DRAFT
EXISTING AND YEAR 2030 NO-BUILD TRAFFIC OPERATIONS TECHNICAL MEMORANDUM

MONROE CONNECTOR / BYPASS
STIP NUMBER R-3329 / R-2559
UNION AND MECKLENBURG COUNTIES

Prepared For:

North Carolina Turnpike Authority
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612

Prepared By:

PBS&J
1616 East Millbrook Road, Suite 310
Raleigh, NC 27609

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1 INTRODUCTION

The North Carolina Turnpike Authority (NCTA) is studying ways to improve east-west travel in the US 74 corridor from I-485 in Mecklenburg County to just west of the Town of Marshville in Union County. The Monroe Connector project is approximately 21 miles in length and is located southeast of Charlotte, in the vicinity of the towns of Mint Hill, Stallings, Lake Park, Wingate, and Marshville, and the cities of Monroe, Indian Trail, and Matthews.

The Monroe Connector project is a combination of two projects previously analyzed by the North Carolina Department of Transportation (NCDOT), the **Monroe Connector** (TIP number R-3329) and the **Monroe Bypass** (TIP number R-2559).

Figure 1-1 shows a map of the project area.

The purpose of this report is to present the traffic operations analysis results for the Existing and Year 2030 No-Build scenarios for use in the projects Purpose and Need statement. Once additional traffic projections are completed, it is anticipated that several Build alternatives will be studied.

Three interchanges and several at-grade intersections are included in the Existing and No-Build analysis. Interchanges include the US 74 / I-485 system interchange, the US 74 / Concord Avenue urban interchange, and the US 74 / US 601 urban interchange. All but six of the 32 studied intersections currently operate with signal control, as seen listed below.

1) US 74 at Stallings Road
2) US 74 at Indian Trail-Fairview Road
3) US 74 at Unionville-Indian Trail Road
4) US 74 at Faith Church Road
5) US 74 at Wesley Chapel Stouts / Sardis Church Road
6) US 74 at Chamber Drive
7) US 74 at North Rocky River Road
8) US 74 at Fowler-Secrest Road / John Moore Road
9) US 74 at Carroll Street / Rolling Hills Drive
10) US 74 at Roland Drive / Round Table Road
11) US 74 at Williams Road
12) US 74 at Hanover Drive
13) US 74 at Dickerson Boulevard
14) US 74 at Secrest Shortcut Road
15) WB US 74 Ramps at Concord Avenue (unsignalized)
16) EB US 74 Ramps at Concord Avenue (unsignalized)
17) East Avenue at US 601 (unsignalized)
18) WB US 74 Off Ramp at East Avenue (unsignalized)
19) EB US 74 Ramps at US 601 (unsignalized)
20) US 74 at Stafford Street
21) US 74 at Boyte Street
22) US 74 at Morgan Mill Road
23) US 74 at Walkup Avenue
24) US 74 at Sutherland Avenue

25) US 74 at Dove Street / Venus Street
26) US 74 at East Franklin Street
27) US 74 at Pageland Highway
28) US 74 at South Secrest Avenue / Old Pageland Road
29) US 74 at Bivens Road (unsignalized)
30) US 74 at Bivens Street
31) US 74 at Main Street
32) US 74 at Forest Hill School Road

2 TRAFFIC VOLUMES AND CHARACTERISTICS

Tube counts results (obtained in 2007) showing daily traffic volumes on several segments of US 74 and other intersecting roadways were provided by Martin / Alexiou / Bryson (MAB). These volumes are presented in **Table 2-1** and **Figure 2-1**. Within the study area, the counts show daily traffic volume ranges on US 74 from 28,200 east of Pageland Highway to 59,600 west of Stallings Road.

Table 2-1: Existing Daily Traffic Volumes

Location	Daily Volume
US 74, west of Stallings Road	59,600
US 74, west of Secrest Shortcut Road	43,400
US 74, west of US 601	50,600
US 74, east of US 601	54,400
US 74, east of Pageland Highway	28,200
I-485, north of US 74	60,200
I-485, south of US 74	45,000
Stallings Road, north of US 74	4,600
Indian Trail Fairview Road, north of US 74	10,400
Unionville Indian Trail Road, north of US 74	14,000
Faith Church Road, north of US 74	3,600
North Rocky River Road, north of US 74	6,800
Fowler Secrest Road, north of US 74	3,000
Rolling Hills Drive, north of US 74	1,200
Round Table Road, north of US 74	1,600
Williams Road, south of US 74	5,600
Williams Road ext, south of US 74	6,000
Concord Ave, westbound ramps	5,200
Concord Ave, eastbound ramps	5,200
US 601, westbound ramps	14,000
Morgan Mill Road, north of US 74	10,600

Location	Daily Volume
Sutherland Ave, north of US 74	10,600
Venus Street, north of US 74	2,600
E. Franklin Street, south of US 74	12,800
Pageland Highway, south of US 74	16,200
Bivens Street, north of US 74	2,000
Forest Hill School Road, north of US 74	1,600

AM and PM Peak hour traffic counts for use in developing the 2007 Existing and 2030 No-Build traffic forecasts were collected by MAB. These traffic counts can be found in **Appendix A**.

Also contained in **Appendix A** are the projected peak hour turning movement volumes for the year 2007 Existing conditions and year 2030 No-Build conditions. **Figures 3-1** through **3-11** and **Figures 3-12** through **3-22** show the projected Existing and No-Build volumes, respectively.

3 LANE GEOMETRY

Currently, the US 74 corridor is a four-lane divided arterial from I-485 to Hanover Drive. From Hanover Drive to Pageland Highway, US 74 exists as a 6-lane divided arterial. From Pageland Highway through the intersection with Forest Hill School Road, US 74 exists as a 4-lane divided arterial.

The system interchange with US 74 and I-485 provides direct connections for all movements between the two roadways. Included in the interchange is a collector-distributor roadway serving I-485 northbound traffic destined to or from US 74 to the north and loop ramps in the northeast, southeast, and southwest quadrants. Two urban style interchanges (Concord Avenue and US 601), numerous signalized and unsignalized intersections, as well as numerous commercial driveways are located along US 74.

Intersection data sheets showing the existing conditions of the study area intersections are included in **Appendix B**. **Figures 3-1** through **3-11** and **Figures 3-12** through **3-22** show the Existing and No-Build lane geometry respectively. Field visits were conducted to obtain accurate lane geometry for all the analyzed intersections. Due to new construction along US 74, some approaches differ from the aerial images provided on the intersection data sheets. In locations where actual lane geometry differs from the provided aerial image the label "Aerial outdated, figure below represents field verified lane geometry" was added to the bottom left corner of the aerial image.

4 LEVEL OF SERVICE ANALYSIS

The Level of Service (LOS) analysis was performed following the NCDOT Congestion Management Section's Capacity Analysis Guidelines for TIP Project Traffic Analyses. In cases where a channelized, yield controlled turning movement operates at a signalized intersection, this movement was analyzed with a permitted right turn, and right turns on red were allowed to more accurately model conditions in the field.

Traffic operations analysis for individual freeway elements (basic freeway segments, ramp merge/diverge areas, and weave sections) was conducted using Highway Capacity Software 2000 (HCS 2000, version 4.1f), which is based on the methodologies of the 2000 Highway Capacity Manual.

All signalized intersections were analyzed using the Synchro software package, Version 7, Build 755.

Stop-controlled intersections were analyzed using HCS 2000, Version 4.1f. The intersection LOS and volume to capacity ratio was determined by taking the values from the worst operating of all the stop-controlled movements.

4.1 Existing Conditions

4.1.1 US 74 / I-485 Interchange

Using AM and PM peak hour volumes for year 2007, an analysis of the interchange at US 74 and I-485 as it currently exists was performed for all mainline, ramp merge, and ramp diverge locations. **Table 4-1** and **Figure 3-1** show the calculated LOS for the individual elements of the US 74 / I-485 interchange. The HCS analysis reports are included in **Appendix C**. For the purposes of this report, I-485 NB refers to the I-485 outer loop and I-485 SB refers to the I-485 inner loop.

Table 4-1: US 74 / I-485 Interchange Existing LOS Analysis Results

Interchange Element	2007 LOS AM (PM)
I-485 NB, south of interchange (mainline)	B (B)
I-485 NB off-ramp to US 74 (diverge)	B (C)
I-485 NB, center of interchange (mainline)	A (B)
I-485 NB on-ramp from US 74 (merge)	E (F)
I-485 NB, north of interchange (mainline)	C (D)
I-485 SB, north of interchange (mainline)	D (C)
I-485 SB off-ramp to US 74 WB (diverge)	D (C)
I-485 SB off-ramp to US 74 EB (diverge)	B (B)
I-485 SB on-ramp from US 74 (merge)	C (B)
I-485 SB, south of interchange (mainline)	B (B)
I-485 NB off-ramp split to US 74 WB and US 74 EB (diverge)	B (C)
I-485 NB weaving section between US 74 EB off-ramp and US 74 WB on-ramp (weave)	F (F)
I-485 NB on-ramp merge from US 74 WB and US 74 EB (merge)	C (C)
US 74 EB, west of interchange (mainline)	B (B)
US 74 EB off-ramp to I-485 SB (diverge)	B (B)
US 74 weaving section between I-485 SB and I-485 NB (weave)	B (C)
US 74 EB on-ramp from I-485 NB (merge)	B (C)
US 74 EB, east of interchange (mainline)	B (B)
US 74 WB, east of interchange (mainline)	B (B)

Interchange Element	2007 LOS AM (PM)
US 74 WB off-ramp to I-485 (diverge)	C (B)
US 74 WB on-ramp from I-485 NB (merge)	B (B)
US 74 WB on-ramp from I-485 SB (merge)	C (B)
US 74 WB, west of interchange (mainline)	C (B)
US 74 WB off-ramp split to I-485 SB and I-485 NB (diverge)	C (C)
I-485 SB on-ramp merge from US 74 WB and US 74 EB (merge)	C (B)

The existing condition analysis of the US 74 and I-485 interchange indicates that only 2 elements operate at an undesirable LOS. Due to the high entering traffic volumes from US 74 WB to I-485 NB, the on ramp serving this movement operates at a LOS F during the PM peak hour. The short weave section on the I-485 NB C-D roadway also operates at LOS F during the AM and PM peak hours.

4.1.2 US 74 Intersection Analysis

For the purposes of the Synchro intersection analysis of the existing conditions, existing signal phasing and traffic signal cycle lengths of 110 seconds for the AM peak hour and 140 seconds for the PM peak hour were used. These parameters were observed in the field and were noted on signal timing plans received from NCDOT.

The results of the Existing conditions intersection analysis are shown in **Table 4-2** and **Figures 3-2** through **3-11.** In many cases, individual intersection movements operate worse than the overall LOS. This could cause queue spillbacks for these specific movements that would affect the operations of movements showed to operate with a desirable LOS. Existing intersection LOS worksheets can be found in **Appendix C**.

Table 4-2: US 74 Intersections Existing Capacity and LOS Results

Intersection	Existing	
	Capacity (v/c) AM (PM)	LOS AM (PM)
US 74 / Stallings Rd.	1.41 (1.38)	F (F)
US 74 / Indian Trail-Fairview	1.50 (1.38)	F (F)
US 74 / Unionville-Indian Trail	1.26 (1.11)	F (E)
US 74 / Faith Church Rd.	1.20 (1.24)	E (D)
US 74 / Sardis Church Rd.	1.44 (1.36)	F (F)
US 74 / Chamber Dr.	0.89 (0.77)	C (C)
US 74 / North Rocky River Rd.	1.51 (1.17)	F (F)
US 74 / Fowler Secret Rd.	1.06 (0.85)	C (C)
US 74 / Rolling Hills Dr.	0.99 (0.84)	B (B)
US 74 / Round Table Rd.	0.85 (0.87)	B (C)
US 74 / Williams Rd.	1.07 (1.00)	D (D)

Intersection	Existing	
	Capacity (v/c) AM (PM)	**LOS AM (PM)**
US 74 / Hanover Dr.	1.32 (1.23)	D (F)
US 74 / Dickerson Blvd.	1.11 (1.11)	D (E)
US 74 / Secret Shortcut Rd.	1.06 (0.99)	D (D)
WB 74 Ramps / Concord Ave. (unsignalized)	0.21 (0.17)	B (B) WB Left / Right
EB 74 Ramps / Concord Ave. (unsignalized)	0.17 (0.17)	B (B) EB Left / Right
East Ave. / US 601 (unsignalized)	0.39 (0.66)	D (F) WB Left / Through
East Ave. / US 74 Off Ramp (unsignalized)	0.34 (0.35)	B (B) EB Left / Through
EB US 74 Off Ramp / US 601 (unsignalized)	0.90 (1.00)	E (E) WB Left / Right
US 74 / Stafford St.	0.91 (0.92)	C (D)
US 74 / Boyte St.	0.84 (0.76)	C (C)
US 74 / Morgan Mill Rd.	1.10 (0.90)	D (D)
US 74 / Walkup Ave.	1.10 (0.88)	D (D)
US 74 / Sutherland Ave.	0.76 (0.85)	C (C)
US 74 / Dove- Venus St.	0.64 (0.64)	B (B)
US 74 / East Franklin St.	0.87 (0.88)	D (D)
US 74 / Metro Medical Center	0.89 (0.97)	C (C)
US 74 / South Secrest Ave.	0.73 (0.84)	C (C)
US 74 / Bivens Road (unsignalized)	3.90 (3.76)	F (F)
US 74 / Bivens St.	0.57 (0.52)	A (B)
US 74 / Main St.	0.84 (0.97)	C (C)
US 74 / Forest Hill School Rd.	0.61 (0.74)	B (C)

The results of the Existing conditions analysis show that 11 of the 32 intersections studied operate at an undesirable LOS E or F.

Two intersections on US 74, US 74 / Bivens Street and US 74 / Main Street are located within 300' of a railroad track that parallel to and north of US 74 in the Monroe vicinity. Although a detailed queue analysis was not performed as part of this project, Synchro queue analysis (which is calculated based on traffic volumes and associated signal phase green time) shows that the Bivens Street SB approach to US 74 experiences a worst case queue of 125' during the PM peak hour and the Main Street SB approach to US 74 experiences a peak hour queue of 275' during the PM peak hour.

4.1.3 US 74 / Concord Ave. and US 74 / US 601 Interchanges

Using AM and PM peak hour volumes for year 2007, an analysis of the interchanges at US 74 and Concord Avenue and US 74 at US 601 was performed for all ramp merge and ramp diverge locations. **Table 4-3** and **Figure 3-6** show the calculated LOS for the individual elements of the US 74 / Concord

Ave. interchange. The ramp analysis was based on posted speed limits at the interchanges. **Table 4-4** and **Figure 3-7** show the calculated LOS for the individual elements of the US 74 / US 601 interchange. The HCS analysis reports are included in **Appendix** C.

Table 4-3: US 74 / Concord Ave. Interchange Existing LOS Analysis Results

Interchange Element	2007 LOS AM (PM)
US 74 EB off-ramp to Concord Ave. (diverge)	C (C)
US 74 EB on-ramp from Concord Ave. (merge)	B (C)
US 74 WB off-ramp to Concord Ave. (diverge)	D (C)
US 74 WB on-ramp from Concord Ave. (merge)	B (B)

Table 4-4: US 74 / US 601 Interchange Existing LOS Analysis Results

Interchange Element	2007 LOS AM (PM)
US 74 EB off-ramp to US 601 (diverge)	C (C)
US 74 EB loop on-ramp from US 601 (merge)	B (B)
US 74 EB on-ramp from US 601 (merge)	B (B)
US 74 WB off-ramp to US 601 (diverge)	C (B)
US 74 WB weaving section between US 74 WB on-ramp and US 74 WB off-ramp (weave)	B (B)
US 74 WB on-ramp from US 601 (merge)	C (B)

All merge and diverge elements of the interchanges at US 74 / Concord Avenue and US 74 / US 601 operate at a desirable LOS according to the performed analysis.

4.2 No-Build Conditions

For the 2030 No-Build analysis, several changes were made to roadway geometry as a result of various TIP projects. These projects were U-3825 (widening of Stallings Road to US 74), U-3809 (widening of Indian Trail to US 74), U-4024 (improving the US 74 and US 601 interchange and widening US 601), and U-2549 (the construction of the Monroe Outer Loop). The impact to the No-Build roadway geometry will be discussed further in the following sections.

4.2.1 US 74 / I-485 Interchange

Using peak hour volumes projected for the year 2030, an analysis of the interchange at US 74 and I-485 as it currently exists was performed for all mainline, ramp merge, and ramp diverge locations. There are no planned TIP projects that would add capacity to this interchange by the year 2030. **Table 4-5** and **Figure 3-12** shows the calculated LOS for the individual elements of the US 74 / I-485 interchange. The HCS analysis reports are included in **Appendix C**.

Table 4-5: US 74 / I-485 Interchange No-Build LOS Analysis Results

Interchange Element	2030 LOS AM (PM)
I-485 NB, south of interchange (mainline)	C (D)
I-485 NB off-ramp to US 74 (diverge)	C (D)
I-485 NB, center of interchange (mainline)	B (C)
I-485 NB on-ramp from US 74 (merge)	F (F)
I-485 NB, north of interchange (mainline)	F (F)
I-485 SB, north of interchange (mainline)	F (F)
I-485 SB off-ramp to US 74 WB (diverge)	F (F)
I-485 SB off-ramp to US 74 EB (diverge)	D (C)
I-485 SB on-ramp from US 74 (merge)	D (C)
I-485 SB, south of interchange (mainline)	D (C)
I-485 NB off-ramp split to US 74 WB and US 74 EB (diverge)	D (D)
I-485 NB weaving section between US 74 EB off-ramp and US 74 WB on-ramp (weave)	F (F)
I-485 NB on-ramp merge from US 74 WB and US 74 EB (merge)	D (E)
US 74 EB, west of interchange (mainline)	B (C)
US 74 EB off-ramp to I-485 SB (diverge)	C (D)
US 74 EB weaving section between I-485 SB and I-485 NB (weave)	D (E)
US 74 EB on-ramp from I-485 NB (merge)	C (D)
US 74 EB, east of interchange (mainline)	B (C)
US 74 WB, east of interchange (mainline)	C (B)
US 74 WB off-ramp to I-485 (diverge)	D (C)
US 74 WB on-ramp from I-485 NB (merge)	B (B)
US 74 WB on-ramp from I-485 SB (merge)	D (C)
US 74 WB, west of interchange (mainline)	D (C)
US 74 WB off-ramp spit to I-485 SB and I-485 NB (diverge)	D (D)
I-485 SB on-ramp merge from US 74 WB and US 74 EB (merge)	D (D)

The No-Build conditions analysis of the US 74 and I-485 interchange indicates that 7 elements are projected to operate at an undesirable LOS.

4.2.2 US 74 Intersection Analysis

For the year 2030 No-Build analysis, a cycle length of 140 seconds was used for both the AM and PM peak hours. Changes to signal phasing (when compared to the Existing conditions) were implemented if the changes resulted in improved intersection operations. Signal phasing was adjusted only if the current intersection geometry would permit.

Several TIP projects affected the intersection geometry at four locations along US 74.

TIP project U-3825 – Stallings Road Widening

TIP project U-3825, the widening of Stallings Road, is proposed to extend from Old Charlotte Highway to US 74. The widening is expected to extend through the US 74 intersection. Since detailed roadway plans are not currently available, the intersection was analyzed assuming a best case operations scenario for US 74 consisting of dual lefts, two through lanes, and a right turn lane for both the northeast and southwest approaches of Stallings Road. Approach geometry on US 74 was held constant from the Existing conditions.

TIP project U-3809– Indian Trail Road Widening

TIP project U-3809, the widening of Indian Trail Road, is proposed to extend from Old Charlotte Highway to US 74. The widening is expected to extend through the US 74 intersection. Since detailed roadway plans are not currently available, the intersection was analyzed assuming a best case operations scenario for US 74 consisting of dual lefts, two through lanes, and a right turn lane for both the northeast and southwest approaches of Indian Trail Road. Approach geometry on US 74 was held constant from the Existing conditions.

TIP project U-4024– US 601 Widening

TIP project U-4024, the improvement of the US 74 and US 601 interchange and the widening of US 601, the widening of US 601 is proposed to extend from US 74 north to the proposed Monroe Bypass. Since detailed roadway plans are not currently available, engineering judgment was used to anticipate what improvements were likely to be made at the US 74 and US 601 interchanges. It was determined that the stop controlled ramp terminal intersections would meet warrants for signalization. The lane geometry at these intersections was improved to allow for two thru lanes and exclusive turn lanes on the US 601 approaches at both intersections. Dual lefts were added to the eastbound approach at the eastbound US 74 off ramp and US 601 intersection. An exclusive left was also added to the westbound approach at the intersection of East Avenue and US 601.

TIP project U-2549– Monroe Outer Loop

TIP project U-2549, the proposed Monroe Outer Loop, is expected to terminate at US 74, and will create a 4-lane arterial opposing Dickerson Boulevard that will extend to SR 1751 (Walkup Avenue) at SR 1763 (Bivens Road). Since detailed roadway plans are not currently available, the intersection was analyzed assuming a best case operations scenario for US 74 consisting of two left turn lanes, three through lanes, and one right turn lane on US 74 approaches and two left turn lanes, two through lanes, and one right turn lane on Northern Loop/Dickerson Boulevard approaches.

The results of the No-Build conditions intersection analysis are shown in **Table 4-6** and **Figures 3-13** through **3-22.** In many cases individual intersection movements operate worse than the overall LOS. This could cause queue spillbacks for these specific movements that would affect the operations of movements showed to operate with a desirable LOS. No-Build intersection LOS worksheets can be found in **Appendix C**.

Table 4-6: US 74 Intersections No-Build LOS and Capacity Results

Intersection	2030 No Build	
	Capacity (v/c) AM (PM)	LOS AM (PM)
US 74 / Stallings Rd.	1.69 (1.69)	F (F)
US 74 / Indian Trail-Fairview	1.67 (1.42)	F (F)
US 74 / Unionville-Indian Trail	1.79 (1.75)	F (F)
US 74 / Faith Church Rd.	1.63 (1.52)	F (F)
US 74 / Sardis Church Rd.	1.97 (2.22)	F (F)
US 74 / Chamber Dr.	1.37 (1.30)	F (F)
US 74 / North Rocky River Rd.	2.26 (1.86)	F (F)
US 74 / Fowler Secret Rd.	1.25 (1.27)	F (F)
US 74 / Rolling Hills Dr.	1.31 (1.30)	D (E)
US 74 / Round Table Rd.	1.28 (1.24)	E (F)
US 74 / Williams Rd.	1.30 (1.37)	F (F)
US 74 / Hanover Dr.	1.33 (1.44)	F (F)
US 74 / Monroe Northern Loop	1.58 (1.56)	F (F)
US 74 / Secret Shortcut Rd.	1.10 (1.12)	E (E)
WB 74 Ramps / Concord Ave. (unsignalized)	0.44 (0.36)	C (C) WB Left / Right
EB 74 Ramps / Concord Ave. (unsignalized)	0.27 (0.32)	C (C) EB Left / Right
East Ave. / US 601	0.56 (0.65)	C (C)
East Ave. / US 74 Off Ramp (unsignalized)	0.89 (0.81)	F (E) EB Left / Through
EB US 74 Off Ramp / US 601	0.63 (0.78)	C (C)
US 74 / Stafford St.	1.36 (1.35)	F (F)
US 74 / Boyte St.	1.10 (0.96)	E (D)
US 74 / Morgan Mill Rd.	1.30 (1.27)	F (F)
US 74 / Walkup Ave.	1.25 (1.06)	F (E)
US 74 / Sutherland Ave.	1.06 (1.09)	E (E)
US 74 / Dove- Venus St.	0.76 (0.82)	C (C)
US 74 / East Franklin St.	0.99 (1.08)	D (E)
US 74 / Metro Medical Center	1.11 (1.21)	E (F)
US 74 / South Secrest Ave.	0.99 (0.95)	D (D)
US 74 / Bivens Road (unsignalized)	0.55 (0.36)	F (F)
US 74 / Bivens St.	0.82 (0.87)	C (C)
US 74 / Main St.	1.41 (1.31)	F (F)
US 74 / Forest Hill School Rd.	0.92 (0.89)	C (D)

The results of the No-Build conditions analysis show that 24 of the 32 intersections studied are projected to operate at an undesirable LOS E or F.

Two intersections on US 74, US 74 / Bivens Street and US 74 / Main Street are located within 300' of a railroad track that is parallel to and north of US 74 in the Monroe vicinity. Although a detailed queue analysis was not performed as part of this project, Synchro queue analysis (which is calculated based on traffic volumes and associated signal phase green time) shows that the Bivens Street SB approach to US 74 is projected to experience a worst case queue of 375' during the PM peak hour and the Main Street SB approach to US 74 is projected to experience a peak hour queue of 475' during the PM peak hour.

4.2.3 US 74 / Concord Ave. and US 74 / US 601 Interchanges

Using AM and PM peak hour volumes projected for the year 2030, an analysis of the interchanges at US 74 and Concord Avenue and US 74 at US 601 as they currently exist was performed for all ramp merge and ramp diverge locations. **Table 4-7** and **Figure 3-17** show the calculated LOS for the individual elements of the US 74 / Concord Ave. interchange. **Table 4-8** and **Figure 3-18** show the calculated LOS for the individual elements of the US 74 / US 601 interchange. The HCS analysis reports are included in **Appendix C**.

Table 4-7: US 74 / Concord Ave. Interchange No-Build LOS Analysis Results

Interchange Element	2030 LOS AM (PM)
US 74 EB off-ramp to Concord Ave. (diverge)	C (C)
US 74 EB on-ramp from Concord Ave. (merge)	B (C)
US 74 WB off-ramp to Concord Ave. (diverge)	D (D)
US 74 WB on-ramp from Concord Ave. (merge)	B (B)

Table 4-8: US 74 / US 601 Interchange No-Build LOS Analysis Results

Interchange Element	2030 LOS AM (PM)
US 74 EB off-ramp to US 601 (diverge)	C (C)
US 74 EB loop on-ramp from US 601 (merge)	B (B)
US 74 EB on-ramp from US 601 (merge)	B (C)
US 74 WB off-ramp to US 601 (diverge)	C (C)
US 74 weaving section between US 74 WB on-ramp and US 74 WB off-ramp (weave)	C (B)
US 74 WB on-ramp from US 601 (merge)	C (B)

All segments of the interchanges at US 74 / Concord Avenue and US 74 / US 601 are projected to operate at a desirable LOS according to the performed analysis.

5 TRAVEL TIME RUN ANALYSIS

A travel time run analysis was performed for the US 74 corridor within the study area limits. The goal of the analysis was to determine the amount of time it currently takes to travel the entire length of US 74 in each direction and the expected amount of time it will take to travel the same distance in the year 2030, assuming no improvements are made to the corridor except for expected improvements made as a result of proposed TIP projects.

The travel time analysis was performed using the SimTraffic simulation software, which is based on the Synchro intersection analysis results. For the travel time analysis runs, existing and No-Build analysis files (which followed Congestion Management Guidelines) were modified in order to accurately represent existing travel characteristics on the US 74 corridor. These modifications included allowing right turns on red and also allowing right turn yield controlled movements at movements where yield conditions exist.

The first step in the analysis was to perform existing travel time runs so that the Existing SimTraffic runs could be verified as being calibrated. Two runs were made in each direction, the Eastbound direction was recorded during the PM peak hour and the Westbound direction was recorded during the AM peak hour. Results show that it took 41 minutes at an average speed of 30 mph to travel the corridor during the PM peak hour in the Eastbound direction and 40 minutes at an average speed of 30 mph to travel the corridor during the AM peak hour in the Westbound direction.

Once the existing travel time runs were completed, the SimTraffic existing conditions analysis was performed. Three runs were completed for each scenario. Simulation results show that it took 47 minutes at an average speed of 29 mph to travel the corridor during the PM peak hour in the Eastbound direction and 50 minutes at an average speed of 24 mph to travel the corridor during the AM peak hour in the Westbound direction. When comparing the actual travel run results and simulation travel run results, you can see that the simulation results show higher travel time and slightly lower travel speeds. This is mainly due to the year 2007 volumes provided by MAB being projected volumes generated by travel demand forecast volumes, which are higher than recent turning movement volumes collected at intersections throughout the corridor. Because of this, the simulation results seem reasonable and the model was considered calibrated.

Future SimTraffic results were then completed using the year 2030 model and the results were recorded. Simulation results show that it took 68 minutes at an average speed of 21 mph to travel the corridor during the PM peak hour in the Eastbound direction and 70 minutes at an average speed of 17 mph to travel the corridor during the AM peak hour in the Westbound direction.

Table 5-1 compares the simulation results for the Existing and No-Build conditions. **Appendix D** contains the SimTraffic results printouts.

Table 5-1: SimTraffic Travel Time Run Results

Scenario	SimTraffic Results		
	Year 2007 Existing Conditions	Year 2030 No-Build Conditions	% Change
Eastbound PM Peak Travel Time (minutes)	47	68	+45%
Eastbound PM Peak Average Speed (mph)	29	21	-28%
Westbound AM Peak Travel Time (minutes)	50	70	+40%
Westbound AM Peak Average Speed (mph)	24	17	-29%

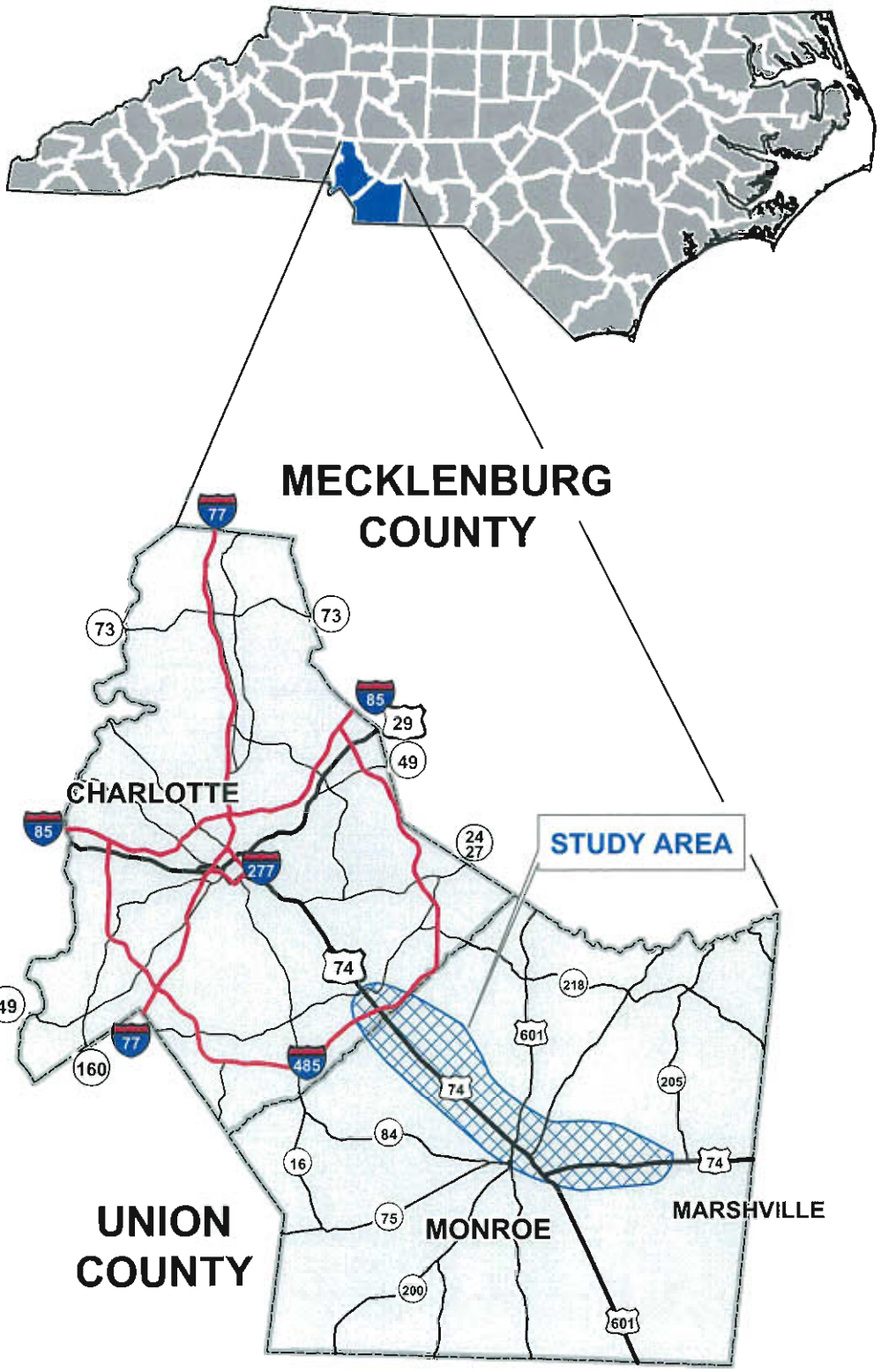
6 CONCLUSIONS

The Existing conditions analysis shows that 2 individual elements of the I-485 system interchange currently operate below a desirable LOS. By the year 2030, if no improvements are made to this interchange, 9 individual elements will operate below a desirable LOS.

The Existing conditions analysis also shows that 11 of the 32 studied intersections along the US 74 corridor, perform below a desirable LOS. By the year 2030, if no improvements are made to US 74, it is expected that 22 of the 32 studied intersections will operate below a desirable LOS. This would mean that two thirds of the intersections within the studied corridor would be operating at an undesirable LOS.

Currently all merge and diverge areas of the US 74 / Concord Avenue and the US 74 / US 601 urban interchanges operate at a desirable LOS. By the year 2030, it is expected that these merge and diverge areas will continue to operate with a desirable LOS, regardless of improvements to the interchanges.

In addition to the intersection LOS analysis, a travel time analysis was performed. This analysis shows that under Existing conditions, vehicles traveling along the studied corridor inbound to the City of Charlotte during the AM peak hour would experience a travel time of 50 minutes at an average speed of 24 mph. By the year 2030, if no improvements are made to the corridor, this same trip would take 70 minutes at an average speed of 17 mph. Vehicles traveling along the studied corridor outbound from the City of Charlotte during the PM peak hour would experience a travel time of 47 minutes at an average speed of 29 mph. By the year 2030, if no improvements are made to the corridor, this same trip would take 68 minutes at an average speed of 21 mph.



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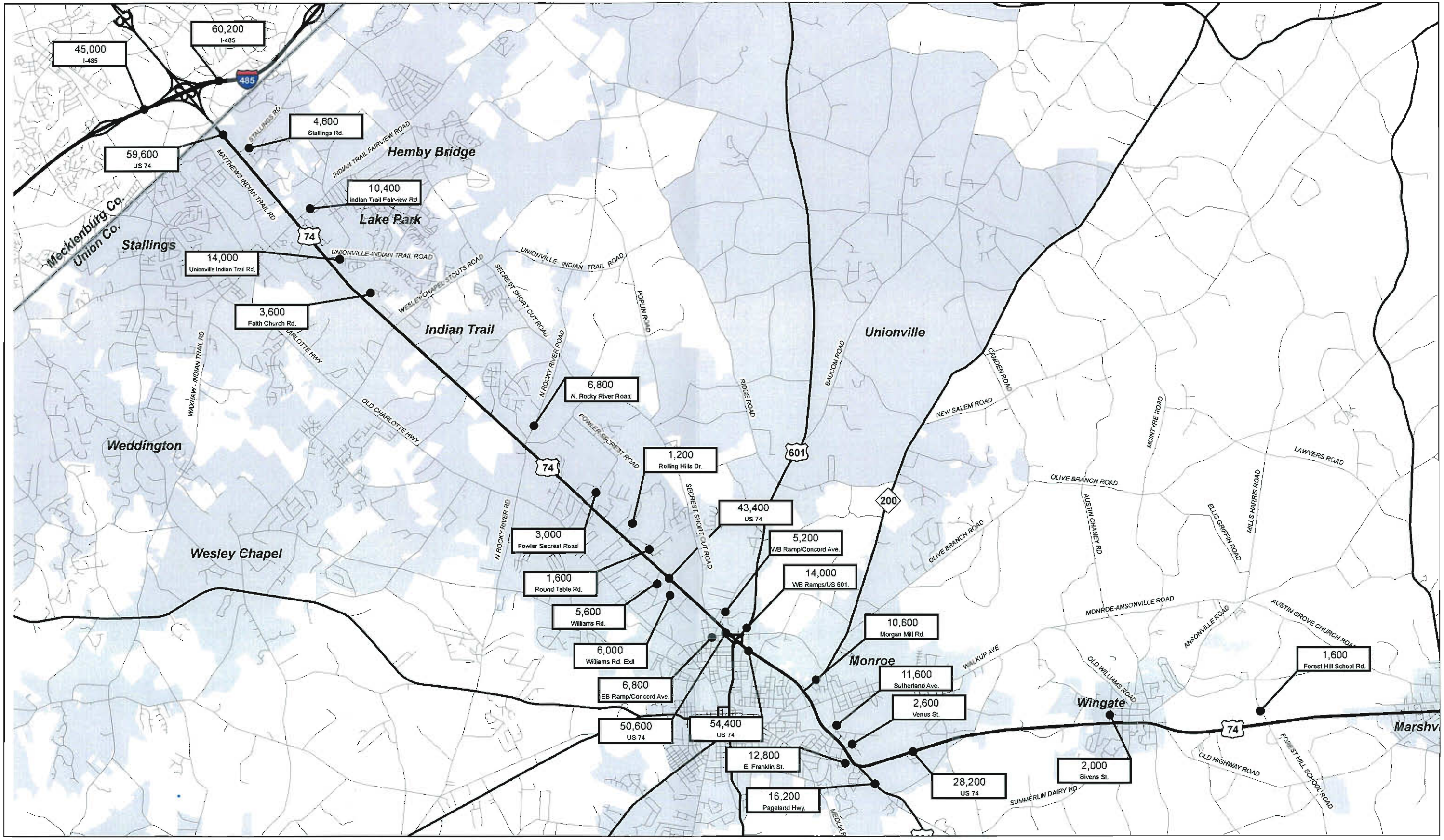
Project Vicinity Map

Figure 1-1

Monroe_Vicinity_map.ai 7-11-07



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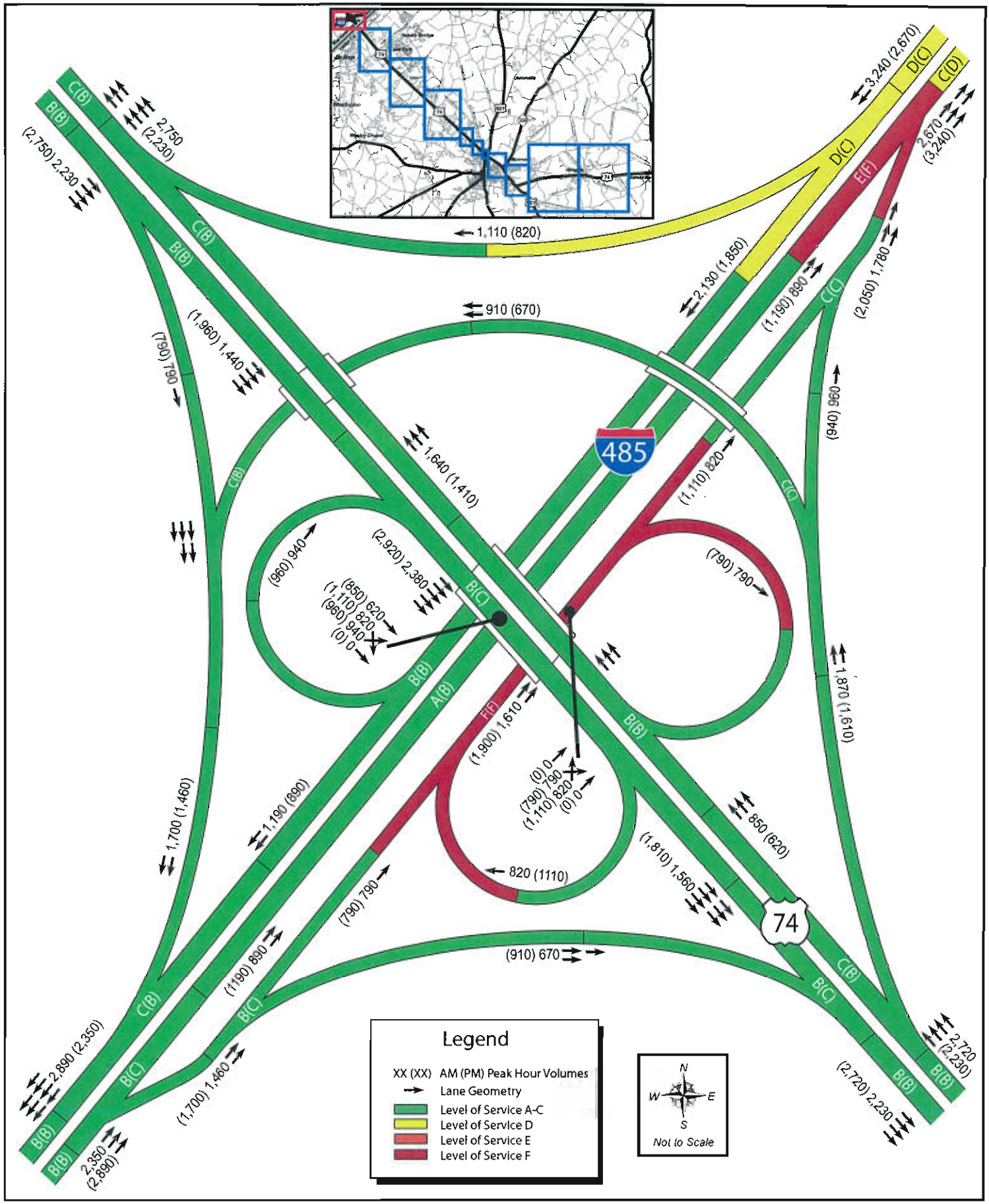
N W E S

