directions Served		T
Maximum Queue (ft)	463	469
Average Queue (ft)	15	16
95th Queue (ft)	153	155
Link Distance (ft)	419	419
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 26

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	44	748	748	88	268	337	301	87
Average Queue (ft)	15	443	480	40	189	224	108	13
95th Queue (ft)	41	754	761	69	281	322	234	44
Link Distance (ft)		714	714		716	716	917	812
Upstream Blk Time (%)		2	4					
Queuing Penalty (veh)		0	0					
Storage Bay Dist (ft)	150			300				
Storage Blk Time (%)		26						
Queuing Penalty (veh)		6						

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	NB	SB
Directions Served	T	TR	R	R
Maximum Queue (ft)	338	376	71	70
Average Queue (ft)	11	13	32	13
95th Queue (ft)	111	125	64	44
Link Distance (ft)	716	716	906	753
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 13: US 17 Bus. (Market St.) & Clay St.

Movement	EB	EB	WB	WB	WB	SB
Directions Served	T	T	T	T	TR	R
Maximum Queue (ft)	132	71	153	69	74	111
Average Queue (ft)	9	8	10	2	5	46
95th Queue (ft)	55	42	66	23	31	89
Link Distance (ft)	244	244	201	201	201	730
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						



Intersection: 14: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	UL	T	T	R	L	T	TR	L	L	TR	L	TR
Maximum Queue (ft)	154	275	274	95	324	566	521	199	220	218	29	113
Average Queue (ft)	69	170	163	43	149	285	279	86	82	118	6	22
95th Queue (ft)	132	288	263	82	256	476	477	144	145	197	24	61
Link Distance (ft)	201	201	201	201		976	976			654		709
Upstream Blk Time (%)		3	2									
Queuing Penalty (veh)		12	11									
Storage Bay Dist (ft)					300			225	225		125	
Storage Blk Time (%)					0	5		0	1			0
Queuing Penalty (veh)					0	7		0	2			0

Intersection: 291: US 17 Bus. (Market St.) & N. 30th St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	UL	T	T	R	L	L	T	TR	L	L	TR	R
Maximum Queue (ft)	190	572	516	473	294	283	394	398	133	146	131	140
Average Queue (ft)	79	235	285	97	160	164	252	271	89	97	69	90
95th Queue (ft)	148	437	484	270	280	276	372	375	127	136	106	129
Link Distance (ft)		476	476				799	799				419
Upstream Blk Time (%)		0	1	0								
Queuing Penalty (veh)		3	8	0								
Storage Bay Dist (ft)	300			450	400	400			275	275		275
Storage Blk Time (%)		2	1	0			0					
Queuing Penalty (veh)		3	3	0			0					

Intersection: 291: US 17 Bus. (Market St.) & N. 30th St.

Movement	SB
Directions Served	LTR
Maximum Queue (ft)	260
Average Queue (ft)	141
95th Queue (ft)	229
Link Distance (ft)	678
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	R	UL	L	T	T	L	L	R	R
Maximum Queue (ft)	156	184	136	265	266	207	197	170	157	130	108
Average Queue (ft)	108	133	64	169	165	91	92	75	84	75	74
95th Queue (ft)	159	183	124	272	263	184	185	125	129	118	106
Link Distance (ft)	799	799		244	244	244	244		418		
Upstream Blk Time (%)				3	2						
Queuing Penalty (veh)				11	9						
Storage Bay Dist (ft)			200					200		200	200
Storage Blk Time (%)		0									
Queuing Penalty (veh)		0									

Intersection: 293: NB Independence Blvd & Independence Blvd.

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 294: SB Independence Blvd. Ramps & SB Independence Blvd

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 76
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# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information			Site Information					
Analyst		URS	Date Performed		2013			
Agency or Company			Analysis Year		2040 Build - Alt 8 BC Quadrant			
Project Description			U-4434 Independence Boulevard Extension					
<b>45</b>			<b>46</b>			<b>47</b>		
Independence Blvd. SB - to US 17 Bus.			Independence Blvd. NB - from US 17 Bus.			Independence Blvd. SB - from US 17 Bus.		
Merge/Diverge	Diverge		Merge/Diverge	Merge		Merge/Diverge	Merge	
No. of lanes on Freeway	2		No. of lanes on Freeway	2		No. of lanes on Freeway	2	
Freeway FFS	60	mph	Freeway FFS	60	mph	Freeway FFS	60	mph
Freeway Volume (AM/PM)	2877	2354	Freeway Volume (AM/PM)	1768	2218	Freeway Volume (AM/PM)	2213	1771
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	15	mph	Ramp FFS	15	mph	Ramp FFS	15	mph
Ramp Volume (AM/PM)	659	586	Ramp Volume (AM/PM)	586	659	Ramp Volume (AM/PM)	471	425
No. Lanes on Ramp	1		No. Lanes on Ramp	1		No. Lanes on Ramp	1	
Accel/Decel Distance 1	800	ft	Accel/Decel Distance 1	1440	ft	Accel/Decel Distance 1	1440	ft
Accel/Decel Distance 2	N/A		Accel/Decel Distance 2	N/A		Accel/Decel Distance 2	N/A	
Adjacent Upstream	Yes		Adjacent Upstream	Yes		Adjacent Upstream	Yes	
Off/On	On		Off/On	Off		Off/On	Off	
Distance	4520	ft	Distance	90	ft	Distance	90	ft
Truck %	4%		Truck %	3%		Truck %	3%	
Ramp Volume (AM/PM)	1628	1103	Ramp Volume (AM/PM)	425	471	Ramp Volume (AM/PM)	659	586
Adjacent Downstream	Yes		Adjacent Downstream	Yes		Adjacent Downstream	No	
Off/On	On - N/A		Off/On	Off		Off/On	N/A	
Distance	N/A		Distance	4930	ft	Distance	N/A	
Truck %	N/A		Truck %	4%		Truck %	N/A	
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	1103	1628	Ramp Volume (AM/PM)	N/A	N/A
Peak Hour Factor	0.90		Peak Hour Factor	0.90		Peak Hour Factor	0.90	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	1.00		Population Adj. Factor	1.00	
Freeway Truck %	4%		Freeway Truck %	4%		Freeway Truck %	4%	
Ramp Truck %	3%		Ramp Truck %	3%		Ramp Truck %	3%	
<b>48</b>								
Independence Blvd. NB - to Darlington								
Merge/Diverge	Diverge		Merge/Diverge	Diverge		Merge/Diverge	Diverge	
No. of lanes on Freeway	2		No. of lanes on Freeway	0		No. of lanes on Freeway	0	
Freeway FFS	60	mph	Freeway FFS	0	mph	Freeway FFS	0	mph
Freeway Volume (AM/PM)	2205	2695	Freeway Volume (AM/PM)	0	0	Freeway Volume (AM/PM)	0	0
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	15	mph	Ramp FFS	0	mph	Ramp FFS	0	mph
Ramp Volume (AM/PM)	99	133	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
No. Lanes on Ramp	1		No. Lanes on Ramp	0		No. Lanes on Ramp	0	
Accel/Decel Distance 1	800	ft	Accel/Decel Distance 1	0	ft	Accel/Decel Distance 1	0	ft
Accel/Decel Distance 2	N/A		Accel/Decel Distance 2	0		Accel/Decel Distance 2	0	
Adjacent Upstream	No		Adjacent Upstream	Yes		Adjacent Upstream	Yes	
Off/On	N/A		Off/On	On		Off/On	On	
Distance	N/A		Distance	0	ft	Distance	0	ft
Truck %	N/A		Truck %			Truck %		
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Adjacent Downstream	Yes		Adjacent Downstream	Yes		Adjacent Downstream	Yes	
Off/On	On - N/A		Off/On	On		Off/On	On	
Distance	N/A		Distance	0	ft	Distance	0	ft
Truck %	N/A		Truck %			Truck %		
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Peak Hour Factor	0.90		Peak Hour Factor	0.00		Peak Hour Factor	0.00	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	0.00		Population Adj. Factor	0.00	
Freeway Truck %	4%		Freeway Truck %	0%		Freeway Truck %	0%	
Ramp Truck %	2%		Ramp Truck %	0%		Ramp Truck %	0%	

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

**HIGHWAY CAPACITY SOFTWARE 2010  
NETWORK DATA SUMMARY - WEAVING SEGMENTS**

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 8 BC Quadrant
Project Description	U-4434 Independence Boulevard Extension		

49			
Independence Blvd. NB - Darlington to Market			
Sides (One or Two)	One	Sides (One or Two)	One
No. of Lanes	3	No. of Lanes	0
Weaving Length, L <sub>s</sub>	1720 ft	Weaving Length, L <sub>s</sub>	0 ft
Multi-Lane FFS	60 mph	Freeway FFS	0 mph
Min. Speed (Def. = 15)	15 mph	Min. Speed (Def. = 15)	0 mph
Segment Type	Multi-Lane	Segment Type	Freeway
Terrain	Level	Terrain	Rolling
AM Peak	Vol	Truck	
F →	V <sub>FF</sub>	1684	4 %
F ↘	V <sub>RF</sub>	87	4 %
R ↗	V <sub>FR</sub>	403	4 %
R →	V <sub>RR</sub>	22	4 %
PM Peak	Vol	Truck	
F →	V <sub>FF</sub>	2134	4 %
F ↘	V <sub>RF</sub>	79	4 %
R ↗	V <sub>FR</sub>	451	4 %
R →	V <sub>RR</sub>	20	4 %
Peak Hour Factor	0.90	Peak Hour Factor	0.00
Driver Pop. Adj.	1.00	Driver Pop. Adj.	0.00
Maneuver Lns., N <sub>WL</sub>	2	Maneuver Lns., N <sub>WL</sub>	0
Interchange Density	3.00	Interchange Density	0.00
Min. RF In. chng., LC <sub>RF</sub>	1	Min. RF In. chng., LC <sub>RF</sub>	0
Min. FR In. chng., LC <sub>FR</sub>	1	Min. FR In. chng., LC <sub>FR</sub>	0
Min. RR In. chng., LC <sub>RR</sub>	N/A	Min. RR In. chng., LC <sub>RR</sub>	N/A
20% of vehicles from Darlington exit onto Market		(Place weaving % assumption here)	

Sides (One or Two)	One	Sides (One or Two)	One	Sides (One or Two)	One
No. of Lanes	0	No. of Lanes	0	No. of Lanes	0
Weaving Length, L <sub>s</sub>	0 ft	Weaving Length, L <sub>s</sub>	0 ft	Weaving Length, L <sub>s</sub>	0 ft
Freeway FFS	0 mph	Freeway FFS	0 mph	Freeway FFS	0 mph
Min. Speed (Def. = 15)	0 mph	Min. Speed (Def. = 15)	0 mph	Min. Speed (Def. = 15)	0 mph
Segment Type	Freeway	Segment Type	Freeway	Segment Type	Freeway
Terrain	Rolling	Terrain	Rolling	Terrain	Rolling
AM Peak	Vol	Truck		AM Peak	Vol
F →	V <sub>FF</sub>	0	0 %	F →	V <sub>FF</sub>
F ↘	V <sub>RF</sub>	0	0 %	F ↘	V <sub>RF</sub>
R ↗	V <sub>FR</sub>	0	0 %	R ↗	V <sub>FR</sub>
R →	V <sub>RR</sub>	0	0 %	R →	V <sub>RR</sub>
PM Peak	Vol	Truck		PM Peak	Vol
F →	V <sub>FF</sub>	0	0 %	F →	V <sub>FF</sub>
F ↘	V <sub>RF</sub>	0	0 %	F ↘	V <sub>RF</sub>
R ↗	V <sub>FR</sub>	0	0 %	R ↗	V <sub>FR</sub>
R →	V <sub>RR</sub>	0	0 %	R →	V <sub>RR</sub>
Peak Hour Factor	0.00	Peak Hour Factor	0.00	Peak Hour Factor	0.00
Driver Pop. Adj.	0.00	Driver Pop. Adj.	0.00	Driver Pop. Adj.	0.00
Maneuver Lns., N <sub>WL</sub>	0	Maneuver Lns., N <sub>WL</sub>	0	Maneuver Lns., N <sub>WL</sub>	0
Interchange Density	0.00	Interchange Density	0.00	Interchange Density	0.00
Min. RF In. chng., LC <sub>RF</sub>	0	Min. RF In. chng., LC <sub>RF</sub>	0	Min. RF In. chng., LC <sub>RF</sub>	0
Min. FR In. chng., LC <sub>FR</sub>	0	Min. FR In. chng., LC <sub>FR</sub>	0	Min. FR In. chng., LC <sub>FR</sub>	0
Min. RR In. chng., LC <sub>RR</sub>	N/A	Min. RR In. chng., LC <sub>RR</sub>	N/A	Min. RR In. chng., LC <sub>RR</sub>	N/A
(Place weaving % assumption here)		(Place weaving % assumption here)		(Place weaving % assumption here)	

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

### General Information

### Site Information

Analyst URS

Date Performed 2012

Agency or Company

Analysis Year 2040 Build - Alt 8 BC Quadrant

Project Description

U-4434 Independence Boulevard Extension

<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>49</b></div> <p>Independence Blvd. NB - Darlington to Market  <u>Interchange</u>                      <u>No.</u>                      Darlington Ave.                      1                      Market St.                              1</p> <p style="font-size: small;">Note: multi-lane only 0.67 mile long                      Interchange Density                      3.00 int/mi</p>	<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0  <u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Note: freeway only 3.5 miles long                      Interchange Density                      0.00 int/mi</p>	<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0  <u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>
<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0  <u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0  <u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: center; border: 1px solid black; width: 50px; margin: 0 auto; padding: 2px;"><b>0</b></div> <p style="text-align: center;">0  <u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - ANALYSIS NOTES

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 8 BC Quadrant
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV %	Freeway Truck%			
	FR = DS ramp HV %	Off Ramp Truck %			
	RF = US ramp HV %	On Ramp Truck %			
	RR = DS ramp HV %	Off Ramp Truck %			

Level of Service Standards - Freeways	Level of Service Standards - Signalized Intersections
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004	LOS D or better for overall intersection required
	LOS D or better for individual movements recommended
	If not LOS D for individual movement - v/c ratio must be less than 0.85

### Assumed Improvements

TIP No.	Description
U-3338	SR 1175 (Kerr Avenue) - widening, including new interchange at US 74

### General Analysis Notes

- ▶ Interchange/Ramp Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

### Design Specific Analysis Notes

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

### Locations where LOS D or better not achieved

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 8 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 4520 ft V <sub>u</sub> = 1628 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : Deceleration Lane Length L <sub>D</sub> : 800 Freeway Volume, V <sub>F</sub> : 2877 Ramp Volume, V <sub>R</sub> : 659 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2877	0.90	Level	4	0	0.980	1.00	3261
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	1628	0.90	Level	4	0	0.980	1.00	1845
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 3261 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	3261	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2518	Exhibit 13-8	4600 No
V <sub>R</sub>	743	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3261	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 25.1 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = 0.755 (Exhibit 13-12)  
 S<sub>R</sub> = 46.4 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 46.4 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 8 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> = 4520 ft V <sub>u</sub> = 1103 veh/h	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : Deceleration Lane Length L <sub>D</sub> : 800 Freeway Volume, V <sub>F</sub> : 2354 Ramp Volume, V <sub>R</sub> : 586 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> = ft V <sub>D</sub> = veh/h
---	---	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2354	0.90	Level	4	0	0.980	1.00	2668
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	1103	0.90	Level	4	0	0.980	1.00	1250
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 2668 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2668	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2007	Exhibit 13-8	4600 No
V <sub>R</sub>	661	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2668	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 20.0 (pc/mi/ln)  
 LOS = B (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>s</sub> = 0.747 (Exhibit 13-12)  
 S<sub>R</sub> = 46.5 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 46.5 mph (Exhibit 13-13)



## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 8 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1768	$L_{down} =$ ft
$V_u =$ 425 veh/h	Ramp Volume, $V_R$	586	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1768	0.90	Level	4	0	0.980	1.00	2004
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	425	0.90	Level	3	0	0.985	1.00	479
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$	(Equation 13-6 or 13-7)
$P_{FM} =$	1.000 using Equation (Exhibit 13-6)
$V_{12} =$	2004 pc/h
$V_3$ or $V_{av34}$	0 pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$	(Equation 13-12 or 13-13)
$P_{FD} =$	using Equation (Exhibit 13-7)
$V_{12} =$	pc/h
$V_3$ or $V_{av34}$	pc/h (Equation 13-14 or 13-17)
Is $V_3$ or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2665	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2665	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
$D_R =$ 16.9 (pc/mi/ln)
LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)
LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.334 (Exhibit 13-11)
$S_R =$ 54.0 mph (Exhibit 13-11)
$S_0 =$ N/A mph (Exhibit 13-11)
$S =$ 54.0 mph (Exhibit 13-13)

### Speed Determination

$D_s =$ (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #46
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 8 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2218	$L_{down} =$ ft
$V_u =$ 471 veh/h	Ramp Volume, $V_R$	659	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2218	0.90	Level	4	0	0.980	1.00	2514
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	471	0.90	Level	3	0	0.985	1.00	531
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
(Equation 13-6 or 13-7)