Existing (2007) Daily Traffic Volumes

FIGURE 2-1

Alignments_Cons_rev.mxd 1/15/07



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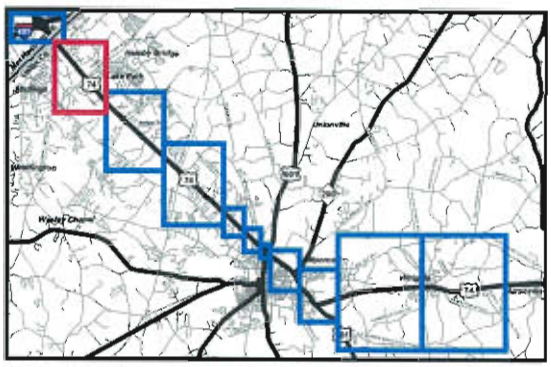
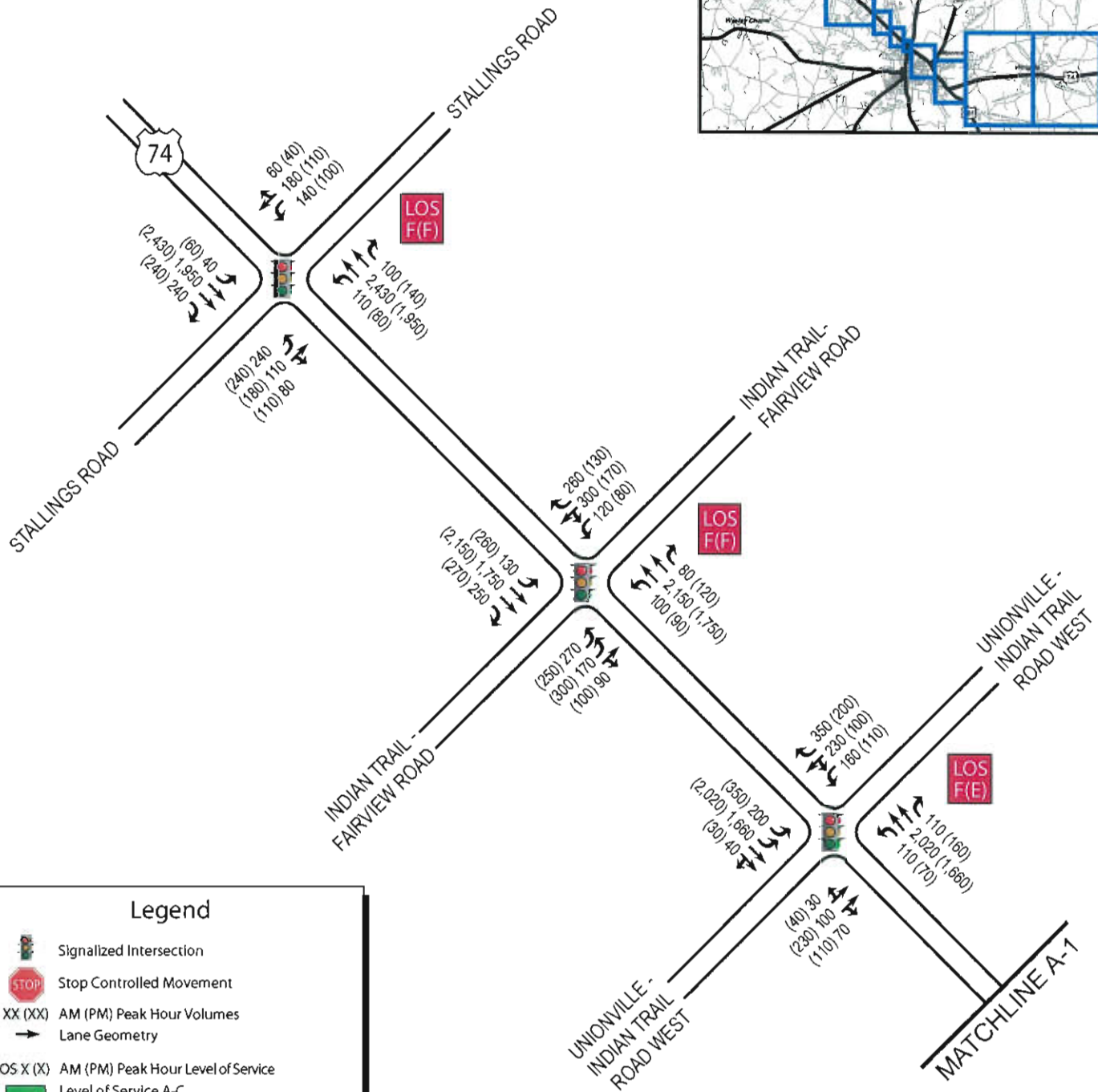
3_1-10 ExistingConditions.ai 7-23-07





Legend

- Signalized Intersection
- Stop Controlled Movement
- XX (XX) AM (PM) Peak Hour Volumes
- Lane Geometry
- LOS X (X) AM (PM) Peak Hour Level of Service
- Level of Service A-C
- Level of Service D
- Level of Service E
- Level of Service F
- LOS E/F Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

N W E S

Not to Scale

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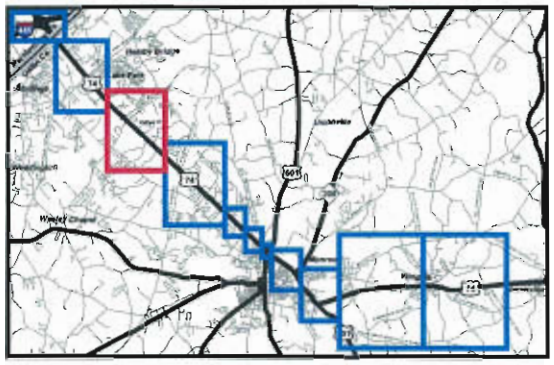

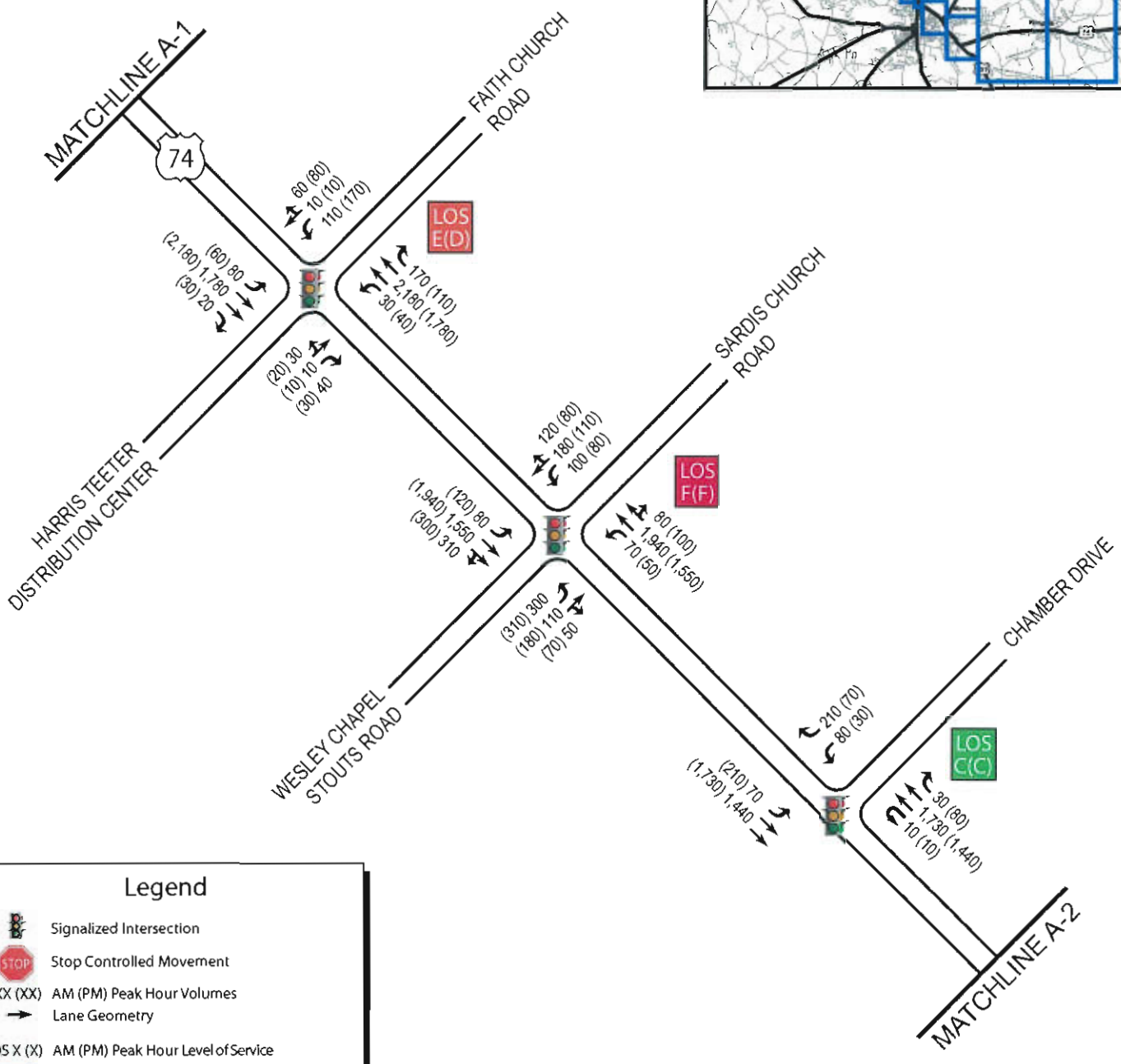

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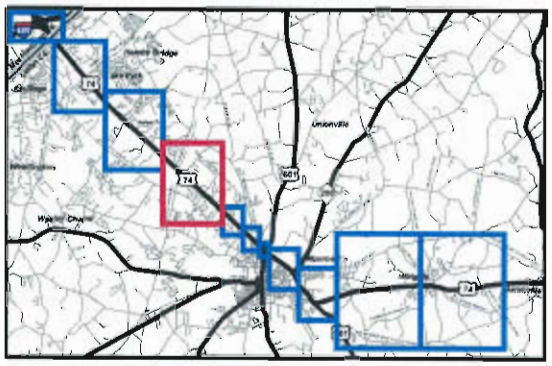

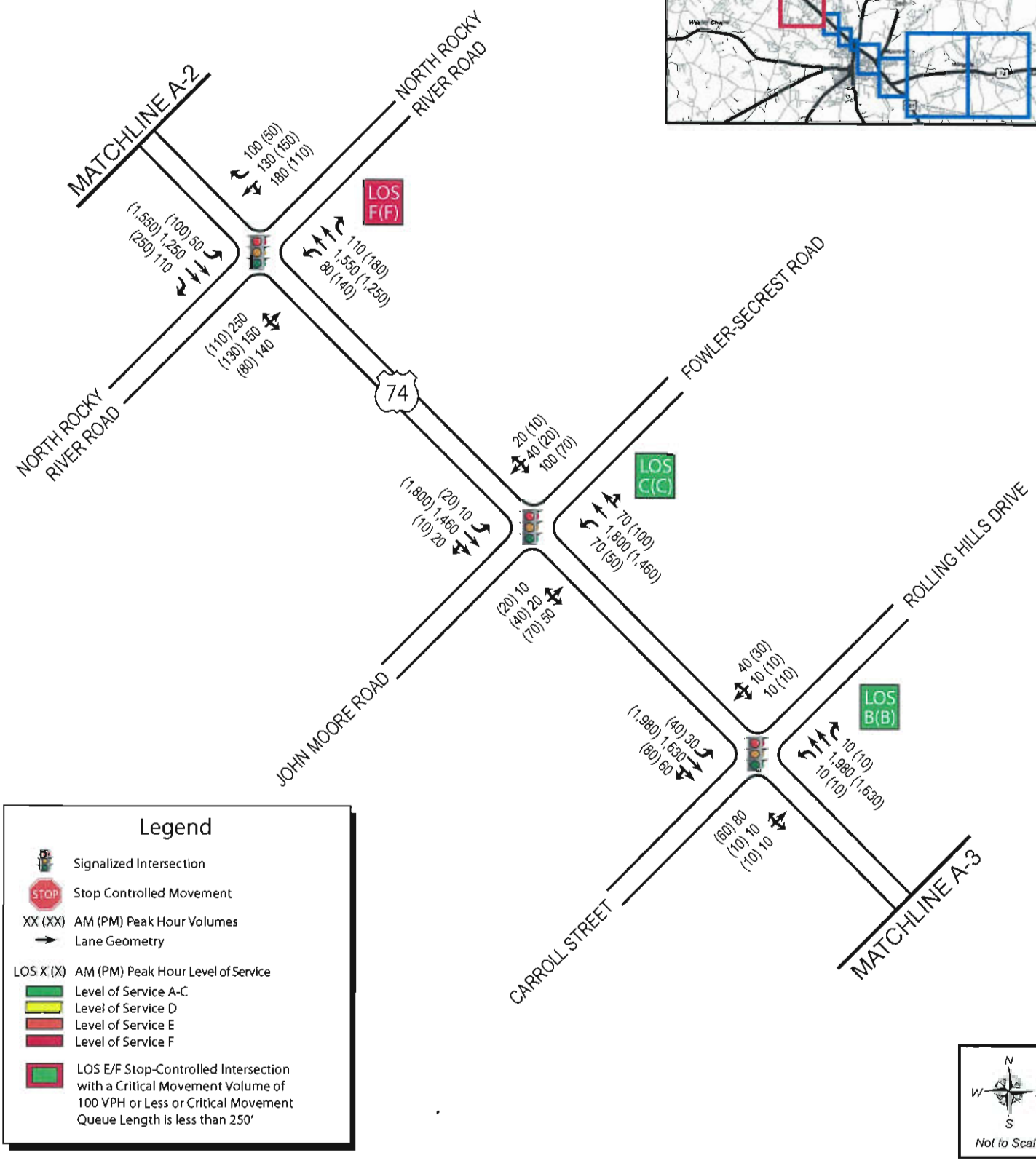

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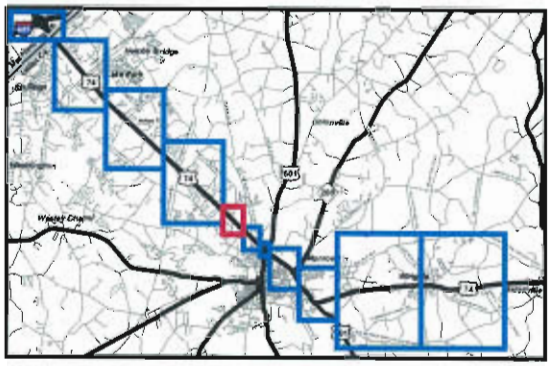

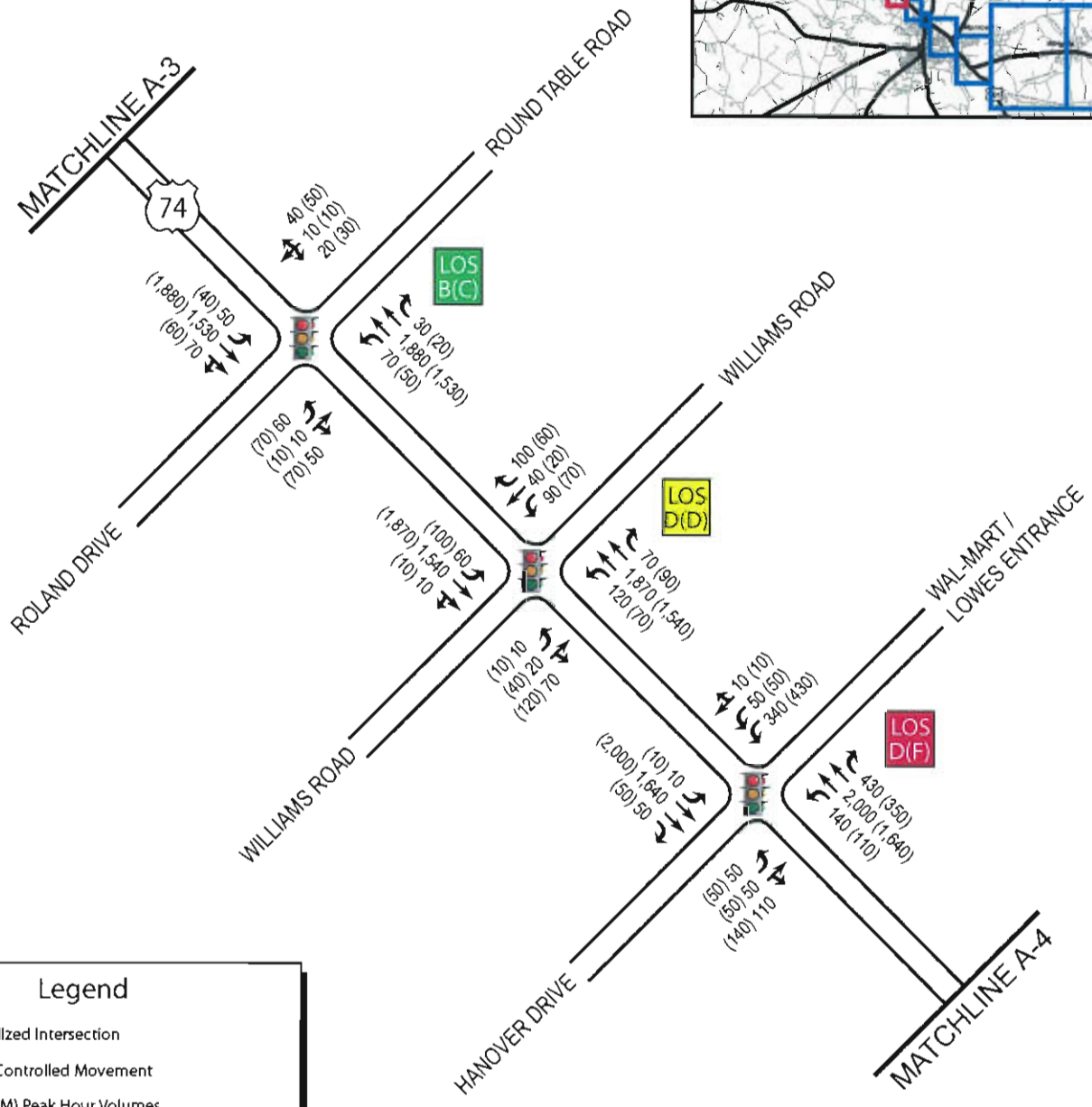

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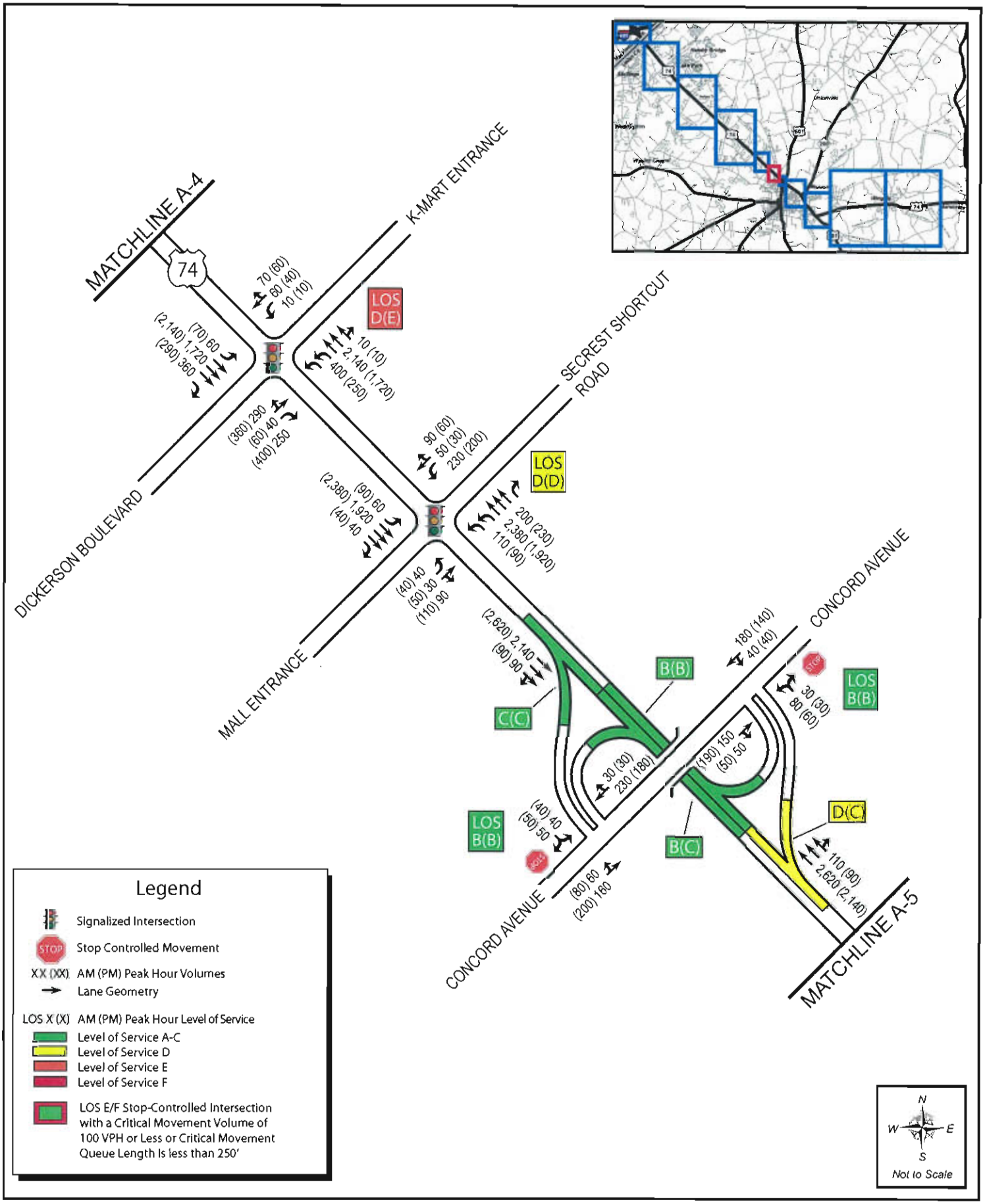

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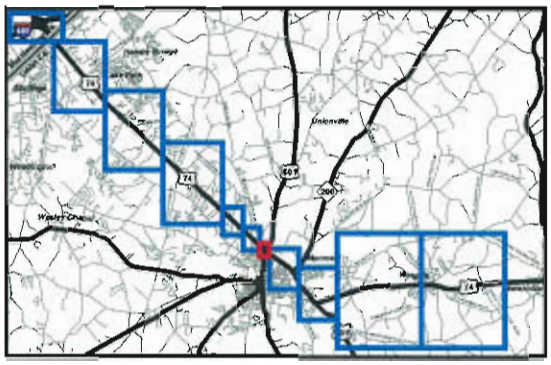
3_1-10 ExistingConditions.ai 1-23-07



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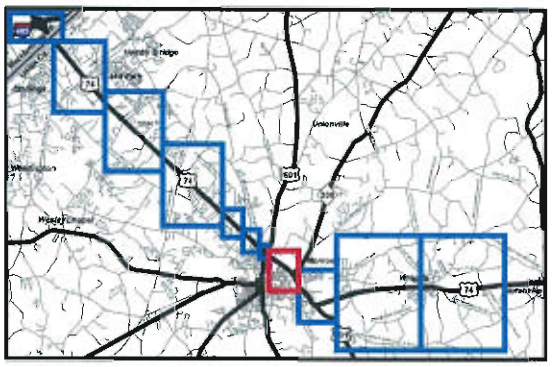

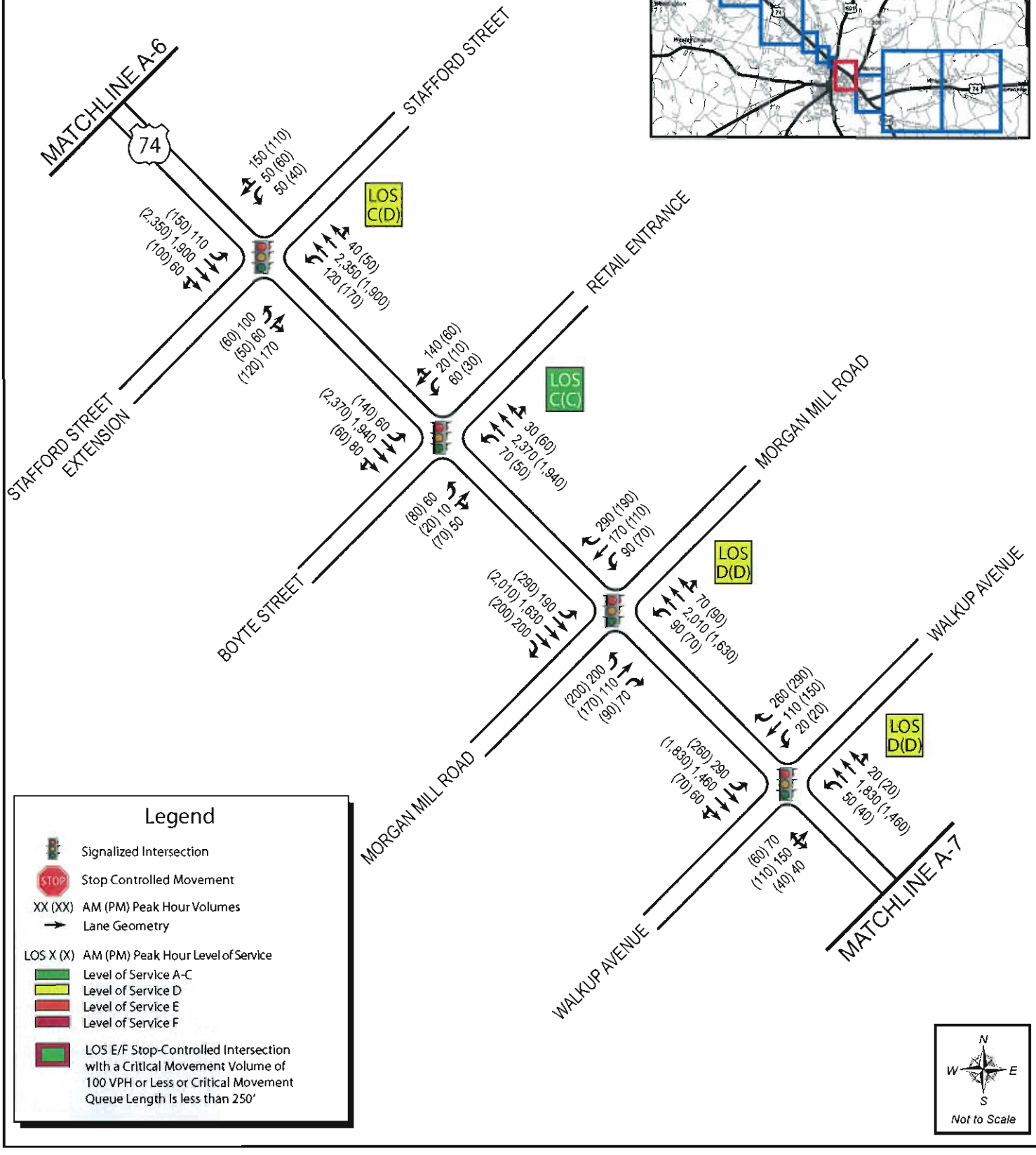

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Mecklenburg and Union Counties

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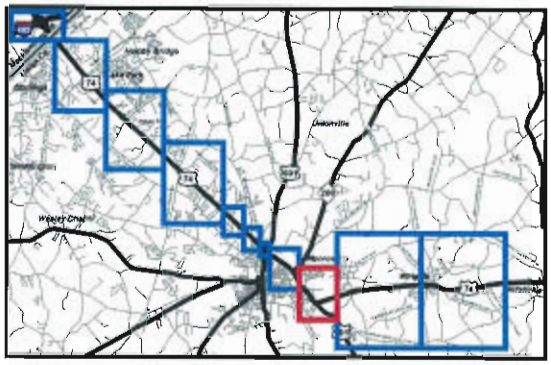

MATCHLINE A-7

74

SUTHERLAND AVENUE

SUTHERLAND AVENUE

VENUS STREET

DOVE STREET

RETAIL ENTRANCE

METRO MEDICAL CENTER CAMPUS

EAST FRANKLIN STREET

MATCHLINE A-8

PAGELAND HIGHWAY

40 (50)
110 (110)
60 (100)

(1,680) 1,350
(40) 50
(130) 160

LOS C(C)

100 (60)
1,680 (1,350)
30 (20)

(160) 130
(110) 110
(30) 20

90 (110)
10 (10)
10 (10)

(1,620) 1,300
(90) 110
(40) 70

LOS B(B)

10 (10)
1,630 (1,300)
10 (10)

(70) 40
(10) 10
(10) 10

90 (60)
90 (90)
110 (100)

(1,450) 1,130
(90) 60
(130) 90

LOS D(D)

100 (110)
1,450 (1,130)
430 (480)
10 (10)

(90) 130
(90) 90
(430) 480

20 (10)

LOS C(C)

10 (20)
1,280 (1,110)
40 (60)

(10) 10
(1,300) 1,120
(820) 480

(480) 820
(40) 60

Legend

- Signalized Intersection
- Stop Controlled Movement
- XX (XX) AM (PM) Peak Hour Volumes
- Lane Geometry
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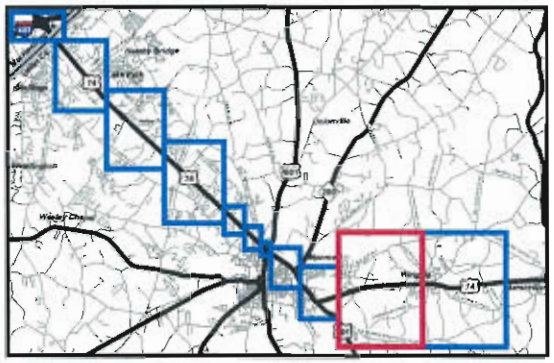
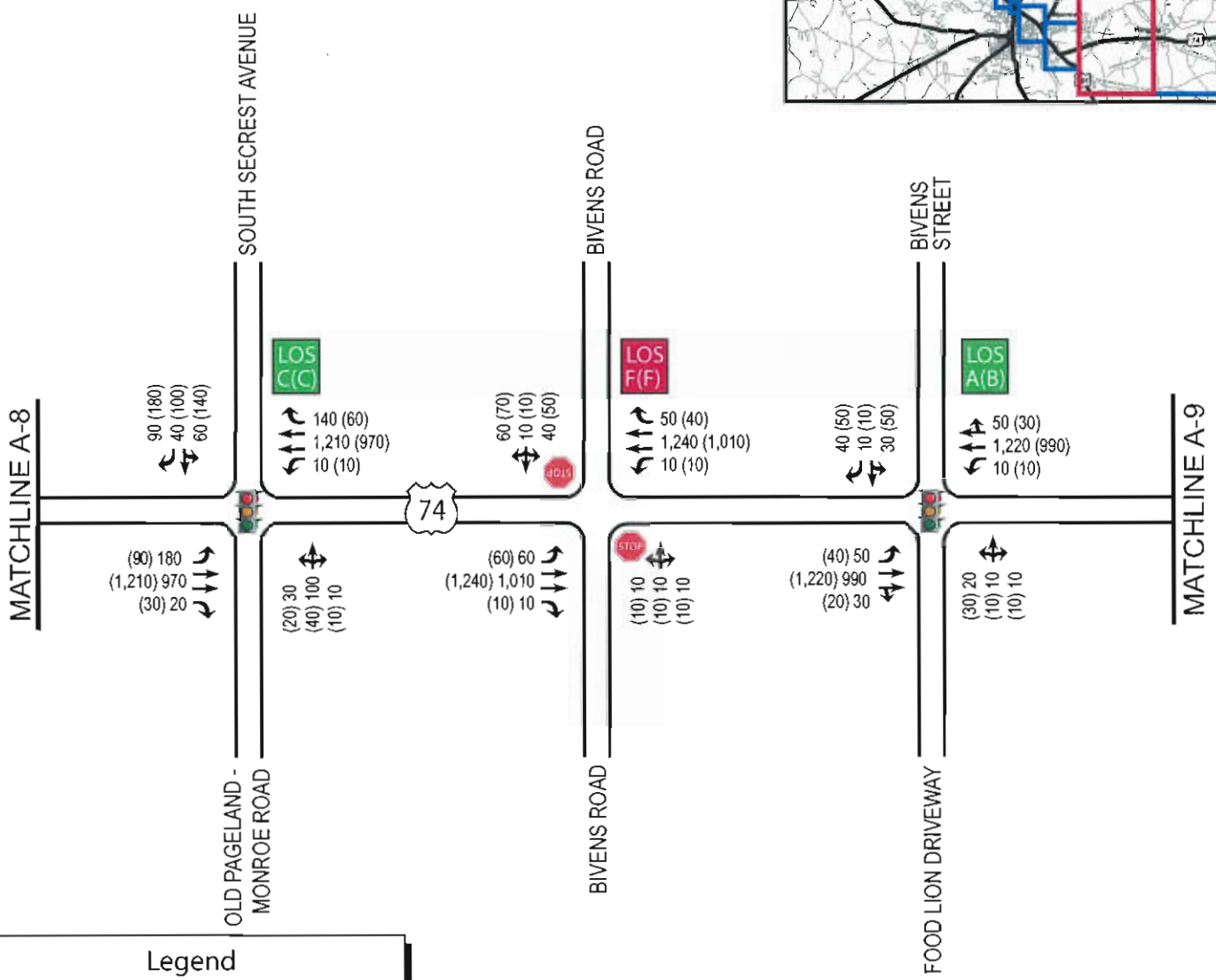
3_1-10 Existing Conditions.ai 1-23-07





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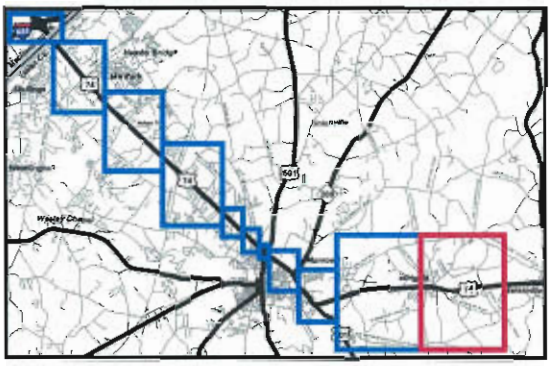
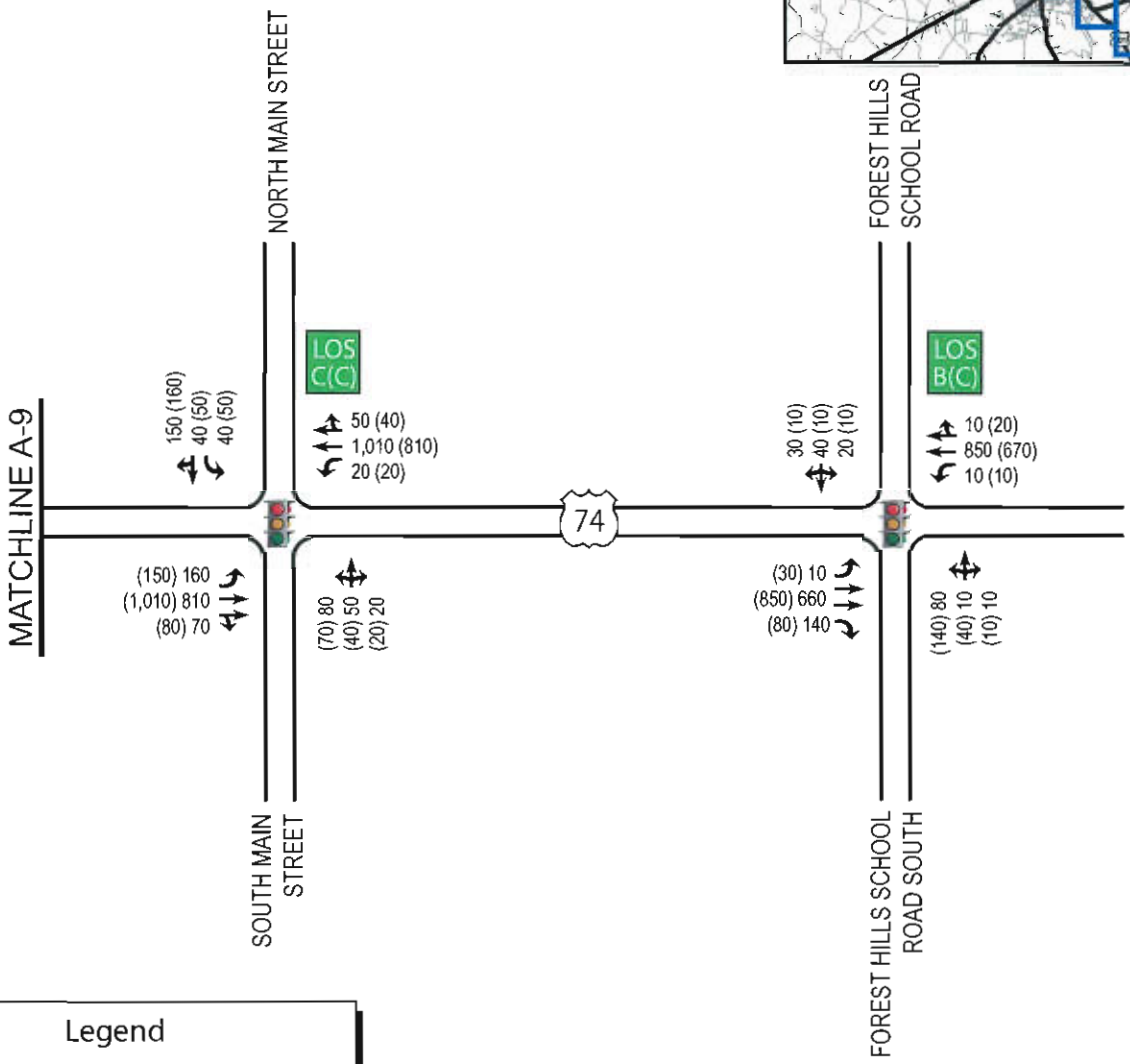
3_1-10 ExistingConditions.ai 7-23-07





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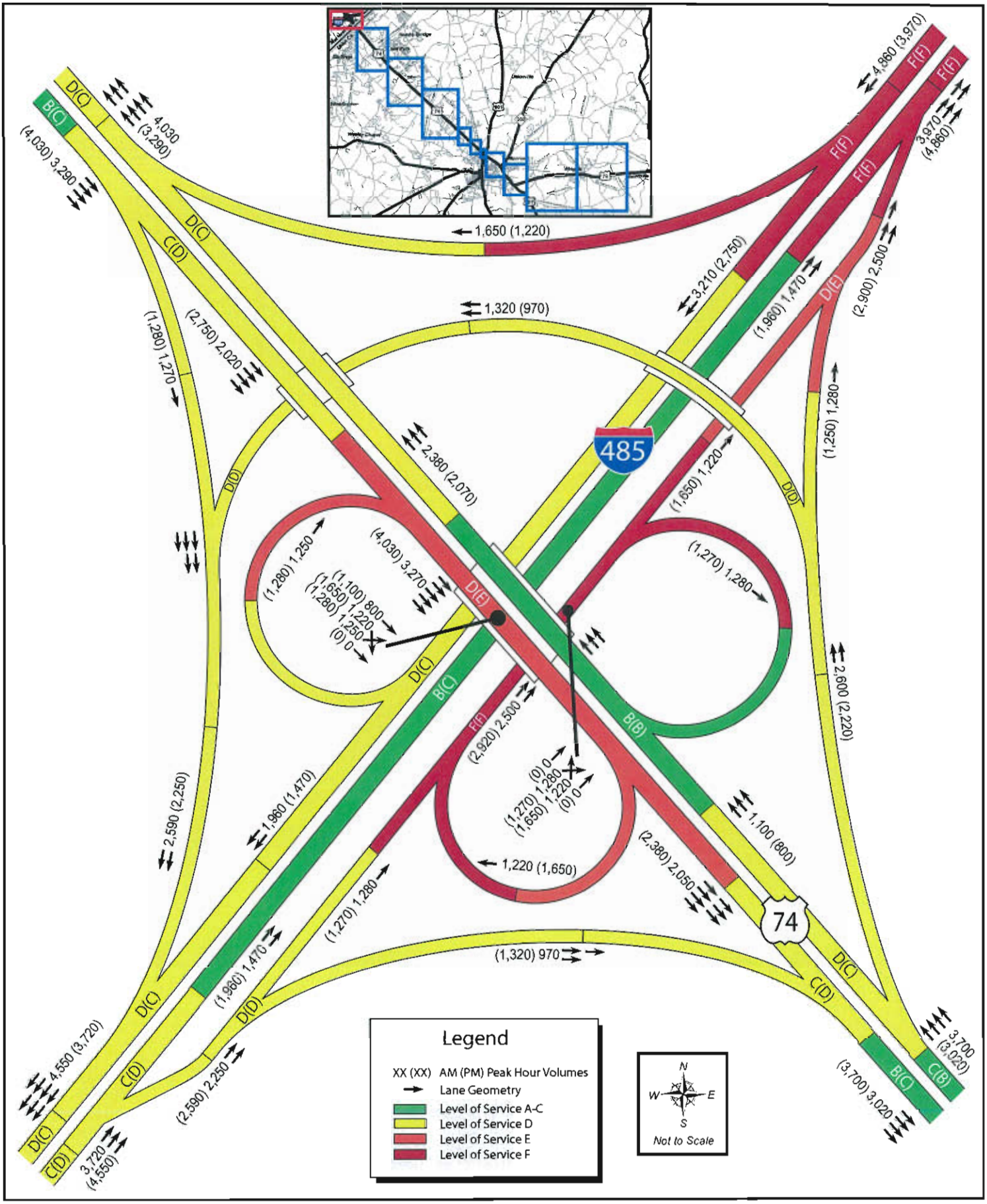
Mecklenburg and Union Counties

Year 2007 Existing Conditions

3_1-10 ExistingConditions.ai 7-23-07



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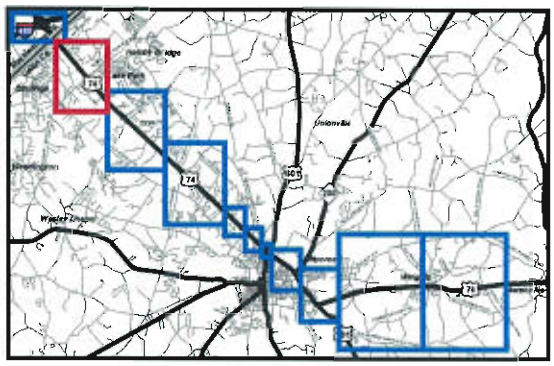
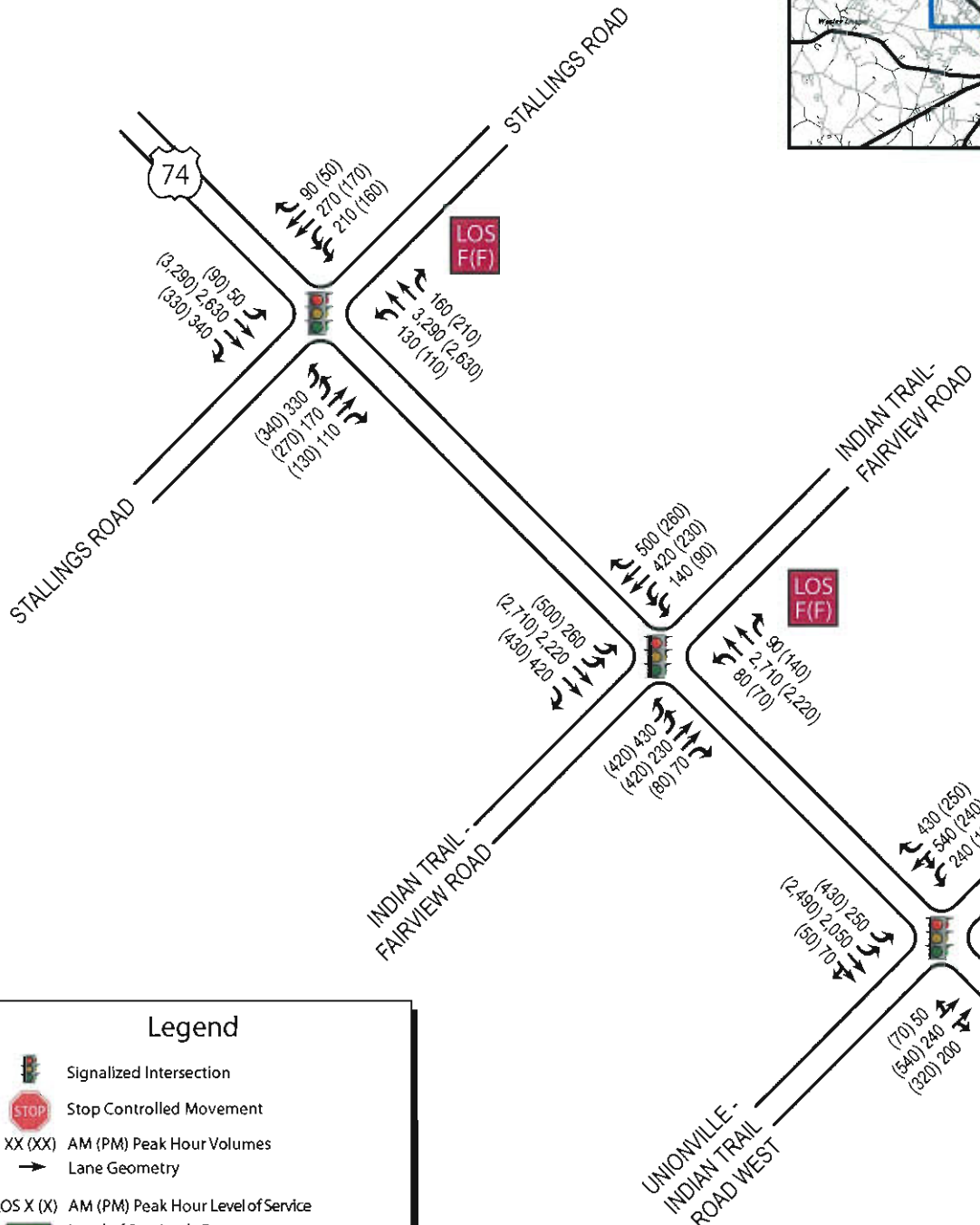
Mecklenburg and Union Counties

Year 2030 No Build Conditions

3_1-10 ExistingConditions.ai 7-23-07





Legend

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N W E S

Not to Scale

NORTH CAROLINA Turnpike Authority

Year 2030 No-Build Conditions

MONROE CONNECTOR / BYPASS

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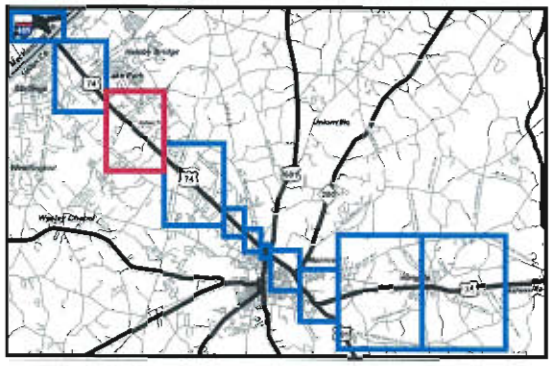
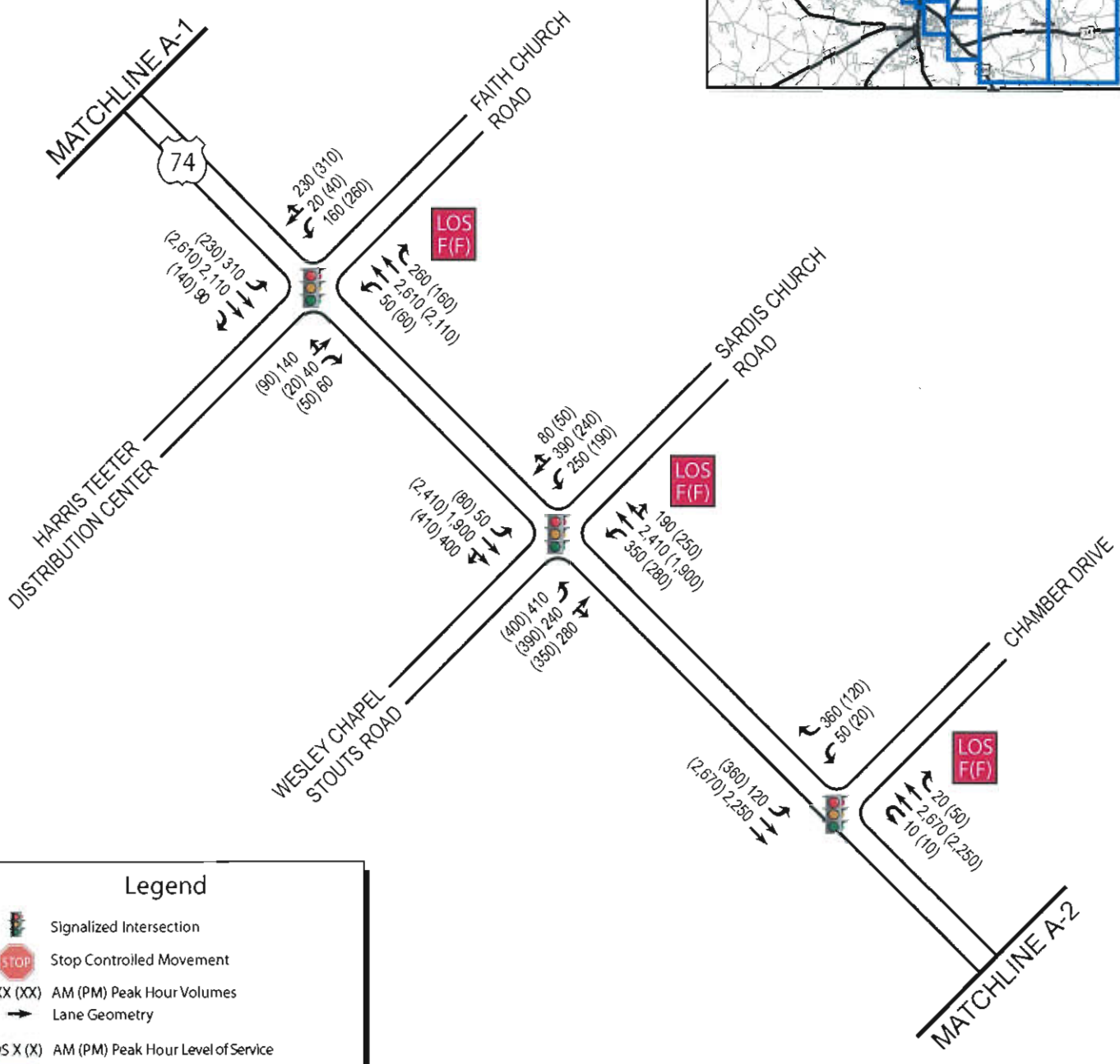
Mecklenburg and Union Counties

3_11-20 NoBuildConditions.ai 7-23-07





Legend

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- Level of Service E
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3_11-20 NoBuildConditions.ai 1-23-07

NORTH CAROLINA Turnpike Authority

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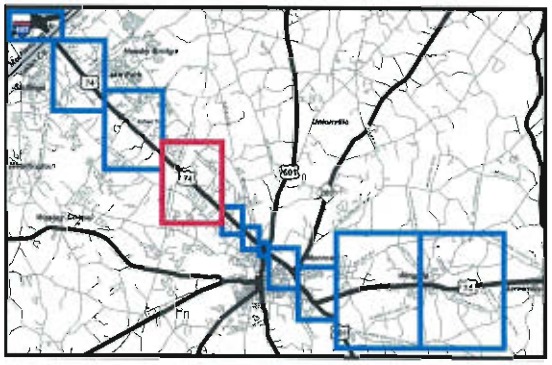
TIP Project Numbers R-3329 & R-2559
Mecklenburg and Union Counties

Year 2030 No-Build Conditions



MATCHLINE A-2
NORTH ROCKY RIVER ROAD
190 (90)
270 (280)
180 (110)
(190) 90
(2,080) 1,730
(650) 300
LOS F(F)
110 (180)
2,080 (1730)
110 (200)
(300) 650
(270) 280
(110) 200
74
NORTH ROCKY RIVER ROAD
FOWLER-SECREST ROAD
30 (20)
60 (30)
160 (120)
(2,400) 1,940
(30) 20
(20) 20
LOS F(F)
120 (160)
2,400 (1,940)
120 (80)
(20) 20
(60) 30
(120) 80
JOHN MOORE ROAD
ROLLING HILLS DRIVE
40 (20)
10 (10)
30 (20)
(2,550) 2,080
(40) 20
(80) 50
LOS D(E)
20 (30)
2,550 (2,080)
50 (50)
(60) 80
(10) 10
(50) 60
CARROLL STREET
MATCHLINE A-3

Legend

- Signalized Intersection
- Stop Controlled Movement
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- Lane Geometry
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- Level of Service D
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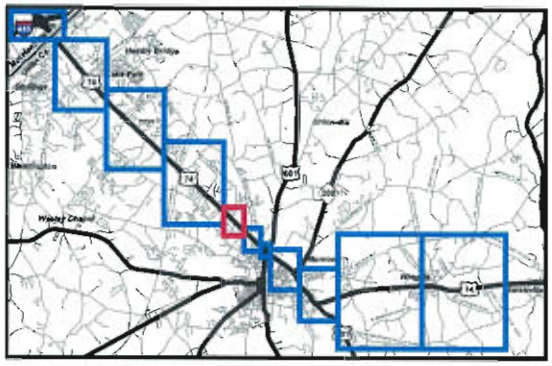
Not to Scale

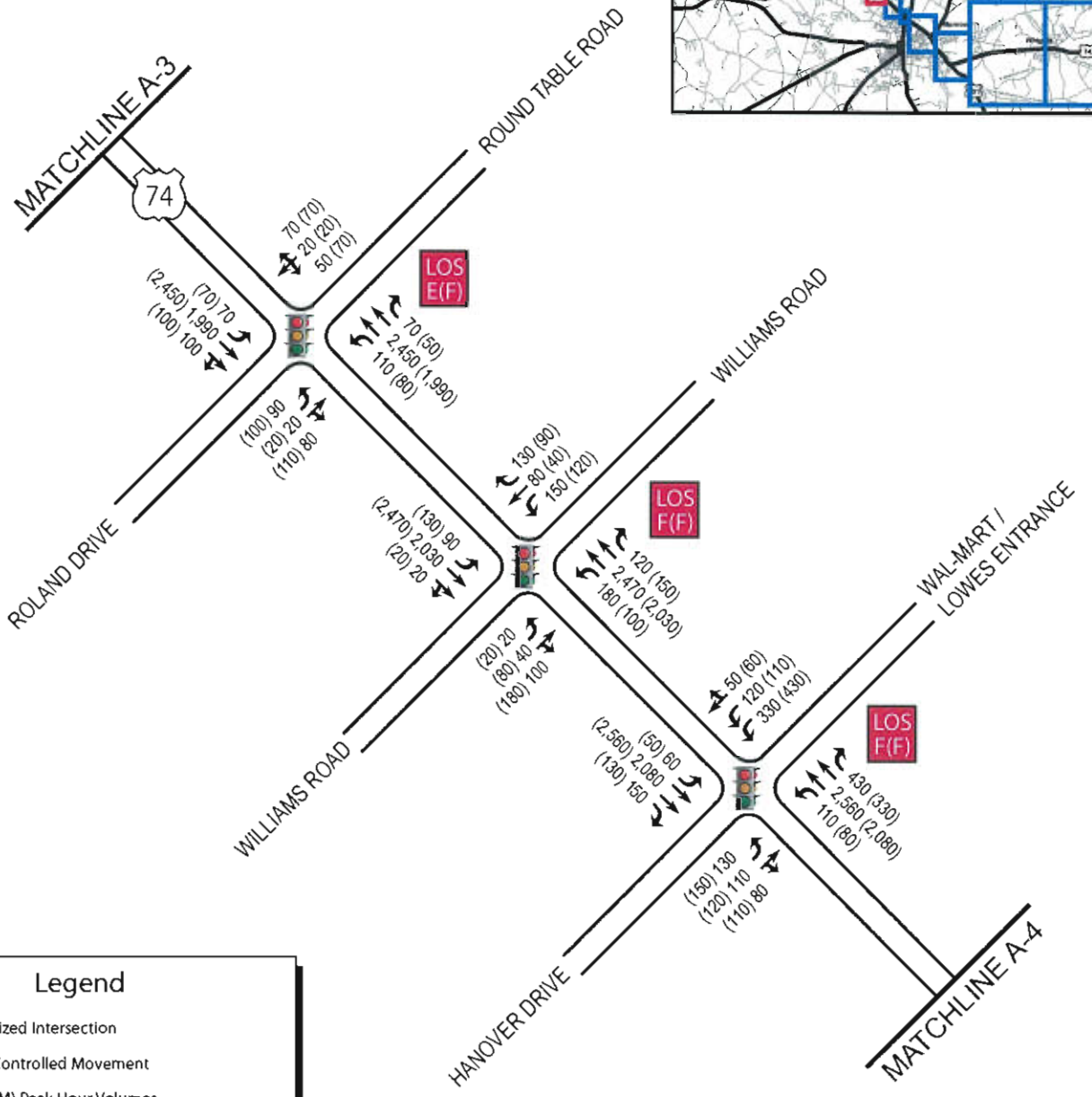
3_11-20 NoBuildConditions.ai 1-23-07

NORTH CAROLINA Turnpike Authority

Year 2030 No-Build Conditions

MONROE CONNECTOR / BYPASS
TIP Project Numbers R-3329 & R-2559
Mecklenburg and Union Counties





Legend

- Signalized Intersection
- Stop Controlled Movement
- XX (XX) AM (PM) Peak Hour Volumes
- Lane Geometry
- LOS X (X) AM (PM) Peak Hour Level of Service
- Level of Service A-C
- Level of Service D
- Level of Service E
- Level of Service F
- LOS E/F Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

N W E S

Not to Scale

3_11-20 NoBuildConditions.ai 7-23-07

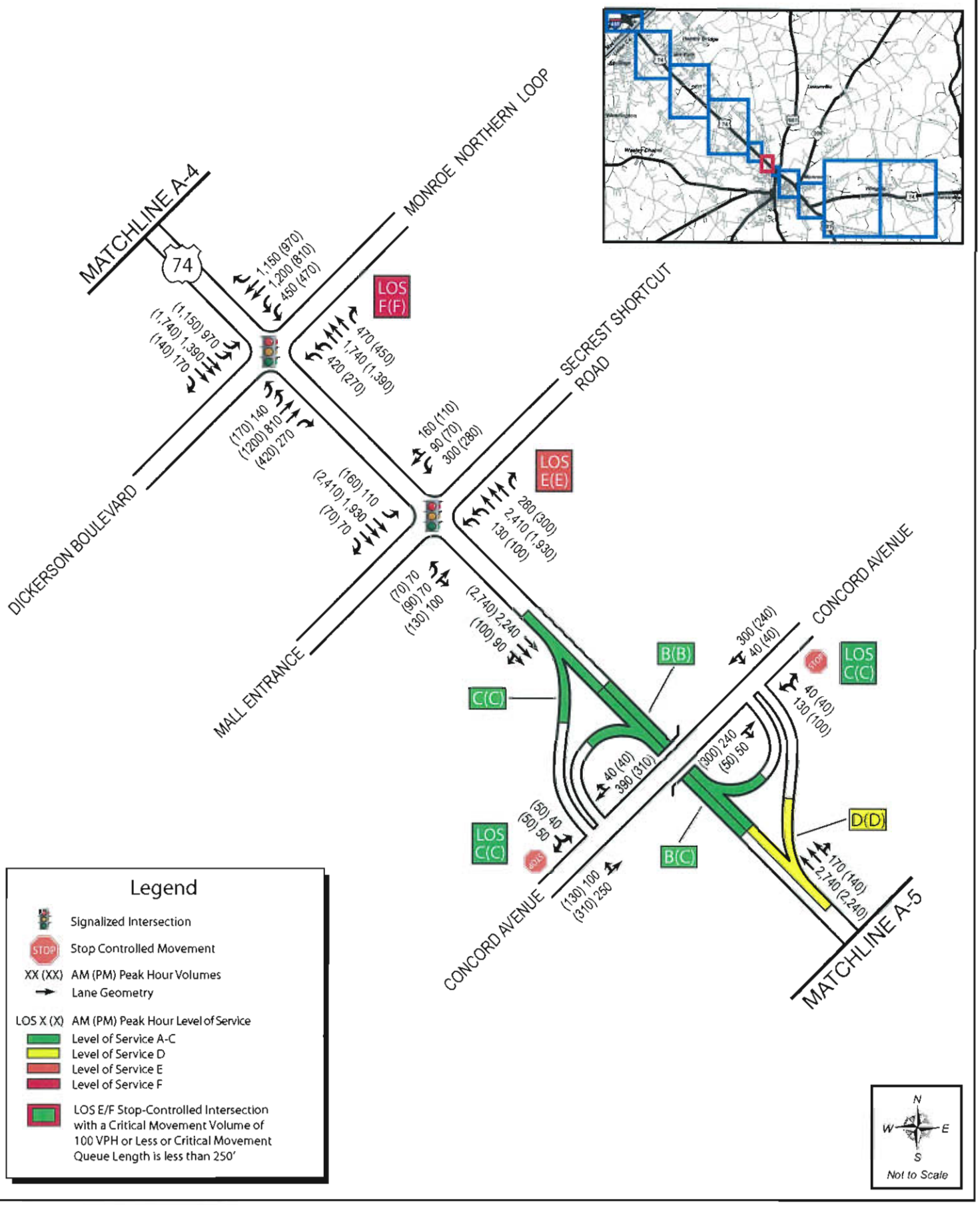
NORTH CAROLINA Turnpike Authority

MONROE CONNECTOR / BYPASS

***TIP* Project Numbers R-3329 & R-2559**

Mecklenburg and Union Counties

Year 2030 No-Build Conditions



NORTH CAROLINA Turnpike Authority

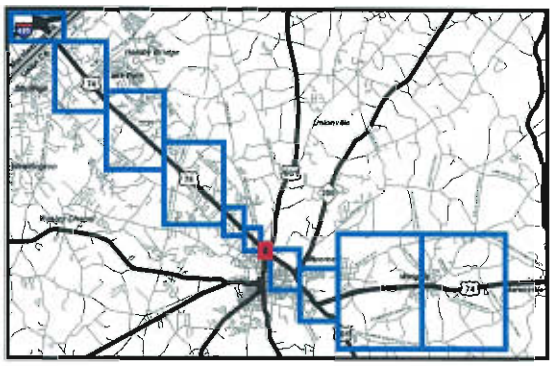
Year 2030 No-Build Conditions

MONROE CONNECTOR / BYPASS

TIP Project Numbers R-3329 & R-2559

Mecklenburg and Union Counties

3_11-20 NoBuildConditions.ai 7-23-07



Legend

- Signalized Intersection
- Stop Controlled Movement
- XX (XX) AM (PM) Peak Hour Volumes
- Lane Geometry
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Not to Scale

3_11-20-NoBuildConditions.ai 7-23-07

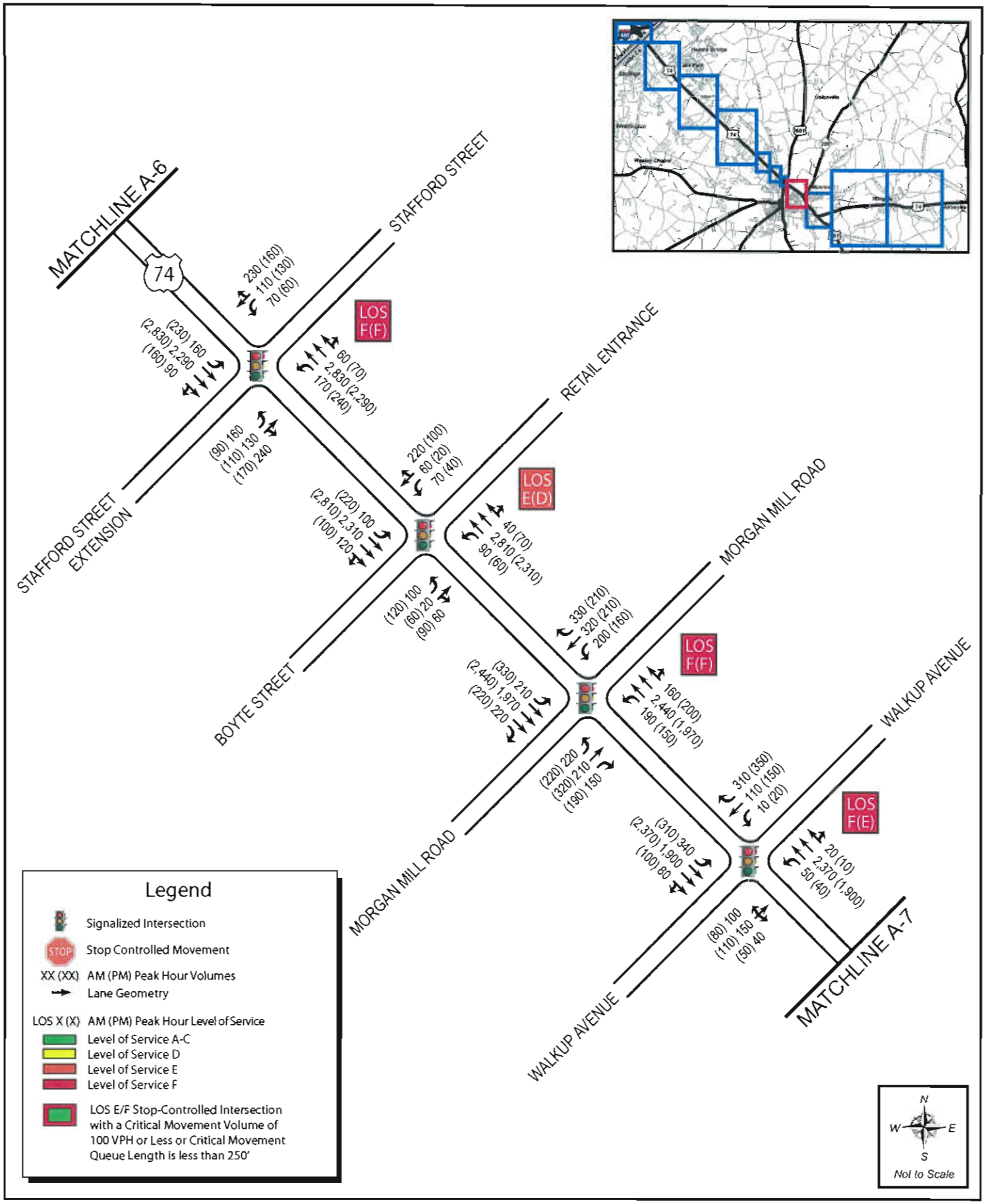
NORTH CAROLINA Turnpike Authority

MONROE CONNECTOR / BYPASS

TIP Project Numbers R-3329 & R-2559

Mecklenburg and Union Counties

Year 2030 No-Build Conditions



NORTH CAROLINA Turnpike Authority

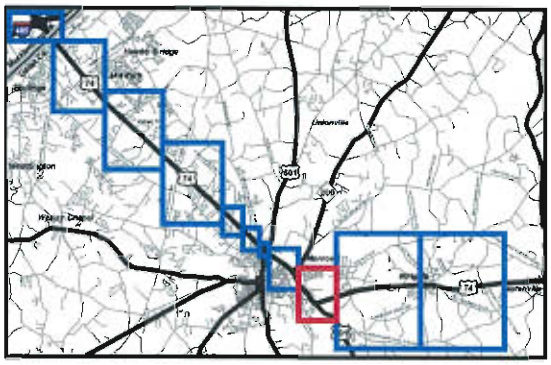
MONROE CONNECTOR / BYPASS

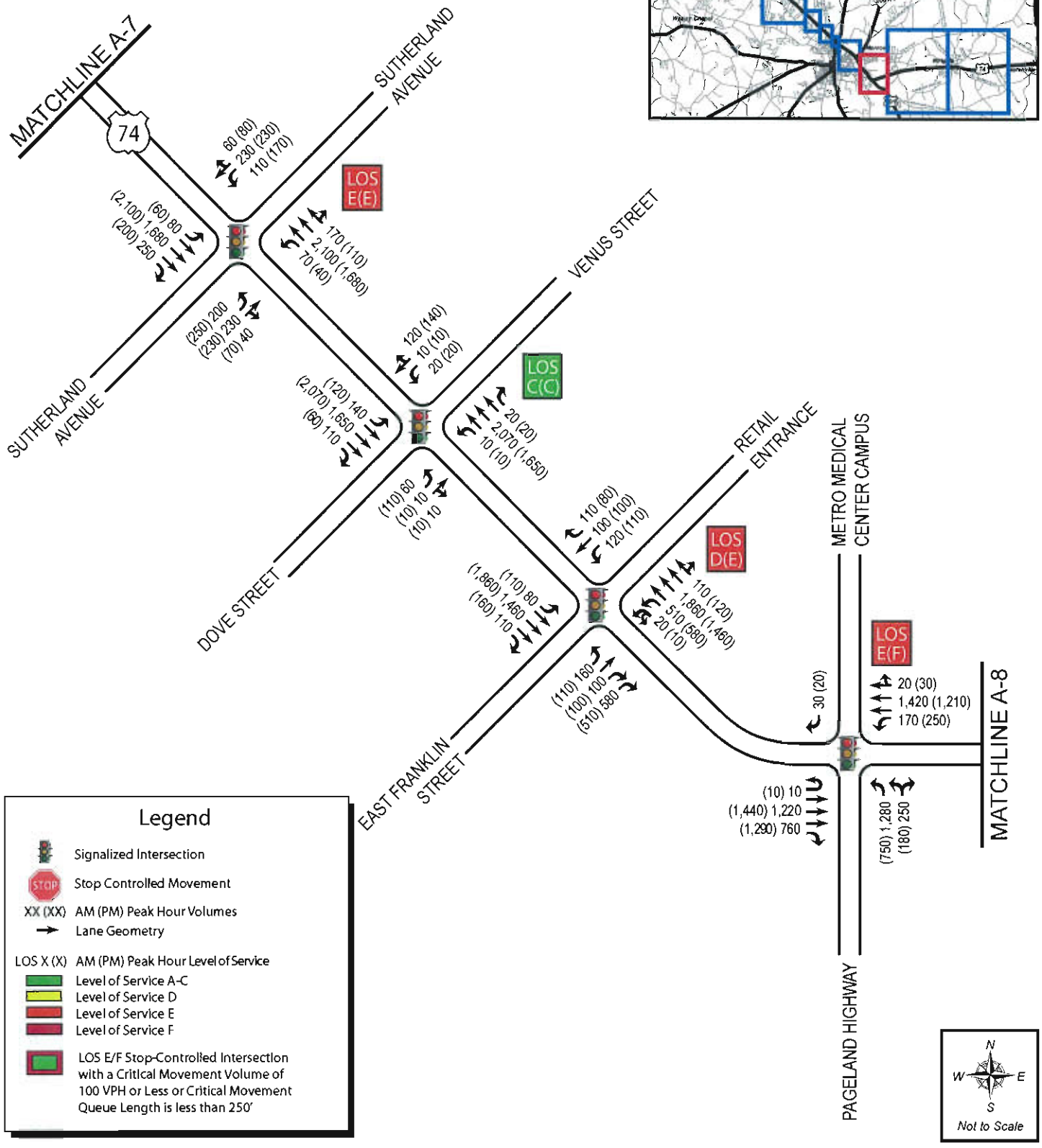
TIP Project Numbers R-3329 & R-2559

Mecklenburg and Union Counties

Year 2030 No-Build Conditions

3_11-20 NoBuildConditions.ai 1-23-07





NORTH CAROLINA Turnpike Authority

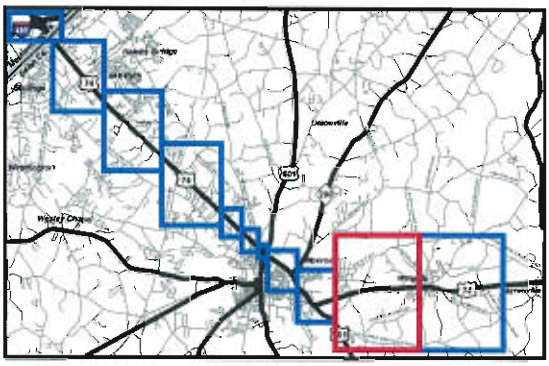
Year 2030 No-Build Conditions

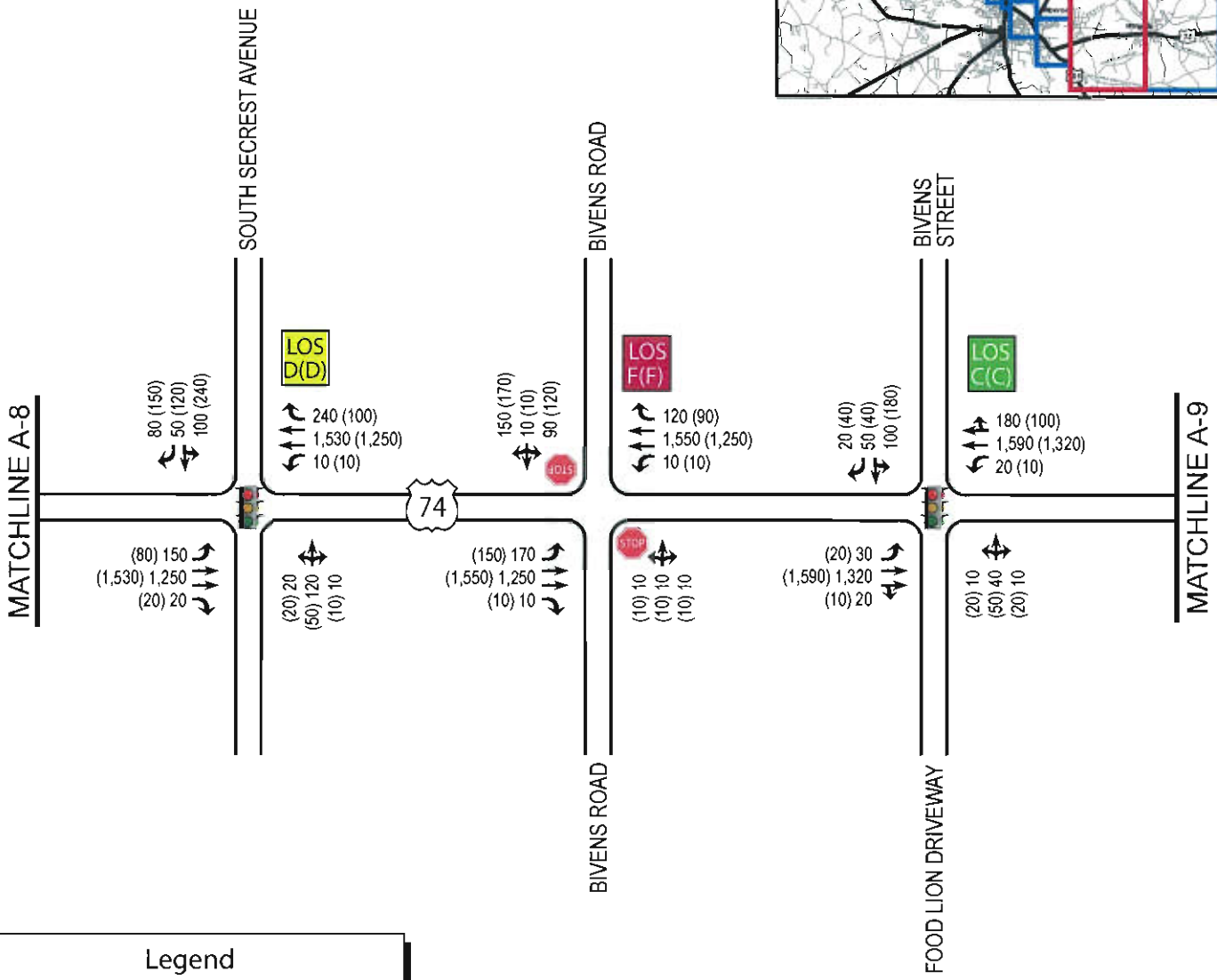
MONROE CONNECTOR / BYPASS

TIP Project Numbers R-3329 & R-2559

Mecklenburg and Union Counties

3_11-20 NoBuildConditions.ai 7-22-07





Legend

- Signalized Intersection
- Stop Controlled Movement
- XX (XX) AM (PM) Peak Hour Volumes
- Lane Geometry
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- LOS E/F Stop-Controlled Intersection with a Critical Movement Volume of 100 VPH or Less or Critical Movement Queue Length is less than 250'

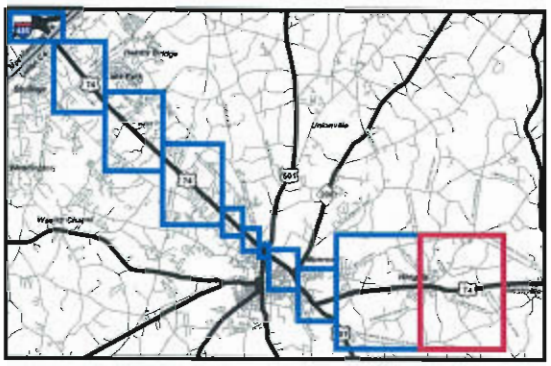
N
W E
S
Not to Scale

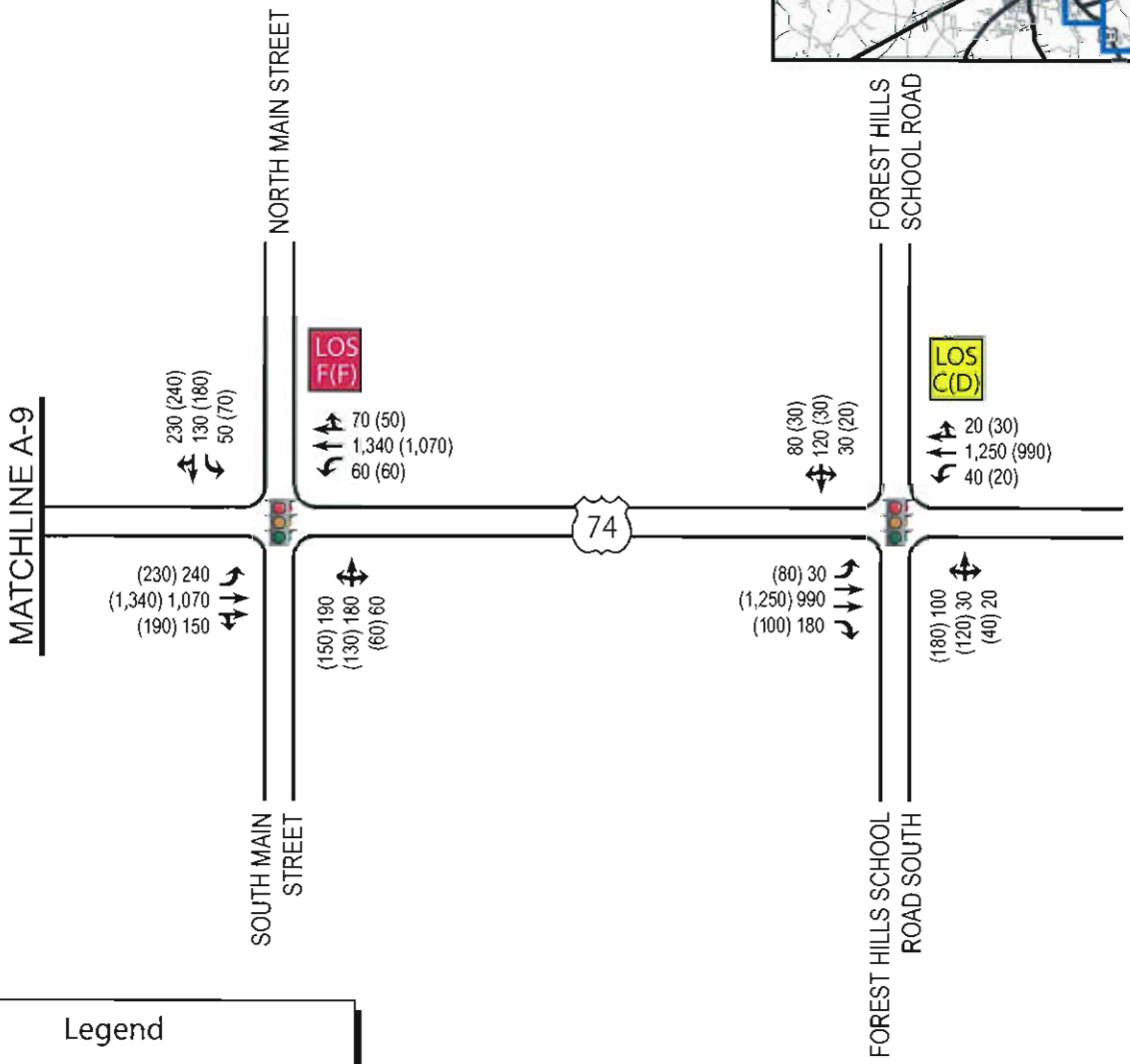
NORTH CAROLINA Turnpike Authority

Year 2030 No-Build Conditions

MONROE CONNECTOR / BYPASS
TIP Project Numbers R-3329 & R-2559
Mecklenburg and Union Counties

3_11-20 NoBuildConditions.ai 7-23-07





Legend

- Signalized Intersection
- Stop Controlled Movement
- XX (XX) AM (PM) Peak Hour Volumes
- Lane Geometry
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N W E S

Not to Scale

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North Carolina Turnpike Authority

MONROE CONNECTOR / BYPASS

TIP Project Numbers R-3329 & R-2559

Mecklenburg and Union Counties

Year 2030 No-Build Conditions

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

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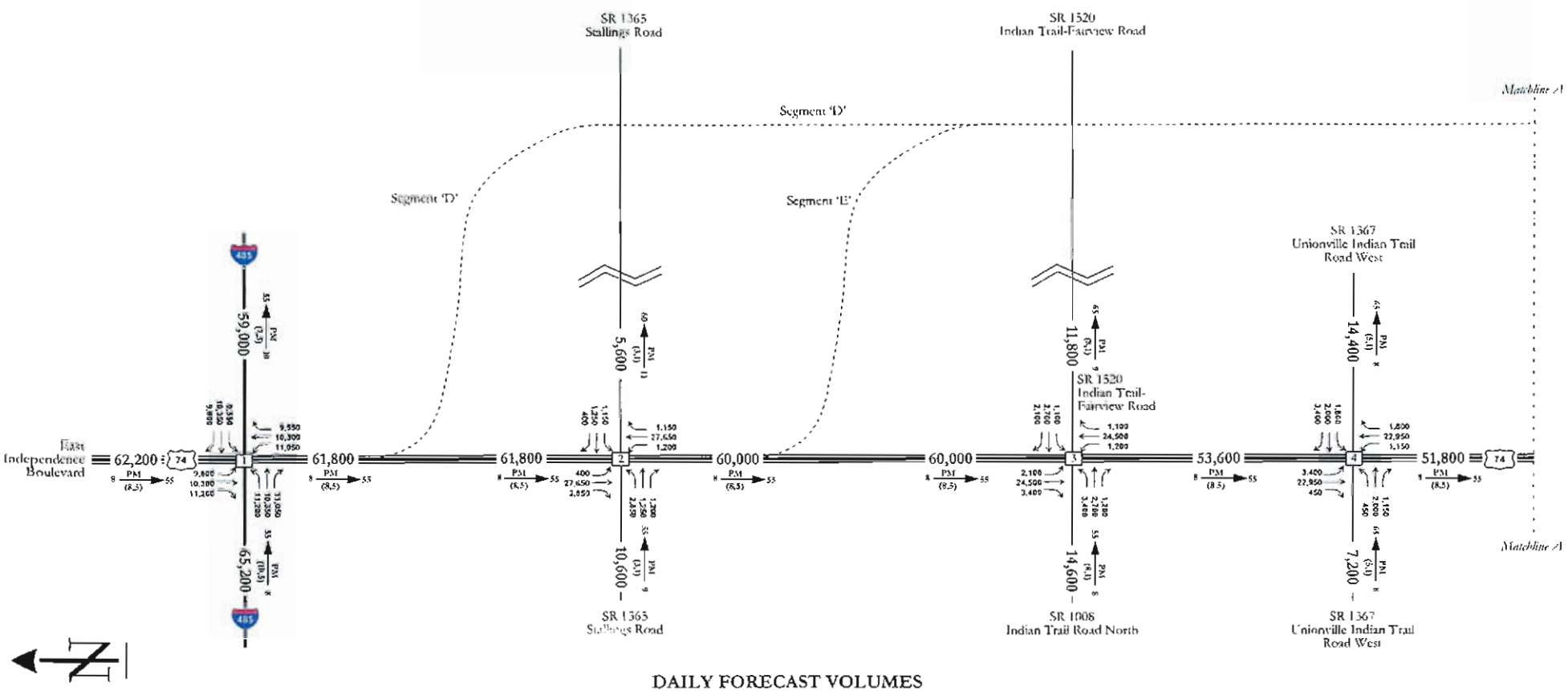
Appendix A
Turning Movement Counts and Traffic Forecasts



DAILY FORECAST VOLUMES

MARTIN ALEXIOU BRYSON
4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
Fax: 919-829-0329
Transportation Planning - Traffic Engineering

PROJECT

TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg County & Union County, North Carolina

DIAGRAM 1a:
BASE YEAR (2007)
NO-BUILD
NON-TOLL
(Alternative 1)

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d,t) DUALS, TT-ST'S (%)