$L_{EQ} =$  (Equation 13-6 or 13-7)

$P_{FM} =$  1.000 using Equation (Exhibit 13-6)

$V_{12} =$  2514 pc/h

$V_3$  or  $V_{av34} =$  0 pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
(Equation 13-12 or 13-13)

$L_{EQ} =$  (Equation 13-12 or 13-13)

$P_{FD} =$  using Equation (Exhibit 13-7)

$V_{12} =$  pc/h

$V_3$  or  $V_{av34} =$  pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3257	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3257	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$  21.5 (pc/mi/ln)

LOS = C (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$  (pc/mi/ln)

LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$  0.379 (Exhibit 13-11)

$S_R =$  53.2 mph (Exhibit 13-11)

$S_0 =$  N/A mph (Exhibit 13-11)

$S =$  53.2 mph (Exhibit 13-13)

### Speed Determination

$D_s =$  (Exhibit 13-12)

$S_R =$  mph (Exhibit 13-12)

$S_0 =$  mph (Exhibit 13-12)

$S =$  mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 8 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	2213	$L_{down} =$ ft
$V_u =$ 659 veh/h	Ramp Volume, $V_R$	471	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2213	0.90	Level	4	0	0.980	1.00	2508
Ramp	471	0.90	Level	3	0	0.985	1.00	531
UpStream	659	0.90	Level	3	0	0.985	1.00	743
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$ (Equation 13-6 or 13-7)	
$P_{FM} =$ 1.000 using Equation (Exhibit 13-6)	
$V_{12} =$ 2508 pc/h	
$V_3$ or $V_{av34} =$ 0 pc/h (Equation 13-14 or 13-17)	
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$ (Equation 13-12 or 13-13)	
$P_{FD} =$ using Equation (Exhibit 13-7)	
$V_{12} =$ pc/h	
$V_3$ or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)	
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	3039	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	3039	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
$D_R =$ 19.9 (pc/mi/ln)
LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)
LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.359 (Exhibit 13-11)
$S_R =$ 53.5 mph (Exhibit 13-11)
$S_0 =$ N/A mph (Exhibit 13-11)
$S =$ 53.5 mph (Exhibit 13-13)

### Speed Determination

$D_s =$ (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	from US 17 Business
Date Performed	2012	Jurisdiction	Segment #47
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 8 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, $L_A$	1440	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Deceleration Lane Length $L_D$		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 90 ft	Freeway Volume, $V_F$	1771	$L_{down} =$ ft
$V_u =$ 586 veh/h	Ramp Volume, $V_R$	425	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	15.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1771	0.90	Level	4	0	0.980	1.00	2007
Ramp	425	0.90	Level	3	0	0.985	1.00	479
UpStream	586	0.90	Level	3	0	0.985	1.00	661
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$	
$L_{EQ} =$ (Equation 13-6 or 13-7)	
$P_{FM} =$ 1.000 using Equation (Exhibit 13-6)	
$V_{12} =$ 2007 pc/h	
$V_3$ or $V_{av34} =$ 0 pc/h (Equation 13-14 or 13-17)	
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$	
$L_{EQ} =$ (Equation 13-12 or 13-13)	
$P_{FD} =$ using Equation (Exhibit 13-7)	
$V_{12} =$ pc/h	
$V_3$ or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)	
Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	2486	Exhibit 13-8	No	$V_F$		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2486	Exhibit 13-8	4600:All
			No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
$D_R =$ 15.6 (pc/mi/ln)
LOS = B (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
$D_R =$ (pc/mi/ln)
LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$ 0.325 (Exhibit 13-11)
$S_R =$ 54.2 mph (Exhibit 13-11)
$S_0 =$ N/A mph (Exhibit 13-11)
$S =$ 54.2 mph (Exhibit 13-13)

### Speed Determination

$D_s =$ (Exhibit 13-12)
$S_R =$ mph (Exhibit 13-12)
$S_0 =$ mph (Exhibit 13-12)
$S =$ mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	to Darlington Ave
Date Performed	2013	Jurisdiction	Segment #48
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Alt 8 BC Quadrant

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =    ft V <sub>u</sub> =    veh/h	Number of Lanes, N                      2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 800 Freeway Volume, V <sub>F</sub> 2205 Ramp Volume, V <sub>R</sub> 99 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =    ft V <sub>D</sub> =    veh/h
--	--	--

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2205	0.90	Level	4	0	0.980	1.00	2499
Ramp	99	0.90	Level	2	0	0.990	1.00	111
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 L<sub>EQ</sub> =                      (Equation 13-6 or 13-7)  
 P<sub>FM</sub> =                      using Equation (Exhibit 13-6)  
 V<sub>12</sub> =                      pc/h  
 V<sub>3</sub> or V<sub>av34</sub>              pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?     Yes     No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2     Yes     No  
 If Yes, V<sub>12a</sub> =              pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 L<sub>EQ</sub> =                      (Equation 13-12 or 13-13)  
 P<sub>FD</sub> =                      1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> =                      2499 pc/h  
 V<sub>3</sub> or V<sub>av34</sub>              0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?     Yes     No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2     Yes     No  
 If Yes, V<sub>12a</sub> =              pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	2499	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2388	Exhibit 13-8	4600 No
V <sub>R</sub>	111	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	2499	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> =    (pc/mi/ln)  
 LOS =    (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> =    18.5 (pc/mi/ln)  
 LOS =    B (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> =    (Exhibit 13-11)  
 S<sub>R</sub> =    mph (Exhibit 13-11)  
 S<sub>0</sub> =    mph (Exhibit 13-11)  
 S =    mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> =    0.698 (Exhibit 13-12)  
 S<sub>R</sub> =    47.4 mph (Exhibit 13-12)  
 S<sub>0</sub> =    N/A mph (Exhibit 13-12)  
 S =    47.4 mph (Exhibit 13-13)



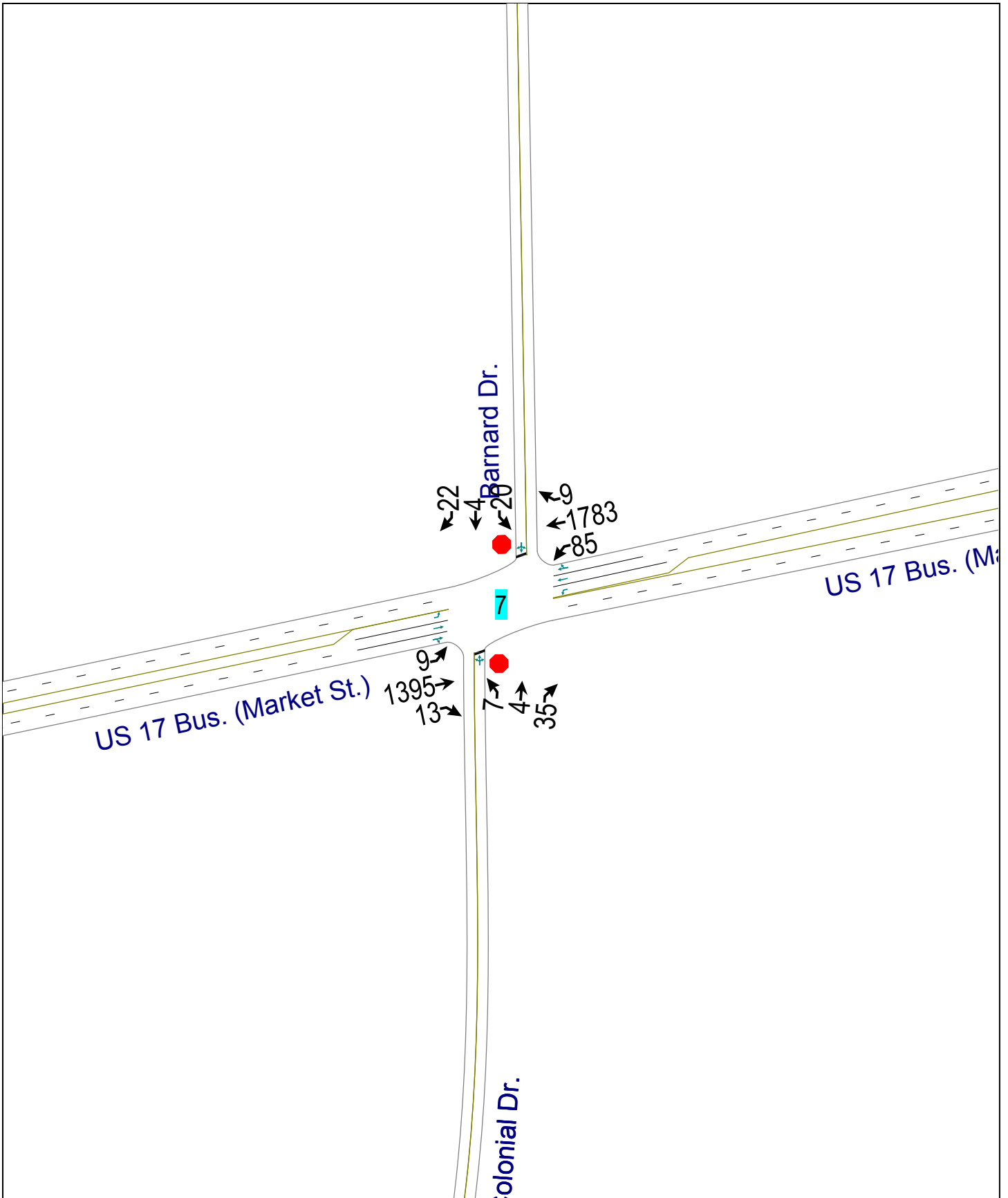
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 8 BC Quadrant			
Analysis Time Period	AM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1750ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	1684	0.90	4	0	1.5	1.2	0.980	1.00	1909
V <sub>RF</sub>	87	0.90	4	0	1.5	1.2	0.980	1.00	99
V <sub>FR</sub>	403	0.90	4	0	1.5	1.2	0.980	1.00	457
V <sub>RR</sub>	22	0.90	4	0	1.5	1.2	0.980	1.00	25
V <sub>NW</sub>	1934							V =	2490
V <sub>W</sub>	556								
VR	0.223								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	556 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	961 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	769 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1730 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	1015			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	2490 pc/h				Weaving intensity factor, W	0.224			
Weaving segment capacity, c <sub>w</sub>	6085 veh/h				Weaving segment speed, S	52.0 mph			
Weaving segment v/c ratio	0.401				Average weaving speed, S <sub>W</sub>	51.8 mph			
Weaving segment density, D	16.0 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	52.0 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4776 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

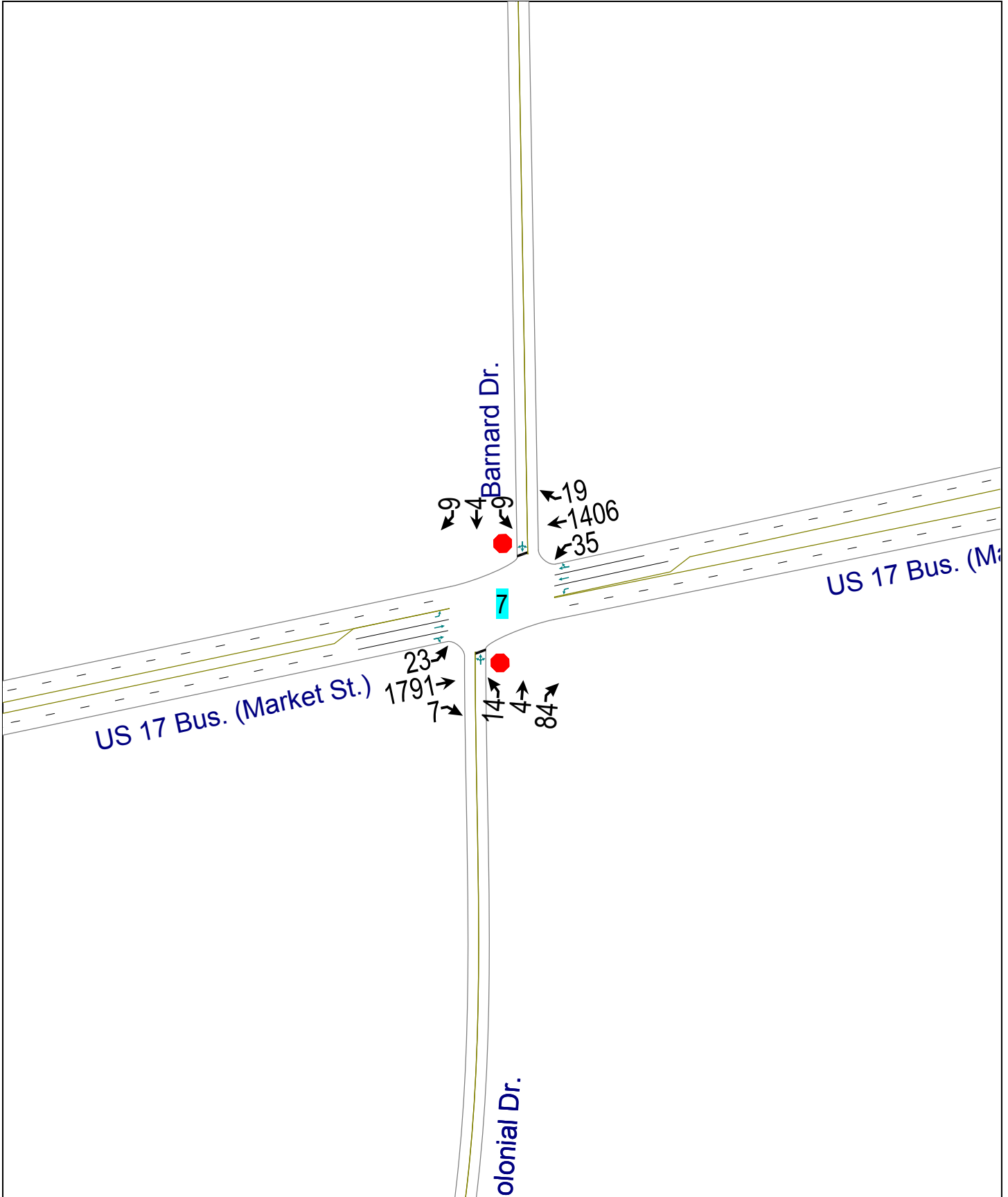
<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 8 BC Quadrant			
Analysis Time Period	PM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1750ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	2134	0.90	4	0	1.5	1.2	0.980	1.00	2419
V <sub>RF</sub>	79	0.90	4	0	1.5	1.2	0.980	1.00	90
V <sub>FR</sub>	451	0.90	4	0	1.5	1.2	0.980	1.00	511
V <sub>RR</sub>	21	0.90	4	0	1.5	1.2	0.980	1.00	24
V <sub>NW</sub>	2443							V =	3044
V <sub>W</sub>	601								
VR	0.197								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	601 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	1006 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	874 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1880 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	1283			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	3044 pc/h				Weaving intensity factor, W	0.239			
Weaving segment capacity, c <sub>w</sub>	6144 veh/h				Weaving segment speed, S	50.9 mph			
Weaving segment v/c ratio	0.486				Average weaving speed, S <sub>W</sub>	51.3 mph			
Weaving segment density, D	19.9 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	50.8 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4510 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									



## **Build Alternative 8, Tight Urban Diamond**

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U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	1395	13	85	1783	9	7	4	35	20	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Flt Permitted	0.950			0.950				0.992			0.978	
Satd. Flow (perm)	1770	3536	0	1770	3536	0	0	1658	0	0	1703	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		796			861			978			871	
Travel Time (s)		15.5			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	1564	0	94	1991	0	0	51	0	0	50	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	69.0%
ICU Level of Service	C
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑		↖	↑↑			↕			↕	
Volume (veh/h)	9	1395	13	85	1783	9	7	4	35	20	4	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	1550	14	94	1981	10	8	4	39	22	4	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					861							
pX, platoon unblocked	0.54						0.54	0.54		0.54	0.54	0.54
vC, conflicting volume	1991			1564			2783	3757	782	3011	3759	996
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1127			1564			2598	4406	782	3021	4410	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			77			0	0	88	0	0	96
cM capacity (veh/h)	332			418			0	1	337	0	1	584

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	10	1033	531	94	1321	670	51	51
Volume Left	10	0	0	94	0	0	8	22
Volume Right	0	0	14	0	0	10	39	24
cSH	332	1700	1700	418	1700	1700	0	0
Volume to Capacity	0.03	0.61	0.31	0.23	0.78	0.39	Err	Err
Queue Length 95th (ft)	2	0	0	21	0	0	Err	Err
Control Delay (s)	16.2	0.0	0.0	16.1	0.0	0.0	Err	Err
Lane LOS	C			C			F	F
Approach Delay (s)	0.1			0.7			Err	Err
Approach LOS							F	F