DHV —PM (d, t)→ D

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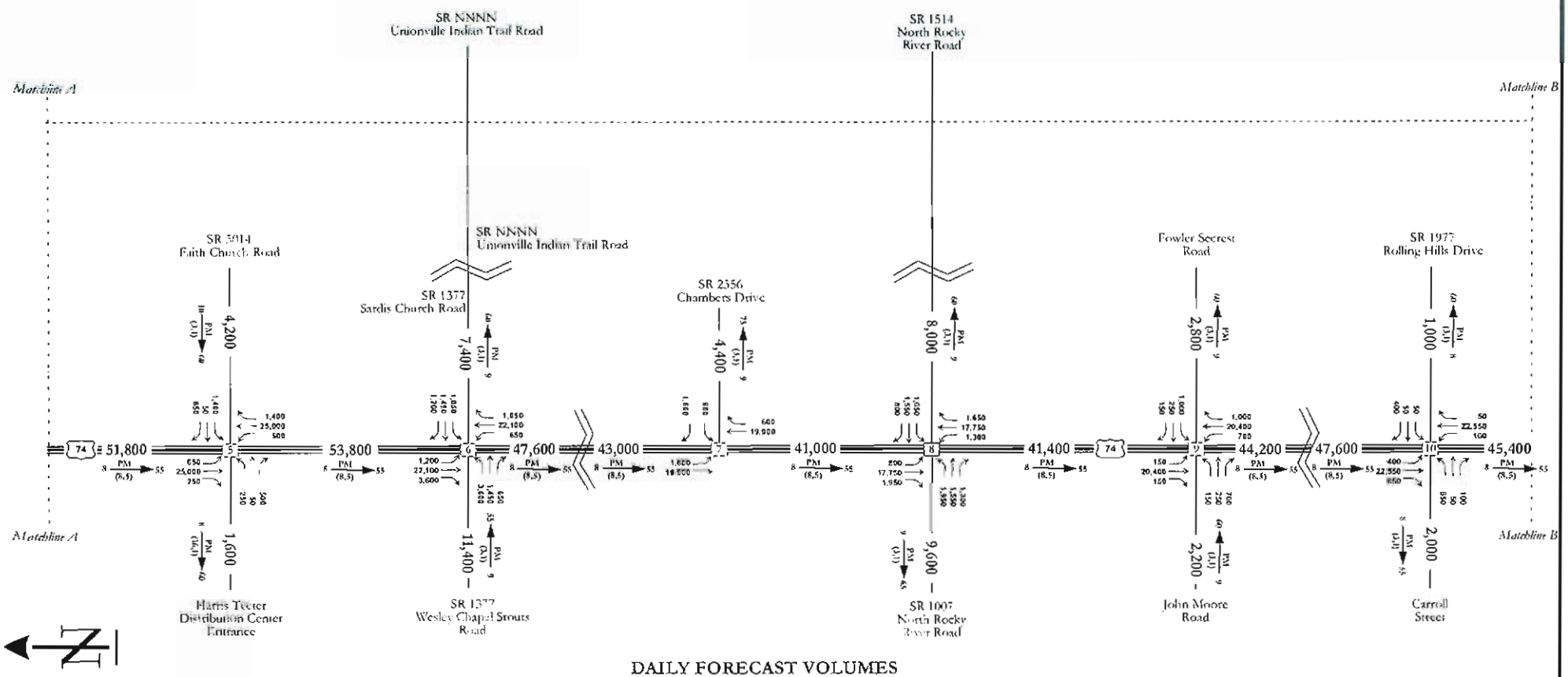

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MARTIN ALEXIOU BRYSON
4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
Fax: 919-829-0329
Transportation Planning - Traffic Engineering

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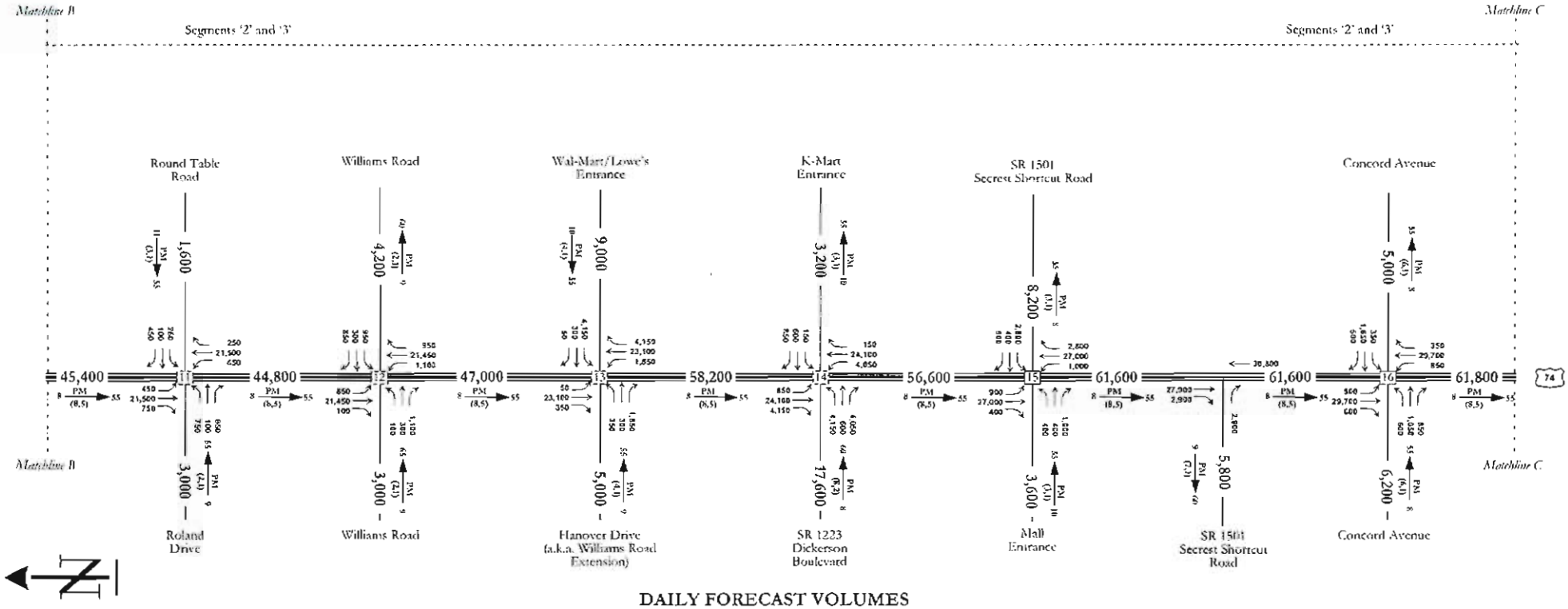
DIAGRAM 1b:
BASE YEAR (2007)
NO-BUILD
NON-TOLL
(Alternative 1)

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d,t) = D.U.M.S. TT-ST'S (%)

DHV —PM (d, t)→ D



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MARTIN ALEXIOU BRYSON

4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
Fax: 919-829-0329

Transportation Planning - Traffic Engineering

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Mecklenburg County & Union County, North Carolina

DIAGRAM 1c:
BASE YEAR (2007)
NO-BUILD
NON-TOLL
(Alternative 1)

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d,t) DUALS, TT ST'S (%)

DHV — PM (d, t) → D

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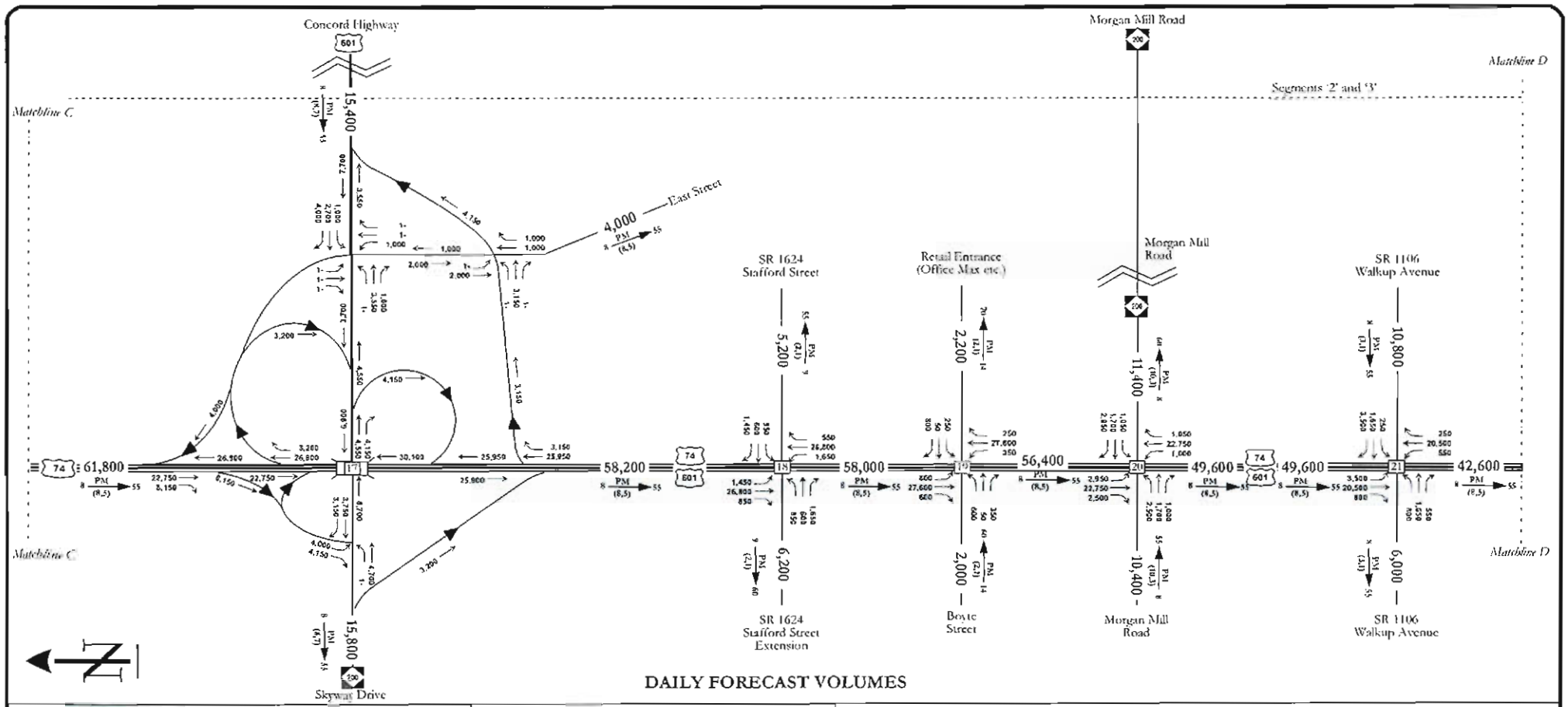

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MARTIN ALEXIOU BRYSON

4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
Fax: 919-829-0329

Transportation Planning - Traffic Engineering

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Mecklenburg County & Union County, North Carolina

DIAGRAM 1d:
BASE YEAR (2007)
NO-BUILD
NON-TOLL
(Alternative 1)

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d,t) DUALS, TRUCKS (%)

DHV — PM (d, t) → D

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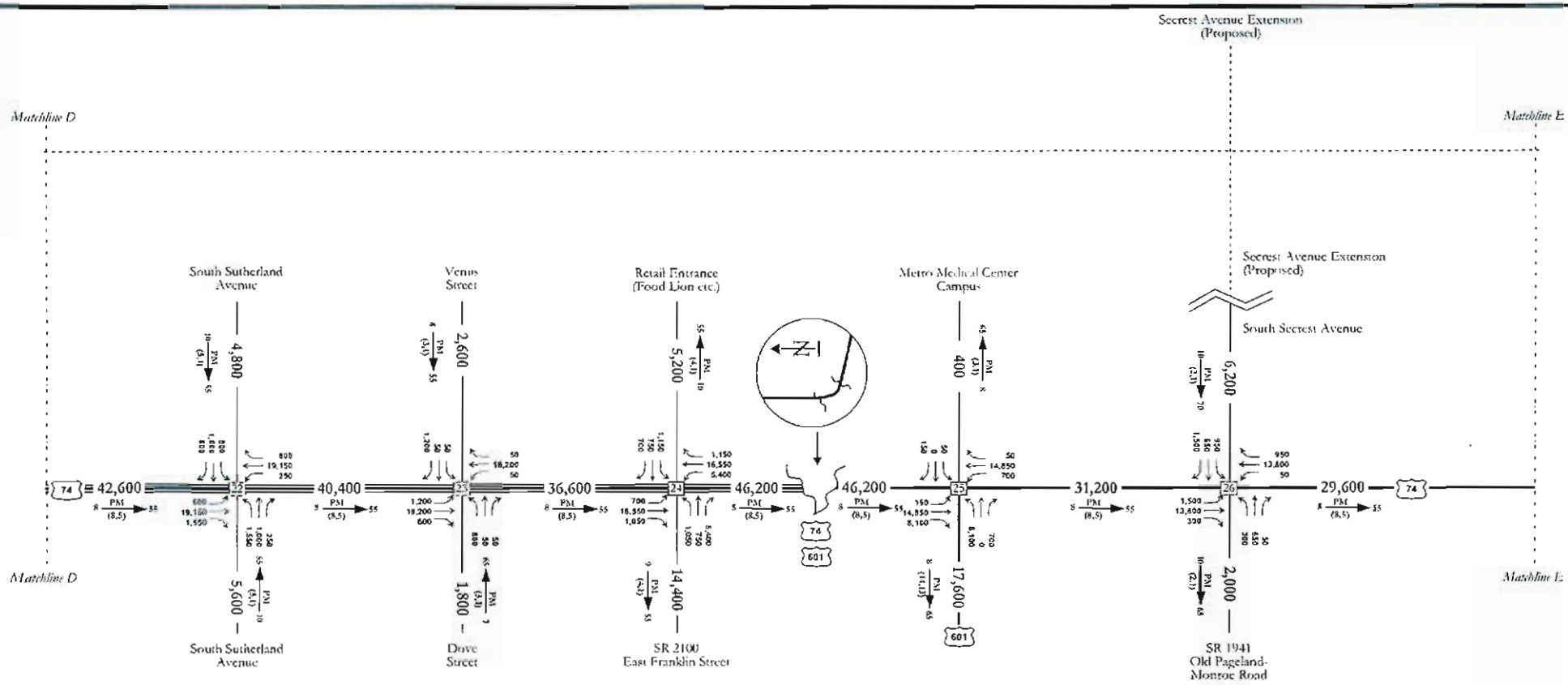

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4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
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Mecklenburg County & Union County, North Carolina

DIAGRAM 1e:
BASE YEAR (2007)
NO-BUILD
NON-TOLL
(Alternative 1)

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D REVERSE FOR AM PEAK
(d, t) DUALS, TT ST'S (%)

DHV — PM (d, t) → D

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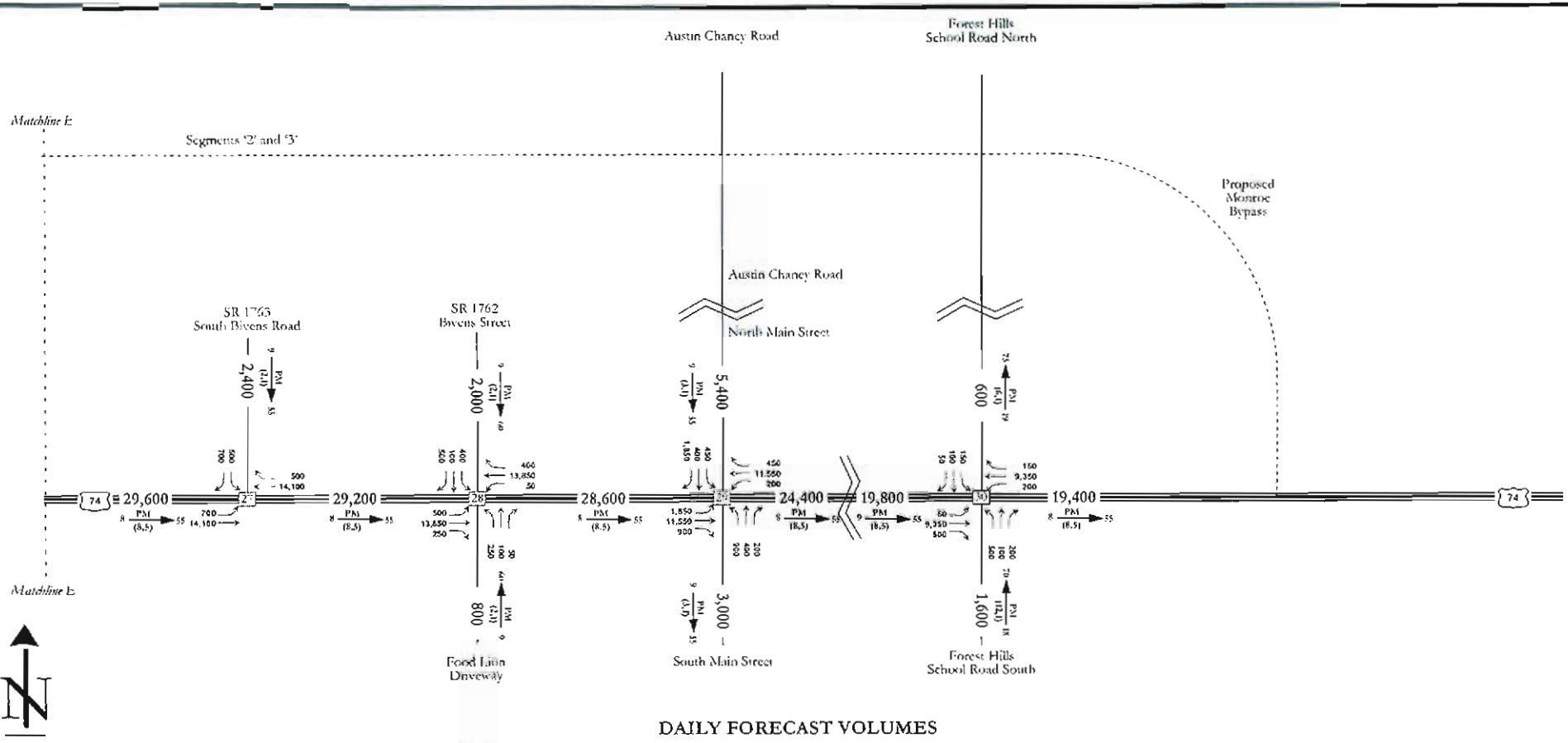

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Raleigh, North Carolina 27607
Phone: 919-829-0328
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NCDOT Division 10
Mecklenburg County & Union County, North Carolina

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d,t) DEALS, TT STS (%)

DHV —PM (d, t)→ D

DIAGRAM 1f:
BASE YEAR (2007)
NO-BUILD
NON-TOLL
(Alternative 1)

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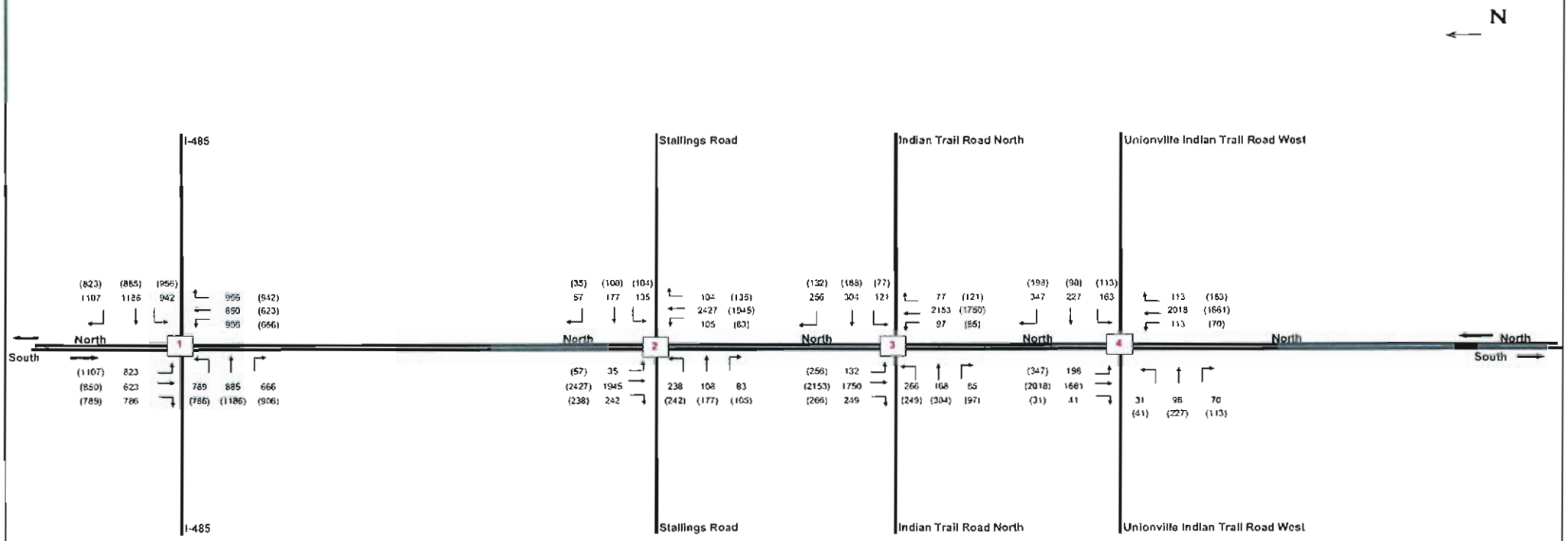

DIAGRAM 2a:
BASE YEAR (2007)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 1)

PROJECT
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Raleigh, North Carolina 27607
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Fax: 919-829-0329
Transportation Planning · Traffic Engineering

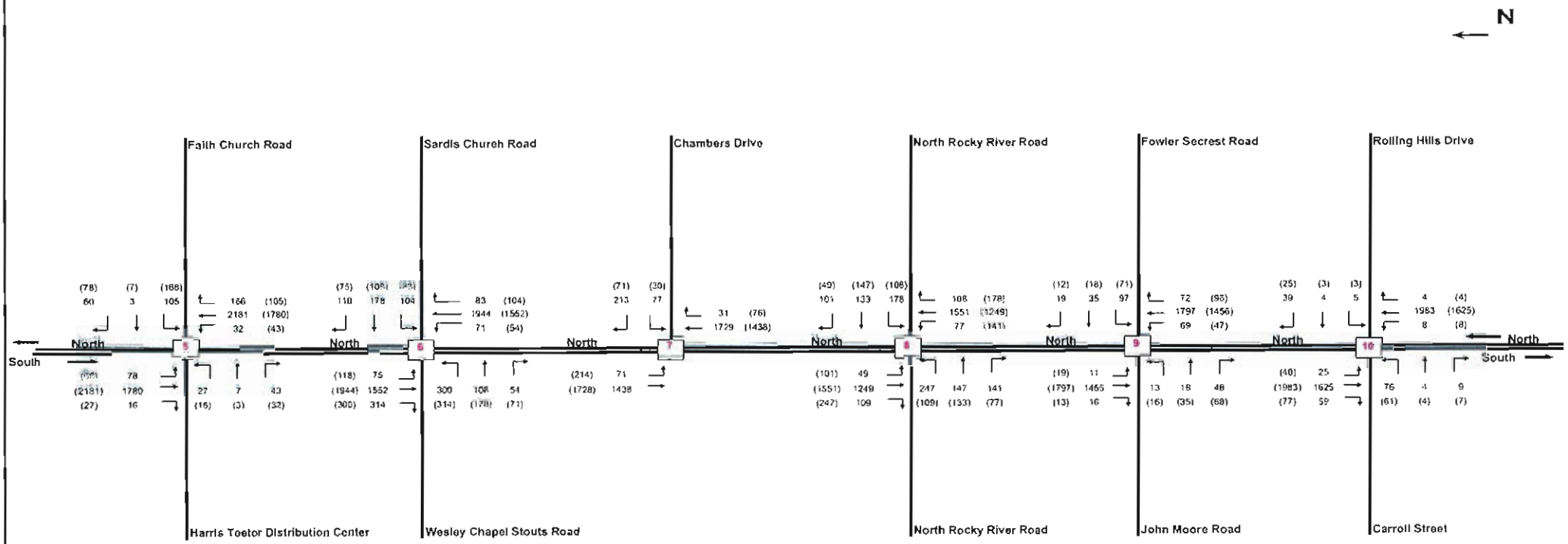

DIAGRAM 2b:
BASE YEAR (2007)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 1)

PROJECT
TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg and Union County, NC

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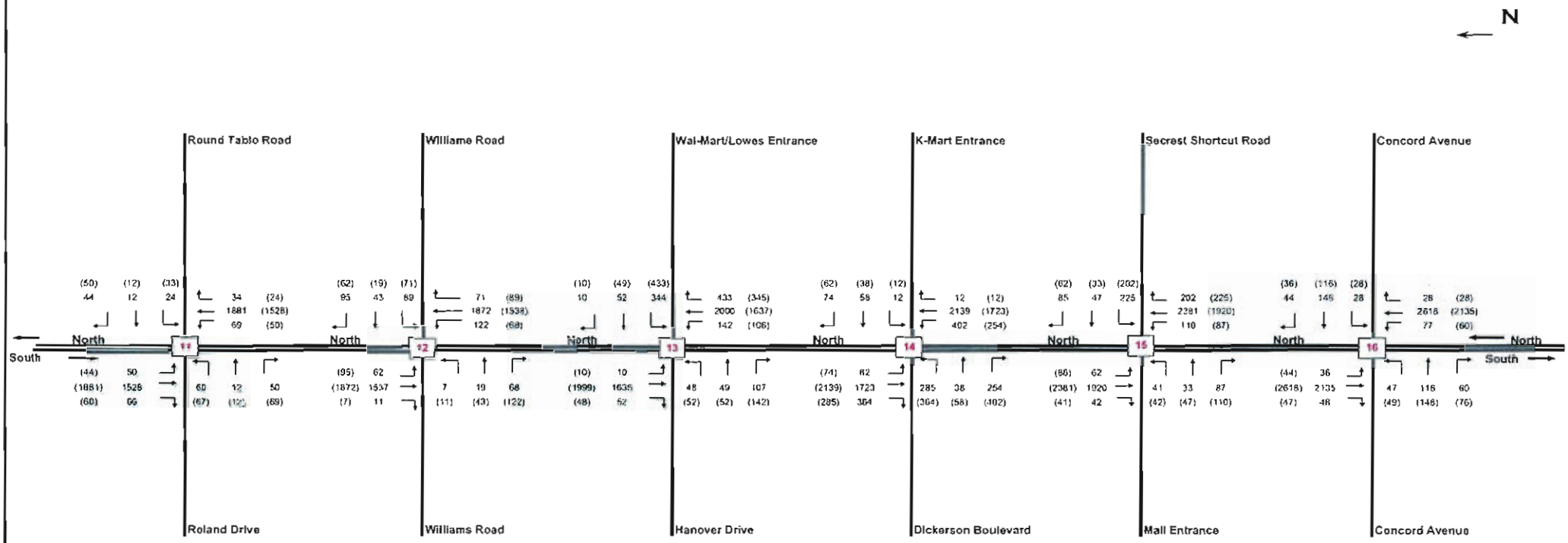

DIAGRAM 2c:
BASE YEAR (2007)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 1)

PROJECT
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Raleigh, North Carolina 27607
Phone: 919 329-0329
Fax: 919 329-9329
Transportation Planning - Traffic Engineering

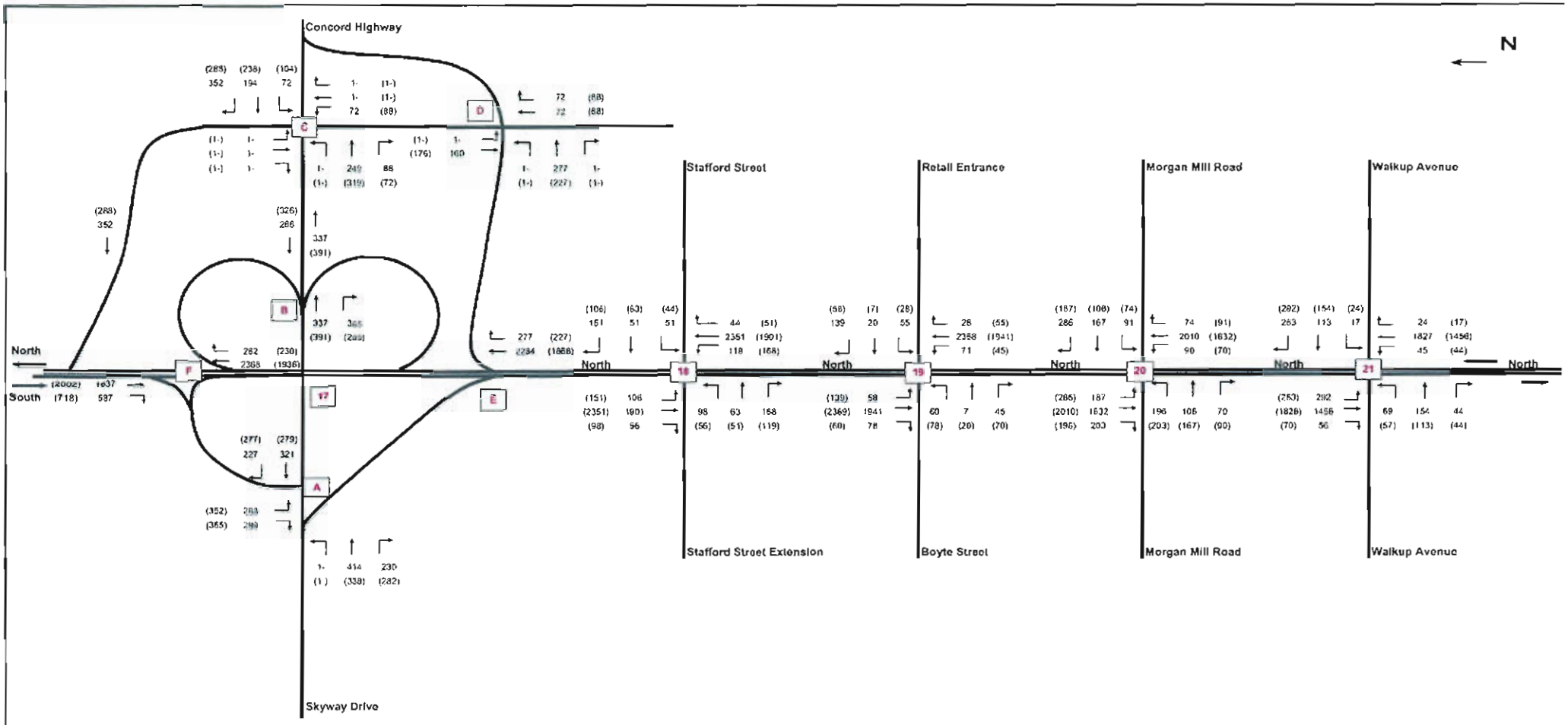

DIAGRAM 2d:
BASE YEAR (2007)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 1)

PROJECT
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Mecklenburg and Union County, NC

MARTIN ALEXIOU BRYSON
4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919.829.0328
Fax: 919.829.9328
Transportation Planning - Traffic Engineering

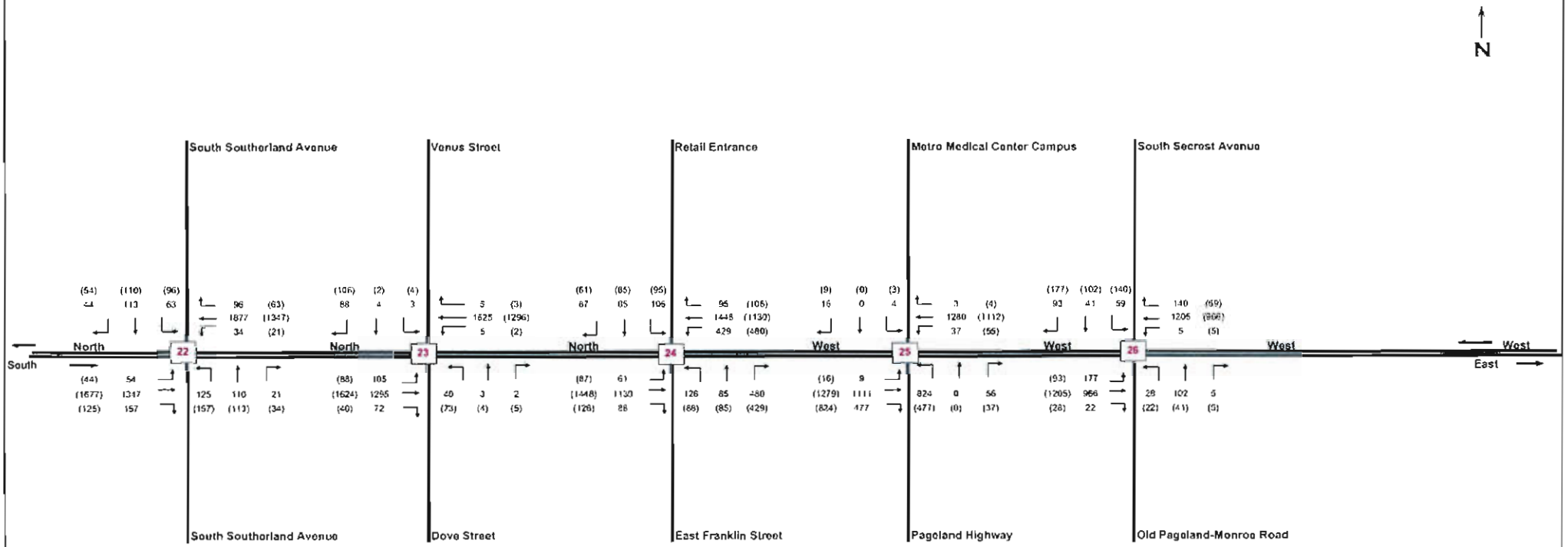

DIAGRAM 2e:
BASE YEAR (2007)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 1)

PROJECT
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Mecklenburg and Union County, NC

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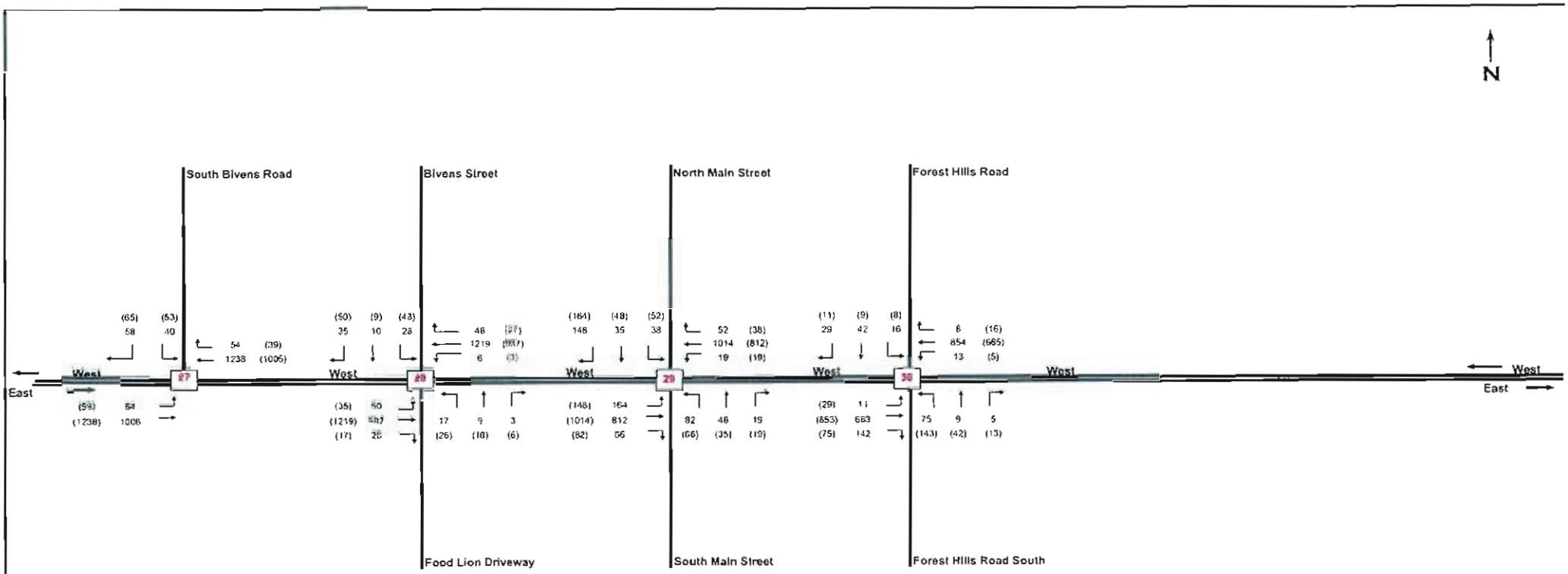

DIAGRAM 2f:
BASE YEAR (2007)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 1)

PROJECT
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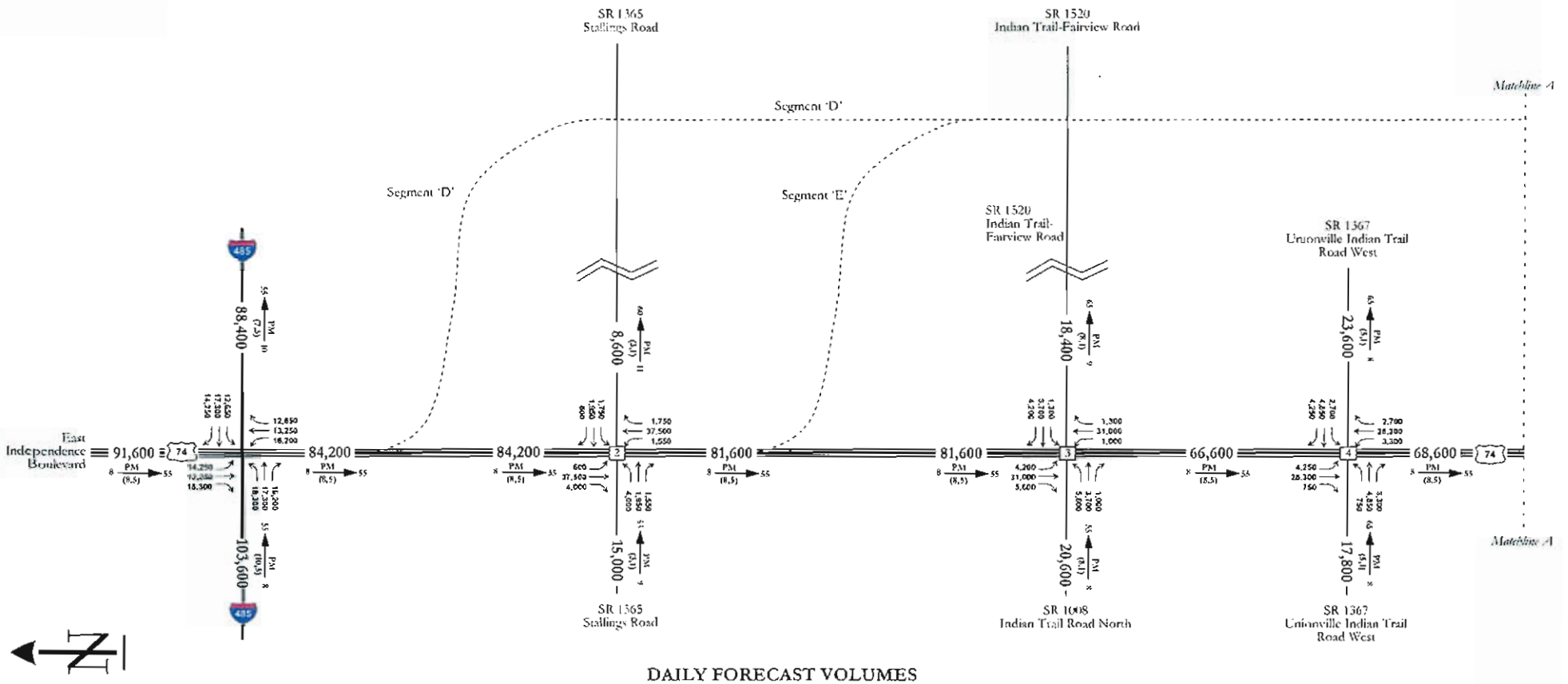

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MARTIN ALEXIOU BRYSON

4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
Fax: 919-829-0329

Transportation Planning - Traffic Engineering

PROJECT

TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg County & Union County,
North Carolina

DIAGRAM 5a:
FUTURE YEAR (2030)
NO-BUILD
NON-TOLL
(Alternative 3)

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d,t) DUALS, TT-ST'S (%)

DHV (d, t) PM → D

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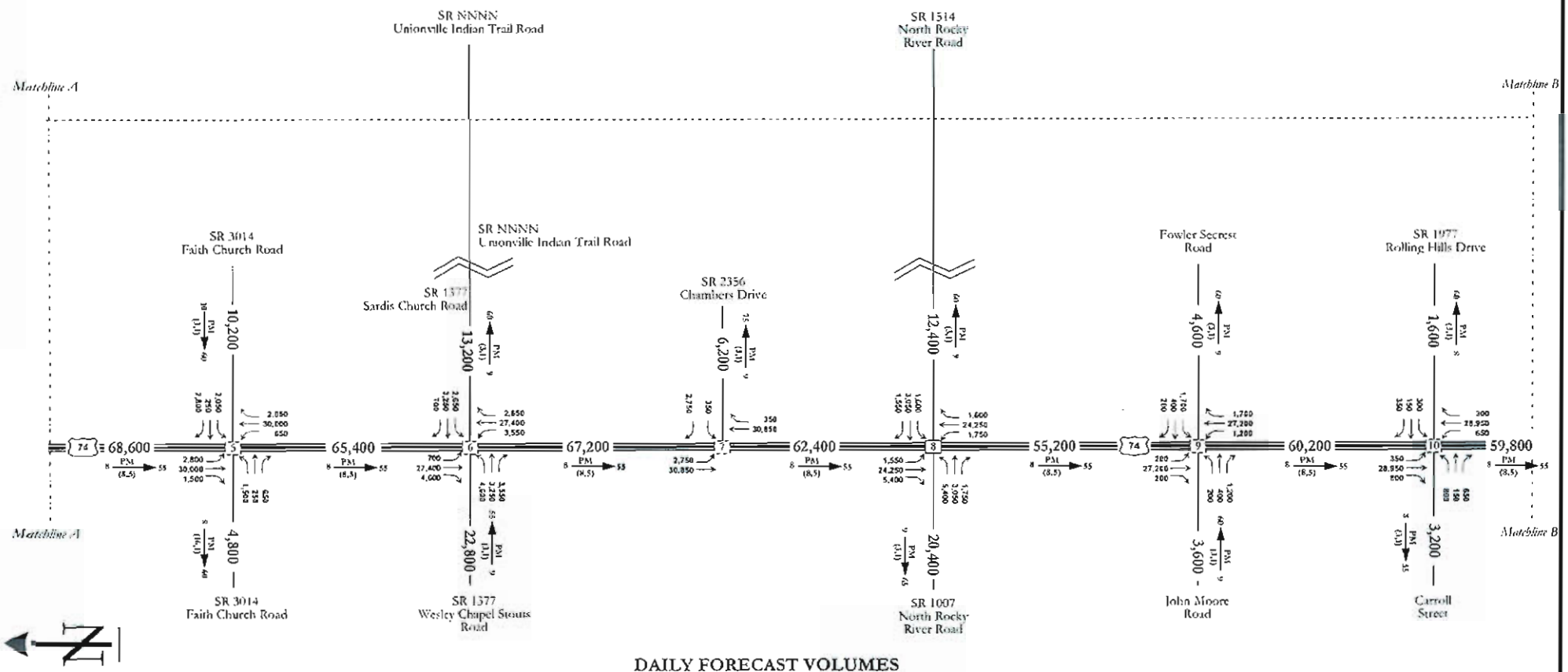

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MARTIN ALEXIOU BRYSON
4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
Fax: 919-829-0329
Transportation Planning - Traffic Engineering

PROJECT

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Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg County & Union County,
North Carolina

DIAGRAM 5b:
FUTURE YEAR (2030)
NO-BUILD
NON-TOLL
(Alternative 3)

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d,t) DUALS, TT-STS (%)

DHV — PM (d, t) — D

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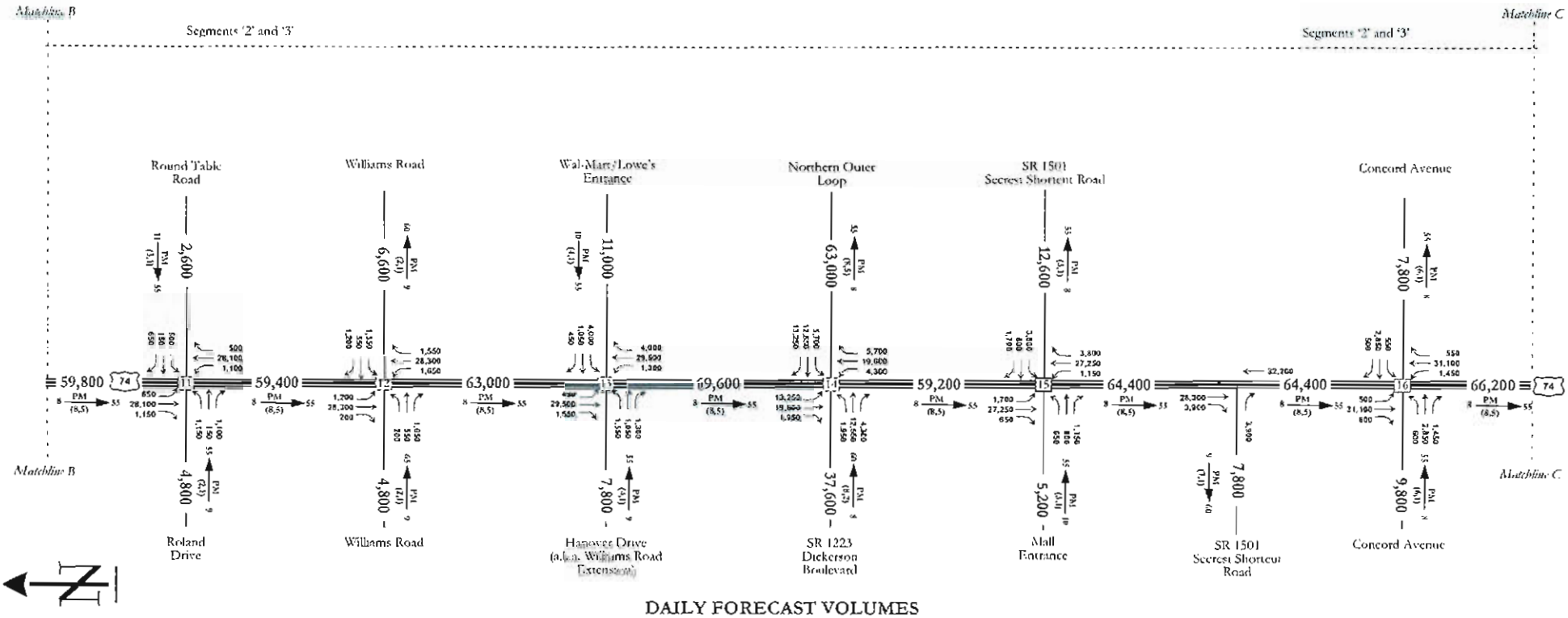

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MARTIN ALEXIOU BRYSON
4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
Fax: 919-829-0329
Transportation Planning - Traffic Engineering

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Mecklenburg County & Union County, North Carolina

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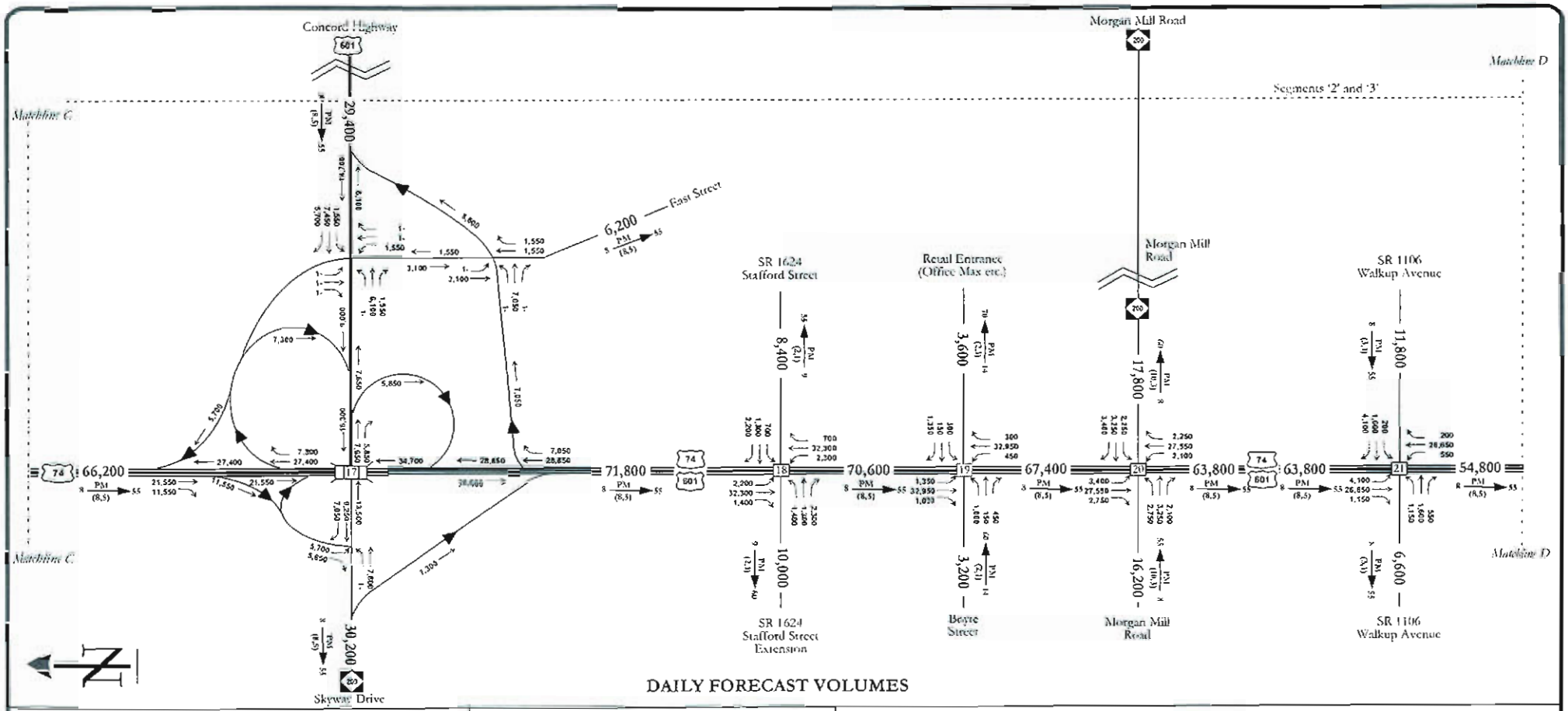
DIAGRAM 5c:
FUTURE YEAR (2030)
NO-BUILD
NON-TOLL
(Alternative 3)

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d,t) DAILY, IT-STS (%)

DHV —PM (d, t)→ D



MARTIN ALEXIOU BRYSON

4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
Fax: 919-829-0329

Transportation Planning · Traffic Engineering

PROJECT

TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg County & Union County, North Carolina

DIAGRAM 5d:
FUTURE YEAR (2030)
NO-BUILD
NON-TOLL
(Alternative 3)

LEGEND

DHV = DESIGN HOURLY VOLUME (K% × K30)
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d, t) = DUALS, TRUCKS (%)

DHV — PM (d, t) — D

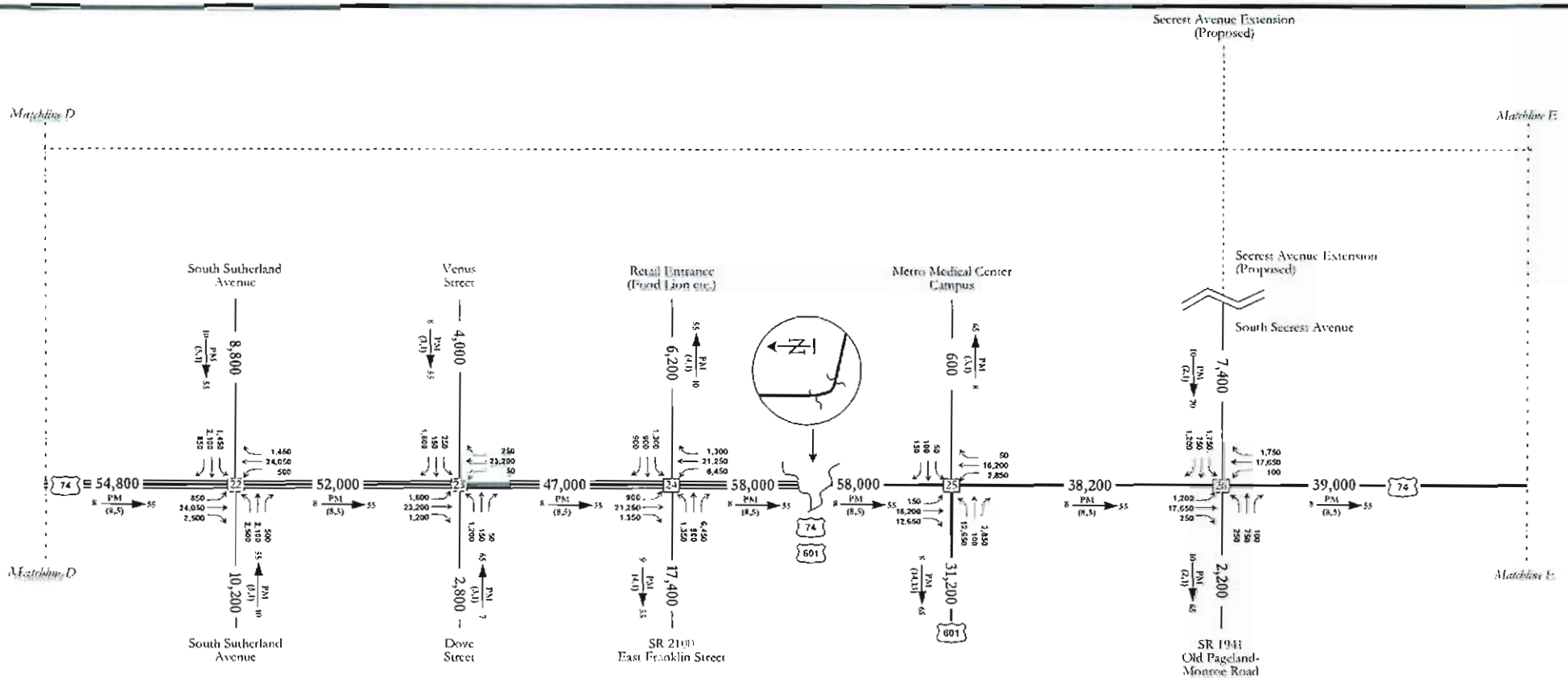
Preliminary Not for Distribution

Not to Scale

NORTH CAROLINA Turnpike Authority

June 1, 2007

Draft



DAILY FORECAST VOLUMES

MARTIN ALEXIOU BRYSON

4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
Fax: 919-829-0329

Transportation Planning - Traffic Engineering

PROJECT

TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg County & Union County, North Carolina

DIAGRAM 5e:
FUTURE YEAR (2030)
NO-BUILD
NON-TOLL
(Alternative 3)

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d,t) = DUALS, TT SUS (%)

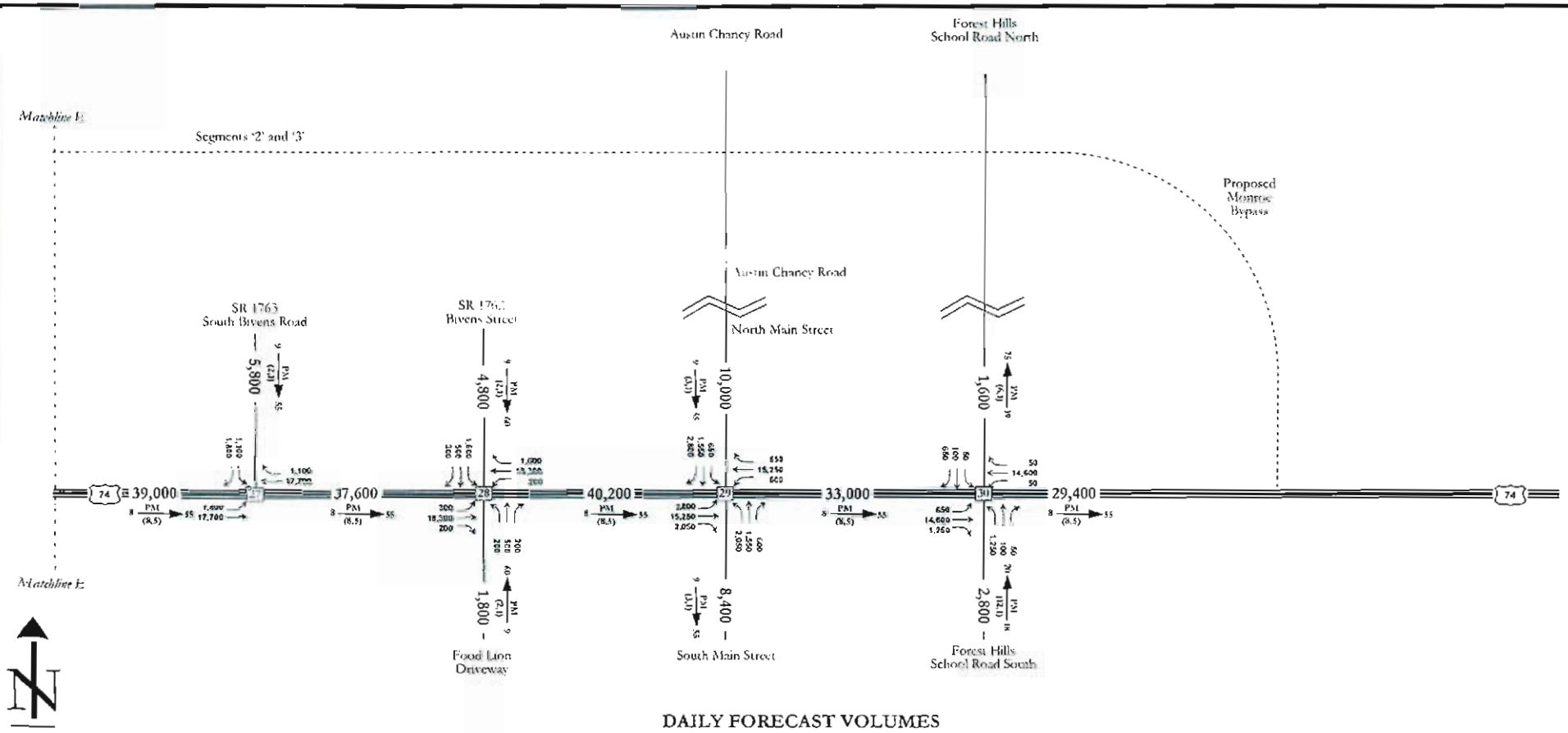
DHV —PM→ D (d, t)

Not to Scale

NORTH CAROLINA Turnpike Authority

June 1, 2007

Draft



DAILY FORECAST VOLUMES

MARTIN ALEXIOU BRYSON

4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-829-0328
Fax: 919-829-0329

Transportation Planning · Traffic Engineering

PROJECT

TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg County & Union County,
North Carolina

DIAGRAM 5f:
FUTURE YEAR (2030)
NO-BUILD
NON-TOLL
(Alternative 3)

LEGEND

DHV = DESIGN HOURLY VOLUME (%) = K30
K30 = 30th HIGHEST HOURLY VOLUME
PM = PM PEAK PERIOD
D = DIRECTIONAL SPLIT (%)
INDICATES DIRECTION OF D
REVERSE FOR AM PEAK
(d,t) DUALS, TT-ST'S (%)

DHV PM (d, t) D

Preliminary Not for Distribution

NORTH CAROLINA Turnpike Authority

Not to Scale

June 1, 2007

Draft

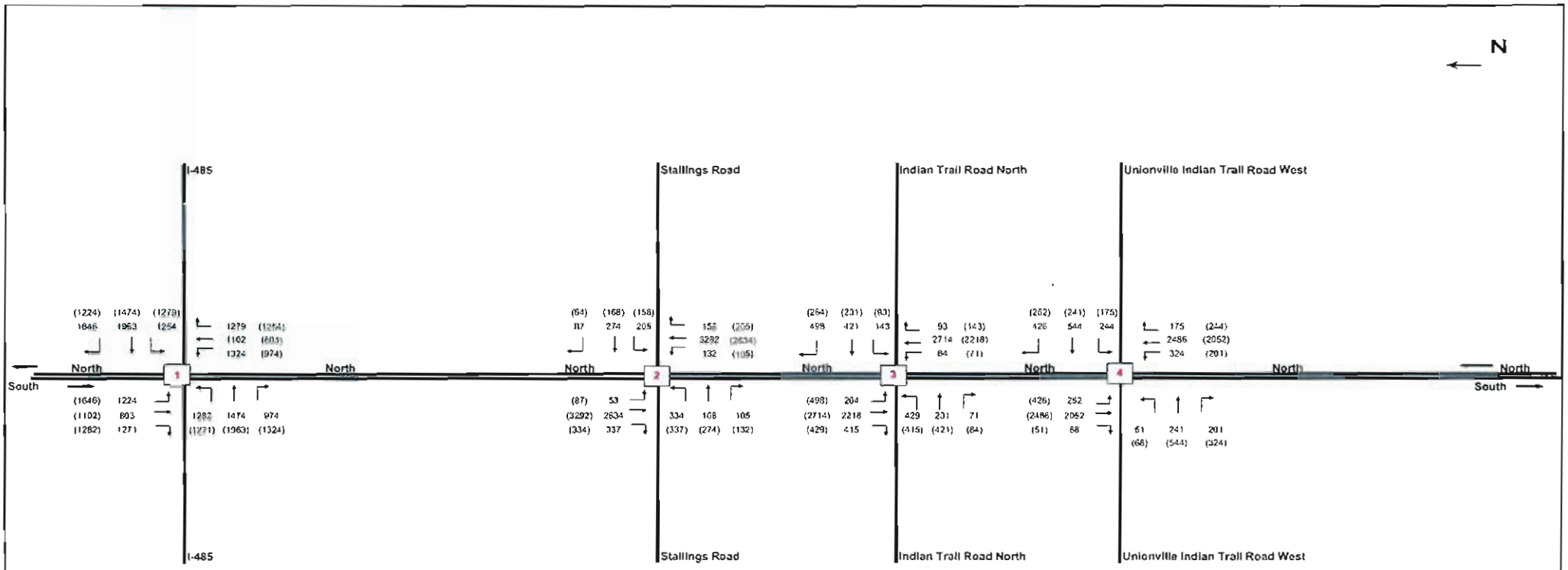


DIAGRAM 6a:
FUTURE YEAR (2030)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 3)

PROJECT
TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg and Union County, NC

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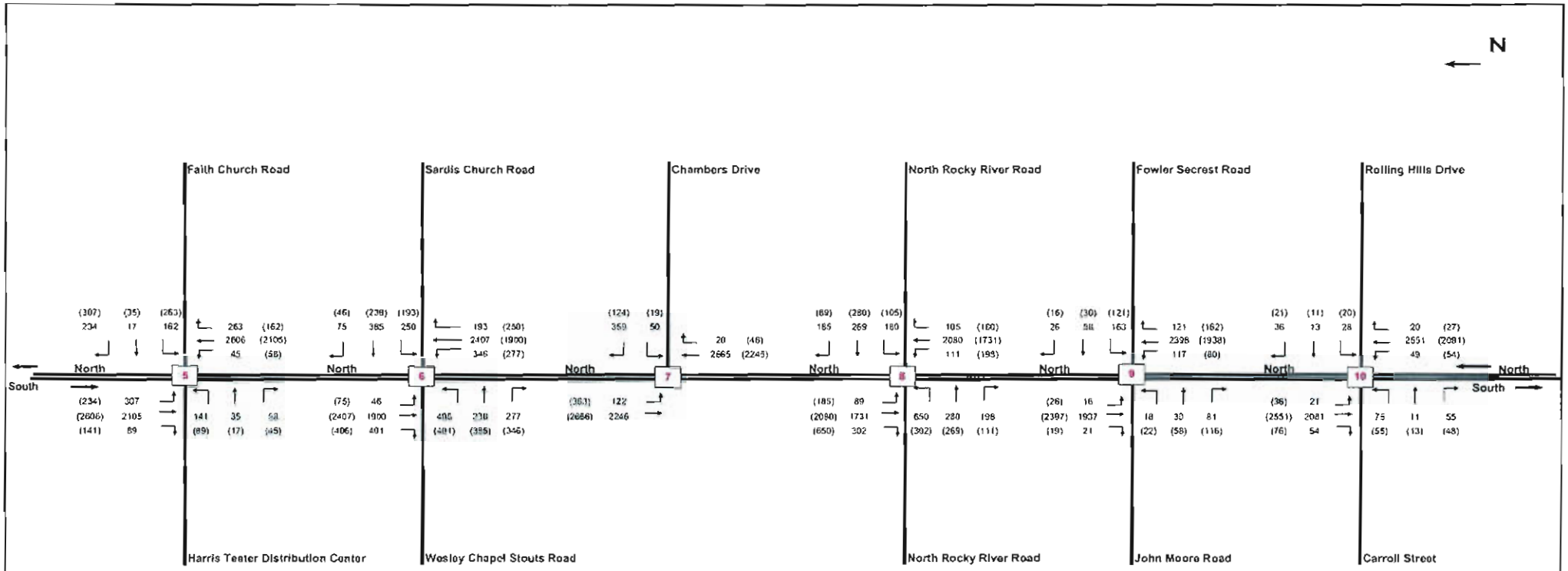

DIAGRAM 6b:
FUTURE YEAR (2030)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 3)

PROJECT
TIP Project No. R-3329 and TIP Project No R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg and Union County, NC

MARTIN ALEXIOU BRYSON
4000 WestChase Boulevard
Suite 530
Raleigh, North Carolina 27607
Phone: 919-828-0306
Fax: 919-828-0329
Transportation Planning · Traffic Engineering

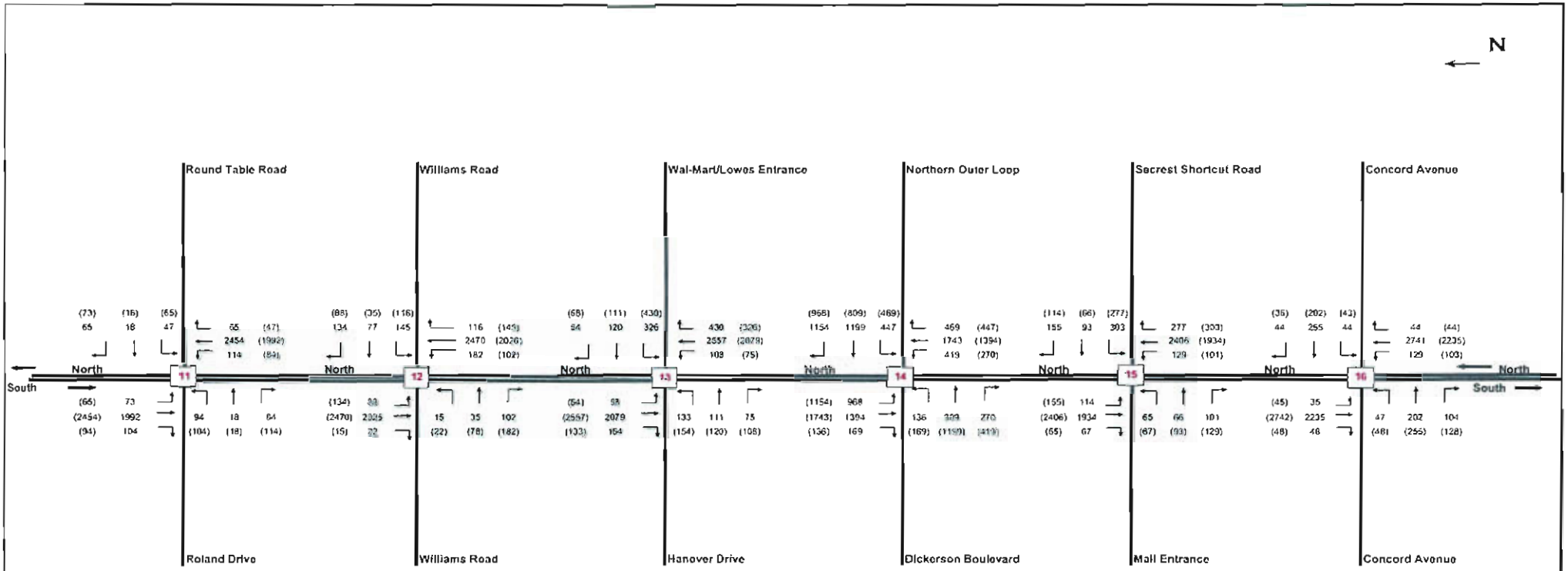

DIAGRAM 6c:
FUTURE YEAR (2030)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 3)

PROJECT
TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg and Union County, NC

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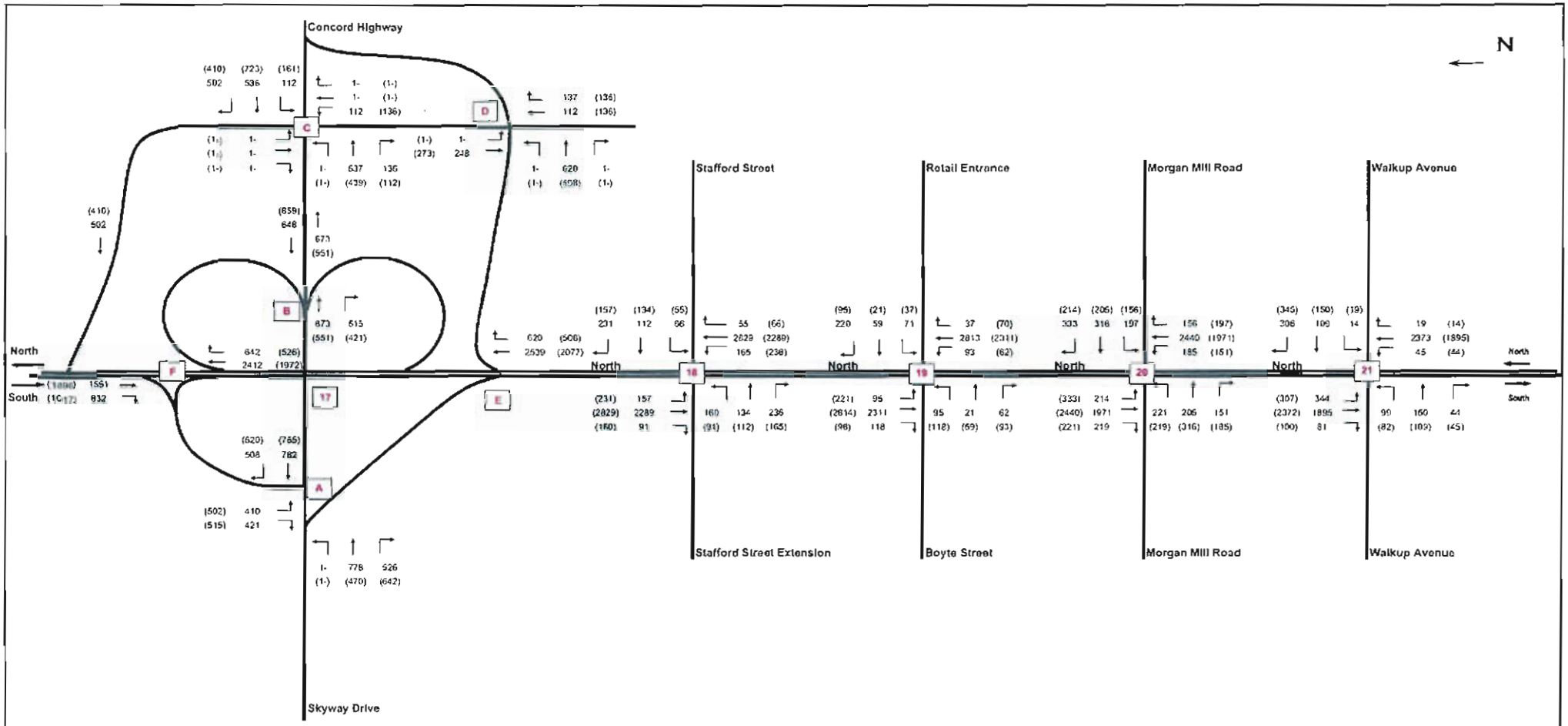

DIAGRAM 6d:
FUTURE YEAR (2030)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 3)

PROJECT
TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg and Union County, NC

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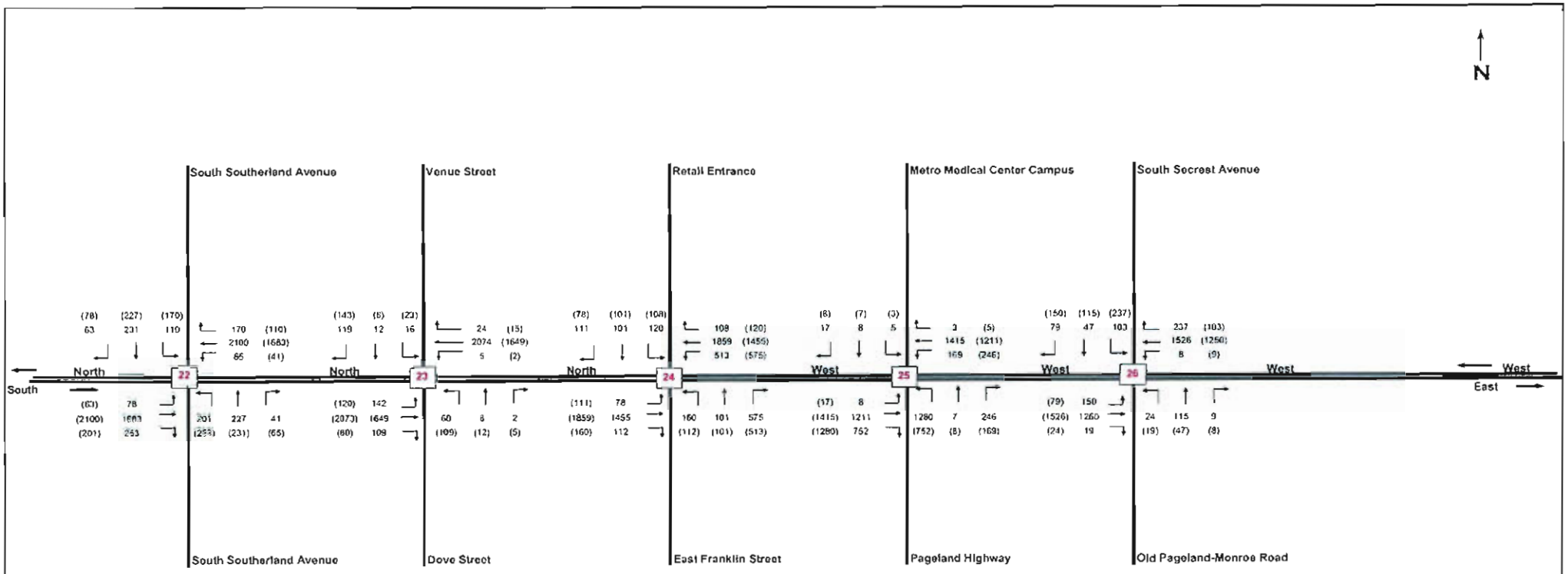


DIAGRAM 6e:
FUTURE YEAR (2030)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 3)

PROJECT
TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg and Union County, NC

MARTIN ALEXIOU BRYSON
Transportation Planning - Traffic Engineering

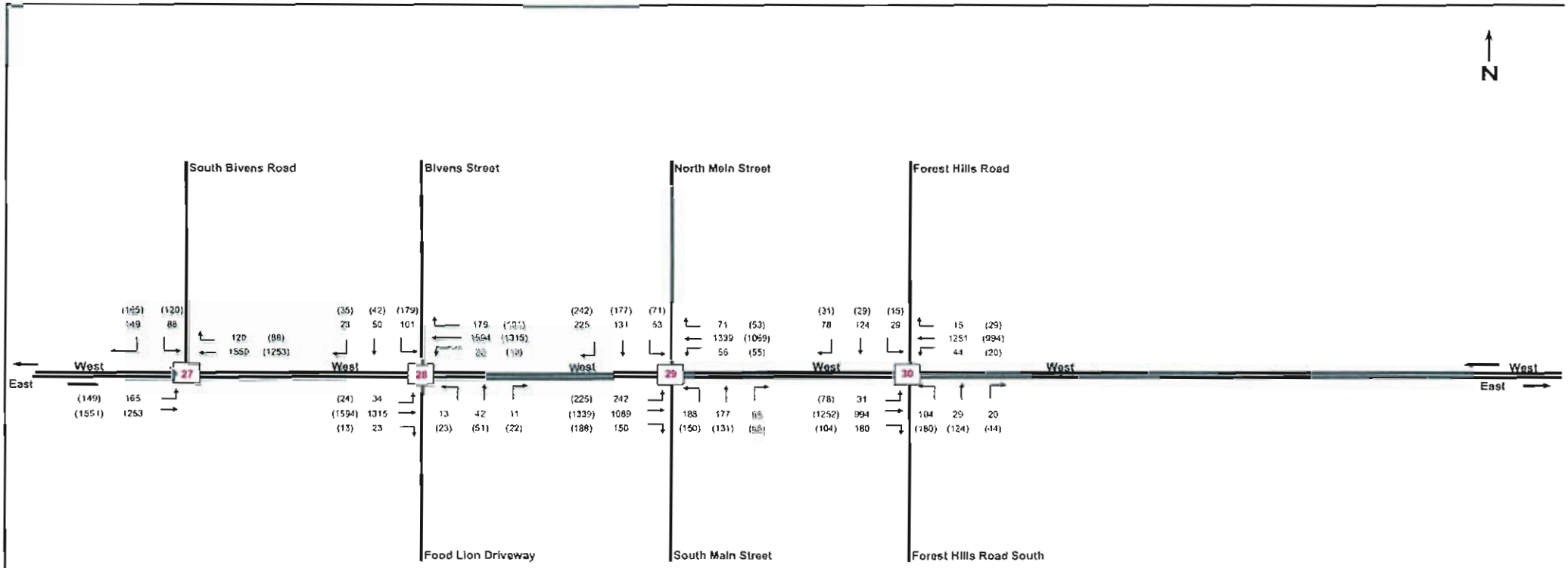


DIAGRAM 6f:
FUTURE YEAR (2030)
NO-BUILD NON-TOLL
HOURLY FORECAST VOLUMES
(Alternative 3)

PROJECT
TIP Project No. R-3329 and TIP Project No. R-2559
Monroe Connector/Bypass Study
NCDOT Division 10
Mecklenburg and Union County, NC

MARTIN ALEXIOU BRYSON
Transportation Planning - Traffic Engineering

Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

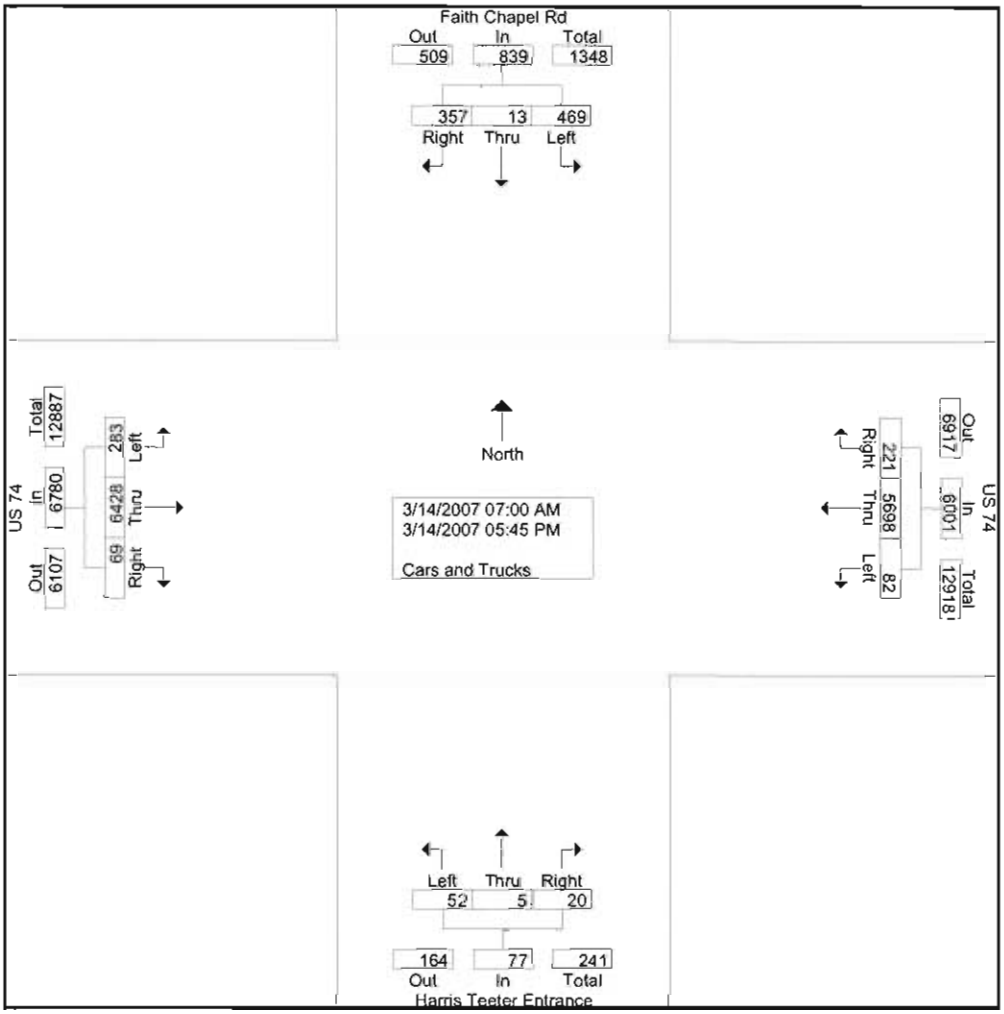
File Name : Faith Church & US 74 5014 Peak
Site Code : 00005014
Start Date : 3/14/2007
Page No : 1

Groups Printed- Cars and Trucks

	Faith Chapel Rd Southbound				US 74 Westbound				Harris Teeter Entrance Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Exclu. Total	Inclu. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	26	1	30	0	9	413	8	29	5	0	0	1	4	289	14	20	50	799	849
07:15 AM	14	1	40	0	4	391	9	29	1	0	4	2	5	312	5	27	58	786	844
07:30 AM	30	3	16	0	5	429	8	29	2	0	0	1	11	319	3	40	70	826	896
07:45 AM	33	1	32	0	4	345	12	15	1	0	1	1	14	422	6	27	43	871	914
Total	103	6	118	0	22	1578	37	102	9	0	5	5	34	1342	28	114	221	3282	3503
08:00 AM	36	0	23	0	7	323	14	17	1	1	1	1	7	399	5	28	46	817	863
08:15 AM	10	0	16	0	1	381	7	24	1	0	2	1	8	357	5	22	47	788	835
08:30 AM	22	1	20	1	1	302	8	19	5	0	2	3	11	307	3	31	54	682	736
08:45 AM	21	0	20	0	3	299	12	22	4	0	2	3	11	317	6	26	51	695	746
Total	89	1	79	1	12	1305	41	82	11	1	7	8	37	1380	19	107	198	2982	3180
04:00 PM	21	3	18	0	6	345	15	17	6	0	1	0	26	414	2	14	31	857	888
04:15 PM	27	0	21	0	10	350	17	27	7	1	3	2	21	431	4	17	46	892	938
04:30 PM	23	2	16	0	8	341	15	28	7	0	0	1	20	447	4	18	47	883	930
04:45 PM	31	0	18	1	3	359	24	28	6	1	1	1	27	492	3	18	48	965	1013
Total	102	5	73	1	27	1395	71	100	26	2	5	4	94	1784	13	67	172	3597	3769
05:00 PM	33	0	22	0	3	295	22	17	1	0	0	0	25	463	3	15	32	867	899
05:15 PM	56	1	28	4	4	398	23	27	2	0	2	0	24	486	2	20	51	1026	1077
05:30 PM	37	0	24	0	5	371	12	27	2	2	1	1	27	461	1	8	36	943	979
05:45 PM	49	0	13	0	9	356	15	15	1	0	0	0	42	512	3	20	35	1000	1035
Total	175	1	87	4	21	1420	72	86	6	2	3	1	118	1922	9	63	154	3836	3990
Grand Total	469	13	357	6	82	5698	221	370	52	5	20	18	283	6428	69	351	745	13697	14442
Apprch %	55.9	1.5	42.6		1.4	95	3.7		67.5	6.5	26		4.2	94.8	1				
Total %	3.4	0.1	2.6		0.6	41.6	1.6		0.4	0	0.1		2.1	46.9	0.5		5.2	94.8	

Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

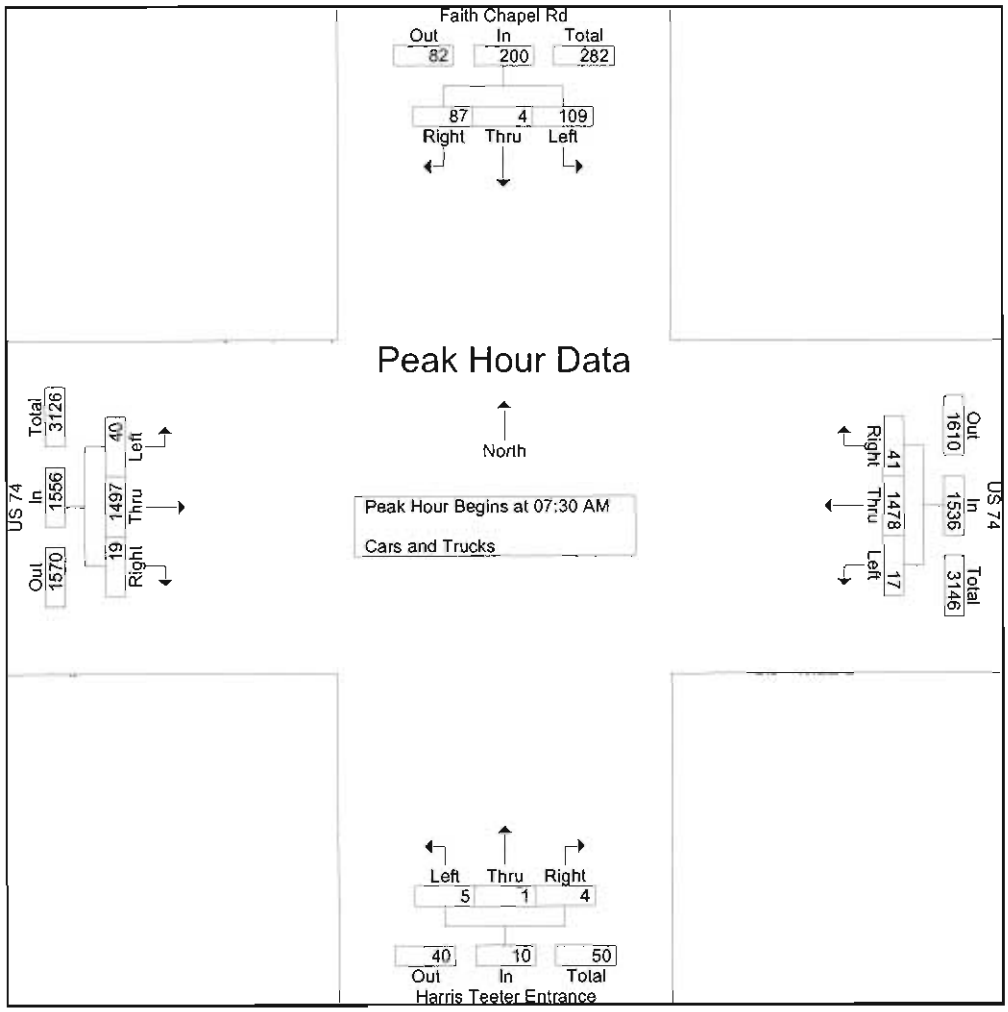
File Name : Faith Church & US 74 5014 Peak
Site Code : 00005014
Start Date : 3/14/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Faith Church & US 74 5014 Peak
Site Code : 00005014
Start Date : 3/14/2007