Intersection Summary

Average Delay		Err	
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

7: US 17 Bus. (Market St.) & Barnard Dr.  
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1791	7	35	1406	19	14	4	84	9	4	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Satd. Flow (prot)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Flt Permitted	0.950			0.950				0.993			0.980	
Satd. Flow (perm)	1770	3536	0	1770	3532	0	0	1644	0	0	1723	0
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		796			861			978			871	
Travel Time (s)		15.5			16.8			26.7			23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	1998	0	39	1583	0	0	113	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			-30			-30	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	62.9%
ICU Level of Service	B
Analysis Period (min)	15

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 8 TUDI PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Volume (veh/h)	23	1791	7	35	1406	19	14	4	84	9	4	9		
Sign Control		Free			Free			Stop			Stop			
Grade		0%			0%			0%			0%			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly flow rate (vph)	26	1990	8	39	1562	21	16	4	93	10	4	10		
Pedestrians														
Lane Width (ft)														
Walking Speed (ft/s)														
Percent Blockage														
Right turn flare (veh)														
Median type	None					None								
Median storage (veh)														
Upstream signal (ft)												861		
pX, platoon unblocked	0.75						0.75	0.75				0.75	0.75	0.75
vC, conflicting volume	1583						1998	2916	3706	999	2792	3699	792	
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	1100						1998	2887	3947	999	2721	3938	38	
tC, single (s)	4.1						4.1	7.5	6.5	6.9	7.5	6.5	6.9	
tC, 2 stage (s)														
tF (s)	2.2						2.2	3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	95						86	0	0	61	0	0	99	
cM capacity (veh/h)	470						284	0	2	242	0	2	765	

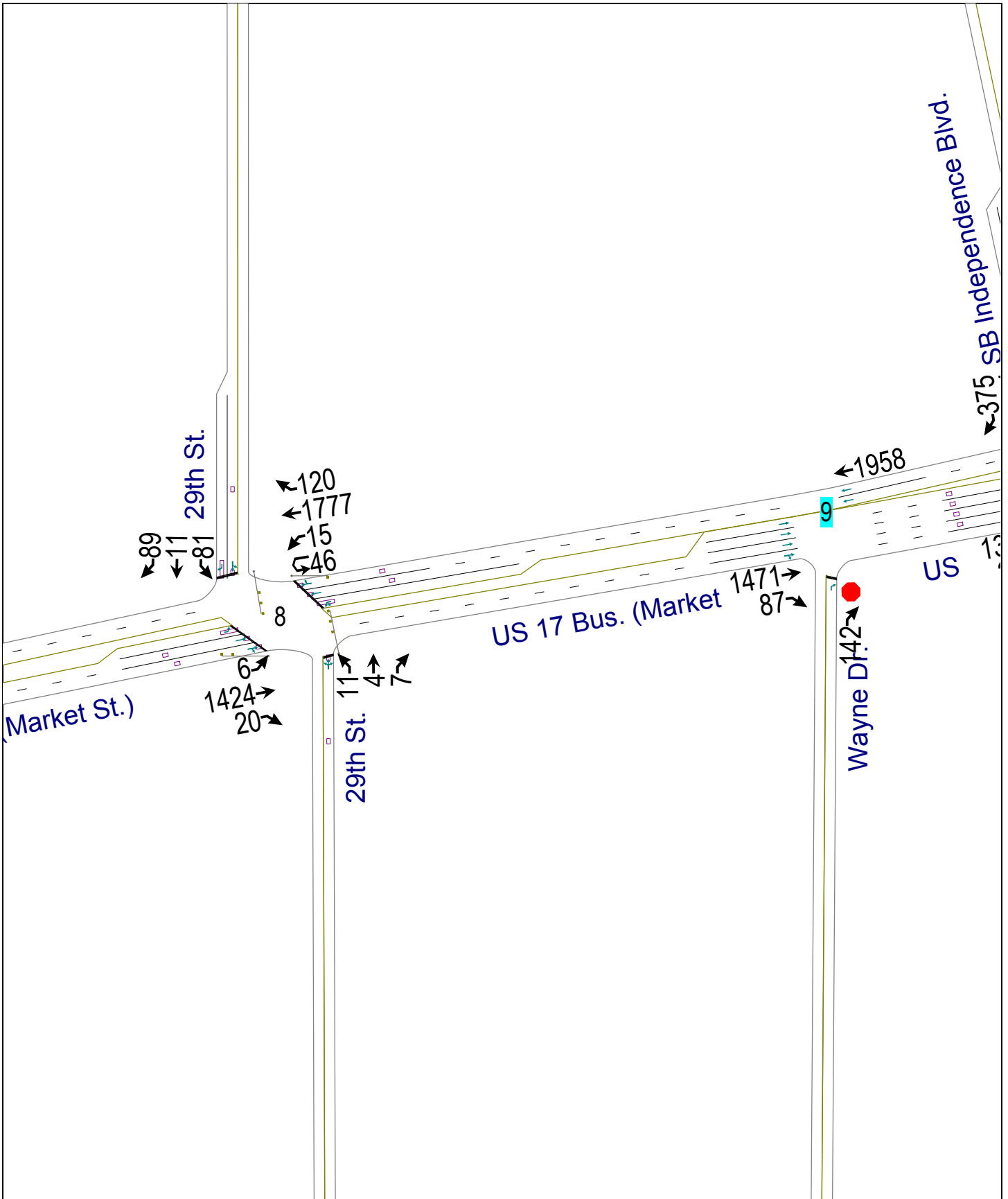
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1		
Volume Total	26	1327	671	39	1041	542	113	24		
Volume Left	26	0	0	39	0	0	16	10		
Volume Right	0	0	8	0	0	21	93	10		
cSH	470	1700	1700	284	1700	1700	0	0		
Volume to Capacity	0.05	0.78	0.39	0.14	0.61	0.32	Err	Err		
Queue Length 95th (ft)	4	0	0	12	0	0	Err	Err		
Control Delay (s)	13.1	0.0	0.0	19.7	0.0	0.0	Err	Err		
Lane LOS	B				C				F	F
Approach Delay (s)	0.2						0.5	Err	Err	
Approach LOS							F	F		

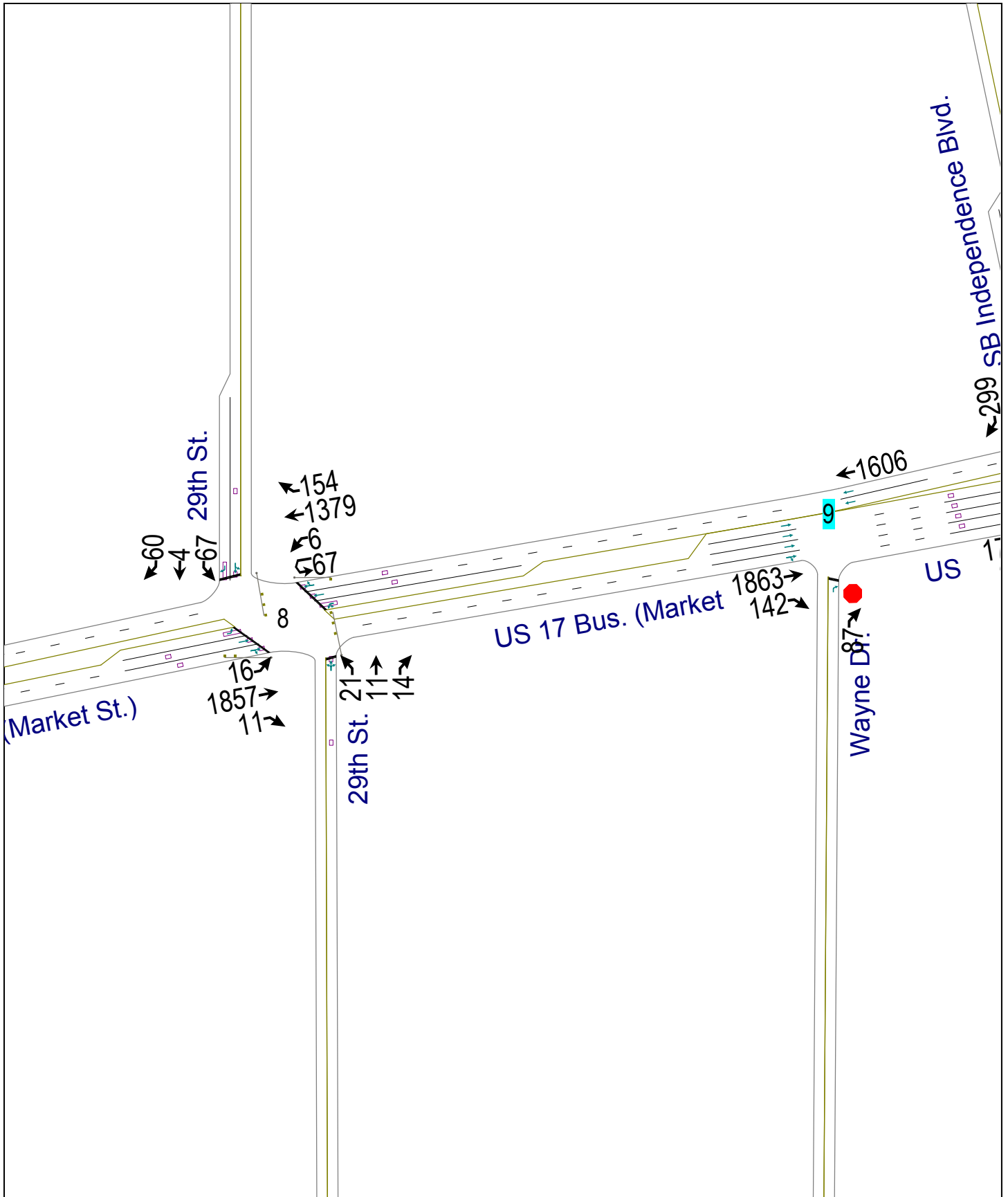
**Intersection Summary**

Average Delay			Err		
Intersection Capacity Utilization	62.9%		ICU Level of Service	B	
Analysis Period (min)	15				

7: US 17 Bus. (Market St.) & Barnard Dr.  
 Build Alt. 8 TUDI PM Peak

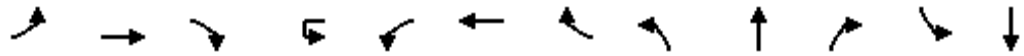






U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	6	1424	20	46	15	1777	120	11	4	7	81	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0		200		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3532	0	0	1770	3507	0	0	1736	0	0	1767
Flt Permitted	0.052				0.950				0.976			0.958
Satd. Flow (perm)	97	3532	0	0	1770	3507	0	0	1736	0	0	1767
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			25			25
Link Distance (ft)		861				627			952			799
Travel Time (s)		14.7				10.7			26.0			21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1604	0	0	68	2107	0	0	24	0	0	102
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			0			0
Link Offset(ft)		0				0			48			48
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	82.0	82.0	0.0	15.0	15.0	97.0	0.0	14.0	14.0	0.0	19.0	19.0
Total Split (%)	63.1%	63.1%	0.0%	11.5%	11.5%	74.6%	0.0%	10.8%	10.8%	0.0%	14.6%	14.6%
Maximum Green (s)	75.0	75.0		8.0	8.0	90.0		7.0	7.0		12.0	12.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	86.4	86.4			9.9	98.5			9.0			13.1
Actuated g/C Ratio	0.66	0.66			0.08	0.76			0.07			0.10
v/c Ratio	0.11	0.68			0.50	0.79			0.20			0.58
Control Delay	17.0	17.8			72.5	6.4			61.4			68.9
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

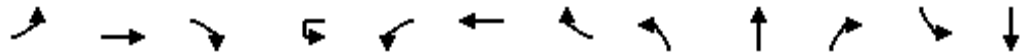
8: US 17 Bus. (Market St.) & 29th St.  
Build Alt. 8 TUDI AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	89
Ideal Flow (vphpl)	1900
Storage Length (ft)	200
Storage Lanes	1
Taper Length (ft)	25
Satd. Flow (prot)	1568
Flt Permitted	
Satd. Flow (perm)	1568
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	99
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Detector Phase	4
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	19.0
Total Split (%)	14.6%
Maximum Green (s)	12.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Act Effct Green (s)	13.1
Actuated g/C Ratio	0.10
v/c Ratio	0.63
Control Delay	73.9
Queue Delay	0.0

8: US 17 Bus. (Market St.) & 29th St.  
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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	17.0	17.8			72.5	6.5			61.4			68.9
LOS	B	B			E	A			E			E
Approach Delay		17.8				8.5			61.4			71.3
Approach LOS		B				A			E			E
Queue Length 50th (ft)	2	505			59	240			19			83
Queue Length 95th (ft)	12	600			m84	277			49			144
Internal Link Dist (ft)		781				547			872			719
Turn Bay Length (ft)	100				200							
Base Capacity (vph)	64	2347			138	2658			120			190
Starvation Cap Reductn	0	0			0	23			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.11	0.68			0.49	0.80			0.20			0.54


Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 15.7  
 Intersection LOS: B  
 Intersection Capacity Utilization 77.1%  
 ICU Level of Service D  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: US 17 Bus. (Market St.) & 29th St.



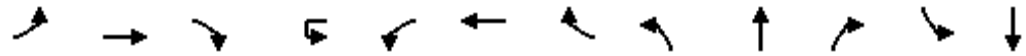
8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 TUDI AM Peak



Lane Group	SBR
Total Delay	73.9
LOS	E
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	81
Queue Length 95th (ft)	143
Internal Link Dist (ft)	
Turn Bay Length (ft)	200
Base Capacity (vph)	169
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.59
Intersection Summary	

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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	16	1857	11	67	6	1379	154	21	11	14	67	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0		200		0	0		0	0	
Storage Lanes	1		0		1		0	0		0	0	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	1770	3536	0	0	1770	3486	0	0	1745	0	0	1762
Flt Permitted	0.115				0.950				0.978			0.955
Satd. Flow (perm)	214	3536	0	0	1770	3486	0	0	1745	0	0	1762
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			25			25
Link Distance (ft)		861				627			952			799
Travel Time (s)		14.7				10.7			26.0			21.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	2075	0	0	81	1703	0	0	51	0	0	78
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)		24				24			0			0
Link Offset(ft)		0				0			48			48
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type	Perm			Prot	Prot			Split				Split
Protected Phases		2		1	1	6		8	8		4	4
Permitted Phases	2											
Detector Phase	2	2		1	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	19.0	19.0		14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	78.0	78.0	0.0	14.0	14.0	92.0	0.0	14.0	14.0	0.0	14.0	14.0
Total Split (%)	65.0%	65.0%	0.0%	11.7%	11.7%	76.7%	0.0%	11.7%	11.7%	0.0%	11.7%	11.7%
Maximum Green (s)	71.0	71.0		7.0	7.0	85.0		7.0	7.0		7.0	7.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	2.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	C-Max	C-Max		None	None	C-Max		None	None		None	None
Act Effct Green (s)	78.6	78.6			9.0	89.8			9.0			9.0
Actuated g/C Ratio	0.66	0.66			0.08	0.75			0.08			0.08
v/c Ratio	0.13	0.90			0.61	0.65			0.39			0.59
Control Delay	12.9	26.2			65.8	11.9			62.1			72.4
Queue Delay	0.0	0.0			0.0	0.0			0.0			0.0

8: US 17 Bus. (Market St.) & 29th St.  
Build Alt. 8 TUDI PM Peak

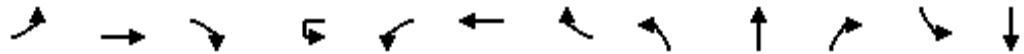
Lane Group	SBR
Lane Configurations	
Volume (vph)	60
Ideal Flow (vphpl)	1900
Storage Length (ft)	200
Storage Lanes	1
Taper Length (ft)	25
Satd. Flow (prot)	1568
Flt Permitted	
Satd. Flow (perm)	1568
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	67
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Detector Phase	4
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	14.0
Total Split (%)	11.7%
Maximum Green (s)	7.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Act Effct Green (s)	9.0
Actuated g/C Ratio	0.08
v/c Ratio	0.57
Control Delay	72.8
Queue Delay	0.0

8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 TUDI PM Peak



U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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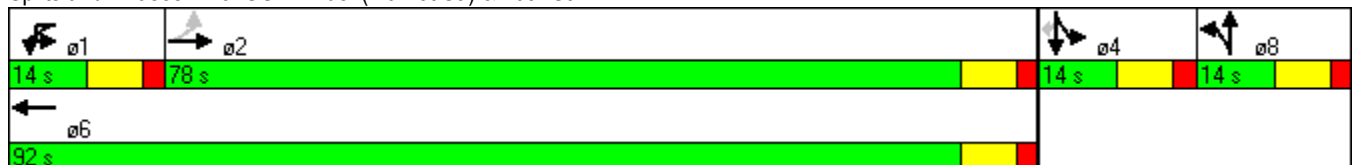


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay	12.9	26.2			65.8	11.9			62.1			72.4
LOS	B	C			E	B			E			E
Approach Delay		26.1				14.3			62.1			72.6
Approach LOS		C				B			E			E
Queue Length 50th (ft)	6	753			60	444			38			60
Queue Length 95th (ft)	19	#985			m#121	510			81			#122
Internal Link Dist (ft)		781				547			872			719
Turn Bay Length (ft)	100				200							
Base Capacity (vph)	140	2316			133	2608			131			132
Starvation Cap Reductn	0	0			0	24			0			0
Spillback Cap Reductn	0	0			0	0			0			0
Storage Cap Reductn	0	0			0	0			0			0
Reduced v/c Ratio	0.13	0.90			0.61	0.66			0.39			0.59


Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 97 (81%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 23.0 Intersection LOS: C  
 Intersection Capacity Utilization 78.3% ICU Level of Service D  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: US 17 Bus. (Market St.) & 29th St.