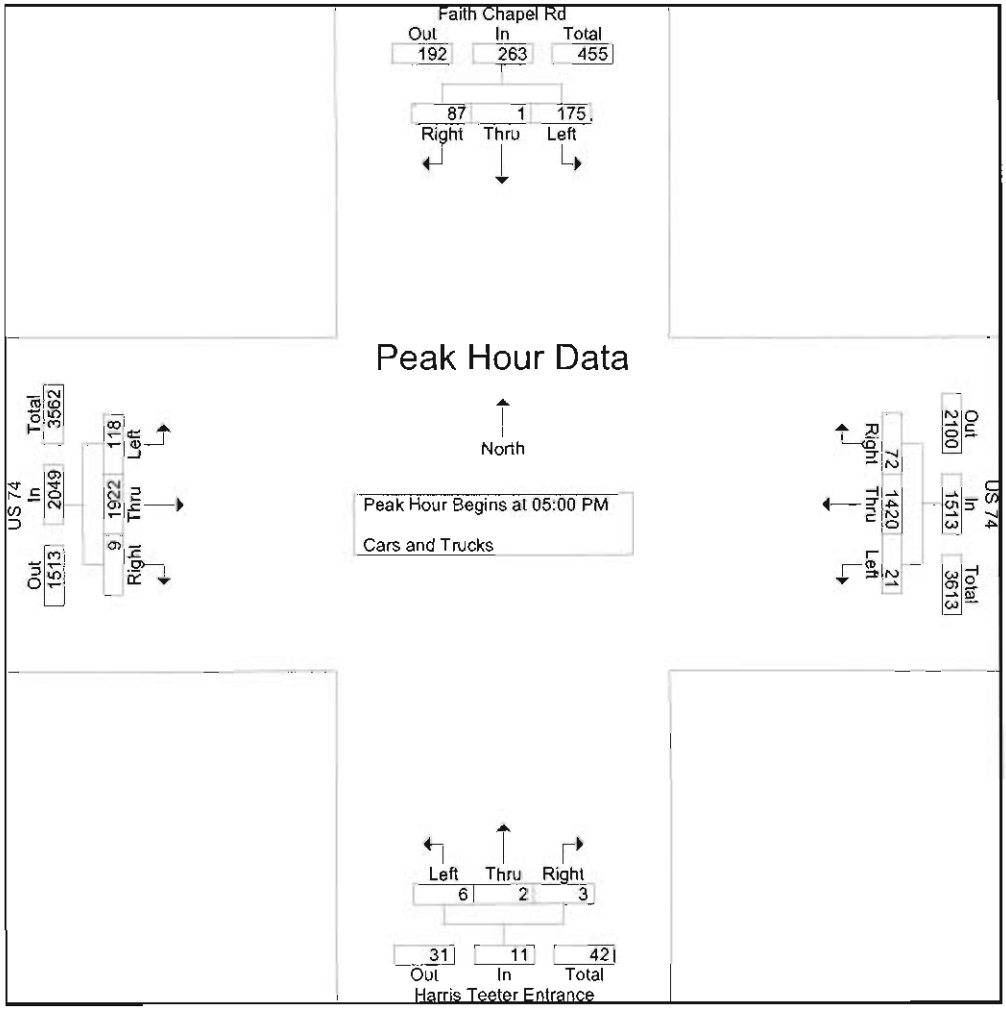
	Faith Chapel Rd From North				US 74 From East				Harris Teeter Entrance From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	16	3	30	49	8	429	5	442	0	0	2	2	3	319	11	333	826
07:45 AM	32	1	33	66	12	345	4	361	1	0	1	2	6	422	14	442	871
08:00 AM	23	0	36	59	14	323	7	344	1	1	1	3	5	399	7	411	817
08:15 AM	16	0	10	26	7	381	1	389	2	0	1	3	5	357	8	370	788
Total Volume	87	4	109	200	41	1478	17	1536	4	1	5	10	19	1497	40	1556	3302
% App. Total	43.5	2	54.5		2.7	96.2	1.1		40	10	50		1.2	96.2	2.6		
PHF	.680	.333	.757	.758	.732	.861	.607	.869	.500	.250	.625	.833	.792	.887	.714	.880	.948



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Faith Church & US 74 5014 Peak
Site Code : 00005014
Start Date : 3/14/2007

	Faith Chapel Rd From North				US 74 From East				Harris Teeter Entrance From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	22	0	33	55	22	295	3	320	0	0	1	1	3	463	25	491	867
05:15 PM	28	1	56	85	23	398	4	425	2	0	2	4	2	486	24	512	1026
05:30 PM	24	0	37	61	12	371	5	388	1	2	2	5	1	461	27	489	943
05:45 PM	13	0	49	62	15	356	9	380	0	0	1	1	3	512	42	557	1000
Total Volume	87	1	175	263	72	1420	21	1513	3	2	6	11	9	1922	118	2049	3836
% App. Total	33.1	0.4	66.5		4.8	93.9	1.4		27.3	18.2	54.5		0.4	93.8	5.8		
PHF	.777	.250	.781	.774	.783	.892	.583	.890	.375	.250	.750	.550	.750	.938	.702	.920	.935

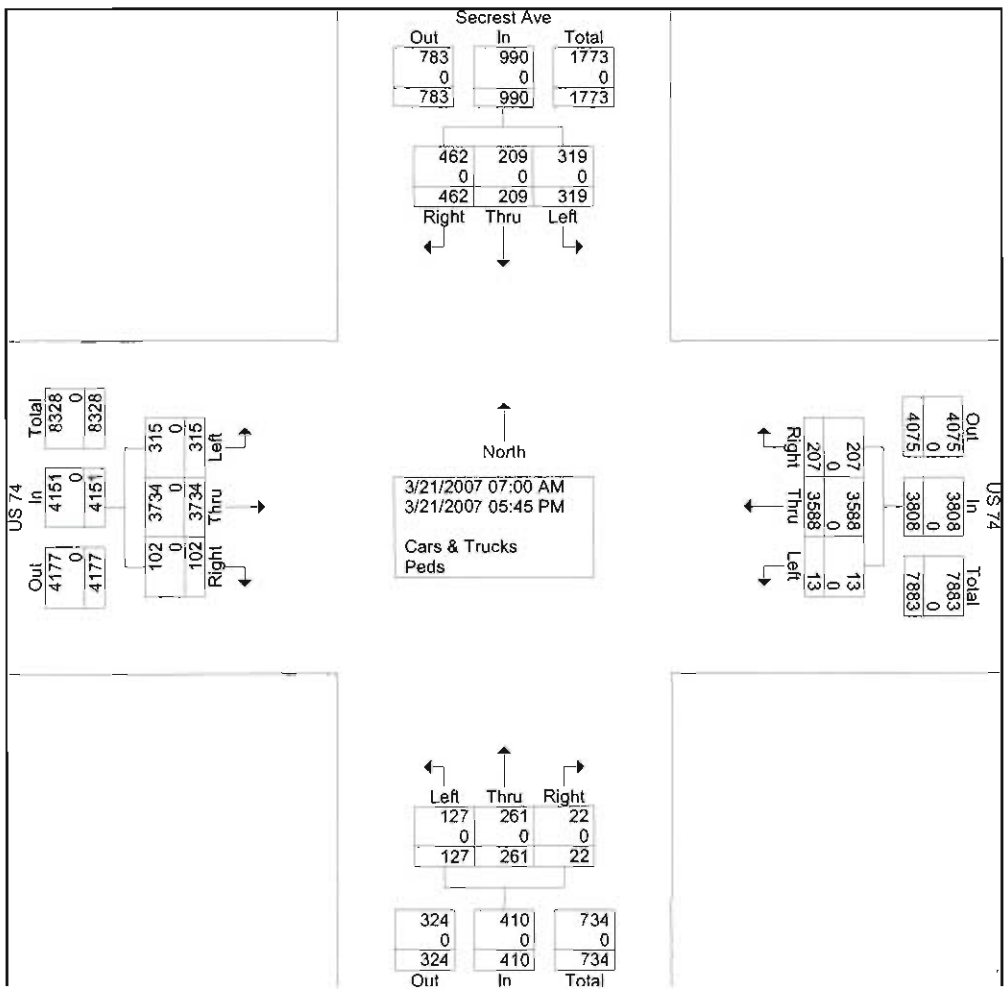


Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328, Fax: 919-829-0329

File Name : Secrest Old Pagland & US 74 5037 peak
Site Code : 00005037
Start Date : 3/21/2007

Groups Printed- Cars & Trucks - Peds

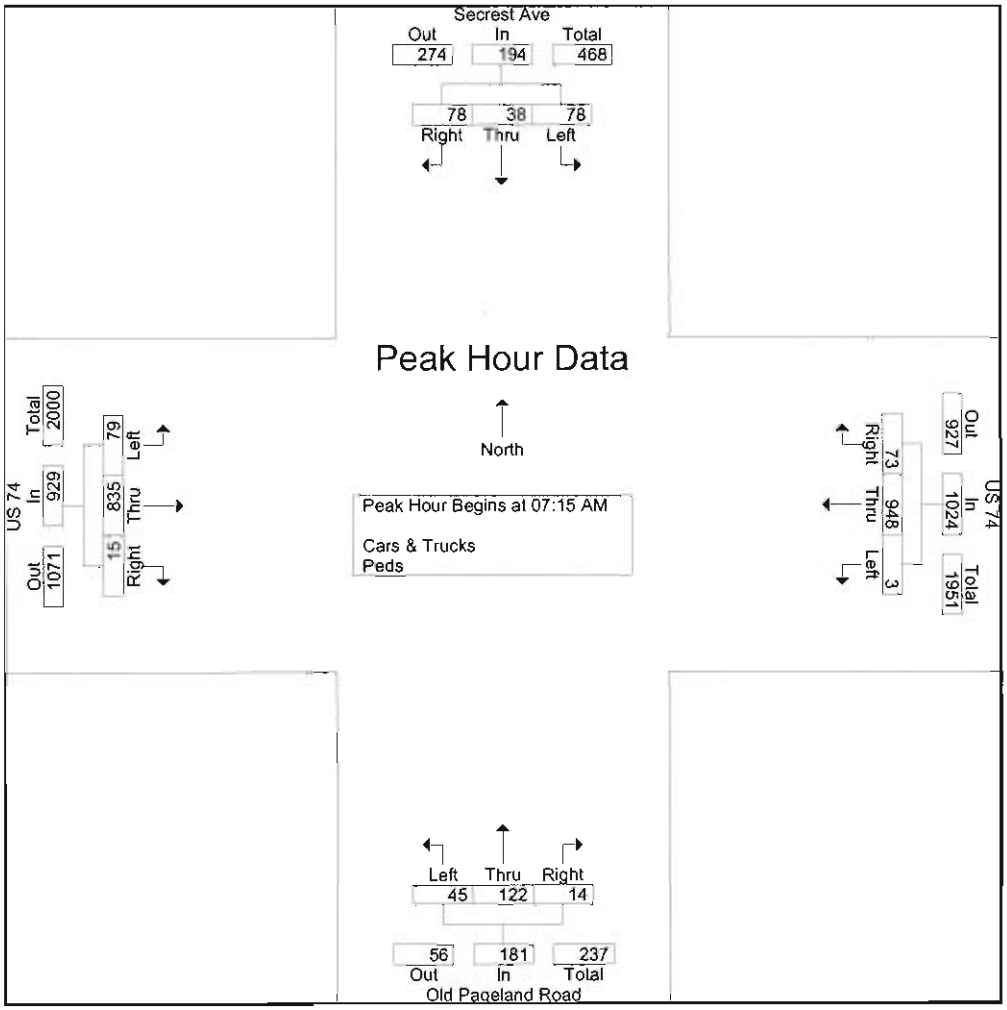
	Secrest Ave From North					US 74 From East					Old Pageland Road From South					US 74 From West							
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	18	14	13	1	45	20	211	1	10	232	2	36	6	1	44	9	156	33	18	198	90	519	549
07:15 AM	38	12	31	6	81	14	175	1	6	196	3	45	14	1	62	2	186	37	17	225	90	558	588
07:30 AM	11	10	17	1	38	18	226	1	17	245	4	28	15	0	47	7	205	17	27	229	45	559	604
07:45 AM	14	9	17	4	40	17	298	1	16	316	2	25	6	0	33	1	246	14	29	261	49	650	699
Total	81	45	78	12	204	69	910	4	49	983	11	134	41	2	186	19	793	101	91	913	154	2286	2440
08:00 AM	15	7	13	11	35	24	249	0	20	273	5	24	10	0	39	5	198	11	13	214	44	561	605
08:15 AM	11	3	15	2	29	11	235	0	6	246	0	18	8	1	26	8	206	8	27	222	36	523	559
08:30 AM	18	7	11	5	36	11	201	0	16	212	0	12	7	0	19	5	172	11	20	188	41	455	496
08:45 AM	12	2	11	5	25	9	175	0	16	184	0	7	6	0	13	5	203	14	17	222	38	444	482
Total	56	19	50	23	125	55	860	0	58	915	5	61	31	1	97	23	779	44	77	846	159	1983	2142
*** BREAK ***																							
04:00 PM	29	22	24	8	75	14	221	0	19	235	1	21	9	1	31	7	248	27	22	282	50	623	673
04:15 PM	39	25	23	6	87	9	255	2	18	266	0	13	8	1	21	5	243	39	12	287	37	661	698
04:30 PM	63	24	24	4	111	6	247	1	14	254	3	10	9	0	22	11	254	29	18	294	36	681	717
04:45 PM	65	22	23	7	110	11	272	1	9	284	1	5	3	1	9	7	269	23	15	299	31	702	733
Total	196	93	94	25	383	40	995	4	59	1039	5	49	29	3	83	30	1014	118	67	1162	154	2667	2821
05:00 PM	59	23	36	8	118	7	210	1	6	218	1	5	4	0	10	6	290	21	18	317	32	663	695
05:15 PM	30	12	29	6	71	10	228	0	16	238	0	3	11	0	14	3	309	8	8	320	30	643	673
05:30 PM	16	11	15	6	42	15	173	3	10	191	0	4	6	0	10	16	298	13	14	327	30	570	600
05:45 PM	24	6	17	9	47	11	212	1	11	224	0	5	5	0	10	5	251	10	11	266	31	547	578
Total	129	52	97	29	278	43	823	5	43	871	1	17	26	0	44	30	1148	52	51	1230	123	2423	2546
Grand Total	462	209	319	89	990	207	3588	13	209	3808	22	261	127	6	410	102	3734	315	286	4151	590	9359	9949
Apprch %	48.7	21.1	32.2			5.4	94.2	0.3			5.4	63.7	31			2.5	90	7.6					
Total %	4.9	2.2	3.4		10.6	2.2	38.3	0.1		40.7	0.2	2.8	1.4		4.4	1.1	39.9	3.4		44.4	5.9	94.1	
Cars & Trucks % Cars & Trucks	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0	0	100
Peds	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328, Fax: 919-829-0329

File Name : Secrest Old Pagland & US 74 5037 peak
Site Code : 00005037
Start Date : 3/21/2007

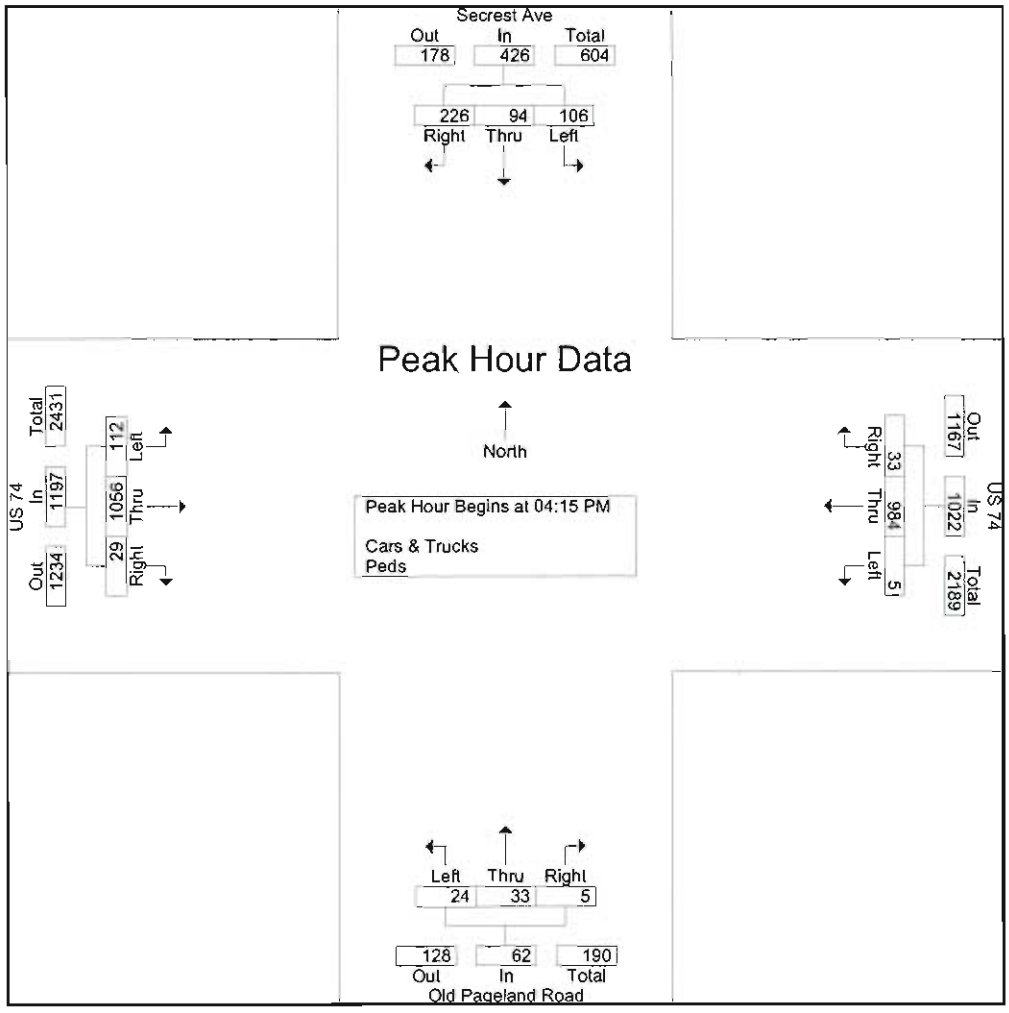
	Secrest Ave From North				US 74 From East				Old Pageland Road From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**38**	**12**	**31**	**81**	14	175	**1**	190	3	**45**	14	**62**	2	186	37	225	558
07:30 AM	11	10	17	38	18	226	1	245	4	28	**15**	47	7	205	17	229	559
07:45 AM	14	9	17	40	17	**298**	1	**316**	2	25	6	33	1	**246**	14	**261**	**650**
08:00 AM	15	7	13	35	**24**	249	0	273	**5**	24	10	39	5	198	11	214	561
Total Volume	78	38	78	194	73	948	3	1024	14	122	45	181	15	835	79	929	2328
% App. Total	40.2	19.6	40.2		7.1	92.6	0.3		7.7	67.4	24.9		1.6	89.9	8.5		
PHF	.513	.792	.629	.599	.760	.795	.750	.810	.700	.678	.750	.730	.536	.849	.534	.890	.895



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328, Fax: 919-829-0329

File Name : Secrest Old Pagland & US 74 5037 peak
Site Code : 00005037
Start Date : 3/21/2007
Page No : 3

	Secrest Ave From North				US 74 From East				Old Pageland Road From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	39	**25**	23	87	9	255	**2**	266	0	**13**	8	21	5	243	**39**	287	661
04:30 PM	63	24	24	111	6	247	1	254	**3**	10	**9**	**22**	**11**	254	29	294	681
04:45 PM	**65**	22	23	110	**11**	**272**	1	**284**	1	5	3	9	7	269	23	299	**702**
05:00 PM	59	23	**36**	**118**	7	210	1	218	1	5	4	10	6	**290**	21	**317**	663
Total Volume	226	94	106	426	33	984	5	1022	5	33	24	62	29	1056	112	1197	2707
% App. Total	53.1	22.1	24.9		3.2	96.3	0.5		8.1	53.2	38.7		2.4	88.2	9.4		
PHF	.869	.940	.736	.903	.750	.904	.625	.900	.417	.635	.667	.705	.659	.910	.718	.944	.964



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

File Name : Sutherland Ave & US 74 5033 peak
Site Code : 5033
Start Date : 3/14/2007
Page No : 1

Groups Printed- Cars & Trucks

	Sutherland Ave Southbound				US 74 Westbound				Sutherland Ave Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	18	16	1	0	6	278	12	26	21	29	5	0	4	183	41	29	55	614	669
07:15 AM	15	25	6	1	7	292	19	16	30	21	0	0	4	260	34	31	48	713	761
07:30 AM	13	21	9	0	11	273	13	20	29	24	5	1	2	225	46	31	52	671	723
07:45 AM	12	31	3	1	12	369	20	30	20	34	4	2	4	263	62	28	61	834	895
Total	58	93	19	2	36	1212	64	92	100	108	14	3	14	931	183	119	216	2832	3048
08:00 AM	22	24	8	4	23	319	12	26	24	37	5	5	4	230	62	30	65	770	835
08:15 AM	16	27	2	3	14	292	7	33	31	34	6	2	3	231	52	33	71	715	786
08:30 AM	12	22	4	2	18	259	7	22	9	17	9	1	6	197	27	28	53	587	640
08:45 AM	3	10	7	7	9	268	8	25	27	7	6	1	2	246	36	23	56	629	685
Total	53	83	21	16	64	1138	34	106	91	95	26	9	15	904	177	114	245	2701	2946
*** BREAK ***																			
04:00 PM	19	28	4	1	9	284	4	29	52	33	12	2	9	311	41	26	58	806	864
04:15 PM	25	29	8	0	6	368	12	36	41	35	8	2	21	273	18	18	56	844	900
04:30 PM	21	26	8	2	8	357	8	30	33	32	7	1	6	303	50	19	52	859	911
04:45 PM	21	32	8	0	12	344	9	32	50	28	14	1	4	291	40	23	56	853	909
Total	86	115	28	3	35	1353	33	127	176	128	41	6	40	1178	149	86	222	3362	3584
05:00 PM	21	27	7	0	21	326	18	37	37	29	13	2	9	387	35	20	59	930	989
05:15 PM	21	31	19	0	8	298	16	20	48	36	8	0	13	363	25	16	36	886	922
05:30 PM	26	22	2	1	12	323	22	26	40	30	8	1	12	379	23	17	45	899	944
05:45 PM	19	22	3	0	7	294	14	17	35	37	11	0	18	289	44	14	31	793	824
Total	87	102	31	1	48	1241	70	100	160	132	40	3	52	1418	127	67	171	3508	3679
Grand Total	284	393	99	22	183	4944	201	425	527	463	121	21	121	4431	636	386	854	12403	13257
Apprch %	36.6	50.6	12.8		3.4	92.8	3.8		47.4	41.7	10.9		2.3	85.4	12.3				
Total %	2.3	3.2	0.8		1.5	39.9	1.6		4.2	3.7	1		1	35.7	5.1		6.4	93.6	

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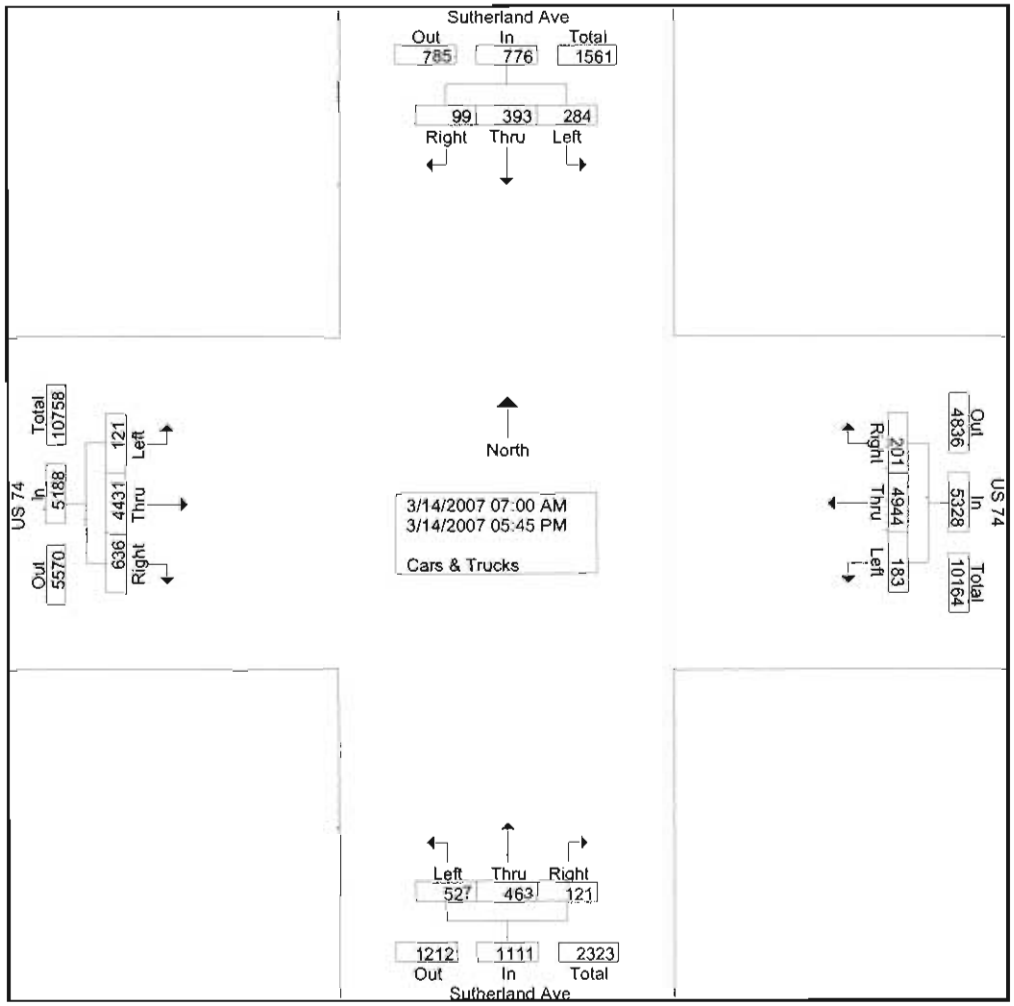
919-858-1855

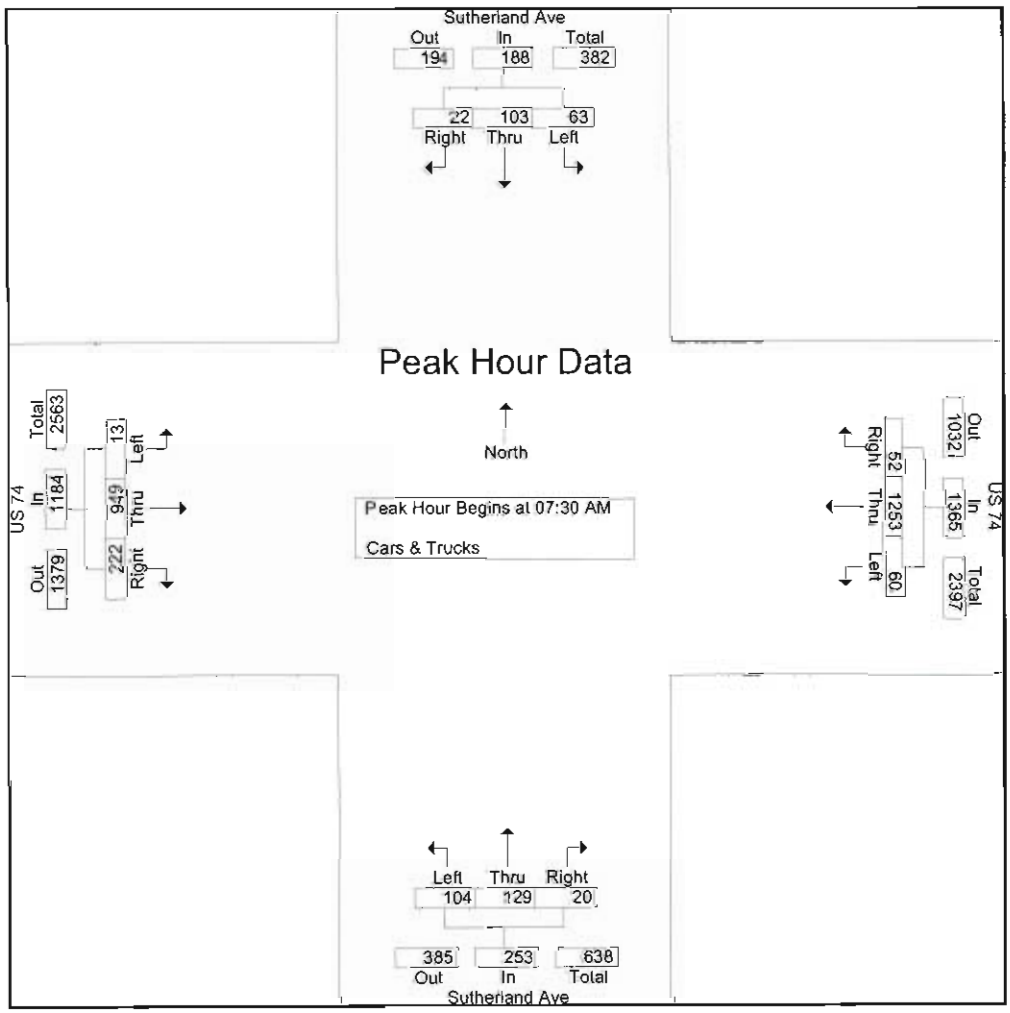
File Name : Sutherland Ave & US 74 5033 peak
Site Code : 5033
Start Date : 3/14/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Sutherland Ave & US 74 5033 peak
Site Code : 5033
Start Date : 3/14/2007

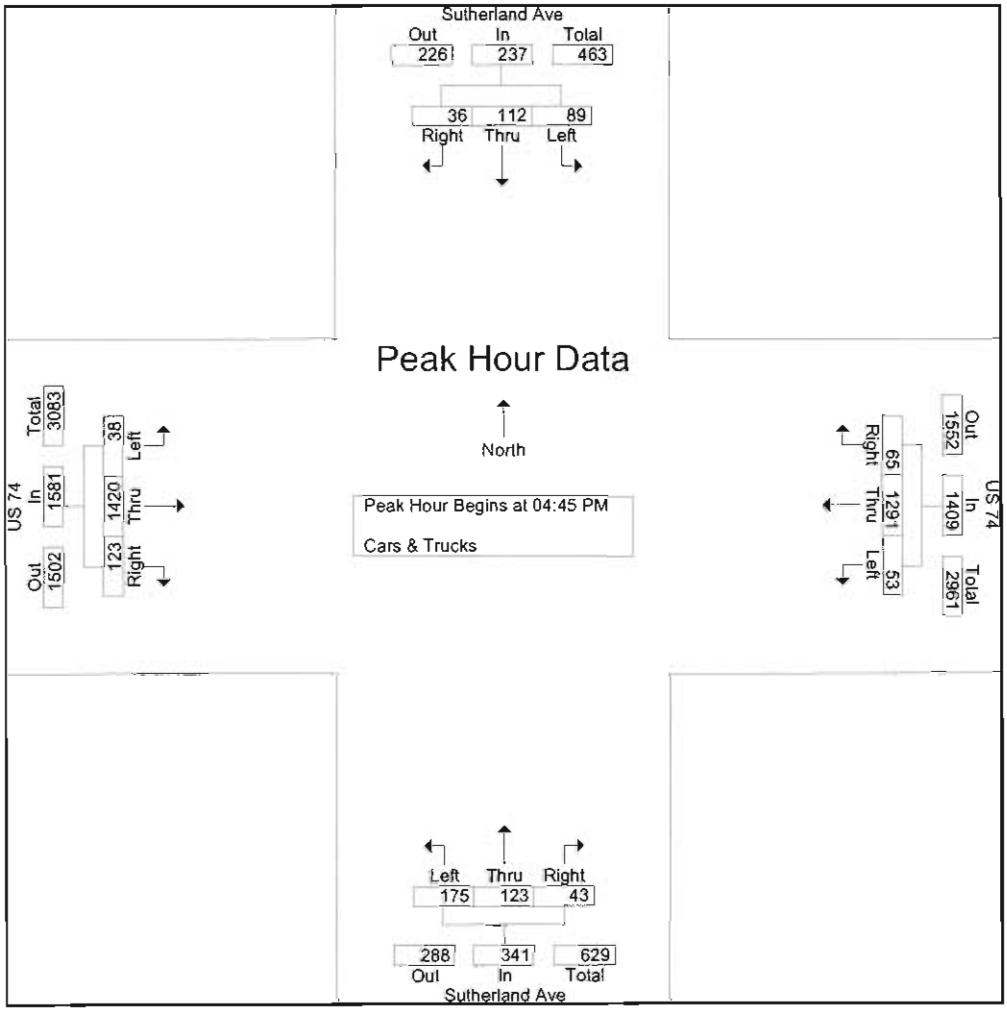
	Sutherland Ave From North				US 74 From East				Sutherland Ave From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**9**	21	13	43	13	273	11	297	5	24	29	58	46	225	2	273	671
07:45 AM	3	**31**	12	46	**20**	**369**	12	**401**	4	34	20	58	**62**	**263**	4	**329**	**834**
08:00 AM	8	24	**22**	**54**	12	319	**23**	354	5	**37**	24	66	62	230	4	296	770
08:15 AM	2	27	16	45	7	292	14	313	6	34	**31**	71	52	231	3	286	715
Total Volume	22	103	63	188	52	1253	60	1365	20	129	104	253	222	949	13	1184	2990
% App. Total	11.7	54.8	33.5		3.8	91.8	4.4		7.9	51	41.1		18.8	80.2	1.1		
PHF	.611	.831	.716	.870	.650	.849	.652	.851	.833	.872	.839	.891	.895	.902	.813	.900	.896



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Sutherland Ave & US 74 5033 peak
Site Code : 5033
Start Date : 3/14/2007
Page No : 3

	Sutherland Ave From North				US 74 From East				Sutherland Ave From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	**32**	21	61	9	**344**	12	**365**	**14**	28	**50**	**92**	**40**	291	4	335	853
05:00 PM	7	27	21	55	18	326	**21**	365	13	29	37	79	35	**387**	9	**431**	**930**
05:15 PM	**19**	31	21	**71**	16	298	8	322	8	**36**	48	92	25	363	**13**	401	886
05:30 PM	2	22	**26**	50	**22**	323	12	357	8	30	40	78	23	379	12	414	899
Total Volume	36	112	89	237	65	1291	53	1409	43	123	175	341	123	1420	38	1581	3568
% App. Total	15.2	47.3	37.6		4.6	91.6	3.8		12.6	36.1	51.3		7.8	89.8	2.4		
PHF	.474	.875	.856	.835	.739	.938	.631	.965	.768	.854	.875	.927	.769	.917	.731	.917	.959



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

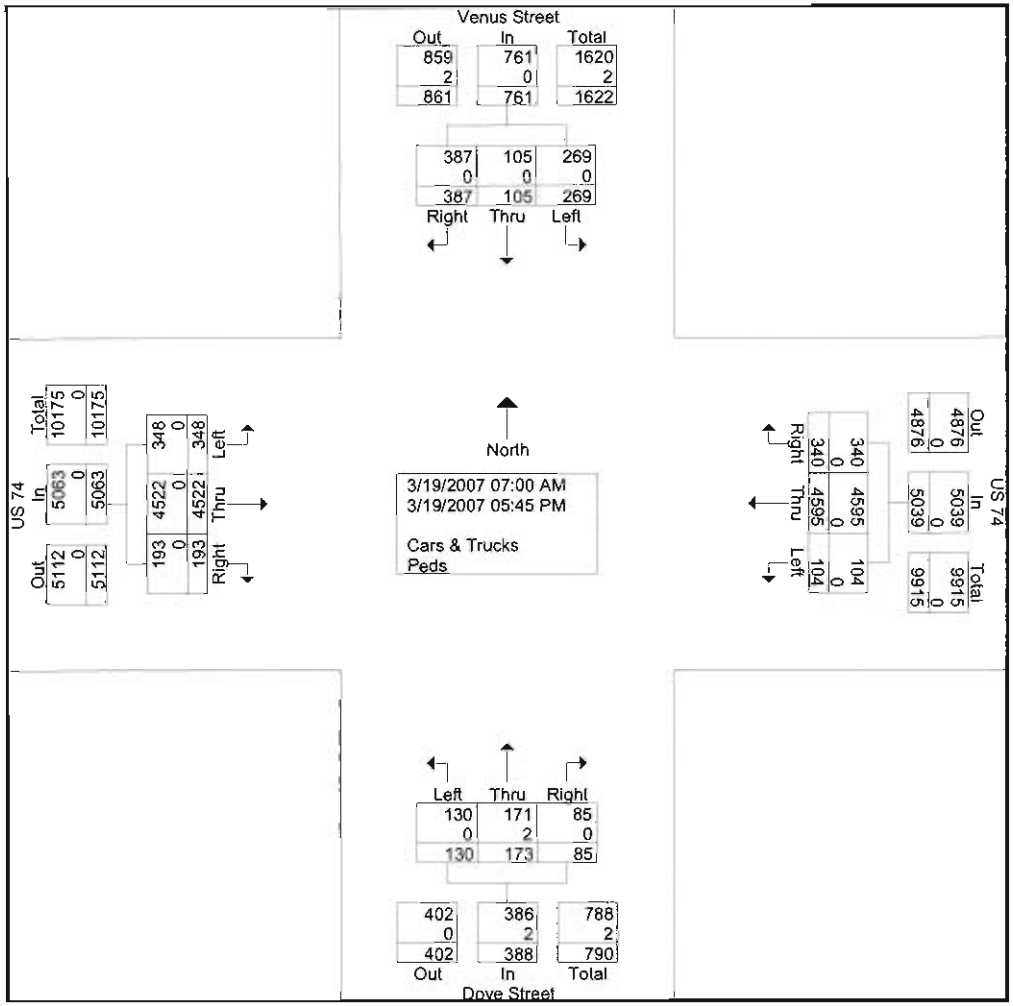
File Name : Venus Dove & US 74 5034 peak
Site Code : 00005034
Start Date : 3/19/2007
Page No : 1

Groups Printed- Cars & Trucks - Peds

	Venus Street Southbound				US 74 Westbound				Dove Street Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	26	5	17	0	15	213	24	22	1	59	8	4	13	209	16	31	57	606	663
07:15 AM	15	6	17	0	5	263	28	23	2	12	3	0	18	246	8	34	57	623	680
07:30 AM	14	2	30	1	12	287	40	25	2	10	4	0	28	203	14	24	50	646	696
07:45 AM	24	7	27	2	7	354	39	26	6	5	0	0	23	234	19	28	56	745	801
Total	79	20	91	3	39	1117	131	96	11	86	15	4	82	892	57	117	220	2620	2840
08:00 AM	25	11	24	3	14	306	50	30	2	8	3	0	41	213	25	31	64	722	786
08:15 AM	20	9	28	2	5	293	21	25	5	6	7	0	23	210	22	34	61	649	710
08:30 AM	22	7	26	1	10	233	25	33	6	12	2	0	29	203	12	17	51	587	638
08:45 AM	23	6	29	3	12	228	23	35	2	14	2	0	18	197	19	32	70	573	643
Total	90	33	107	9	41	1060	119	123	15	40	14	0	111	823	78	114	246	2531	2777
*** BREAK ***																			
04:00 PM	26	8	28	0	7	294	12	38	12	8	12	0	38	293	7	34	72	745	817
04:15 PM	9	7	30	0	3	315	8	29	17	6	8	0	16	364	15	29	58	798	856
04:30 PM	14	7	27	1	2	323	15	40	11	6	7	0	13	345	8	25	66	778	844
04:45 PM	12	6	22	0	5	299	11	25	13	6	7	0	16	290	9	22	47	696	743
Total	61	28	107	1	17	1231	46	132	53	26	34	0	83	1292	39	110	243	3017	3260
05:00 PM	6	8	18	0	4	323	3	25	19	5	5	0	25	369	7	18	43	792	835
05:15 PM	12	5	20	0	1	313	10	29	12	9	8	0	11	407	4	22	51	812	863
05:30 PM	11	3	24	0	1	289	10	31	11	4	5	0	16	400	6	21	52	780	832
05:45 PM	10	8	20	0	1	262	21	30	9	3	4	0	20	339	2	21	51	699	750
Total	39	24	82	0	7	1187	44	115	51	21	22	0	72	1515	19	82	197	3083	3280
Grand Total	269	105	387	13	104	4595	340	466	130	173	85	4	348	4522	193	423	906	11251	12157
Apprch %	35.3	13.8	50.9		2.1	91.2	6.7		33.5	44.6	21.9		6.9	89.3	3.8				
Total %	2.4	0.9	3.4		0.9	40.8	3		1.2	1.5	0.8		3.1	40.2	1.7		7.5	92.5	
Cars & Trucks	269	105	387		104	4595	340		130	171	85		348	4522	193		0	0	12155
% Cars & Trucks	100	100	100	100	100	100	100	100	100	98.8	100	100	100	100	100	100	0	0	100
Peds	0	0	0		0	0	0		0	2	0		0	0	0		0	0	2
% Peds	0	0	0	0	0	0	0	0	0	1.2	0	0	0	0	0	0	0	0	0

Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

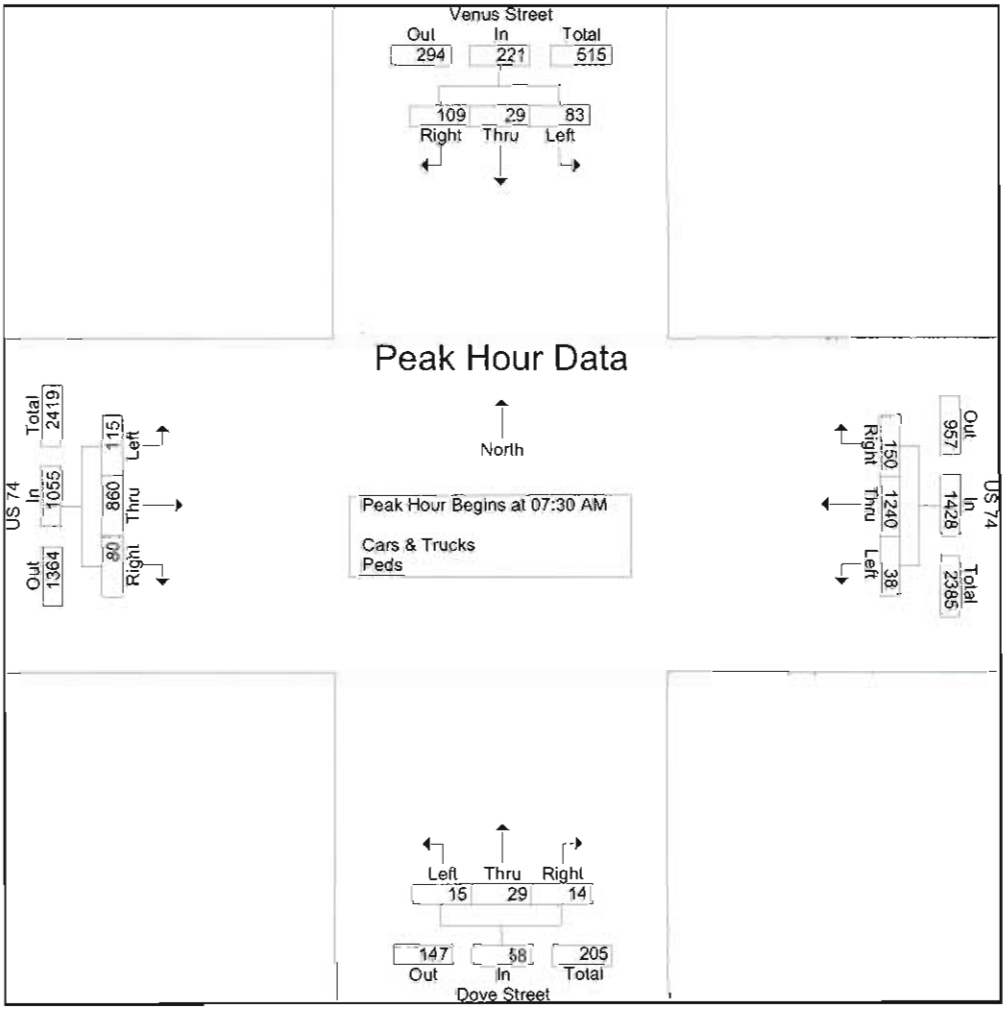
File Name : Venus Dove & US 74 5034 peak
Site Code : 00005034
Start Date : 3/19/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Venus Dove & US 74 5034 peak
Site Code : 00005034
Start Date : 3/19/2007
Page No : 2

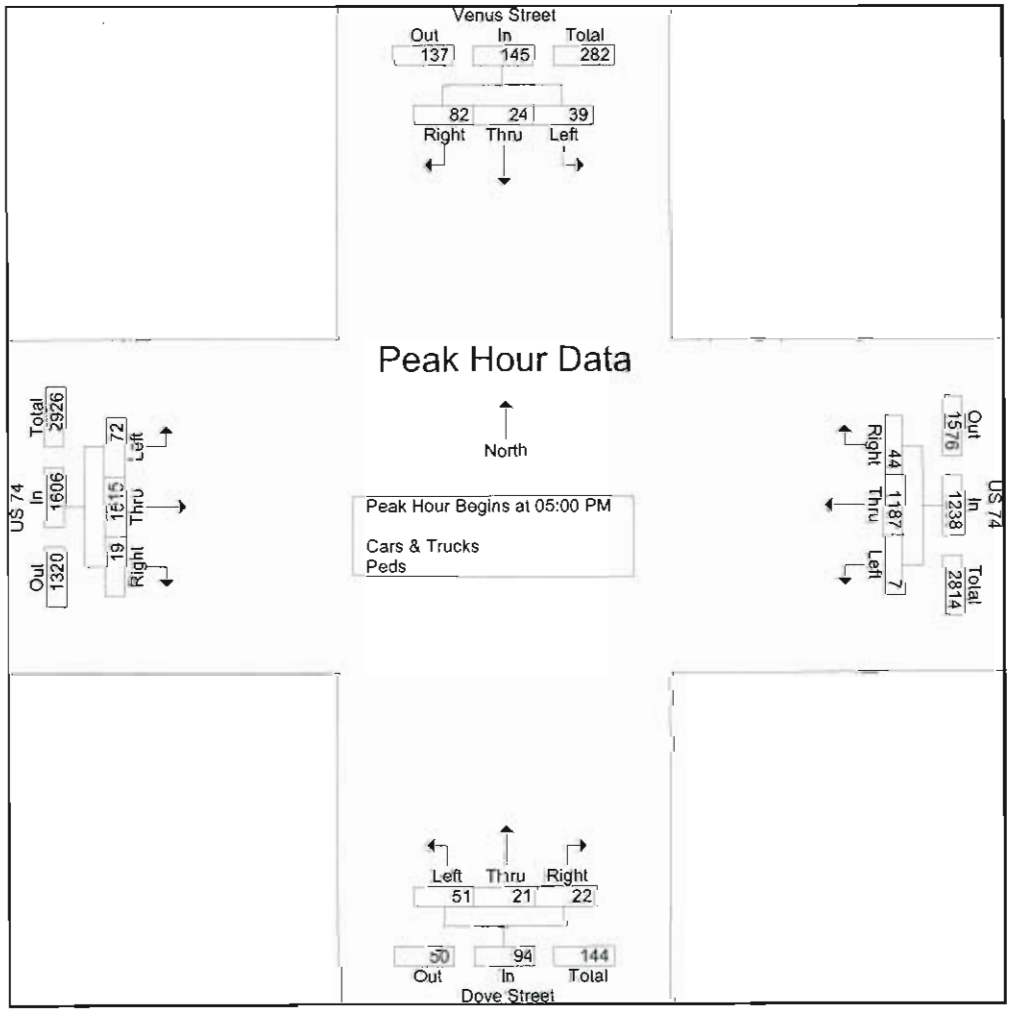
	Venus Street From North				US 74 From East				Dove Street From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**30**	2	14	46	40	287	12	339	4	**10**	2	16	14	203	28	245	646
07:45 AM	27	7	24	58	39	**354**	7	**400**	0	5	**6**	11	19	**234**	23	276	**745**
08:00 AM	24	**11**	**25**	**60**	**50**	306	**14**	370	3	8	2	13	**25**	213	**41**	**279**	722
08:15 AM	28	9	20	57	21	293	5	319	7	6	5	**18**	22	210	23	255	649
Total Volume	109	29	83	221	150	1240	38	1428	14	29	15	58	80	860	115	1055	2762
% App. Total	49.3	13.1	37.6		10.5	86.8	2.7		24.1	50	25.9		7.6	81.5	10.9		
PHF	.908	.659	.830	.921	.750	.876	.679	.893	.500	.725	.625	.806	.800	.919	.701	.945	.927



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Venus Dove & US 74 5034 peak
Site Code : 00005034
Start Date : 3/19/2007

	Venus Street From North				US 74 From East				Dove Street From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	18	**8**	6	32	3	**323**	**4**	**330**	5	5	**19**	**29**	7	369	25	401	792
05:15 PM	20	5	**12**	37	10	313	1	324	**8**	9	12	29	4	**407**	11	**422**	**812**
05:30 PM	**24**	3	11	**38**	10	289	1	300	5	4	11	20	6	400	16	422	780
05:45 PM	20	8	10	38	**21**	262	1	284	4	3	9	16	2	339	20	361	699
Total Volume	82	24	39	145	44	1187	7	1238	22	21	51	94	19	1515	72	1606	3083
% App. Total	56.6	16.6	26.9		3.6	95.9	0.6		23.4	22.3	54.3		1.2	94.3	4.5		
PHF	.854	.750	.813	.954	.524	.919	.438	.938	.688	.583	.671	.810	.679	.931	.720	.951	.949



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

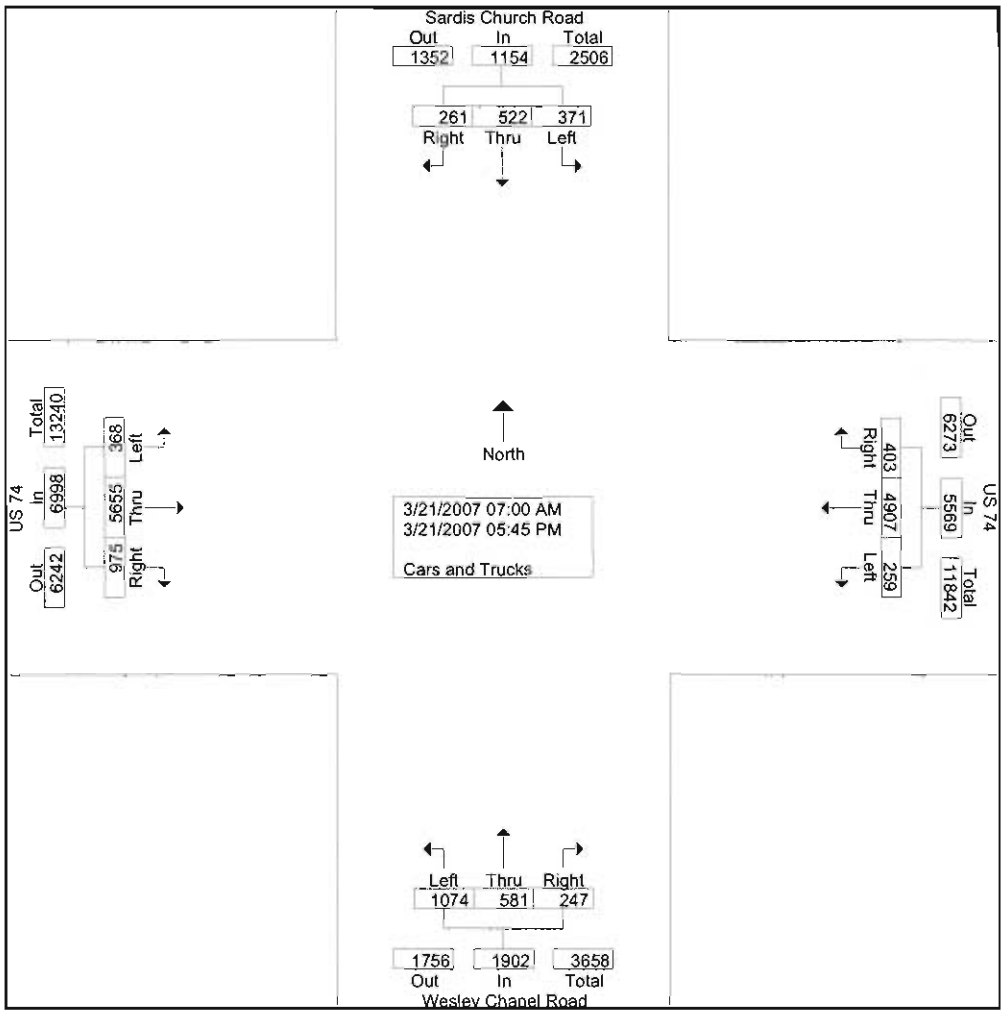
File Name : Wesley Chapel & US 74 5015 peak
Site Code : 00005015
Start Date : 3/21/2007
Page No : 1

Groups Printed- Cars and Trucks

	Sardis Church Road Southbound				US 74 Westbound				Wesley Chapel Road Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Exclu. Total	Inclu. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	16	35	12	1	10	403	33	32	73	43	5	2	56	257	55	25	60	998	1058
07:15 AM	24	31	17	2	15	321	36	24	100	57	6	1	44	200	31	14	41	882	923
07:30 AM	11	18	14	1	20	342	22	17	66	22	10	2	27	370	47	42	62	969	1031
07:45 AM	36	44	20	2	6	240	22	18	97	41	20	0	23	318	54	21	41	921	962
Total	87	128	63	6	51	1306	113	91	336	163	41	5	150	1145	187	102	204	3770	3974
08:00 AM	46	41	16	0	12	301	22	22	67	31	19	2	17	407	53	24	48	1032	1080
08:15 AM	20	41	9	1	2	242	17	12	78	49	12	6	24	315	35	32	51	844	895
08:30 AM	26	30	12	3	6	258	18	21	56	29	26	2	17	340	39	32	58	857	915
08:45 AM	19	27	15	2	11	274	15	26	50	20	15	1	23	300	34	30	59	803	862
Total	111	139	52	6	31	1075	72	81	251	129	72	11	81	1362	161	118	216	3536	3752
04:00 PM	26	29	18	2	21	307	20	27	50	23	17	0	22	395	64	30	59	992	1051
04:15 PM	18	28	23	2	20	279	15	22	56	28	23	4	14	386	71	19	47	961	1008
04:30 PM	23	25	14	1	20	359	14	29	40	37	18	1	12	367	72	24	55	1001	1056
04:45 PM	34	32	27	2	24	262	24	20	66	38	17	2	14	326	72	16	40	936	976
Total	101	114	82	7	85	1207	73	98	212	126	75	7	62	1474	279	89	201	3890	4091
05:00 PM	14	42	14	0	33	327	28	22	53	34	13	0	23	416	68	15	37	1065	1102
05:15 PM	27	42	17	0	20	354	51	19	75	38	12	2	15	426	92	21	42	1169	1211
05:30 PM	13	24	19	0	21	343	33	18	64	42	15	2	13	413	101	13	33	1101	1134
05:45 PM	18	33	14	1	18	295	33	14	83	49	19	1	24	419	87	17	33	1092	1125
Total	72	141	64	1	92	1319	145	73	275	163	59	5	75	1674	348	66	145	4427	4572
Grand Total	371	522	261	20	259	4907	403	343	1074	581	247	28	368	5655	975	375	766	15623	16389
Apprch %	32.1	45.2	22.6		4.7	88.1	7.2		56.5	30.5	13		5.3	80.8	13.9				
Total %	2.4	3.3	1.7		1.7	31.4	2.6		6.9	3.7	1.6		2.4	36.2	6.2		4.7	95.3	

Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

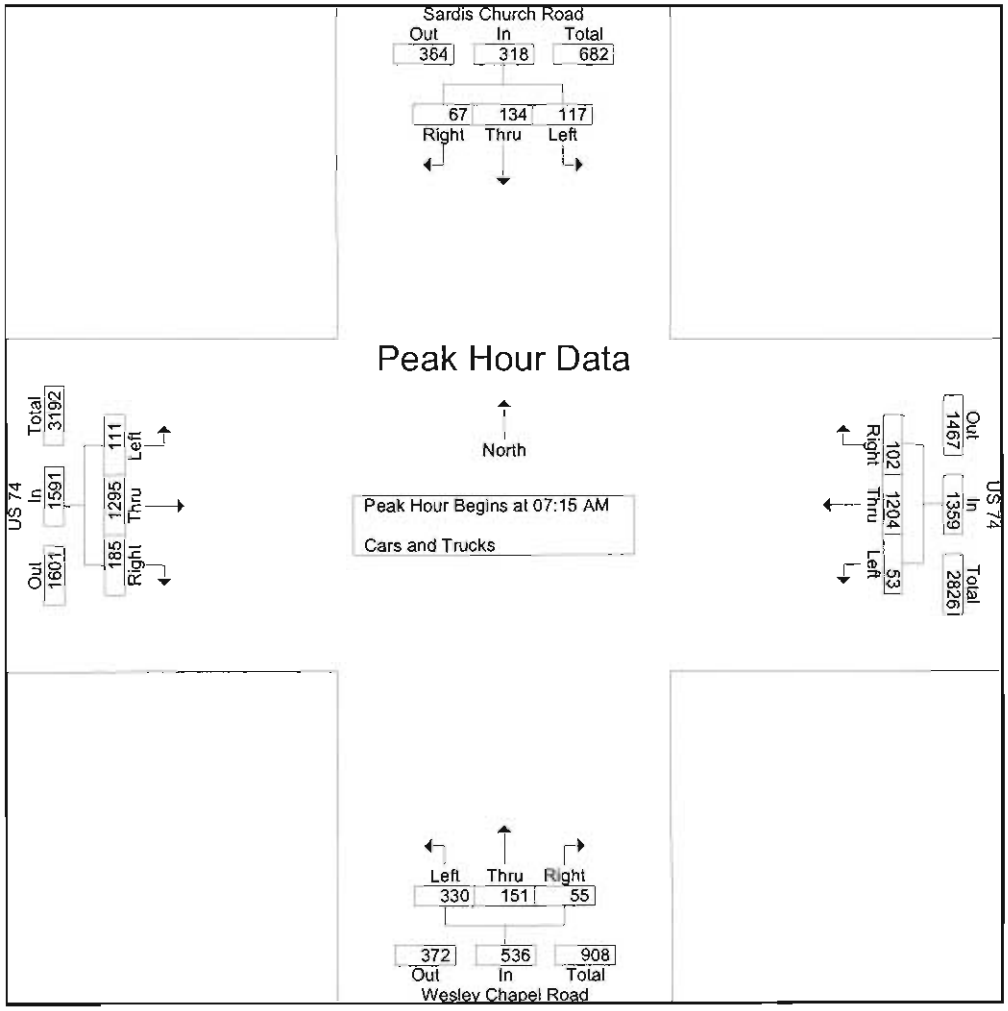
File Name : Wesley Chapel & US 74 5015 peak
Site Code : 00005015
Start Date : 3/21/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Wesley Chapel & US 74 5015 peak
Site Code : 00005015
Start Date : 3/21/2007

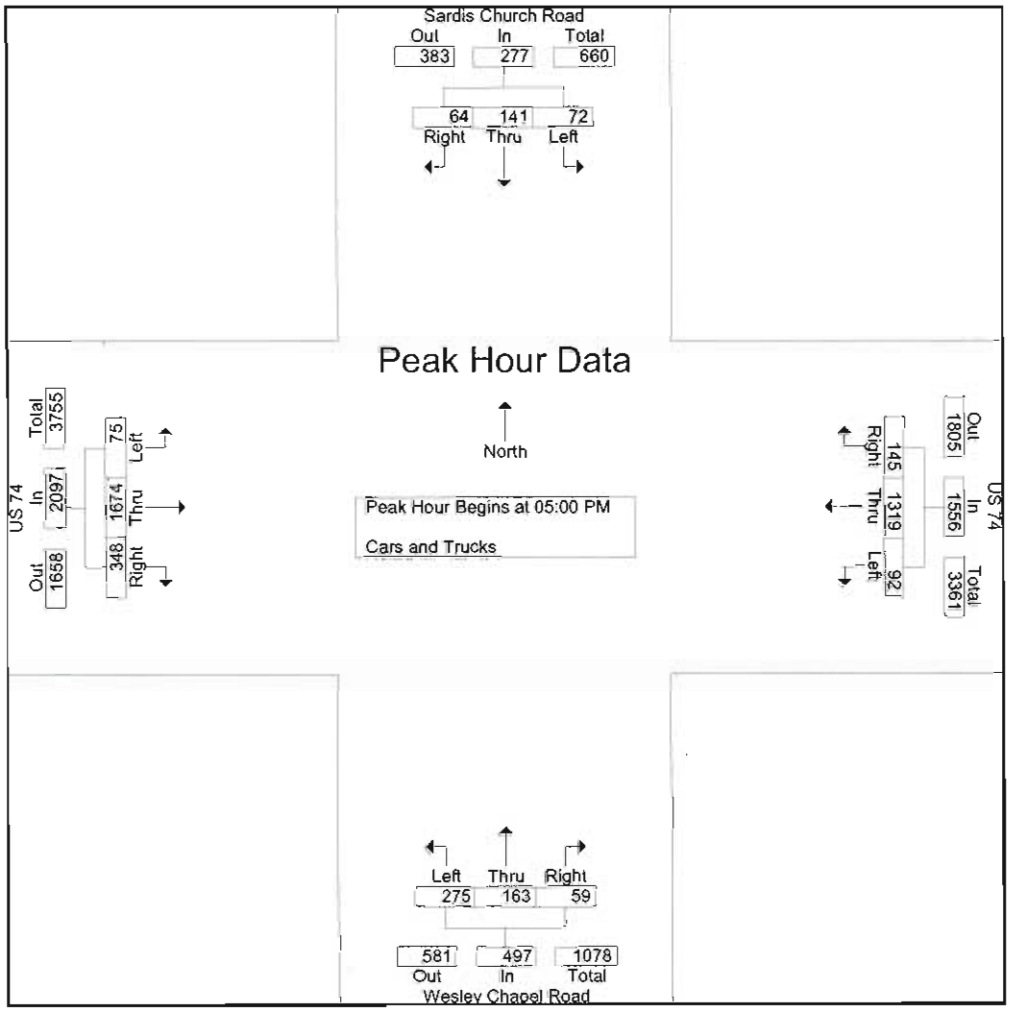
	Sardis Church Road From North				US 74 From East				Wesley Chapel Road From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	17	31	24	72	36	321	15	372	6	57	**100**	**163**	31	200	**44**	275	882
07:30 AM	14	18	11	43	22	342	**20**	384	10	22	66	98	47	370	27	444	989
07:45 AM	**20**	**44**	36	100	22	240	6	268	**20**	41	97	158	**54**	318	23	395	921
08:00 AM	16	41	**46**	**103**	22	301	12	335	19	31	67	117	53	**407**	17	477	**1032**
Total Volume	67	134	117	318	102	1204	53	1359	55	151	330	536	185	1295	111	1591	3604
% App. Total	21.1	42.1	36.8		7.5	88.6	3.9		10.3	28.2	61.6		11.6	81.4	7		
PHF	.838	.761	.636	.772	.708	.880	.663	.885	.668	.662	.825	.822	.856	.795	.631	.634	.922



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Wesley Chapel & US 74 5015 peak
Site Code : 00005015
Start Date : 3/21/2007

	Sardis Church Road From North				US 74 From East				Wesley Chapel Road From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	14	42	14	70	28	327	33	388	13	34	53	100	68	416	23	507	1065
05:15 PM	17	42	27	86	51	354	20	425	12	38	75	125	92	426	15	533	1169
05:30 PM	19	24	13	56	33	343	21	397	15	42	64	121	101	413	13	527	1101
05:45 PM	14	33	18	65	33	295	18	346	19	49	83	151	87	419	24	530	1092
Total Volume	64	141	72	277	145	1319	92	1556	59	163	275	497	348	1674	75	2097	4427
% App. Total	23.1	50.9	26		9.3	84.8	5.9		11.9	32.8	55.3		16.6	79.8	3.6		
PHF	.842	.839	.667	.805	.711	.931	.697	.915	.776	.832	.828	.823	.861	.982	.781	.984	.947



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

File Name : Bivens Street 5039 peaks
Site Code : 00005039
Start Date : 4/4/2007
Page No : 1

Groups Printed- Cars and Trucks

	Bivens Street Southbound				US 74 Westbound				driveway Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Exclu. Total	Inclu. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	13	3	24	0	0	214	2	10	2	0	1	0	6	132	5	13	23	402	425
07:15 AM	17	1	29	0	0	198	3	14	2	1	0	0	1	176	1	13	27	429	456
07:30 AM	19	1	24	0	1	254	3	11	3	1	1	1	10	199	1	15	27	517	544
07:45 AM	6	0	13	0	0	337	4	11	3	0	1	0	2	200	1	14	25	567	592
Total	55	5	90	0	1	1003	12	46	10	2	3	1	19	707	8	55	102	1915	2017
08:00 AM	9	1	13	0	0	242	9	13	0	1	0	0	4	155	3	12	25	437	462
08:15 AM	6	3	10	0	4	232	11	12	7	0	0	1	7	137	3	13	26	420	446
08:30 AM	2	0	6	0	0	192	2	17	4	0	0	0	3	149	2	19	36	360	396
08:45 AM	5	0	10	0	0	147	1	9	0	0	0	0	6	153	15	24	33	337	370
Total	22	4	39	0	4	813	23	51	11	1	0	1	20	594	23	68	120	1554	1674
04:00 PM	11	5	14	0	0	253	9	12	4	2	3	0	6	272	4	17	29	583	612
04:15 PM	6	7	15	0	0	227	5	20	0	0	0	0	15	270	6	8	28	551	579
04:30 PM	8	0	14	1	0	224	3	14	1	3	1	0	9	257	6	6	21	526	547
04:45 PM	6	3	19	0	0	251	8	23	2	0	1	0	7	288	6	12	35	591	626
Total	31	15	62	1	0	955	25	69	7	5	5	0	37	1087	22	43	113	2251	2364
05:00 PM	8	6	18	0	0	186	2	4	5	5	0	0	9	275	11	9	13	525	538
05:15 PM	9	1	23	0	1	274	3	18	4	3	0	0	10	318	7	13	31	653	684
05:30 PM	2	5	16	0	0	249	7	19	2	7	0	0	17	304	4	10	29	613	642
05:45 PM	8	5	11	0	0	199	4	11	5	54	4	4	11	236	6	8	23	543	566
Total	27	17	68	0	1	908	16	52	16	69	4	4	47	1133	28	40	96	2334	2430
Grand Total	135	41	259	1	6	3679	76	218	44	77	12	6	123	3521	81	206	431	8054	8485
Apprch %	31	9.4	59.5		0.2	97.8	2		33.1	57.9	9		3.3	94.5	2.2				
Total %	1.7	0.5	3.2		0.1	45.7	0.9		0.5	1	0.1		1.5	43.7	1		5.1	94.9	

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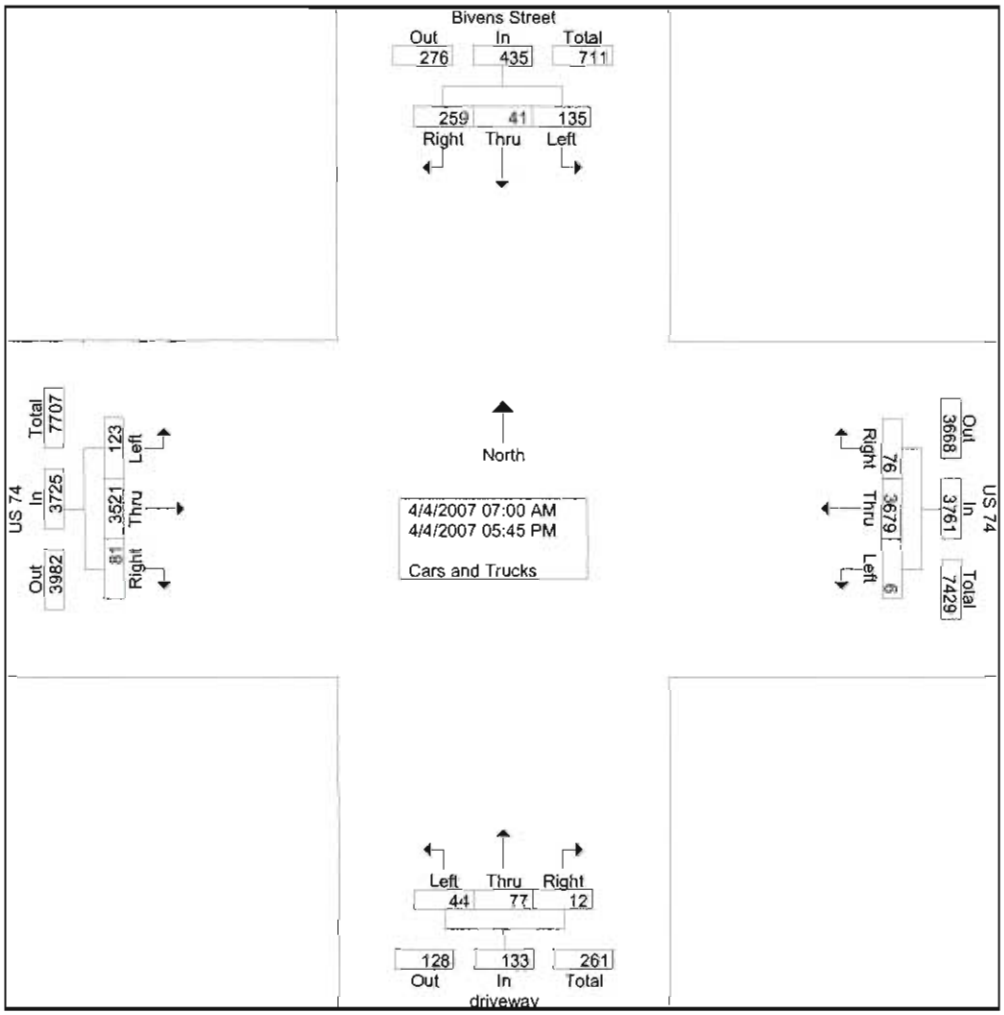
Cary, NC 27518
919-858-1855

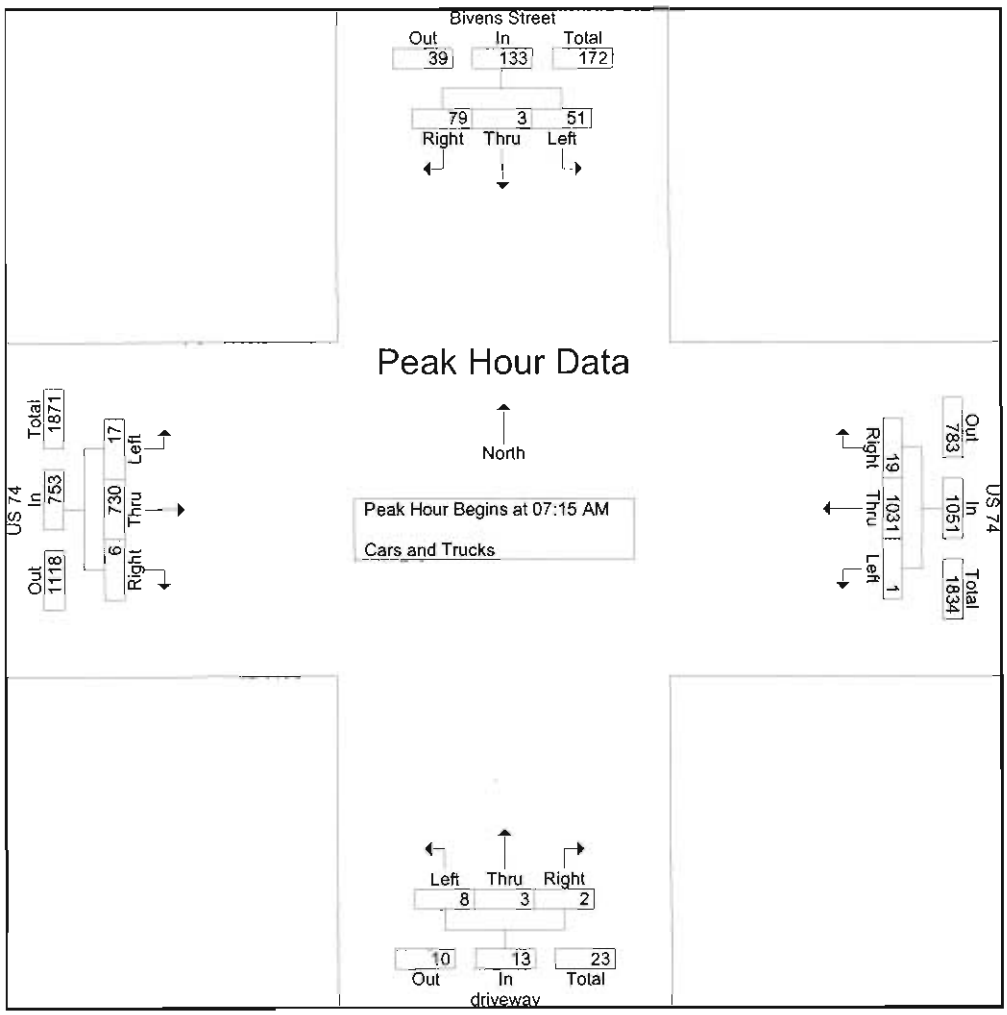
File Name : Bivens Street 5039 peaks
Site Code : 00005039
Start Date : 4/4/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0829

File Name : Bivens Street 5039 peaks
Site Code : 00005039
Start Date : 4/4/2007

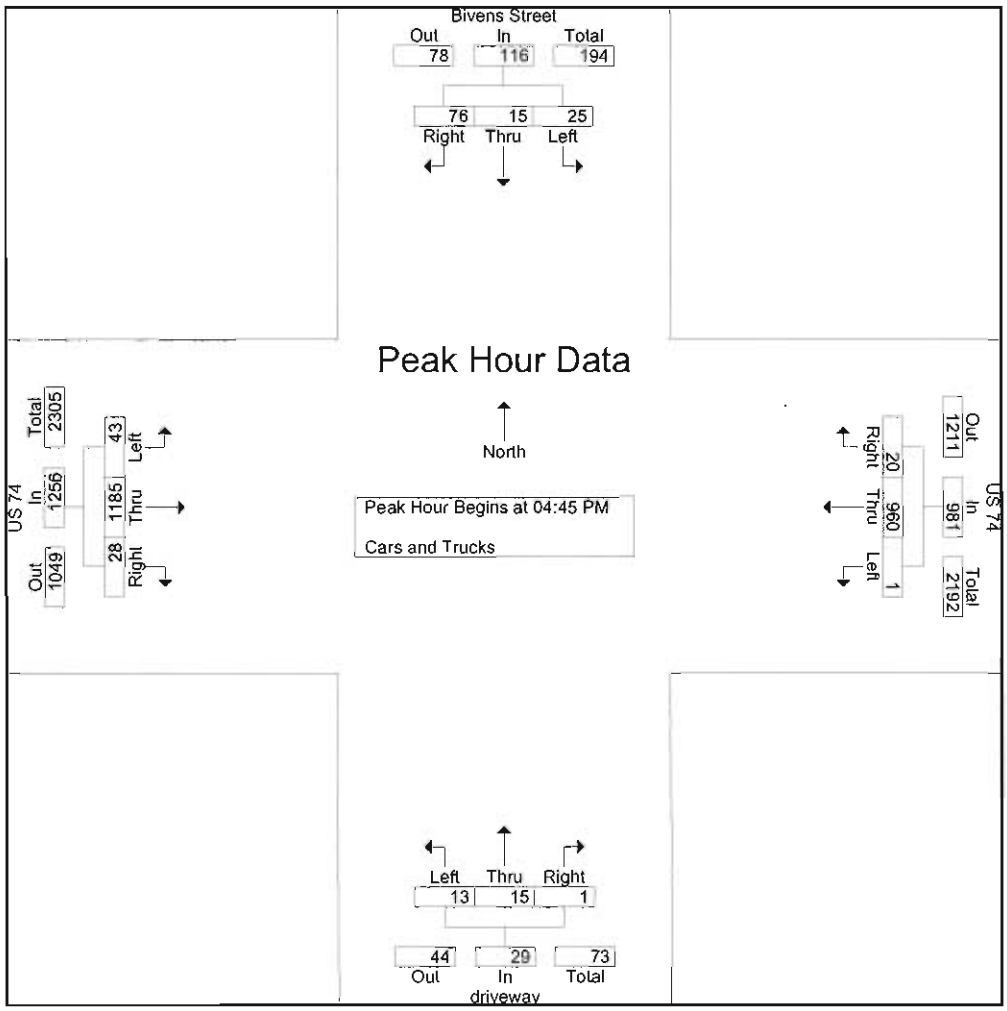
	Bivens Street From North				US 74 From East				driveway From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	29	1	17	47	3	198	0	201	0	1	2	3	1	176	1	178	429
07:30 AM	24	1	19	44	3	254	1	258	1	1	3	5	1	199	10	210	517
07:45 AM	13	0	6	19	4	337	0	341	1	0	3	4	1	200	2	203	567
08:00 AM	13	1	9	23	9	242	0	251	0	1	0	1	3	155	4	162	437
Total Volume	79	3	51	133	19	1031	1	1051	2	3	8	13	6	730	17	753	1950
% App. Total	59.4	2.3	38.3		1.8	98.1	0.1		15.4	23.1	61.5		0.8	96.9	2.3		
PHF	.681	.750	.671	.707	.528	.765	.250	.771	.500	.750	.667	.650	.500	.913	.425	.898	.860



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0829

File Name : Bivens Street 5039 peaks
Site Code : 00005039
Start Date : 4/4/2007

	Bivens Street From North				US 74 From East				driveway From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	19	3	6	28	8	251	0	259	1	0	2	3	6	288	7	301	591
05:00 PM	18	6	8	32	2	186	0	188	0	5	5	10	11	275	9	295	525
05:15 PM	23	1	9	33	3	274	1	278	0	3	4	7	7	318	10	335	653
05:30 PM	16	5	2	23	7	249	0	256	0	7	2	9	4	304	17	325	613
Total Volume	76	15	25	116	20	960	1	981	1	15	13	29	28	1185	43	1256	2382
% App. Total	65.5	12.9	21.6		2	97.9	0.1		3.4	51.7	44.8		2.2	94.3	3.4		
PHF	.826	.625	.694	.879	.625	.876	.250	.882	.250	.536	.650	.725	.636	.932	.632	.937	.912



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

File Name : Chamber Drive 5016 peaks
Site Code : 00005016
Start Date : 3/26/2007
Page No : 1

Groups Printed- Cars and Trucks

	Chamber Drive Southbound				US 74 Westbound				Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Exclu. Total	Inclu. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	9	0	20	6	2	277	39	17	0	0	0	0	53	227	0	20	43	627	670
07:15 AM	8	0	29	2	4	278	21	16	0	0	0	0	32	182	0	16	34	554	588
07:30 AM	14	0	18	5	1	260	17	13	0	0	0	0	55	259	0	30	48	624	672
07:45 AM	4	0	13	2	2	401	52	29	0	0	0	0	70	230	0	22	53	772	825
Total	35	0	80	15	9	1216	129	75	0	0	0	0	210	898	0	88	178	2577	2755
08:00 AM	8	0	28	9	0	263	53	14	0	0	0	0	71	272	0	26	49	695	744
08:15 AM	11	0	29	7	0	287	35	20	0	0	0	0	37	246	0	27	54	645	699
08:30 AM	11	0	38	1	0	237	23	16	0	0	0	0	24	297	0	37	54	630	684
08:45 AM	16	0	26	4	1	254	16	29	0	0	0	0	28	219	0	30	63	560	623
Total	46	0	121	21	1	1041	127	79	0	0	0	0	160	1034	0	120	220	2530	2750
04:00 PM	25	0	36	4	1	328	21	31	0	0	0	0	25	286	0	20	55	722	777
04:15 PM	22	0	36	3	0	344	5	24	0	0	0	0	22	388	0	26	53	817	870
04:30 PM	56	0	40	5	1	287	10	23	0	0	0	0	15	329	0	25	53	738	791
04:45 PM	15	0	27	6	1	282	7	23	0	0	0	0	13	295	0	15	44	640	684
Total	118	0	139	18	3	1241	43	101	0	0	0	0	75	1298	0	86	205	2917	3122
05:00 PM	41	0	52	4	0	289	9	30	0	0	0	0	16	397	0	15	49	804	853
05:15 PM	26	0	54	7	0	311	3	15	0	0	0	0	17	390	0	17	39	801	840
05:30 PM	27	0	50	5	0	291	3	16	0	0	0	0	12	342	0	12	33	725	758
05:45 PM	11	0	26	1	0	314	8	16	0	0	0	0	19	302	0	10	27	680	707
Total	105	0	182	17	0	1205	23	77	0	0	0	0	64	1431	0	54	148	3010	3158
Grand Total	304	0	522	71	13	4703	322	332	0	0	0	0	509	4661	0	348	751	11034	11785
Apprch %	36.8	0	63.2		0.3	93.4	6.4		0	0	0		9.8	90.2	0				
Total %	2.8	0	4.7		0.1	42.6	2.9		0	0	0		4.6	42.2	0		6.4	93.6	

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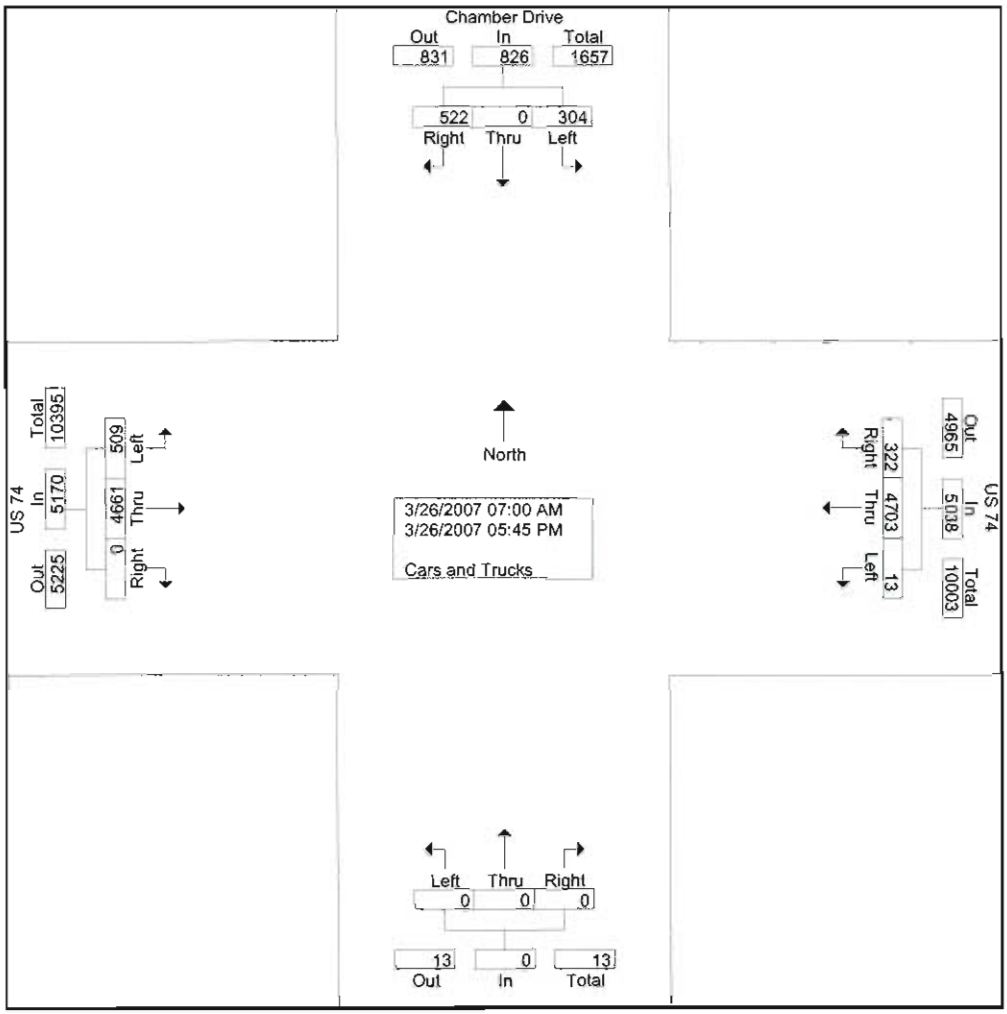
919-858-1855