8: US 17 Bus. (Market St.) & 29th St.  
 Build Alt. 8 TUDI PM Peak



Lane Group	SBR
Total Delay	72.8
LOS	E
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	51
Queue Length 95th (ft)	#110
Internal Link Dist (ft)	
Turn Bay Length (ft)	200
Base Capacity (vph)	118
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.57
Intersection Summary	

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑↑		↗
Volume (vph)	1471	87	0	1958	0	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	6357	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	6357	0	0	3539	0	1611
Link Speed (mph)	40			40	25	
Link Distance (ft)	627			283	873	
Travel Time (s)	10.7			4.8	23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	2%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1731	0	0	2176	0	158
Enter Blocked Intersection	No	No	No	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.5%
	ICU Level of Service B
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & Wayne Dr.  
 Build Alt. 8 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑↑		↗
Volume (veh/h)	1471	87	0	1958	0	142
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1634	97	0	2176	0	158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	627			283		
pX, platoon unblocked					0.70	
vC, conflicting volume	1731			2771		457
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1731			2673		457
tC, single (s)	4.1			6.8		6.9
tC, 2 stage (s)						
tF (s)	2.2			3.5		3.3
p0 queue free %	100			100		71
cM capacity (veh/h)	369			13		551

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	467	467	467	330	1088	1088	158
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	97	0	0	158
cSH	1700	1700	1700	1700	1700	1700	551
Volume to Capacity	0.27	0.27	0.27	0.19	0.64	0.64	0.29
Queue Length 95th (ft)	0	0	0	0	0	0	29
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	14.1
Lane LOS							B
Approach Delay (s)	0.0				0.0		14.1
Approach LOS							B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

9: US 17 Bus. (Market St.) & Wayne Dr.  
 Build Alt. 8 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑↑		↗
Volume (vph)	1863	142	0	1606	0	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		0	1
Taper Length (ft)		25	25		25	25
Satd. Flow (prot)	6337	0	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	6337	0	0	3539	0	1611
Link Speed (mph)	40			40	25	
Link Distance (ft)	627			283	873	
Travel Time (s)	10.7			4.8	23.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	0%	2%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2228	0	0	1784	0	97
Enter Blocked Intersection	No	No	No	Yes	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.7%
	ICU Level of Service A
Analysis Period (min)	15

9: US 17 Bus. (Market St.) & Wayne Dr.  
 Build Alt. 8 TUDI PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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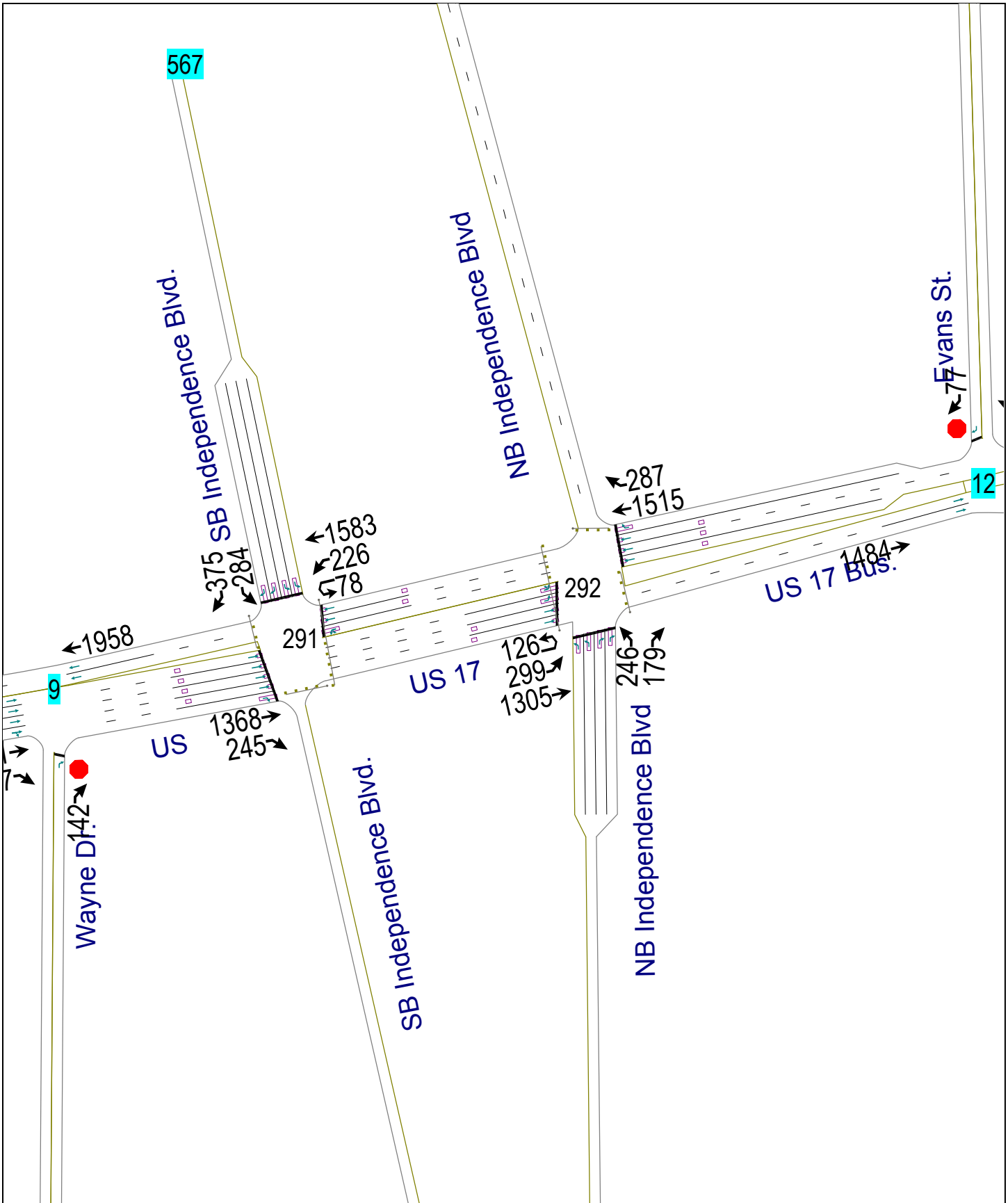


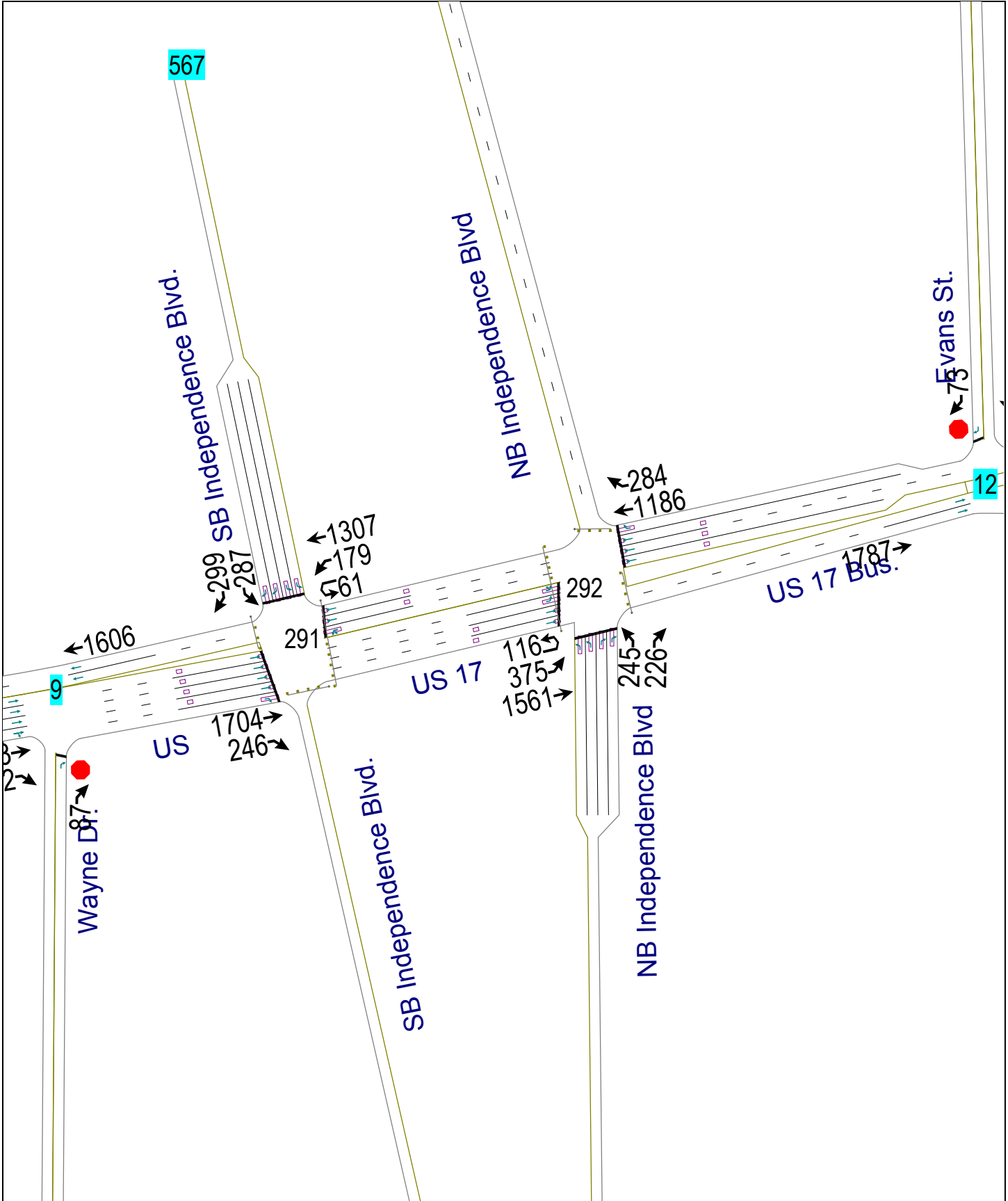
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑↑		↗
Volume (veh/h)	1863	142	0	1606	0	87
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2070	158	0	1784	0	97
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	627			283		
pX, platoon unblocked				0.81		
vC, conflicting volume	2228			3041	596	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2228			3051	596	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			100	78	
cM capacity (veh/h)	237			8	447	

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	NB 1
Volume Total	591	591	591	453	892	892	97
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	158	0	0	97
cSH	1700	1700	1700	1700	1700	1700	447
Volume to Capacity	0.35	0.35	0.35	0.27	0.52	0.52	0.22
Queue Length 95th (ft)	0	0	0	0	0	0	20
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	15.3
Lane LOS							C
Approach Delay (s)	0.0			0.0			15.3
Approach LOS							C

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		

9: US 17 Bus. (Market St.) & Wayne Dr.  
 Build Alt. 8 TUDI PM Peak

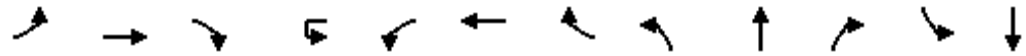






U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↑↑↑	↗		↖	↑↑					↙	↓
Volume (vph)	0	1368	245	78	226	1583	0	0	0	0	284	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		0		0	0		0	250	
Storage Lanes	0		0		0		0	0		0	1	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	0	6408	1583	0	1752	3505	0	0	0	0	3400	0
Flt Permitted					0.950						0.950	
Satd. Flow (perm)	0	6408	1583	0	1752	3505	0	0	0	0	3400	0
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			45			45
Link Distance (ft)		283				322			784			658
Travel Time (s)		4.8				5.5			11.9			10.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	3%	3%	3%	0%	0%	0%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1520	272	0	338	1759	0	0	0	0	316	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	R NA	Left
Median Width(ft)		12				12			24			24
Link Offset(ft)		0				0			0			0
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type			Perm	Prot	Prot							Prot
Protected Phases		2		1	1	6						4
Permitted Phases			2									
Detector Phase		2	2	1	1	6						4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	7.0	12.0						7.0
Minimum Split (s)		19.0	19.0	14.0	14.0	19.0						14.0
Total Split (s)	0.0	49.0	49.0	46.0	46.0	95.0	0.0	0.0	0.0	0.0	35.0	0.0
Total Split (%)	0.0%	37.7%	37.7%	35.4%	35.4%	73.1%	0.0%	0.0%	0.0%	0.0%	26.9%	0.0%
Maximum Green (s)		42.0	42.0	39.0	39.0	88.0						28.0
Yellow Time (s)		5.0	5.0	5.0	5.0	5.0						5.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0						2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	5.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	5.0	2.0
Lead/Lag		Lag	Lag	Lead	Lead							
Lead-Lag Optimize?		Yes	Yes	Yes	Yes							
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0						3.0
Recall Mode		C-Max	C-Max	None	None	C-Max						None
Act Effct Green (s)		56.4	56.4		32.3	93.7						26.3
Actuated g/C Ratio		0.43	0.43		0.25	0.72						0.20
v/c Ratio		0.55	0.40		0.78	0.70						0.46
Control Delay		18.6	18.0		56.7	5.0						47.3
Queue Delay		0.0	0.0		2.4	0.2						0.0

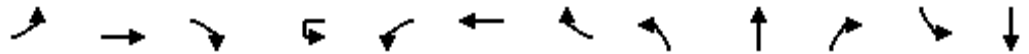
291: US 17 Bus. (Market St.) & SB Independence Blvd.  
Build Alt. 8 TUDI AM Peak

Lane Group	SBR
Lane Configurations	FF
Volume (vph)	375
Ideal Flow (vphpl)	1900
Storage Length (ft)	250
Storage Lanes	2
Taper Length (ft)	25
Satd. Flow (prot)	2760
Flt Permitted	
Satd. Flow (perm)	2760
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	417
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	custom
Protected Phases	
Permitted Phases	4
Detector Phase	4
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	35.0
Total Split (%)	26.9%
Maximum Green (s)	28.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Act Effct Green (s)	26.3
Actuated g/C Ratio	0.20
v/c Ratio	0.75
Control Delay	57.3
Queue Delay	0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd.  
 Build Alt. 8 TUDI AM Peak

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Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		18.6	18.0		59.2	5.2						47.3
LOS		B	B		E	A						D
Approach Delay		18.5				13.9						
Approach LOS		B				B						
Queue Length 50th (ft)		167	84		220	147						121
Queue Length 95th (ft)		290	210		240	166						162
Internal Link Dist (ft)		203				242			704			578
Turn Bay Length (ft)												250
Base Capacity (vph)		2780	687		553	2527						785
Starvation Cap Reductn		0	0		114	207						0
Spillback Cap Reductn		83	0		0	10						0
Storage Cap Reductn		0	0		0	0						0
Reduced v/c Ratio		0.56	0.40		0.77	0.76						0.40

Intersection Summary


Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 34 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.78  
 Intersection Signal Delay: 21.9  
 Intersection Capacity Utilization 65.2%  
 Analysis Period (min) 15

Intersection LOS: C  
 ICU Level of Service C

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd.



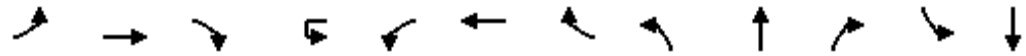
291: US 17 Bus. (Market St.) & SB Independence Blvd.  
 Build Alt. 8 TUDI AM Peak



Lane Group	SBR
Total Delay	57.3
LOS	E
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	188
Queue Length 95th (ft)	246
Internal Link Dist (ft)	
Turn Bay Length (ft)	250
Base Capacity (vph)	637
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.65
Intersection Summary	

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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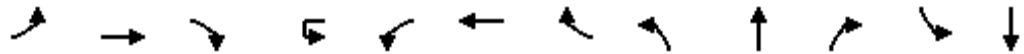


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↑↑↑	↗		↘	↑↑					↖	
Volume (vph)	0	1704	246	61	179	1307	0	0	0	0	287	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		0		0	0		0	250	
Storage Lanes	0		0		0		0	0		0	1	
Taper Length (ft)	25		25		25		25	25		25	25	
Satd. Flow (prot)	0	6408	1583	0	1752	3505	0	0	0	0	3400	0
Flt Permitted					0.950						0.950	
Satd. Flow (perm)	0	6408	1583	0	1752	3505	0	0	0	0	3400	0
Right Turn on Red			No				No			No		
Satd. Flow (RTOR)												
Link Speed (mph)		40				40			45			45
Link Distance (ft)		283				322			784			658
Travel Time (s)		4.8				5.5			11.9			10.0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	2%	2%	3%	3%	3%	0%	0%	0%	0%	3%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1893	273	0	267	1452	0	0	0	0	319	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	R NA	Left	Left	Right	Left	Left	Right	R NA	Left
Median Width(ft)		12				12			24			24
Link Offset(ft)		0				0			0			0
Crosswalk Width(ft)		16				16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	9	15		9	15		9	15	
Turn Type			Perm	Prot	Prot							Prot
Protected Phases		2		1	1	6						4
Permitted Phases			2									
Detector Phase		2	2	1	1	6						4
Switch Phase												
Minimum Initial (s)		12.0	12.0	7.0	7.0	12.0						7.0
Minimum Split (s)		19.0	19.0	14.0	14.0	19.0						14.0
Total Split (s)	0.0	55.0	55.0	36.0	36.0	91.0	0.0	0.0	0.0	0.0	29.0	0.0
Total Split (%)	0.0%	45.8%	45.8%	30.0%	30.0%	75.8%	0.0%	0.0%	0.0%	0.0%	24.2%	0.0%
Maximum Green (s)		48.0	48.0	29.0	29.0	84.0						22.0
Yellow Time (s)		5.0	5.0	5.0	5.0	5.0						5.0
All-Red Time (s)		2.0	2.0	2.0	2.0	2.0						2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	2.0	5.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	5.0	2.0
Lead/Lag		Lead	Lead	Lag	Lag							
Lead-Lag Optimize?		Yes	Yes	Yes	Yes							
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0						3.0
Recall Mode		C-Max	C-Max	None	None	C-Max						None
Act Effct Green (s)		53.0	53.0		31.0	89.0						21.0
Actuated g/C Ratio		0.44	0.44		0.26	0.74						0.18
v/c Ratio		0.67	0.39		0.59	0.56						0.54
Control Delay		13.9	11.1		34.9	6.1						48.1
Queue Delay		0.1	0.0		2.6	0.2						0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd.  
Build Alt. 8 TUDI PM Peak

Lane Group	SBR
Lane Configurations	FF
Volume (vph)	299
Ideal Flow (vphpl)	1900
Storage Length (ft)	250
Storage Lanes	2
Taper Length (ft)	25
Satd. Flow (prot)	2760
Flt Permitted	
Satd. Flow (perm)	2760
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	332
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	custom
Protected Phases	
Permitted Phases	4
Detector Phase	4
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	14.0
Total Split (s)	29.0
Total Split (%)	24.2%
Maximum Green (s)	22.0
Yellow Time (s)	5.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Act Effct Green (s)	21.0
Actuated g/C Ratio	0.18
v/c Ratio	0.69
Control Delay	53.9
Queue Delay	0.0

291: US 17 Bus. (Market St.) & SB Independence Blvd.  
 Build Alt. 8 TUDI PM Peak

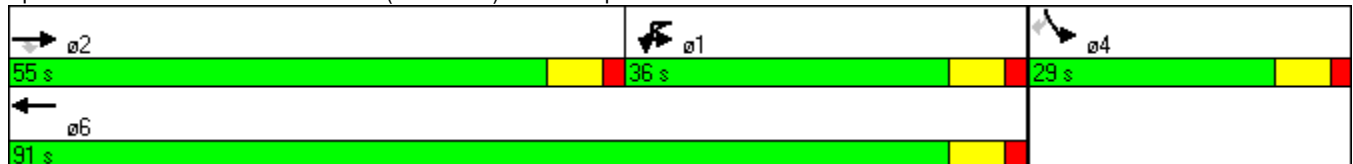


Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		14.0	11.1		37.5	6.3					48.1	
LOS		B	B		D	A					D	
Approach Delay		13.6				11.1						
Approach LOS		B				B						
Queue Length 50th (ft)		231	84		184	121					116	
Queue Length 95th (ft)		286	m111		259	134					159	
Internal Link Dist (ft)		203				242			704			578
Turn Bay Length (ft)												250
Base Capacity (vph)		2829	699		453	2599						680
Starvation Cap Reductn		0	0		96	407						0
Spillback Cap Reductn		89	0		0	0						0
Storage Cap Reductn		0	0		0	0						0
Reduced v/c Ratio		0.69	0.39		0.75	0.66						0.47

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 15 (13%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.69  
 Intersection Signal Delay: 18.0  
 Intersection LOS: B  
 Intersection Capacity Utilization 59.4%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 291: US 17 Bus. (Market St.) & SB Independence Blvd.



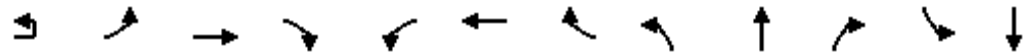


Lane Group	SBR
Total Delay	53.9
LOS	D
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	137
Queue Length 95th (ft)	189
Internal Link Dist (ft)	
Turn Bay Length (ft)	250
Base Capacity (vph)	552
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.60
Intersection Summary	



U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	126	299	1305	0	0	1515	287	246	0	179	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	300		325	200		200	0	
Storage Lanes		0		0	1		1	1		2	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	3400	3505	0	0	5036	1568	3400	0	2760	0	0
Flt Permitted		0.950						0.950				
Satd. Flow (perm)	0	3400	3505	0	0	5036	1568	3400	0	2760	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			45			45
Link Distance (ft)			322			465			920			782
Travel Time (s)			5.5			7.9			13.9			11.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	0%	0%	3%	3%	3%	0%	3%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	472	1450	0	0	1683	319	273	0	199	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	R NA	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot					Perm	Prot		custom		
Protected Phases	5	5	2			6		8				
Permitted Phases							6			8		
Detector Phase	5	5	2			6	6	8		8		
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0			12.0	12.0	7.0		7.0		
Minimum Split (s)	14.0	14.0	19.0			19.0	19.0	14.0		14.0		
Total Split (s)	35.0	35.0	106.0	0.0	0.0	71.0	71.0	24.0	0.0	24.0	0.0	0.0
Total Split (%)	26.9%	26.9%	81.5%	0.0%	0.0%	54.6%	54.6%	18.5%	0.0%	18.5%	0.0%	0.0%
Maximum Green (s)	28.0	28.0	99.0			64.0	64.0	17.0		17.0		
Yellow Time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0		
All-Red Time (s)	2.0	2.0	2.0			2.0	2.0	2.0		2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	2.0	2.0	5.0	5.0	5.0	2.0	5.0	2.0	2.0
Lead/Lag	Lag	Lag				Lead	Lead					
Lead-Lag Optimize?	Yes	Yes				Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0			3.0	3.0	3.0		3.0		
Recall Mode	None	None	C-Max			C-Max	C-Max	None		None		
Act Effct Green (s)		30.0	103.0			68.0	68.0	17.0		17.0		
Actuated g/C Ratio		0.23	0.79			0.52	0.52	0.13		0.13		
v/c Ratio		0.60	0.52			0.64	0.39	0.61		0.55		
Control Delay		32.6	4.6			14.4	12.8	59.4		58.7		
Queue Delay		3.9	0.3			0.0	0.0	0.3		0.0		

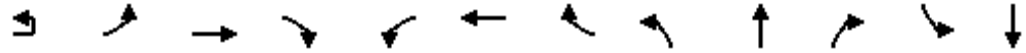
292: US 17 Bus. (Market St.) & NB Independence Blvd  
Build Alt. 8 TUDI AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

292: US 17 Bus. (Market St.) & NB Independence Blvd  
 Build Alt. 8 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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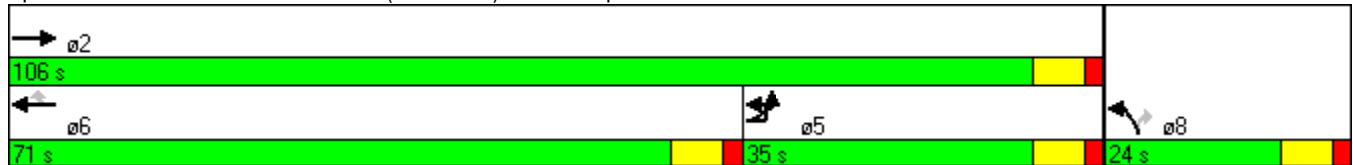


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		36.5	4.9			14.4	12.8	59.7		58.7		
LOS		D	A			B	B	E		E		
Approach Delay			12.7			14.1						
Approach LOS			B			B						
Queue Length 50th (ft)		180	106			190	96	112		89		
Queue Length 95th (ft)		247	175			241	152	158		133		
Internal Link Dist (ft)			242			385			840			702
Turn Bay Length (ft)							325	200		200		
Base Capacity (vph)		785	2776			2634	820	497		403		
Starvation Cap Reductn		227	652			0	0	0		0		
Spillback Cap Reductn		0	0			15	0	30		0		
Storage Cap Reductn		0	0			0	0	0		0		
Reduced v/c Ratio		0.85	0.68			0.64	0.39	0.58		0.49		

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 128 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64  
 Intersection Signal Delay: 18.3  
 Intersection Capacity Utilization 65.2%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service C

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd



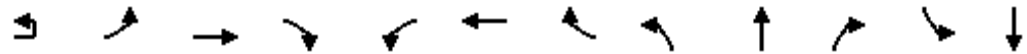
292: US 17 Bus. (Market St.) & NB Independence Blvd  
 Build Alt. 8 TUDI AM Peak



Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↘↘	↗↗			↗↗↗	↗	↘↘		↗↗		
Volume (vph)	116	375	1561	0	0	1186	284	245	0	226	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	300		325	200		200	0	
Storage Lanes		0		0	1		1	1		2	0	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	3400	3505	0	0	5036	1568	3400	0	2760	0	0
Flt Permitted		0.950						0.950				
Satd. Flow (perm)	0	3400	3505	0	0	5036	1568	3400	0	2760	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			45			45
Link Distance (ft)			322			465			920			782
Travel Time (s)			5.5			7.9			13.9			11.8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	0%	0%	3%	3%	3%	0%	3%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	546	1734	0	0	1318	316	272	0	251	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	R NA	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot					Perm	Prot		custom		
Protected Phases	5	5	2			6		8				
Permitted Phases							6			8		
Detector Phase	5	5	2			6	6	8		8		
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0			12.0	12.0	7.0		7.0		
Minimum Split (s)	14.0	14.0	19.0			19.0	19.0	14.0		14.0		
Total Split (s)	38.0	38.0	94.0	0.0	0.0	56.0	56.0	26.0	0.0	26.0	0.0	0.0
Total Split (%)	31.7%	31.7%	78.3%	0.0%	0.0%	46.7%	46.7%	21.7%	0.0%	21.7%	0.0%	0.0%
Maximum Green (s)	31.0	31.0	87.0			49.0	49.0	19.0		19.0		
Yellow Time (s)	5.0	5.0	5.0			5.0	5.0	5.0		5.0		
All-Red Time (s)	2.0	2.0	2.0			2.0	2.0	2.0		2.0		
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	2.0	2.0	5.0	5.0	5.0	2.0	5.0	2.0	2.0
Lead/Lag	Lead	Lead				Lag	Lag					
Lead-Lag Optimize?	Yes	Yes				Yes	Yes					
Vehicle Extension (s)	3.0	3.0	3.0			3.0	3.0	3.0		3.0		
Recall Mode	None	None	C-Max			C-Max	C-Max	None		None		
Act Effct Green (s)		26.5	92.2			60.8	60.8	17.8		17.8		
Actuated g/C Ratio		0.22	0.77			0.51	0.51	0.15		0.15		
v/c Ratio		0.73	0.64			0.52	0.40	0.54		0.62		
Control Delay		45.7	7.2			10.0	9.9	51.1		54.3		
Queue Delay		0.6	2.5			0.0	0.0	0.0		0.0		

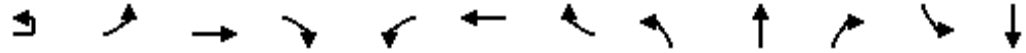
292: US 17 Bus. (Market St.) & NB Independence Blvd  
Build Alt. 8 TUDI PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

292: US 17 Bus. (Market St.) & NB Independence Blvd  
 Build Alt. 8 TUDI PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		46.3	9.7			10.0	9.9	51.1		54.3		
LOS		D	A			B	A	D		D		
Approach Delay			18.4			10.0						
Approach LOS			B			B						
Queue Length 50th (ft)		143	183			100	66	101		104		
Queue Length 95th (ft)		159	230			199	147	142		149		
Internal Link Dist (ft)			242			385			840			702
Turn Bay Length (ft)							325	200		200		
Base Capacity (vph)		935	2694			2551	794	595		483		
Starvation Cap Reductn		137	797			0	0	0		0		
Spillback Cap Reductn		0	0			60	0	0		0		
Storage Cap Reductn		0	0			0	0	0		0		
Reduced v/c Ratio		0.68	0.91			0.53	0.40	0.46		0.52		

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 49 (41%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 19.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 59.4%  
 ICU Level of Service B  
 Analysis Period (min) 15

Splits and Phases: 292: US 17 Bus. (Market St.) & NB Independence Blvd

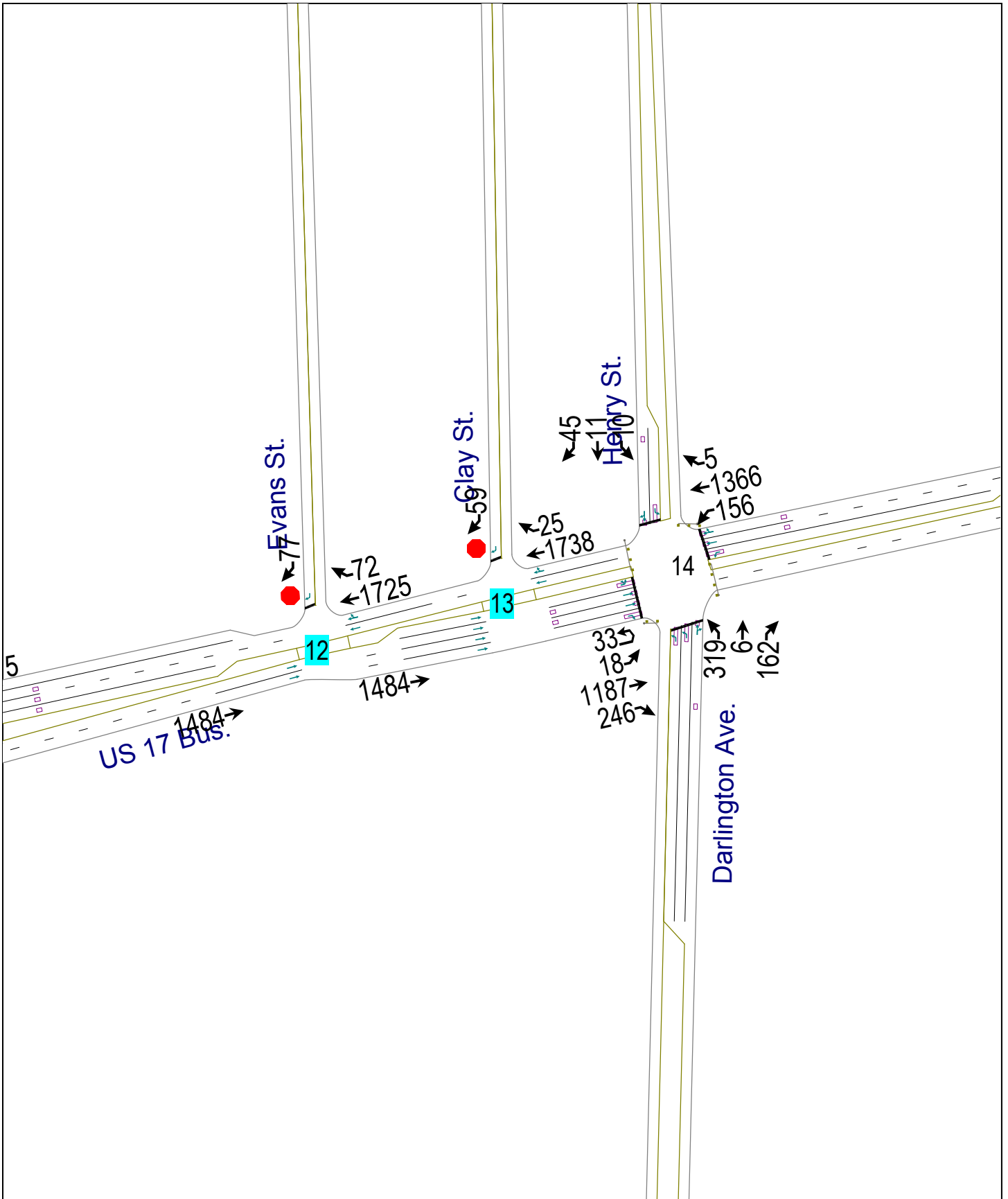


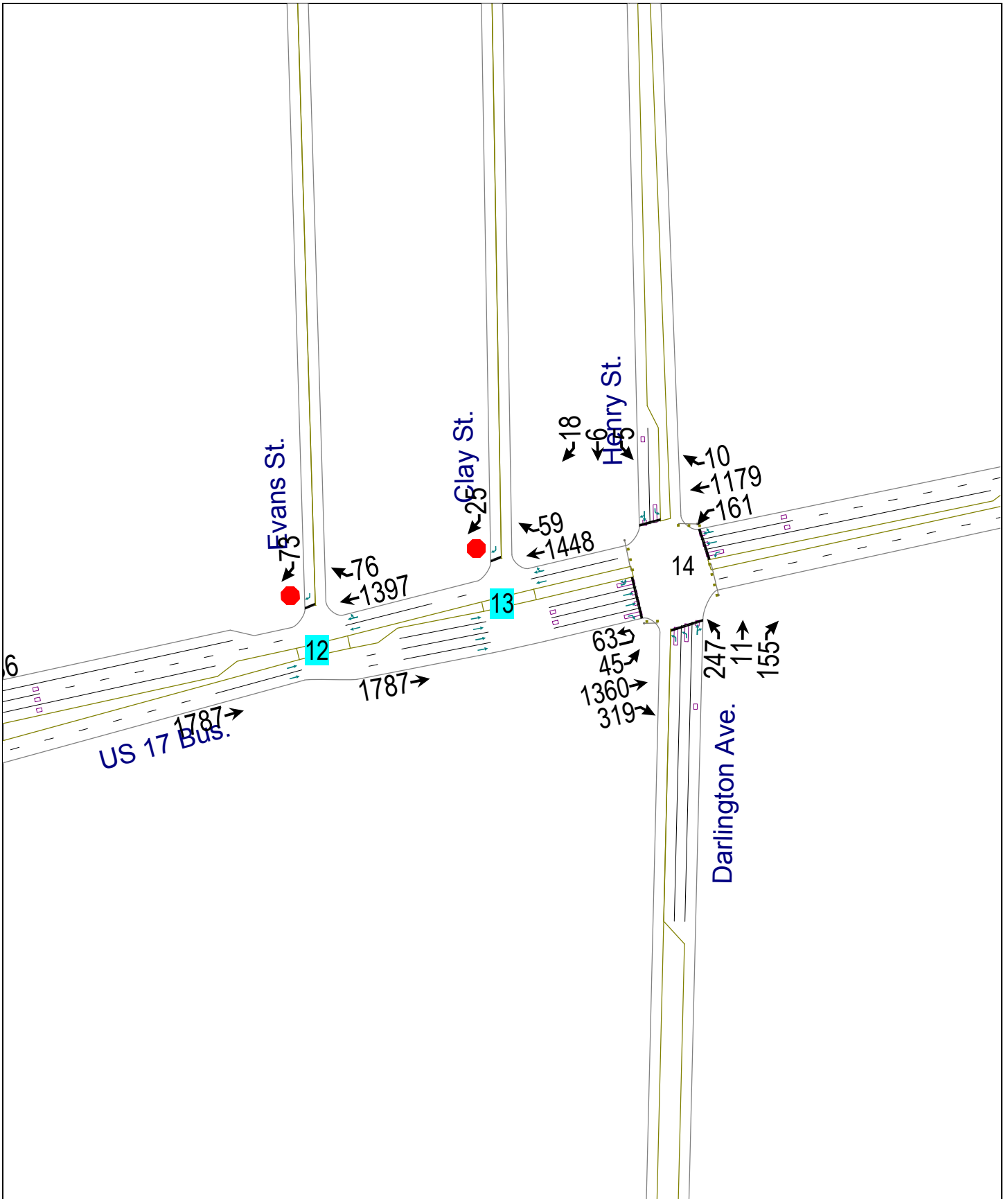
292: US 17 Bus. (Market St.) & NB Independence Blvd  
 Build Alt. 8 TUDI PM Peak



Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	







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 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Volume (vph)	0	1484	1725	72	0	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3505	3484	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	3505	3484	0	0	1580
Link Speed (mph)		40	40		25	
Link Distance (ft)		465	216		781	
Travel Time (s)		7.9	3.7		21.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1649	1997	0	0	86
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.4%
Analysis Period (min)	15
	ICU Level of Service B

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 8 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Volume (veh/h)	0	1484	1725	72	0	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1649	1917	80	0	86
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		465	424			
pX, platoon unblocked	0.66				0.74	0.66
vC, conflicting volume	1997				2781	998
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1474				1739	0
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	88
cM capacity (veh/h)	305				59	709

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	824	824	1278	719	86
Volume Left	0	0	0	0	0
Volume Right	0	0	0	80	86
cSH	1700	1700	1700	1700	709
Volume to Capacity	0.48	0.48	0.75	0.42	0.12
Queue Length 95th (ft)	0	0	0	0	10
Control Delay (s)	0.0	0.0	0.0	0.0	10.8
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.8
Approach LOS					B

Intersection Summary					
Average Delay			0.2		
Intersection Capacity Utilization			61.4%	ICU Level of Service	B
Analysis Period (min)			15		

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 8 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Volume (vph)	0	1787	1397	76	0	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	3505	3477	0	0	1580
Flt Permitted						
Satd. Flow (perm)	0	3505	3477	0	0	1580
Link Speed (mph)		40	40		25	
Link Distance (ft)		465	216		781	
Travel Time (s)		7.9	3.7		21.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	4%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1986	1636	0	0	81
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.7%
Analysis Period (min)	15
	ICU Level of Service A

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 8 TUDI PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Volume (veh/h)	0	1787	1397	76	0	73
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1986	1552	84	0	81
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		465	424			
pX, platoon unblocked	0.70				0.83	0.70
vC, conflicting volume	1637				2587	818
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1054				1120	0
tC, single (s)	4.1				6.8	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	89
cM capacity (veh/h)	468				169	755

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	993	993	1035	602	81
Volume Left	0	0	0	0	0
Volume Right	0	0	0	84	81
cSH	1700	1700	1700	1700	755
Volume to Capacity	0.58	0.58	0.61	0.35	0.11
Queue Length 95th (ft)	0	0	0	0	9
Control Delay (s)	0.0	0.0	0.0	0.0	10.3
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.3
Approach LOS					B

Intersection Summary					
Average Delay			0.2		
Intersection Capacity Utilization			52.7%	ICU Level of Service	A
Analysis Period (min)			15		

12: US 17 Bus. (Market St.) & Evans St.  
 Build Alt. 8 TUDI PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (vph)	0	1484	1738	25	0	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	6346	3498	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6346	3498	0	0	1611
Link Speed (mph)		40	40		25	
Link Distance (ft)		216	208		781	
Travel Time (s)		3.7	3.5		21.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1649	1959	0	0	66
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	59.2%
ICU Level of Service	B
Analysis Period (min)	15

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 TUDI AM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (veh/h)	0	1484	1738	25	0	59
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1649	1931	28	0	66
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		681	208			
pX, platoon unblocked	0.66				0.66	0.66
vC, conflicting volume	1959				2357	979
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1425				2028	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	91
cM capacity (veh/h)	320				34	717

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1
Volume Total	412	412	412	412	1287	671	66
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	28	66
cSH	1700	1700	1700	1700	1700	1700	717
Volume to Capacity	0.24	0.24	0.24	0.24	0.76	0.39	0.09
Queue Length 95th (ft)	0	0	0	0	0	0	8
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.5
Lane LOS							B
Approach Delay (s)	0.0				0.0		10.5
Approach LOS							B

Intersection Summary							
Average Delay			0.2				
Intersection Capacity Utilization			59.2%		ICU Level of Service		B
Analysis Period (min)			15				

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 TUDI AM Peak



U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

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Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (vph)	0	1787	1448	59	0	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25			25	25	25
Satd. Flow (prot)	0	6346	3484	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	6346	3484	0	0	1611
Link Speed (mph)		40	40		25	
Link Distance (ft)		216	208		781	
Travel Time (s)		3.7	3.5		21.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	3%	3%	3%	0%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1986	1675	0	0	28
Enter Blocked Intersection	No	Yes	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)		12	12		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	51.9%
ICU Level of Service	A
Analysis Period (min)	15

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 TUDI PM Peak

U-4434 Independence Blvd.  
 Synchro 7 - Report HCM Unsignalized Intersection Capacity Analysis

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑			↗
Volume (veh/h)	0	1787	1448	59	0	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	1986	1609	66	0	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		681	208			
pX, platoon unblocked	0.70				0.70	0.70
vC, conflicting volume	1674				2138	837
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1104				1767	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	447				53	758

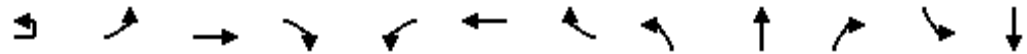
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	SB 1
Volume Total	496	496	496	496	1073	602	28
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	66	28
cSH	1700	1700	1700	1700	1700	1700	758
Volume to Capacity	0.29	0.29	0.29	0.29	0.63	0.35	0.04
Queue Length 95th (ft)	0	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.9
Lane LOS							A
Approach Delay (s)	0.0				0.0		9.9
Approach LOS							A

Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			51.9%		ICU Level of Service		A
Analysis Period (min)			15				

13: US 17 Bus. (Market St.) & Clay St.  
 Build Alt. 8 TUDI PM Peak

U-4434 Independence Blvd.  
Synchro 7 - Report Lanes, Volumes, Timings

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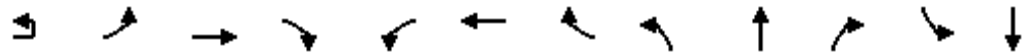


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔	↑↑	↗	↖	↑↓		↖↗	↗		↖	↗
Volume (vph)	33	18	1187	246	156	1366	5	319	6	162	10	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	325		0	325		0	100	
Storage Lanes		0		1	1		0	2		0	1	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	1752	3505	1568	1752	3501	0	3433	1595	0	1752	1621
Flt Permitted		0.950			0.950			0.950			0.950	
Satd. Flow (perm)	0	1752	3505	1568	1752	3501	0	3433	1595	0	1752	1621
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			25
Link Distance (ft)			208			1024			915			767
Travel Time (s)			3.5			17.5			25.0			20.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	57	1319	273	173	1524	0	354	187	0	11	62
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	Left	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			24
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot		pm+ov	Prot			Split				Split
Protected Phases	5	5	2	8	1	6		8	8		4	4
Permitted Phases				2								
Detector Phase	5	5	2	8	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	14.0	14.0	19.0	14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	14.0	14.0	65.0	27.0	24.0	75.0	0.0	27.0	27.0	0.0	14.0	14.0
Total Split (%)	10.8%	10.8%	50.0%	20.8%	18.5%	57.7%	0.0%	20.8%	20.8%	0.0%	10.8%	10.8%
Maximum Green (s)	7.0	7.0	58.0	20.0	17.0	68.0		20.0	20.0		7.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag		Lead	Lead						
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max	None	None	C-Max		None	None		None	None
Act Effct Green (s)		9.0	65.3	87.2	17.6	76.8		20.8	20.8		9.0	9.0
Actuated g/C Ratio		0.07	0.50	0.67	0.14	0.59		0.16	0.16		0.07	0.07
v/c Ratio		0.47	0.75	0.26	0.73	0.74		0.64	0.73		0.09	0.55
Control Delay		66.0	26.4	5.9	71.7	24.4		56.8	69.1		58.6	77.6
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0

14: US 17 Bus. (Market St.) & Henry St.  
Build Alt. 8 TUDI AM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	45
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

14: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 8 TUDI AM Peak



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		66.0	26.4	5.9	71.7	24.4		56.8	69.1		58.6	77.6
LOS		E	C	A	E	C		E	E		E	E
Approach Delay			24.3			29.2			61.1			74.7
Approach LOS			C			C			E			E
Queue Length 50th (ft)		42	247	33	140	532		144	150		9	52
Queue Length 95th (ft)		m88	452	107	#223	635		196	#245		29	#107
Internal Link Dist (ft)			128			944			835			687
Turn Bay Length (ft)					325			325			100	
Base Capacity (vph)		121	1762	1066	256	2068		581	270		121	112
Starvation Cap Reductn		0	0	0	0	0		0	0		0	0
Spillback Cap Reductn		0	0	0	0	0		0	0		0	0
Storage Cap Reductn		0	0	0	0	0		0	0		0	0
Reduced v/c Ratio		0.47	0.75	0.26	0.68	0.74		0.61	0.69		0.09	0.55

**Intersection Summary**

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 20 (15%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 32.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 72.0%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: US 17 Bus. (Market St.) & Henry St.

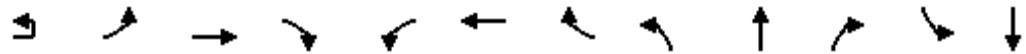




Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

U-4434 Independence Blvd.  
 Synchro 7 - Report Lanes, Volumes, Timings

URS  
 11/28/2012



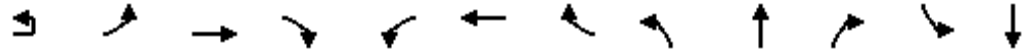
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔	↕	↗	↖	↕		↖	↗		↖	↗
Volume (vph)	63	45	1360	319	161	1179	10	247	11	155	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0		0	325		0	325		0	100	
Storage Lanes		0		1	1		0	2		0	1	
Taper Length (ft)		25		25	25		25	25		25	25	
Satd. Flow (prot)	0	1752	3505	1568	1752	3501	0	3433	1602	0	1752	1640
Flt Permitted		0.950			0.950			0.950			0.950	
Satd. Flow (perm)	0	1752	3505	1568	1752	3501	0	3433	1602	0	1752	1640
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			40			40			25			25
Link Distance (ft)			208			1024			915			767
Travel Time (s)			3.5			17.5			25.0			20.9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	120	1511	354	179	1321	0	274	184	0	6	27
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Right	Right	Left	Left	Right	Left	Left
Median Width(ft)			24			24			24			24
Link Offset(ft)			0			0			0			24
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Turn Type	Prot	Prot		pm+ov	Prot			Split				Split
Protected Phases	5	5	2	8	1	6		8	8		4	4
Permitted Phases				2								
Detector Phase	5	5	2	8	1	6		8	8		4	4
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0	7.0	7.0	12.0		7.0	7.0		7.0	7.0
Minimum Split (s)	14.0	14.0	19.0	14.0	14.0	19.0		14.0	14.0		14.0	14.0
Total Split (s)	20.0	20.0	62.0	23.0	21.0	63.0	0.0	23.0	23.0	0.0	14.0	14.0
Total Split (%)	16.7%	16.7%	51.7%	19.2%	17.5%	52.5%	0.0%	19.2%	19.2%	0.0%	11.7%	11.7%
Maximum Green (s)	13.0	13.0	55.0	16.0	14.0	56.0		16.0	16.0		7.0	7.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead		Lag	Lead						
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode	None	None	C-Max	None	None	C-Max		None	None		None	None
Act Effct Green (s)		14.6	63.0	86.0	15.6	64.0		18.0	18.0		9.0	9.0
Actuated g/C Ratio		0.12	0.52	0.72	0.13	0.53		0.15	0.15		0.08	0.08
v/c Ratio		0.56	0.82	0.31	0.79	0.71		0.53	0.76		0.05	0.22
Control Delay		55.2	13.5	2.7	74.6	25.0		51.2	70.0		52.4	56.9
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0

14: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 8 TUDI PM Peak

Lane Group	SBR
Lane Configurations	
Volume (vph)	18
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	25
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	0.0
Total Split (%)	0.0%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

14: US 17 Bus. (Market St.) & Henry St.  
 Build Alt. 8 TUDI PM Peak



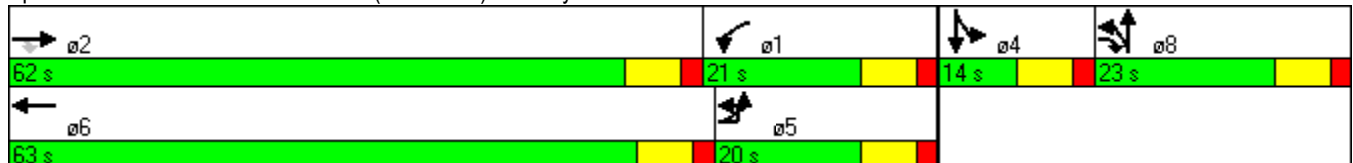


Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Total Delay		55.2	13.5	2.7	74.6	25.0		51.2	70.0		52.4	56.9
LOS		E	B	A	E	C		D	E		D	E
Approach Delay			14.1			31.0			58.8			56.1
Approach LOS			B			C			E			E
Queue Length 50th (ft)		98	349	11	136	434		102	139		4	20
Queue Length 95th (ft)		m155	#564	65	#247	526		147	#250		19	51
Internal Link Dist (ft)			128			944			835			687
Turn Bay Length (ft)					325			325			100	
Base Capacity (vph)		219	1840	1117	234	1867		530	247		131	123
Starvation Cap Reductn		0	0	0	0	0		0	0		0	0
Spillback Cap Reductn		0	0	0	0	0		0	0		0	0
Storage Cap Reductn		0	0	0	0	0		0	0		0	0
Reduced v/c Ratio		0.55	0.82	0.32	0.76	0.71		0.52	0.74		0.05	0.22

**Intersection Summary**

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 29 (24%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 26.0 Intersection LOS: C  
 Intersection Capacity Utilization 72.7% ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: US 17 Bus. (Market St.) & Henry St.





Lane Group	SBR
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	WB	WB	WB	NB	SB
Directions Served	L	L	T	TR	LTR	LTR
Maximum Queue (ft)	45	124	620	594	903	820
Average Queue (ft)	6	105	224	217	476	641
95th Queue (ft)	26	89	597	596	877	969
Link Distance (ft)			706	706	918	811
Upstream Blk Time (%)					0	37
Queuing Penalty (veh)					0	0
Storage Bay Dist (ft)	100	100				
Storage Blk Time (%)		47				
Queuing Penalty (veh)		419				

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LT	R
Maximum Queue (ft)	124	326	421	80	270	287	68	129	196
Average Queue (ft)	5	204	249	27	90	117	23	74	80
95th Queue (ft)	41	318	382	62	190	237	54	127	163
Link Distance (ft)		706	706		512	512	900	746	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	100			200					200
Storage Blk Time (%)	0	14			0				0
Queuing Penalty (veh)	0	1			0				0

Intersection: 9: US 17 Bus. (Market St.) & Wayne Dr.

Movement	EB	EB	EB	NB
Directions Served	T	T	TR	R
Maximum Queue (ft)	125	512	526	199
Average Queue (ft)	5	113	162	81
95th Queue (ft)	43	369	437	147
Link Distance (ft)		512	512	798
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		0	3	
Storage Bay Dist (ft)	100			
Storage Blk Time (%)		2		
Queuing Penalty (veh)		11		

Intersection: 12: US 17 Bus. (Market St.) & Evans St.

Movement	EB	EB	SB
Directions Served	T	T	R
Maximum Queue (ft)	158	250	110
Average Queue (ft)	6	11	59
95th Queue (ft)	53	89	98
Link Distance (ft)	393	393	727
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: US 17 Bus. (Market St.) & Clay St.

Movement	EB	EB	EB	SB
Directions Served	T	T	T	R
Maximum Queue (ft)	230	204	231	90
Average Queue (ft)	65	81	8	33
95th Queue (ft)	170	176	76	69
Link Distance (ft)	156	156	156	727
Upstream Blk Time (%)	1	1		
Queuing Penalty (veh)	7	7		
Storage Bay Dist (ft)				
Storage Blk Time (%)	3			
Queuing Penalty (veh)	12			

Intersection: 14: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	UL	T	T	R	L	T	TR	L	L	TR	L	TR
Maximum Queue (ft)	120	188	188	160	349	458	480	156	349	510	66	129
Average Queue (ft)	51	182	182	68	139	263	303	103	145	203	9	58
95th Queue (ft)	100	200	201	127	263	389	436	142	266	427	36	109
Link Distance (ft)	112	112	112	112		992	992			838		711
Upstream Blk Time (%)	3	33	36	1								
Queuing Penalty (veh)	11	123	133	3								
Storage Bay Dist (ft)					325			325	325		100	
Storage Blk Time (%)						2			0	4		4
Queuing Penalty (veh)						3			0	12		0

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	T	R	UL	T	T	L	L	R	R
Maximum Queue (ft)	153	111	244	237	229	279	308	261	164	200	267	261
Average Queue (ft)	61	58	182	191	109	213	106	78	105	106	141	144
95th Queue (ft)	120	104	258	258	224	289	293	175	159	170	214	221
Link Distance (ft)	214	214	214	214	214	255	255	255		611		
Upstream Blk Time (%)			7	11	1	5	1	0				
Queuing Penalty (veh)			23	37	4	32	7	1				
Storage Bay Dist (ft)									250		250	250
Storage Blk Time (%)											0	0
Queuing Penalty (veh)											1	0

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	UL	L	T	T	T	T	T	R	L	L	R	R
Maximum Queue (ft)	255	217	159	159	202	289	333	348	176	156	114	109
Average Queue (ft)	148	148	43	77	78	187	206	112	106	98	59	65
95th Queue (ft)	218	213	110	139	150	286	318	223	156	143	108	111
Link Distance (ft)	255	255	255	255		393	393			864		
Upstream Blk Time (%)	0											
Queuing Penalty (veh)	2											
Storage Bay Dist (ft)					300			325	200		200	200
Storage Blk Time (%)						0	0	0				
Queuing Penalty (veh)						0	1	0				

Network Summary

Network wide Queuing Penalty: 855

Intersection: 7: US 17 Bus. (Market St.) & Barnard Dr.

Movement	EB	EB	EB	WB	NB	SB
Directions Served	L	T	TR	L	LTR	LTR
Maximum Queue (ft)	44	192	266	109	933	196
Average Queue (ft)	14	20	36	30	832	139
95th Queue (ft)	38	99	154	77	1130	188
Link Distance (ft)		726	726		918	811
Upstream Blk Time (%)					74	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	100			100		
Storage Blk Time (%)		1		1		
Queuing Penalty (veh)		0		4		

Intersection: 8: US 17 Bus. (Market St.) & 29th St.

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	UL	T	TR	LTR	LT	R
Maximum Queue (ft)	124	729	743	174	348	480	92	134	132
Average Queue (ft)	13	456	491	50	64	91	30	57	43
95th Queue (ft)	73	759	777	119	194	254	71	113	92
Link Distance (ft)		706	706		512	512	900	746	
Upstream Blk Time (%)		2	3						
Queuing Penalty (veh)		17	33						
Storage Bay Dist (ft)	100			200					200
Storage Blk Time (%)	0	30			1				
Queuing Penalty (veh)	0	5			0				

Intersection: 9: US 17 Bus. (Market St.) & Wayne Dr.

Movement	EB	EB	EB	NB
Directions Served	T	T	TR	R
Maximum Queue (ft)	125	572	541	247
Average Queue (ft)	33	303	351	90
95th Queue (ft)	119	656	667	194
Link Distance (ft)		512	512	798
Upstream Blk Time (%)		3	5	
Queuing Penalty (veh)		25	53	
Storage Bay Dist (ft)	100			
Storage Blk Time (%)		8		
Queuing Penalty (veh)		74		

Intersection: 12: US 17 Bus. (Market St.) & Evans St.

Movement	WB	SB
Directions Served	TR	R
Maximum Queue (ft)	80	105
Average Queue (ft)	3	40
95th Queue (ft)	28	78
Link Distance (ft)	156	727
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: US 17 Bus. (Market St.) & Clay St.

Movement	EB	EB	EB	SB
Directions Served	T	T	T	R
Maximum Queue (ft)	29	31	50	25
Average Queue (ft)	1	1	8	13
95th Queue (ft)	10	10	33	33
Link Distance (ft)		156	156	727
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: US 17 Bus. (Market St.) & Henry St.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	UL	T	T	R	L	T	TR	L	L	TR	L	TR
Maximum Queue (ft)	187	183	188	116	198	505	492	116	167	424	24	89
Average Queue (ft)	93	121	122	42	125	242	283	59	88	169	3	23
95th Queue (ft)	146	192	194	86	185	391	421	105	130	335	17	68
Link Distance (ft)	112	112	112	112		992	992			838		711
Upstream Blk Time (%)	8	8	10	1								
Queuing Penalty (veh)	36	36	44	5								
Storage Bay Dist (ft)					325			325	325		100	
Storage Blk Time (%)						2				5		0
Queuing Penalty (veh)						3				11		0

Intersection: 291: US 17 Bus. (Market St.) & SB Independence Blvd.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	T	R	UL	T	T	T	L	L	R	R
Maximum Queue (ft)	138	214	238	267	191	240	217	227	227	162	136	227	184
Average Queue (ft)	65	85	207	213	119	132	108	129	129	92	91	109	111
95th Queue (ft)	114	166	259	247	173	226	187	190	190	148	132	183	178
Link Distance (ft)	214	214	214	214	214	255	255	255	255		611		
Upstream Blk Time (%)		1	13	19		0							
Queuing Penalty (veh)		2	50	75		0							
Storage Bay Dist (ft)										250		250	250
Storage Blk Time (%)													
Queuing Penalty (veh)													

Intersection: 292: US 17 Bus. (Market St.) & NB Independence Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	UL	L	T	T	T	T	T	T	R	L	L	R	R
Maximum Queue (ft)	256	256	280	141	92	393	332	340	340	179	158	129	167
Average Queue (ft)	142	146	69	94	41	137	151	84	84	91	95	75	81
95th Queue (ft)	219	224	170	132	79	262	274	180	180	153	148	118	135
Link Distance (ft)	255	255	255	255		393	393				864		
Upstream Blk Time (%)	0	1	0			0							
Queuing Penalty (veh)	2	4	2			0							
Storage Bay Dist (ft)					300			325	325	200		200	200
Storage Blk Time (%)						0	0	0					
Queuing Penalty (veh)						1	0	0					

Network Summary

Network wide Queuing Penalty: 483



# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - RAMPS AND RAMP JUNCTIONS

General Information			Site Information					
Analyst		URS	Date Performed		2013			
Agency or Company			Analysis Year		2040 Build - Alt 8 Tight Urban Diamond			
Project Description			U-4434 Independence Boulevard Extension					
<b>45</b>			<b>46</b>			<b>47</b>		
Independence Blvd. SB - to US 17 Bus.			Independence Blvd. NB - from US 17 Bus.			Independence Blvd. SB - from US 17 Bus.		
Merge/Diverge	Diverge		Merge/Diverge	Merge		Merge/Diverge	Merge	
No. of lanes on Freeway	2		No. of lanes on Freeway	2		No. of lanes on Freeway	2	
Freeway FFS	60	mph	Freeway FFS	60	mph	Freeway FFS	60	mph
Freeway Volume (AM/PM)	2877	2354	Freeway Volume (AM/PM)	1768	2218	Freeway Volume (AM/PM)	2213	1771
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	50	mph	Ramp FFS	50	mph	Ramp FFS	50	mph
Ramp Volume (AM/PM)	659	586	Ramp Volume (AM/PM)	586	659	Ramp Volume (AM/PM)	471	425
No. Lanes on Ramp	1		No. Lanes on Ramp	1		No. Lanes on Ramp	1	
Accel/Decel Distance 1	540	ft	Accel/Decel Distance 1	480	ft	Accel/Decel Distance 1	480	ft
Accel/Decel Distance 2	N/A	ft	Accel/Decel Distance 2	N/A	ft	Accel/Decel Distance 2	N/A	ft
Adjacent Upstream	Yes		Adjacent Upstream	Yes		Adjacent Upstream	Yes	
Off/On	On		Off/On	Off		Off/On	Off	
Distance	3180	ft	Distance	2360	ft	Distance	2370	ft
Truck %	4%		Truck %	3%		Truck %	3%	
Ramp Volume (AM/PM)	1628	1103	Ramp Volume (AM/PM)	425	471	Ramp Volume (AM/PM)	659	586
Adjacent Downstream	Yes		Adjacent Downstream	Yes		Adjacent Downstream	No	
Off/On	On - N/A		Off/On	Off		Off/On	N/A	
Distance	N/A	ft	Distance	3690	ft	Distance	N/A	ft
Truck %	N/A		Truck %	4%		Truck %	N/A	
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	1103	1628	Ramp Volume (AM/PM)	N/A	N/A
Peak Hour Factor	0.90		Peak Hour Factor	0.90		Peak Hour Factor	0.90	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	1.00		Population Adj. Factor	1.00	
Freeway Truck %	4%		Freeway Truck %	4%		Freeway Truck %	4%	
Ramp Truck %	3%		Ramp Truck %	3%		Ramp Truck %	3%	
<b>48</b>								
Independence Blvd. NB - to Darlington								
Merge/Diverge	Diverge		Merge/Diverge	Diverge		Merge/Diverge	Diverge	
No. of lanes on Freeway	2		No. of lanes on Freeway	0		No. of lanes on Freeway	0	
Freeway FFS	60	mph	Freeway FFS	0	mph	Freeway FFS	0	mph
Freeway Volume (AM/PM)	2205	2695	Freeway Volume (AM/PM)	0	0	Freeway Volume (AM/PM)	0	0
Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right		Ramp Side (Left or Right)	Right	
Ramp FFS	15	mph	Ramp FFS	0	mph	Ramp FFS	0	mph
Ramp Volume (AM/PM)	99	133	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
No. Lanes on Ramp	1		No. Lanes on Ramp	0		No. Lanes on Ramp	0	
Accel/Decel Distance 1	800	ft	Accel/Decel Distance 1	0	ft	Accel/Decel Distance 1	0	ft
Accel/Decel Distance 2	N/A	ft	Accel/Decel Distance 2	0	ft	Accel/Decel Distance 2	0	ft
Adjacent Upstream	No		Adjacent Upstream	Yes		Adjacent Upstream	Yes	
Off/On	N/A		Off/On	On		Off/On	On	
Distance	N/A	ft	Distance	0	ft	Distance	0	ft
Truck %	N/A		Truck %			Truck %		
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Adjacent Downstream	Yes		Adjacent Downstream	Yes		Adjacent Downstream	Yes	
Off/On	On - N/A		Off/On	On		Off/On	On	
Distance	N/A	ft	Distance	0	ft	Distance	0	ft
Truck %	N/A		Truck %			Truck %		
Ramp Volume (AM/PM)	N/A	N/A	Ramp Volume (AM/PM)	0	0	Ramp Volume (AM/PM)	0	0
Peak Hour Factor	0.90		Peak Hour Factor	0.00		Peak Hour Factor	0.00	
Terrain	Level		Terrain	Level		Terrain	Level	
Population Adj. Factor	1.00		Population Adj. Factor	0.00		Population Adj. Factor	0.00	
Freeway Truck %	4%		Freeway Truck %	0%		Freeway Truck %	0%	
Ramp Truck %	2%		Ramp Truck %	0%		Ramp Truck %	0%	

\* Denotes BFFS; These speeds were increased for the analysis such that the adjusted FFS is a minimum of 55 MPH

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2013
Agency or Company		Analysis Year	2040 Build - Alt 8 Tight Urban Diamond
Project Description	U-4434 Independence Boulevard Extension		

49																																																															
Independence Blvd. NB - Darlington to Market																																																															
Sides (One or Two)	One	Sides (One or Two)																																																													
No. of Lanes	3	No. of Lanes																																																													
Weaving Length, L <sub>s</sub>	1720 ft	Weaving Length, L <sub>s</sub>																																																													
Multi-Lane FFS	60 mph	Freeway FFS																																																													
Min. Speed (Def. = 15)	15 mph	Min. Speed (Def. = 15)																																																													
Segment Type	Multi-Lane	Segment Type																																																													
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R →	R <sub>VRR</sub>	0	0 %																																																												
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PM Peak		Vol	Truck																																																												
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R →	R <sub>VRR</sub>	0	0 %																																																												
Peak Hour Factor	0.90	Peak Hour Factor	0.00																																																												
Driver Pop. Adj.	1.00	Driver Pop. Adj.	0.00																																																												
Maneuver Lns., N <sub>WL</sub>	2	Maneuver Lns., N <sub>WL</sub>	0																																																												
Interchange Density	3.00	Interchange Density	0.00																																																												
Min. RF In. chng., LC <sub>RF</sub>	1	Min. RF In. chng., LC <sub>RF</sub>	0																																																												
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20% of vehicles from Darlington exit onto Market		(Place weaving % assumption here)																																																													

Sides (One or Two)	One	Sides (One or Two)																																																													
No. of Lanes	0	No. of Lanes																																																													
Weaving Length, L <sub>s</sub>	0 ft	Weaving Length, L <sub>s</sub>																																																													
Freeway FFS	0 mph	Freeway FFS																																																													
Min. Speed (Def. = 15)	0 mph	Min. Speed (Def. = 15)																																																													
Segment Type	Freeway	Segment Type																																																													
Terrain	Rolling	Terrain																																																													
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R →	R <sub>VRR</sub>	0	0 %																																																												
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">PM Peak</td> <td></td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td>F<sub>VFF</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>↘</td> <td>F<sub>VRF</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>↗</td> <td>R<sub>VFR</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>R →</td> <td>R<sub>VRR</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> </table>	PM Peak		Vol	Truck	F →	F <sub>VFF</sub>	0	0 %	↘	F <sub>VRF</sub>	0	0 %	↗	R <sub>VFR</sub>	0	0 %	R →	R <sub>VRR</sub>	0	0 %		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">PM Peak</td> <td></td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td>F<sub>VFF</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>↘</td> <td>F<sub>VRF</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>↗</td> <td>R<sub>VFR</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>R →</td> <td>R<sub>VRR</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> </table>	PM Peak		Vol	Truck	F →	F <sub>VFF</sub>	0	0 %	↘	F <sub>VRF</sub>	0	0 %	↗	R <sub>VFR</sub>	0	0 %	R →	R <sub>VRR</sub>	0	0 %	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">PM Peak</td> <td></td> <td style="text-align: center;">Vol</td> <td style="text-align: center;">Truck</td> </tr> <tr> <td>F →</td> <td>F<sub>VFF</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>↘</td> <td>F<sub>VRF</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>↗</td> <td>R<sub>VFR</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> <tr> <td>R →</td> <td>R<sub>VRR</sub></td> <td style="text-align: center;">0</td> <td style="text-align: center;">0 %</td> </tr> </table>	PM Peak		Vol	Truck	F →	F <sub>VFF</sub>	0	0 %	↘	F <sub>VRF</sub>	0	0 %	↗	R <sub>VFR</sub>	0	0 %	R →	R <sub>VRR</sub>	0	0 %
PM Peak		Vol	Truck																																																												
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R →	R <sub>VRR</sub>	0	0 %																																																												
Peak Hour Factor	0.00	Peak Hour Factor	0.00																																																												
Driver Pop. Adj.	0.00	Driver Pop. Adj.	0.00																																																												
Maneuver Lns., N <sub>WL</sub>	0	Maneuver Lns., N <sub>WL</sub>	0																																																												
Interchange Density	0.00	Interchange Density	0.00																																																												
Min. RF In. chng., LC <sub>RF</sub>	0	Min. RF In. chng., LC <sub>RF</sub>	0																																																												
Min. FR In. chng., LC <sub>FR</sub>	0	Min. FR In. chng., LC <sub>FR</sub>	0																																																												
Min. RR In. chng., LC <sub>RR</sub>	N/A	Min. RR In. chng., LC <sub>RR</sub>	N/A																																																												
(Place weaving % assumption here)		(Place weaving % assumption here)																																																													

# HIGHWAY CAPACITY SOFTWARE 2010

## NETWORK DATA SUMMARY - WEAVING SEGMENTS

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 8 Tight Urban Diamond
Project Description		U-4434 Independence Boulevard Extension	

<div style="text-align: right; margin-bottom: 10px;"><b>49</b></div> <p>Independence Blvd. NB - Darlington to Market  <u>Interchange</u>                      <u>No.</u>                      Darlington Ave.                      1                      Market St.                              1</p> <p style="font-size: small;">Note: multi-lane only 0.67 mile long                      Interchange Density                      3.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Note: freeway only 3.5 miles long                      Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>
<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>	<div style="text-align: right; margin-bottom: 10px;"><b>0</b></div> <p style="text-align: center;">0</p> <p style="text-align: center;"><u>Interchange</u>                      <u>No.</u></p> <p style="font-size: small;">Interchange Density                      0.00 int/mi</p>

**HIGHWAY CAPACITY SOFTWARE 2010  
NETWORK DATA SUMMARY - ANALYSIS NOTES**

General Information		Site Information	
Analyst	URS	Date Performed	2012
Agency or Company		Analysis Year	2040 Build - Alt 8 Tight Urban Diamond
Project Description	U-4434 Independence Boulevard Extension		

Date of NCDOT Capacity Analysis Guidelines for TIP Project Analyses used for this Study: **January 2012**

Default Values - Freeways			Default Values - Signalized Intersections		
Peak Hour Factor (PHF)	0.90	NCDOT Standard	Signal System Type	Coordinated	NCDOT Standard
Terrain	Level	AASHTO Classification	Right Turn on Red	Not Allowed	NCDOT Standard
Driver Population Factor	1	NCDOT Standard - Tourist Area	Total Loss Time	5 sec.	NCDOT Standard
Truck Percentages	1/2 of TTST+Duals	NCDOT Standard (rounded up)	Yellow/All Red	5 sec./2 sec.	NCDOT Standard
Base Free-flow Speed - Freeway	60 mph	Determined to be appropriate based on design speed and speed limit	Minimum Initial Green	7 sec. - Minor	NCDOT Standard
				10-14 sec. - Major (based on speed)	
Freeway Type	Urban	AASHTO Classification	Minimum Cycle Length	60 sec - 2 phase	NCDOT Standard
				90 sec - 3 phase	
				120 sec - 4-8 phase	
Base Free-flow Speed - Ramps	Ramp: 45 mph	NCDOT Standard	Maximum Cycle Length	180 sec.	NCDOT Recommendation
	Loop: 25 mph		Saturation Flow Rate	1900 vphpl	NCDOT Standard
Y-line Truck Percentages - Ramps	Same as Y-line truck percentage	Due to more through trips by trucks this is most reasonable method			
Y-line Truck Percentages - Weaving	FF = freeway HV % FR = DS ramp HV % RF = US ramp HV % RR = DS ramp HV %	Freeway Truck % Off Ramp Truck % On Ramp Truck % Off Ramp Truck %			

Level of Service Standards - Freeways		Level of Service Standards - Signalized Intersections	
Level of Service (LOS) D or better for all freeway movements included in the proposed construction of the project - per FHWA memorandum 07/07/2004		LOS D or better for overall intersection required	
		LOS D or better for individual movements recommended	
		If not LOS D for individual movement - v/c ratio must be less than 0.85	

**Assumed Improvements**

TIP No.	Description
U-3338	SR 1175 (Kerr Avenue) - widening, including new interchange at US 74

**General Analysis Notes**

- ▶ Interchange/Ramp Density – Determined over 6-mile segment (3 miles upstream, 3 miles downstream)
- ▶ Ramp Acceleration/Deceleration Length - Measured from the point where the edge of the ramp lane and edge of freeway lane converge to the end of the taper
- ▶ Adjacent Ramps – Generally included if within 2 miles of ramp. When the subject ramp is a merge, upstream and downstream off ramps will be included. When the subject ramp is a diverge, upstream on ramps and downstream off ramps will be included.
- ▶ Adjacent Ramps Distance – Measured from the point where the edge of the ramp lane and the edge of the freeway converge to the same point on the adjacent ramp
- ▶ Weaving Segment Length – Measured from where solid striping for on-ramp ends to where solid striping on off ramp begins
- ▶ If the v/c ratio for any segment or intersection is 1 or above, the LOS is changed to F by default.
- ▶ LOS E or F for minor movements of unsignalized intersections were considered acceptable

**Design Specific Analysis Notes**

Analysis Points	Note
35, 36	Segment associated with ramps are technically weaving segments. Since there are no volumes for the ramps to NC 133 included in the traffic forecast, these segments are analyzed as ramps. The accel/decel distances used represent the minimum AASHTO Green Book design standards for the given design criteria.

**Locations where LOS D or better not achieved**

Analysis Points	Note
	None

**Traffic elements critical to the design of the project**

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	AM Peak	Analysis Year	2040 Build - Build 8 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Acceleration Lane Length, $L_A$		<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Deceleration Lane Length $L_D$	540	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 3180 ft	Freeway Volume, $V_F$	2877	$L_{down} =$ ft
$V_u =$ 1628 veh/h	Ramp Volume, $V_R$	659	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	50.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2877	0.90	Level	4	0	0.980	1.00	3261
Ramp	659	0.90	Level	3	0	0.985	1.00	743
UpStream	1628	0.90	Level	4	0	0.980	1.00	1845
DownStream								

Merge Areas	Diverge Areas
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### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h $V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 1.000 using Equation (Exhibit 13-7) $V_{12} =$ 3261 pc/h $V_3$ or $V_{av34}$ 0 pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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### Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$		Exhibit 13-8	
	$V_F$	3261	Exhibit 13-8 4600 No
	$V_{FO} = V_F - V_R$	2518	Exhibit 13-8 4600 No
	$V_R$	743	Exhibit 13-10 2100 No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
$V_{R12}$		Exhibit 13-8	
$V_{12}$	3261	Exhibit 13-8 4400:All	No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 27.4 (pc/mi/ln) LOS = C (Exhibit 13-2)
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### Speed Determination

$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_s =$ 0.300 (Exhibit 13-12) $S_R =$ 54.6 mph (Exhibit 13-12) $S_0 =$ N/A mph (Exhibit 13-12) $S =$ 54.6 mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	URS	Freeway/Dir of Travel	Independence Blvd SB
Agency or Company		Junction	to US 17 Business
Date Performed	2012	Jurisdiction	Segment #45
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Build 8 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp	Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Acceleration Lane Length, $L_A$		<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Deceleration Lane Length $L_D$	540	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 3180 ft	Freeway Volume, $V_F$	2354	$L_{down} =$ ft
$V_u =$ 1103 veh/h	Ramp Volume, $V_R$	586	$V_D =$ veh/h
	Freeway Free-Flow Speed, $S_{FF}$	60.0	
	Ramp Free-Flow Speed, $S_{FR}$	50.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2354	0.90	Level	4	0	0.980	1.00	2668
Ramp	586	0.90	Level	3	0	0.985	1.00	661
UpStream	1103	0.90	Level	4	0	0.980	1.00	1250
DownStream								

Merge Areas	Diverge Areas
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### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (Equation 13-6 or 13-7) $P_{FM} =$ using Equation (Exhibit 13-6) $V_{12} =$ pc/h $V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ $L_{EQ} =$ (Equation 13-12 or 13-13) $P_{FD} =$ 1.000 using Equation (Exhibit 13-7) $V_{12} =$ 2668 pc/h $V_3$ or $V_{av34}$ 0 pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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### Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$		Exhibit 13-8	
	$V_F$	2668	Exhibit 13-8 4600 No
	$V_{FO} = V_F - V_R$	2007	Exhibit 13-8 4600 No
		$V_R$	661 Exhibit 13-10 2100 No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
$V_{R12}$		Exhibit 13-8	
$V_{12}$	2668	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 22.3 (pc/mi/ln) LOS = C (Exhibit 13-2)
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### Speed Determination

$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_s =$ 0.292 (Exhibit 13-12) $S_R =$ 54.7 mph (Exhibit 13-12) $S_0 =$ N/A mph (Exhibit 13-12) $S =$ 54.7 mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst: URS	Freeway/Dir of Travel: Independence Blvd SB
Agency or Company:	Junction: from US 17 Business
Date Performed: 2012	Jurisdiction: Segment #47
Analysis Time Period: PM Peak	Analysis Year: 2040 Build - Build 8 TUDI

Project Description: U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Number of Lanes, N: 2 Acceleration Lane Length, L <sub>A</sub> : 480 Deceleration Lane Length L <sub>D</sub> : Freeway Volume, V <sub>F</sub> : 1771 Ramp Volume, V <sub>R</sub> : 425 Freeway Free-Flow Speed, S <sub>FF</sub> : 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> : 50.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =      ft V <sub>D</sub> =      veh/h
L <sub>up</sub> = 2370 ft V <sub>u</sub> = 586 veh/h		

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF × f <sub>HV</sub> × f <sub>p</sub>
Freeway	1771	0.90	Level	4	0	0.980	1.00	2007
Ramp	425	0.90	Level	3	0	0.985	1.00	479
UpStream	586	0.90	Level	3	0	0.985	1.00	661
DownStream								

Merge Areas	Diverge Areas
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Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 2007 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =      pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> =      pc/h V <sub>3</sub> or V <sub>av34</sub> =      pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V <sub>12a</sub> =      pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V <sub>FO</sub>	2486	Exhibit 13-8	No	V <sub>F</sub>		Exhibit 13-8	
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8	
				V <sub>R</sub>		Exhibit 13-10	

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V <sub>R12</sub>	2486	Exhibit 13-8	4600:All	No	V <sub>12</sub>	Exhibit 13-8	

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 21.6 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> =      (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
---------------------	---------------------

M <sub>S</sub> = 0.320 (Exhibit 13-11) S <sub>R</sub> = 54.2 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 54.2 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	URS	Freeway/Dir of Travel	Independence Blvd NB
Agency or Company		Junction	to Darlington
Date Performed	2013	Jurisdiction	Segment #48
Analysis Time Period	PM Peak	Analysis Year	2040 Build - Alt 8 TUDI

Project Description U-4434 Independence Boulevard Extension

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>up</sub> =      ft  V <sub>u</sub> =      veh/h	Number of Lanes, N      2 Acceleration Lane Length, L <sub>A</sub> Deceleration Lane Length L <sub>D</sub> 800 Freeway Volume, V <sub>F</sub> 2695 Ramp Volume, V <sub>R</sub> 133 Freeway Free-Flow Speed, S <sub>FF</sub> 60.0 Ramp Free-Flow Speed, S <sub>FR</sub> 15.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off  L <sub>down</sub> =      ft  V <sub>D</sub> =      veh/h
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### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2695	0.90	Level	4	0	0.980	1.00	3054
Ramp	133	0.90	Level	2	0	0.990	1.00	149
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 L<sub>EQ</sub> =  
 P<sub>FM</sub> = using Equation (Exhibit 13-6)  
 V<sub>12</sub> = pc/h  
 V<sub>3</sub> or V<sub>av34</sub> pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 L<sub>EQ</sub> =  
 P<sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)  
 V<sub>12</sub> = 3054 pc/h  
 V<sub>3</sub> or V<sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)  
 Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No  
 Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No  
 If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>	3054	Exhibit 13-8	4600 No
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2905	Exhibit 13-8	4600 No
V <sub>R</sub>	149	Exhibit 13-10	1800 No

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3054	Exhibit 13-8	4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 D<sub>R</sub> = (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 D<sub>R</sub> = 23.3 (pc/mi/ln)  
 LOS = C (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = (Exhibit 13-11)  
 S<sub>R</sub> = mph (Exhibit 13-11)  
 S<sub>0</sub> = mph (Exhibit 13-11)  
 S = mph (Exhibit 13-13)

### Speed Determination

D<sub>s</sub> = 0.701 (Exhibit 13-12)  
 S<sub>R</sub> = 47.4 mph (Exhibit 13-12)  
 S<sub>0</sub> = N/A mph (Exhibit 13-12)  
 S = 47.4 mph (Exhibit 13-13)

<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 8 TUDI			
Analysis Time Period	AM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1070ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	1684	0.90	4	0	1.5	1.2	0.980	1.00	1909
V <sub>RF</sub>	87	0.90	4	0	1.5	1.2	0.980	1.00	99
V <sub>FR</sub>	403	0.90	4	0	1.5	1.2	0.980	1.00	457
V <sub>RR</sub>	22	0.90	4	0	1.5	1.2	0.980	1.00	25
V <sub>NW</sub>	1934							V =	2490
V <sub>W</sub>	556								
VR	0.223								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	556 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	851 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	401 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1252 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	621			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	2490 pc/h				Weaving intensity factor, W	0.256			
Weaving segment capacity, c <sub>w</sub>	5932 veh/h				Weaving segment speed, S	51.7 mph			
Weaving segment v/c ratio	0.412				Average weaving speed, S <sub>W</sub>	50.8 mph			
Weaving segment density, D	16.0 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	52.0 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4776 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

<b>FREEWAY WEAVING WORKSHEET</b>									
<b>General Information</b>					<b>Site Information</b>				
Analyst	URS				Freeway/Dir of Travel	Independence Blvd			
Agency/Company	Segment #49				Weaving Segment Location	Darlington to Market			
Date Performed	2013				Analysis Year	2040 Build - Alt 8 TUDI			
Analysis Time Period	PM Peak								
Project Description <i>U-4434 Independence Boulevard Extension</i>									
<b>Inputs</b>									
Weaving configuration	One-Sided				Segment type	C-D Roadway/			
Weaving number of lanes, N	3					Multilane			
Weaving segment length, L <sub>S</sub>	1050ft				Freeway minimum speed, S <sub>MIN</sub>	15			
Freeway free-flow speed, FFS	60 mph				Freeway maximum capacity, C <sub>IFL</sub>	2300			
					Terrain type	Level			
<b>Conversions to pc/h Under Base Conditions</b>									
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	f <sub>p</sub>	v (pc/h)
V <sub>FF</sub>	2134	0.90	4	0	1.5	1.2	0.980	1.00	2419
V <sub>RF</sub>	79	0.90	4	0	1.5	1.2	0.980	1.00	90
V <sub>FR</sub>	451	0.90	4	0	1.5	1.2	0.980	1.00	511
V <sub>RR</sub>	21	0.90	4	0	1.5	1.2	0.980	1.00	24
V <sub>NW</sub>	2443							V =	3044
V <sub>W</sub>	601								
VR	0.197								
<b>Configuration Characteristics</b>									
Minimum maneuver lanes, N <sub>WL</sub>	2 lc				Minimum weaving lane changes, LC <sub>MIN</sub>	601 lc/h			
Interchange density, ID	3.0 int/mi				Weaving lane changes, LC <sub>W</sub>	892 lc/h			
Minimum RF lane changes, LC <sub>RF</sub>	1 lc/pc				Non-weaving lane changes, LC <sub>NW</sub>	495 lc/h			
Minimum FR lane changes, LC <sub>FR</sub>	1 lc/pc				Total lane changes, LC <sub>ALL</sub>	1387 lc/h			
Minimum RR lane changes, LC <sub>RR</sub>	lc/pc				Non-weaving vehicle index, I <sub>NW</sub>	770			
<b>Weaving Segment Speed, Density, Level of Service, and Capacity</b>									
Weaving segment flow rate, v	3044 pc/h				Weaving intensity factor, W	0.282			
Weaving segment capacity, c <sub>w</sub>	5985 veh/h				Weaving segment speed, S	50.7 mph			
Weaving segment v/c ratio	0.499				Average weaving speed, S <sub>W</sub>	50.1 mph			
Weaving segment density, D	20.0 pc/mi/ln				Average non-weaving speed, S <sub>NW</sub>	50.8 mph			
Level of Service, LOS	B				Maximum weaving length, L <sub>MAX</sub>	4510 ft			
<b>Notes</b>									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

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