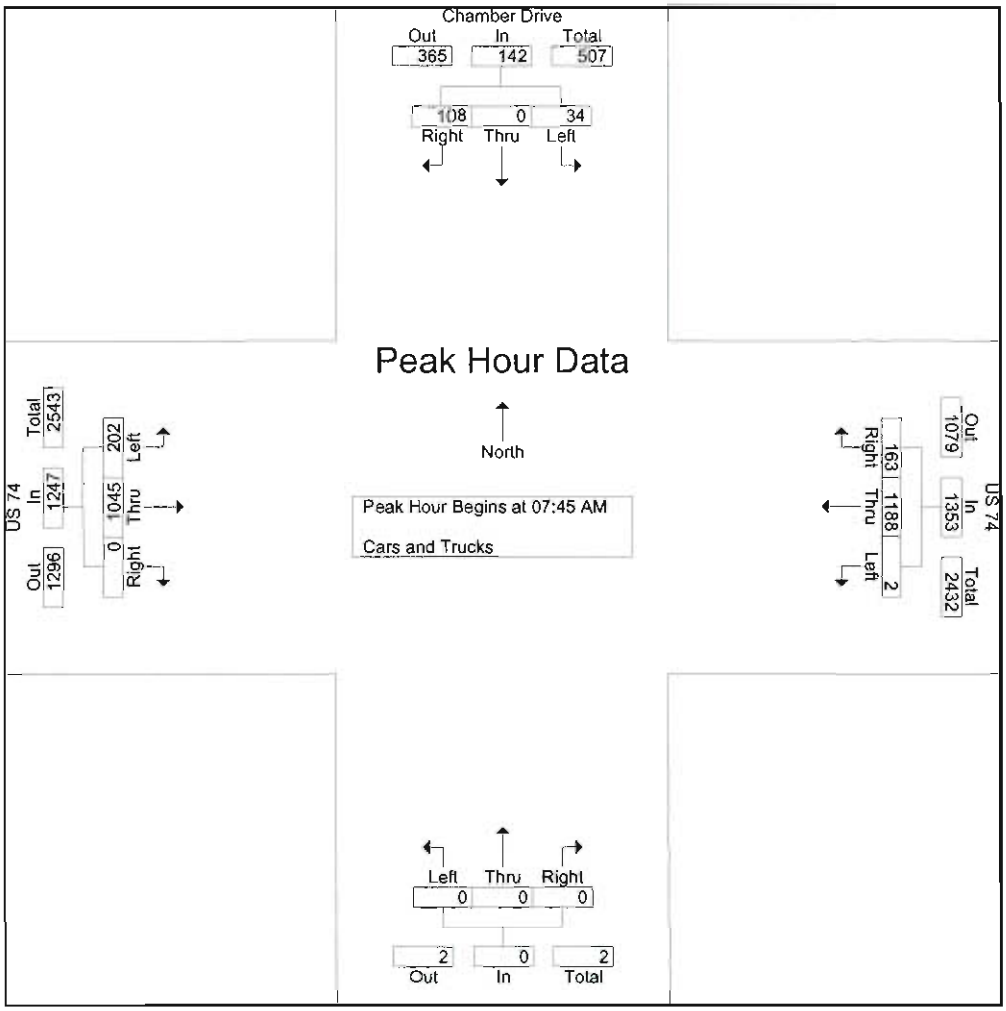
File Name : Chamber Drive 5016 peaks
Site Code : 00005016
Start Date : 3/26/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-8328

File Name : Chamber Drive 5016 peaks
Site Code : 00005016
Start Date : 3/26/2007
Page No : 2

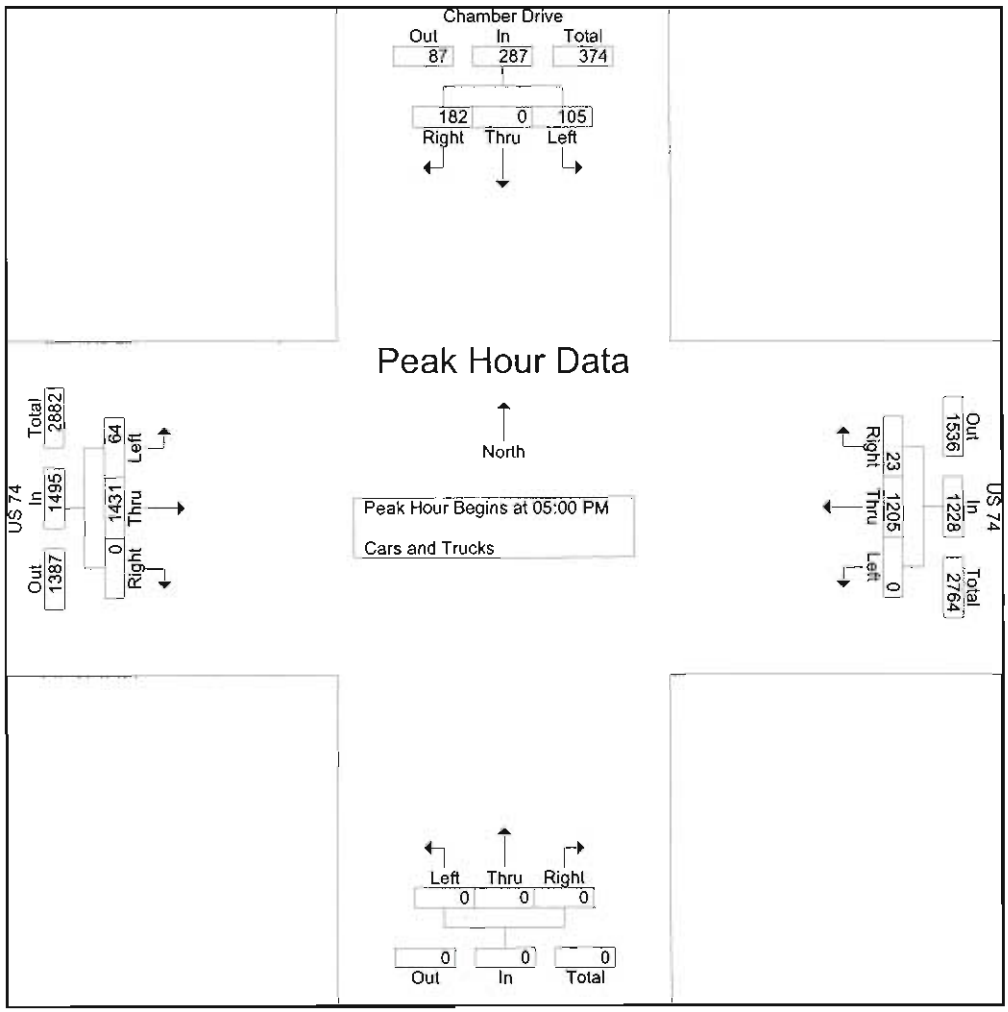
	Chamber Drive From North				US 74 From East				From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	13	0	4	17	52	401	2	455	0	0	0	0	0	230	70	300	772
08:00 AM	28	0	8	36	53	263	0	316	0	0	0	0	0	272	71	343	695
08:15 AM	29	0	11	40	35	287	0	322	0	0	0	0	0	246	37	283	645
08:30 AM	38	0	11	49	23	237	0	280	0	0	0	0	0	297	24	321	630
Total Volume	108	0	34	142	163	1188	2	1353	0	0	0	0	0	1045	202	1247	2742
% App. Total	76.1	0	23.9		12	87.8	0.1		0	0	0		0	83.8	16.2		
PHF	.711	.000	.773	.724	.769	.741	.250	.743	.000	.000	.000	.000	.000	.880	.711	.909	.888



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-8328

File Name : Chamber Drive 5016 peaks
Site Code : 00005016
Start Date : 3/26/2007
Page No : 3

	Chamber Drive From North				US 74 From East				From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	52	0	41	93	9	289	0	298	0	0	0	0	0	397	16	413	804
05:15 PM	54	0	26	80	3	311	0	314	0	0	0	0	0	390	17	407	801
05:30 PM	50	0	27	77	3	291	0	294	0	0	0	0	0	342	12	354	725
05:45 PM	26	0	11	37	8	314	0	322	0	0	0	0	0	302	19	321	680
Total Volume	182	0	105	287	23	1205	0	1228	0	0	0	0	0	1431	64	1495	3010
% App. Total	63.4	0	36.6		1.9	98.1	0		0	0	0		0	95.7	4.3		
PHF	.843	.000	.640	.772	.639	.959	.000	.953	.000	.000	.000	.000	.000	.901	.842	.905	.936



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-7800

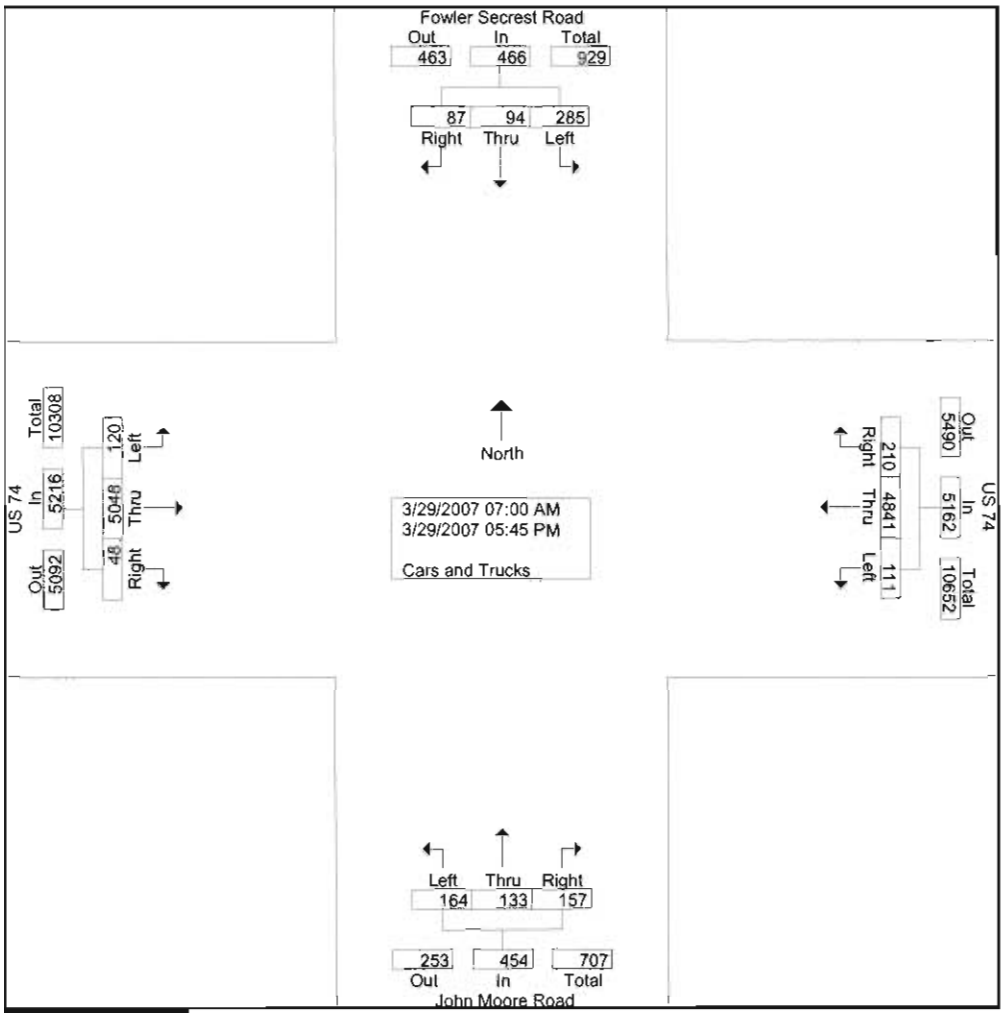
File Name : Fowler Secrest John Moore 5018 peaks
Site Code : 00005018
Start Date : 3/29/2007
Page No : 1

Groups Printed- Cars and Trucks

	Fowler Secrest Road Southbound				US 74 Westbound				John Moore Road Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Excls. Total	Incls. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	7	5	5	1	3	294	5	17	16	11	2	1	2	176	1	20	39	527	566
07:15 AM	16	6	5	0	3	301	2	24	18	5	11	0	0	214	2	18	42	583	625
07:30 AM	21	7	3	0	1	254	3	19	21	4	2	0	1	242	1	23	42	560	602
07:45 AM	28	7	8	0	4	284	12	17	17	6	10	0	5	273	2	18	35	656	691
Total	72	25	21	1	11	1133	22	77	72	26	25	1	8	905	6	79	158	2326	2484
08:00 AM	17	11	9	0	9	282	12	32	18	17	12	2	8	260	2	24	58	657	715
08:15 AM	15	6	11	0	4	266	7	25	6	6	12	0	10	263	3	22	47	609	656
08:30 AM	10	4	5	0	4	257	9	35	7	1	8	1	16	294	2	24	60	617	677
08:45 AM	17	5	6	1	8	238	9	29	11	3	8	0	4	302	2	17	47	613	660
Total	59	26	31	1	25	1043	37	121	42	27	40	3	38	1119	9	87	212	2496	2708
04:00 PM	13	10	6	1	6	315	13	32	7	6	7	2	8	374	1	16	51	766	817
04:15 PM	26	3	5	2	8	321	16	28	6	8	9	0	6	383	6	13	43	797	840
04:30 PM	10	1	2	0	12	387	26	34	5	4	14	2	8	396	6	16	52	871	923
04:45 PM	21	7	1	1	11	306	13	29	6	6	9	0	4	438	1	16	46	823	869
Total	70	21	14	4	37	1329	68	123	24	24	39	4	26	1591	14	61	192	3257	3449
05:00 PM	24	6	9	0	13	334	19	20	6	14	16	1	5	377	3	13	34	826	860
05:15 PM	24	4	3	0	6	384	25	13	10	17	16	0	16	366	3	9	22	874	896
05:30 PM	24	5	4	0	7	330	17	21	9	13	8	0	10	367	7	13	34	801	835
05:45 PM	12	7	5	0	12	288	22	27	1	12	13	0	17	323	6	17	44	718	762
Total	84	22	21	0	38	1336	83	81	26	56	53	1	48	1433	19	52	134	3219	3353
Grand Total	285	94	87	6	111	4841	210	402	164	133	157	9	120	5048	48	279	696	11298	11994
Apprch %	61.2	20.2	18.7		2.2	93.8	4.1		36.1	29.3	34.6		2.3	96.8	0.9				
Total %	2.5	0.8	0.8		1	42.8	1.9		1.5	1.2	1.4		1.1	44.7	0.4		5.8	94.2	

Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-7810

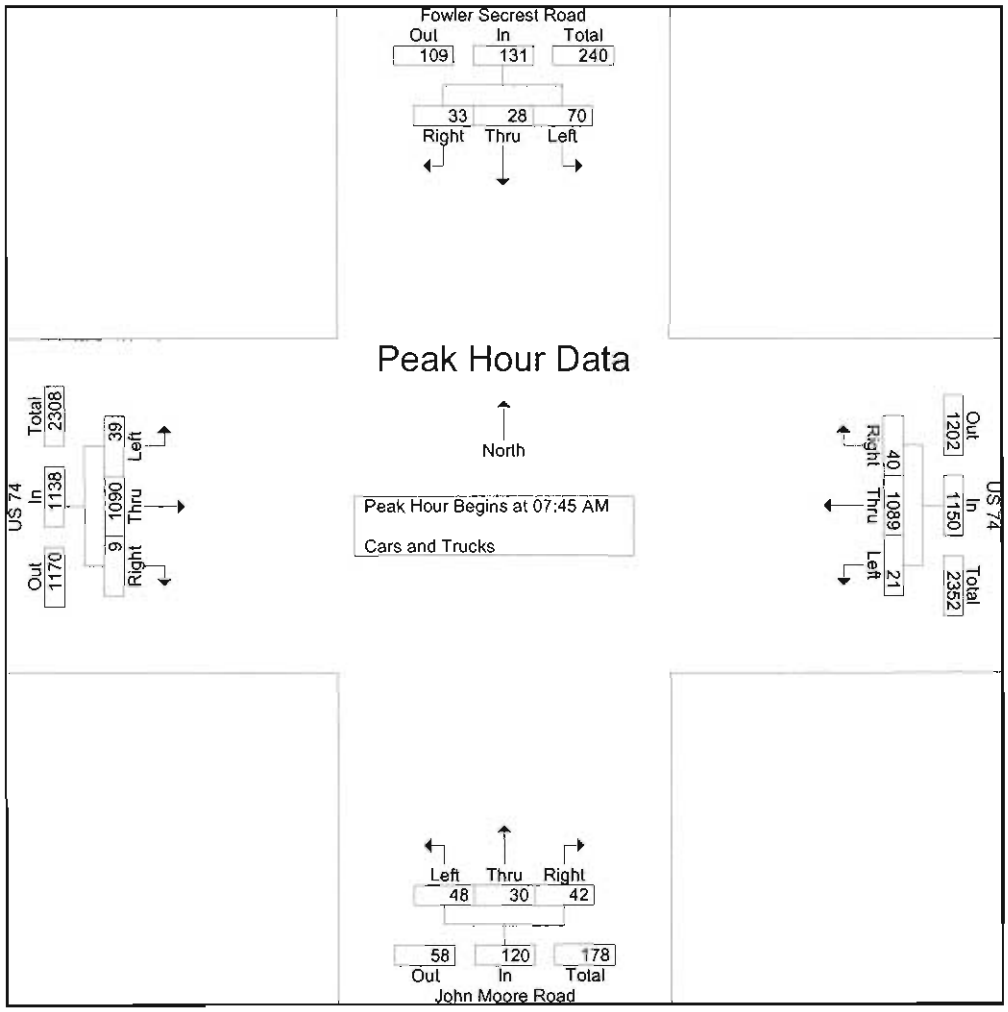
File Name : Fowler Secrest John Moore 5018 peaks
Site Code : 00005018
Start Date : 3/29/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0629

File Name : Fowler Secrest John Moore 5018 peaks
Site Code : 00005018
Start Date : 3/29/2007

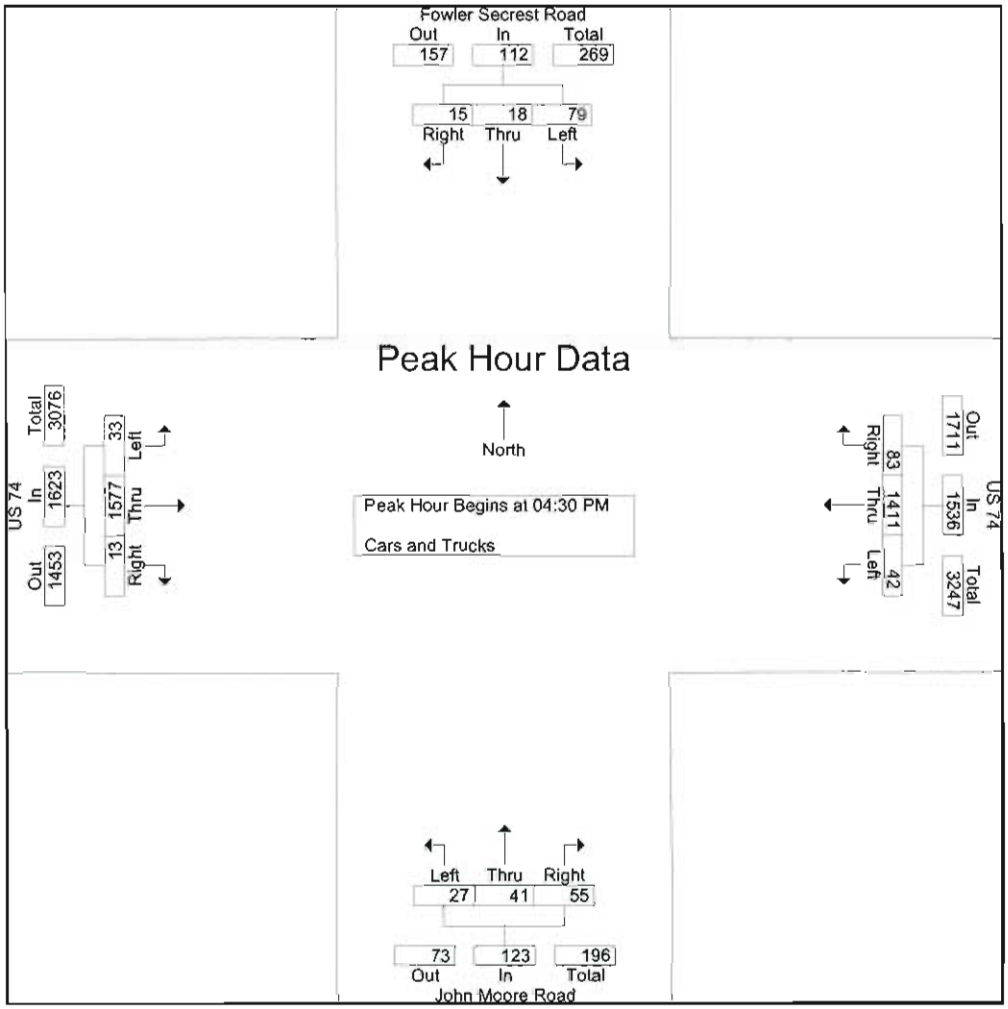
	Fowler Secrest Road From North				US 74 From East				John Moore Road From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	8	7	28	43	12	284	4	300	10	6	17	33	2	273	5	280	656
08:00 AM	9	11	17	37	12	282	9	303	12	17	18	47	2	260	8	270	657
08:15 AM	11	6	15	32	7	266	4	277	12	6	6	24	3	263	10	276	609
08:30 AM	5	4	10	19	9	257	4	270	8	1	7	16	2	294	16	312	617
Total Volume	33	28	70	131	40	1089	21	1150	42	30	48	120	9	1090	39	1138	2539
% App. Total	25.2	21.4	53.4		3.5	94.7	1.6		35	25	40		0.8	95.8	3.4		
PHF	.750	.636	.625	.762	.633	.959	.563	.949	.875	.441	.667	.638	.750	.927	.609	.912	.966



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Fowler Secrest John Moore 5018 peaks
Site Code : 00005018
Start Date : 3/29/2007
Page No : 4

	Fowler Secrest Road From North				US 74 From East				John Moore Road From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	2	1	10	13	26	387	12	425	14	4	5	23	6	396	8	410	871
04:45 PM	1	7	21	29	13	306	11	330	9	6	6	21	1	438	4	443	823
05:00 PM	9	6	24	39	19	334	13	366	16	14	6	36	3	377	5	385	826
05:15 PM	3	4	24	31	25	384	6	415	16	17	10	43	3	366	16	385	874
Total Volume	15	18	79	112	83	1411	42	1536	55	41	27	123	13	1577	33	1623	3394
% App. Total	13.4	16.1	70.5		5.4	91.9	2.7		44.7	33.3	22		0.8	97.2	2		
PHF	.417	.643	.823	.718	.798	.911	.808	.904	.859	.603	.675	.715	.542	.900	.516	.916	.971



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

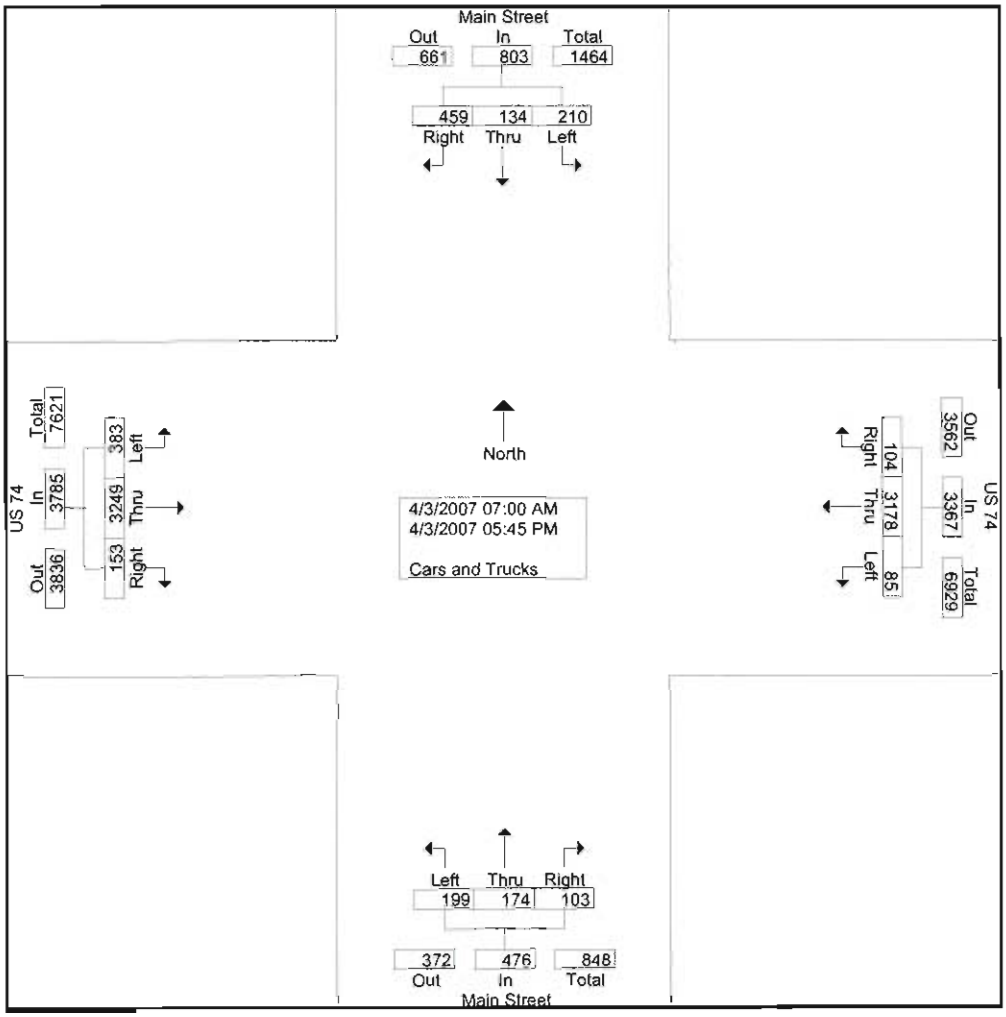
File Name : Main St 5040 peaks
Site Code : 00005040
Start Date : 4/3/2007
Page No : 1

Groups Printed- Cars and Trucks

	Main Street Southbound				US 74 Westbound				Main Street Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Trucks Total	Incln. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	7	5	25	0	0	170	2	17	16	14	9	0	5	95	8	12	29	356	385
07:15 AM	9	9	16	1	6	173	7	17	10	13	7	1	17	193	10	26	45	470	515
07:30 AM	19	7	24	1	3	195	6	16	29	15	9	0	15	203	6	15	32	531	563
07:45 AM	25	8	24	1	4	285	11	17	11	10	11	0	21	203	4	12	30	617	647
Total	60	29	89	3	13	823	26	67	66	52	36	1	58	694	28	65	136	1974	2110
08:00 AM	15	7	20	0	2	208	10	15	12	8	7	0	8	182	4	21	36	483	519
08:15 AM	18	5	19	1	1	221	9	16	9	8	7	0	15	130	4	15	32	446	478
08:30 AM	8	6	21	1	5	165	1	22	6	9	1	1	23	127	4	15	39	376	415
08:45 AM	11	4	29	0	3	145	5	10	10	9	2	0	13	120	6	22	32	357	389
Total	52	22	89	2	11	739	25	63	37	34	17	1	59	559	18	73	139	1662	1801
04:00 PM	8	5	28	0	9	190	7	23	16	7	8	0	31	220	15	14	37	544	581
04:15 PM	18	1	28	2	9	194	7	13	8	7	7	1	36	240	11	18	34	566	600
04:30 PM	13	14	45	2	9	202	9	19	15	17	4	0	45	235	8	9	30	616	646
04:45 PM	21	14	40	0	8	208	6	16	15	16	7	0	37	269	12	10	26	653	679
Total	60	34	141	4	35	794	29	71	54	47	26	1	149	964	46	51	127	2379	2506
05:00 PM	11	9	39	2	11	200	10	13	13	13	9	0	25	251	13	9	24	604	628
05:15 PM	9	15	36	1	6	225	5	15	6	6	5	0	31	288	19	9	25	651	676
05:30 PM	4	13	32	1	5	206	5	16	12	12	7	1	31	269	14	8	26	610	636
05:45 PM	14	12	33	0	4	191	4	8	11	10	3	2	30	224	15	11	21	551	572
Total	38	49	140	4	26	822	24	52	42	41	24	3	117	1032	61	37	96	2416	2512
Grand Total	210	134	459	13	85	3178	104	253	199	174	103	6	383	3249	153	226	498	8431	8929
Apprch %	26.2	16.7	57.2		2.5	94.4	3.1		41.8	36.6	21.6		10.1	85.8	4				
Total %	2.5	1.6	5.4		1	37.7	1.2		2.4	2.1	1.2		4.5	38.5	1.8		5.6	94.4	

Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

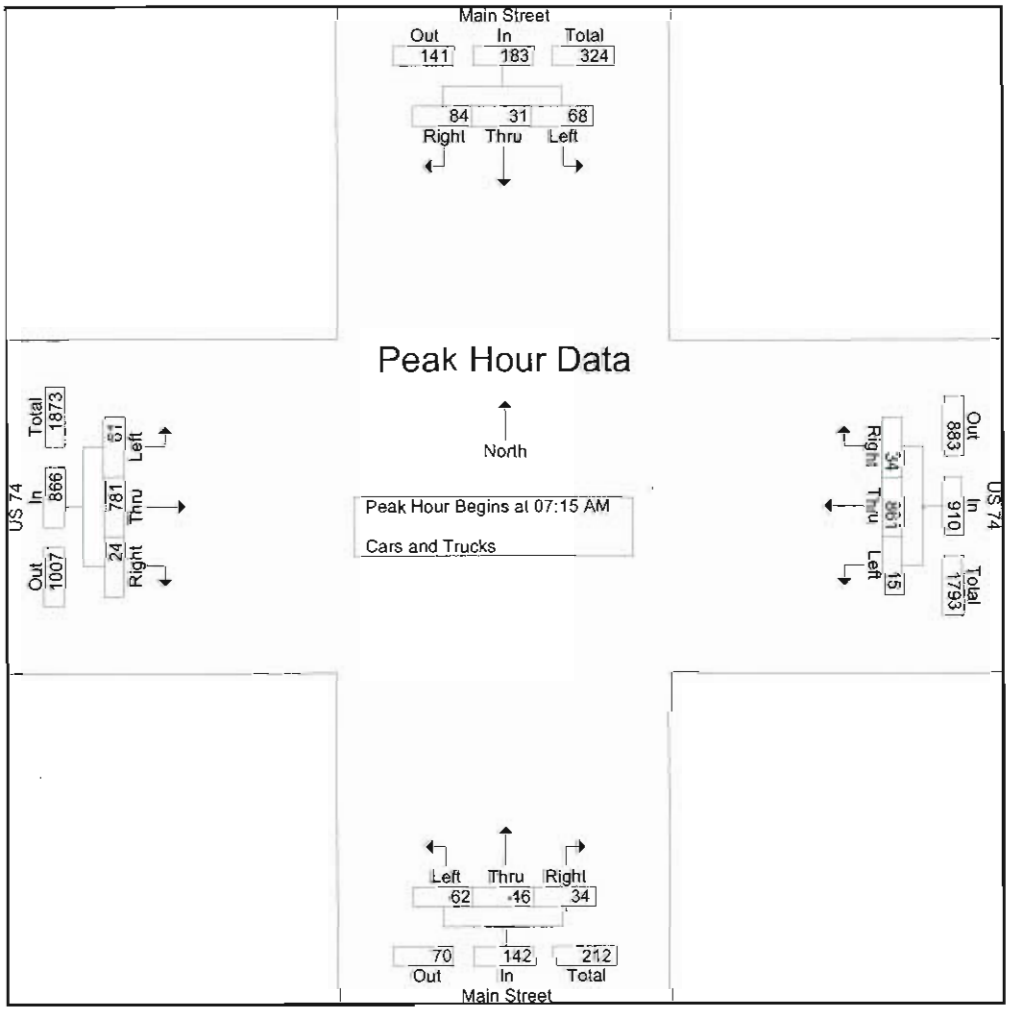
File Name : Main St 5040 peaks
Site Code : 00005040
Start Date : 4/3/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Main St 5040 peaks
Site Code : 00005040
Start Date : 4/3/2007

	Main Street From North				US 74 From East				Main Street From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	16	9	9	34	7	173	6	188	7	13	10	30	10	193	17	220	470
07:30 AM	24	7	19	50	6	195	3	204	9	15	29	53	6	203	15	224	531
07:45 AM	24	8	25	57	11	285	4	300	11	10	11	32	4	203	21	228	617
08:00 AM	20	7	15	42	10	208	2	220	7	8	12	27	4	182	8	194	483
Total Volume	84	31	68	183	34	861	15	910	34	46	62	142	24	781	61	866	2101
% App. Total	45.9	16.9	37.2		3.7	94.6	1.6		23.9	32.4	43.7		2.8	90.2	7		
PHF	.875	.861	.680	.803	.773	.755	.625	.758	.773	.767	.534	.670	.600	.962	.726	.950	.851

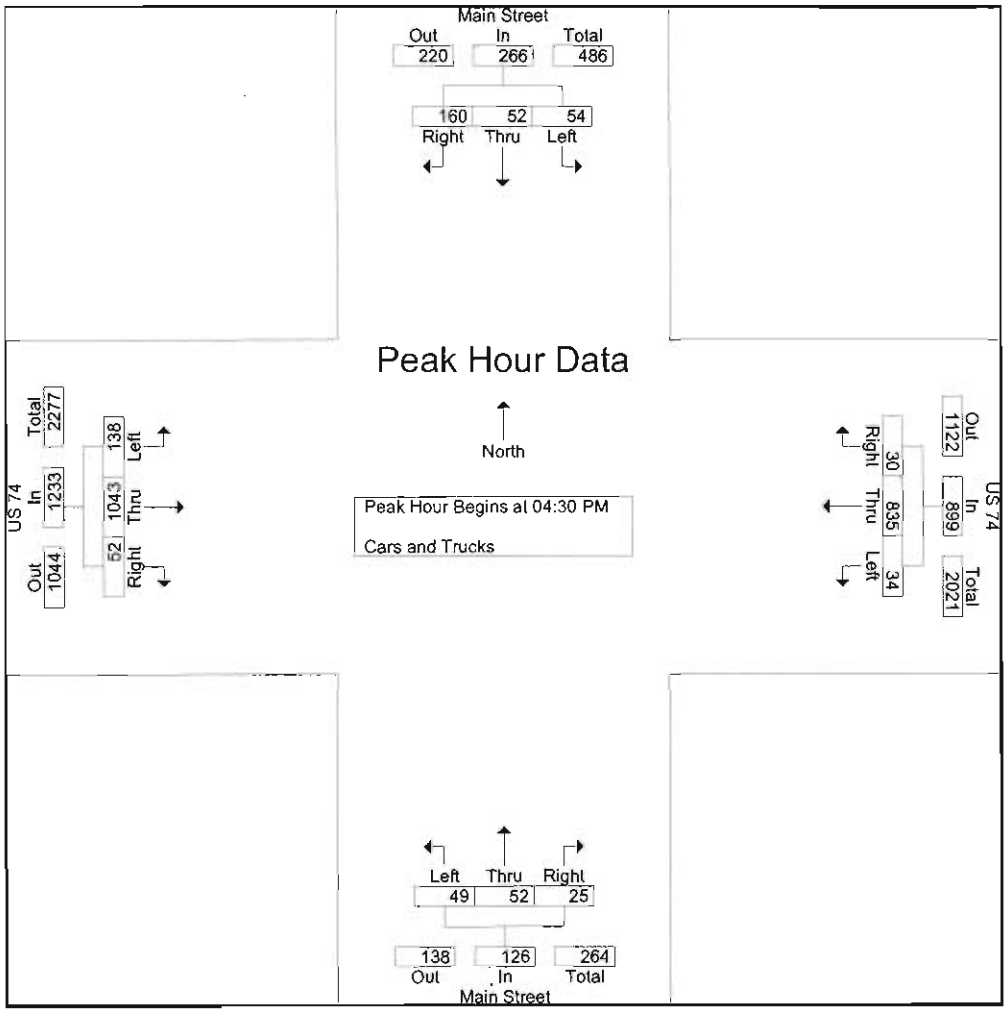


Martin/Alexiou/Bryson, PLLC

4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Main St 5040 peaks
Site Code : 00005040
Start Date : 4/3/2007

	Main Street From North				US 74 From East				Main Street From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	45	14	13	72	9	202	9	220	4	17	15	36	8	235	45	288	616
04:45 PM	40	14	21	75	6	208	8	222	7	16	15	38	12	269	37	318	653
05:00 PM	39	9	11	59	10	200	11	221	9	13	13	35	13	251	25	289	604
05:15 PM	36	15	9	60	5	225	6	236	5	6	6	17	19	288	31	338	651
Total Volume	160	52	54	266	30	835	34	899	25	52	49	126	52	1043	138	1233	2524
% App. Total	60.2	19.5	20.3		3.3	92.9	3.8		19.8	41.3	38.9		4.2	84.6	11.2		
PHF	.889	.867	.643	.887	.750	.928	.773	.952	.694	.765	.617	.829	.684	.905	.787	.912	.966



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

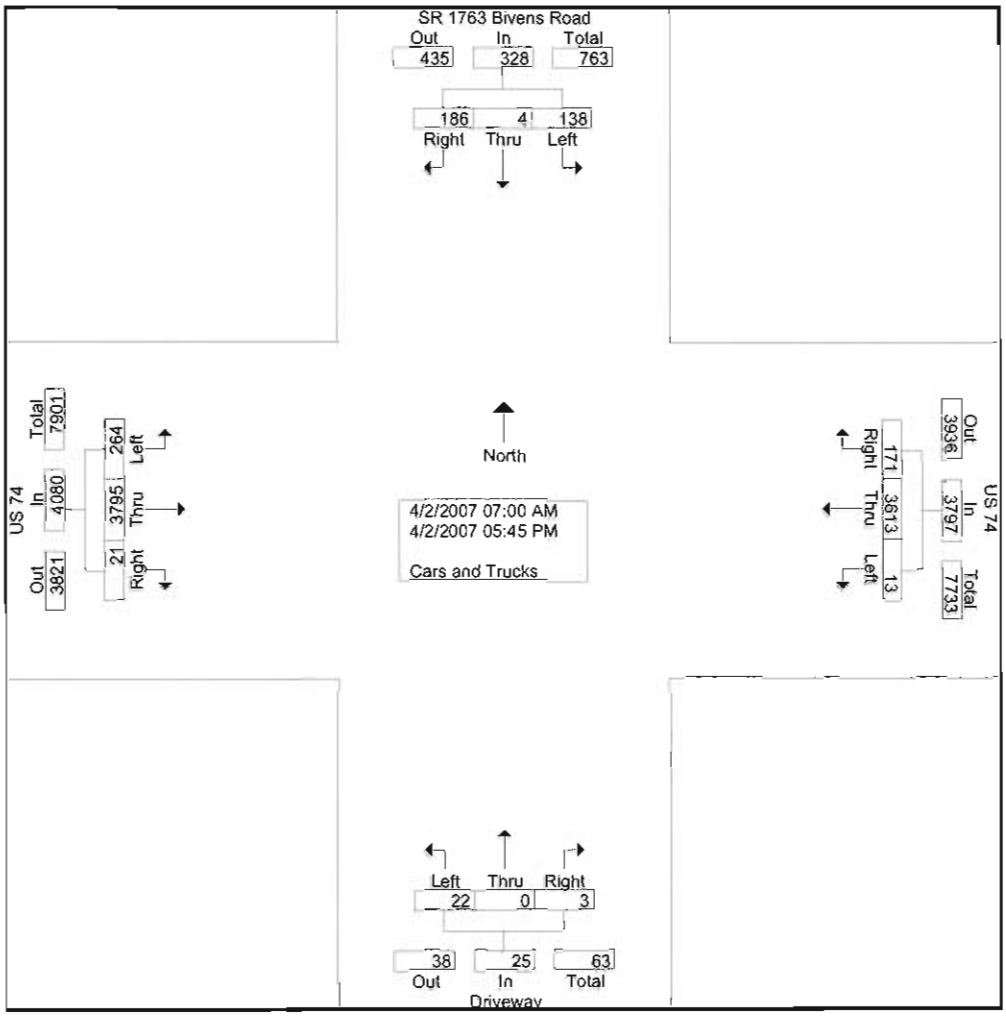
File Name : SR 1763 Bivens Rd 5038 peaks
Site Code : 00005038
Start Date : 4/2/2007
Page No : 1

Groups Printed- Cars and Trucks

	SR 1763 Bivens Road Southbound				US 74 Westbound				Driveway Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Exclu. Total	Inclu. Total	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
07:00 AM	8	0	6	0	10	209	19	11	0	0	0	0	24	159	1	14	25	436	461
07:15 AM	4	0	8	0	0	204	32	19	0	0	0	0	9	199	1	23	42	457	499
07:30 AM	1	0	4	0	0	223	9	14	0	0	0	0	22	251	0	17	31	510	541
07:45 AM	2	1	10	1	0	288	23	12	0	0	0	0	13	230	1	15	28	568	596
Total	15	1	28	1	10	924	83	56	0	0	0	0	68	839	3	69	126	1971	2097
08:00 AM	1	0	8	1	1	250	12	15	1	0	0	0	34	216	4	22	38	527	565
08:15 AM	5	0	7	1	0	240	9	14	3	0	0	0	14	162	6	18	33	446	479
08:30 AM	2	0	10	1	0	212	4	23	2	0	0	0	6	167	2	14	38	405	443
08:45 AM	5	0	8	1	0	184	6	11	0	0	0	0	9	195	2	26	38	409	447
Total	13	0	33	4	1	886	31	63	6	0	0	0	63	740	14	80	147	1787	1934
04:00 PM	6	2	20	1	0	249	12	18	1	0	0	0	14	242	2	12	31	548	579
04:15 PM	15	0	16	0	0	214	10	9	1	0	0	0	19	250	0	19	28	525	553
04:30 PM	32	1	14	1	0	240	9	21	0	0	0	0	22	290	0	18	40	608	648
04:45 PM	22	0	20	0	0	225	10	12	0	0	0	0	14	285	1	16	28	577	605
Total	75	3	70	2	0	928	41	60	2	0	0	0	69	1067	3	65	127	2258	2385
05:00 PM	11	0	18	0	0	197	3	17	6	0	1	0	19	276	0	7	24	531	555
05:15 PM	7	0	10	0	2	226	5	14	6	0	2	0	18	318	1	10	24	595	619
05:30 PM	8	0	11	0	0	236	1	12	1	0	0	0	17	285	0	6	18	559	577
05:45 PM	9	0	16	0	0	216	7	14	1	0	0	0	10	270	0	7	21	529	550
Total	35	0	55	0	2	875	16	57	14	0	3	0	64	1149	1	30	87	2214	2301
Grand Total	138	4	186	7	13	3613	171	236	22	0	3	0	264	3795	21	244	487	8230	8717
Apprch %	42.1	1.2	56.7		0.3	95.2	4.5		88	0	12		6.5	93	0.5				
Total %	1.7	0	2.3		0.2	43.9	2.1		0.3	0	0		3.2	46.1	0.3		5.6	94.4	

Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

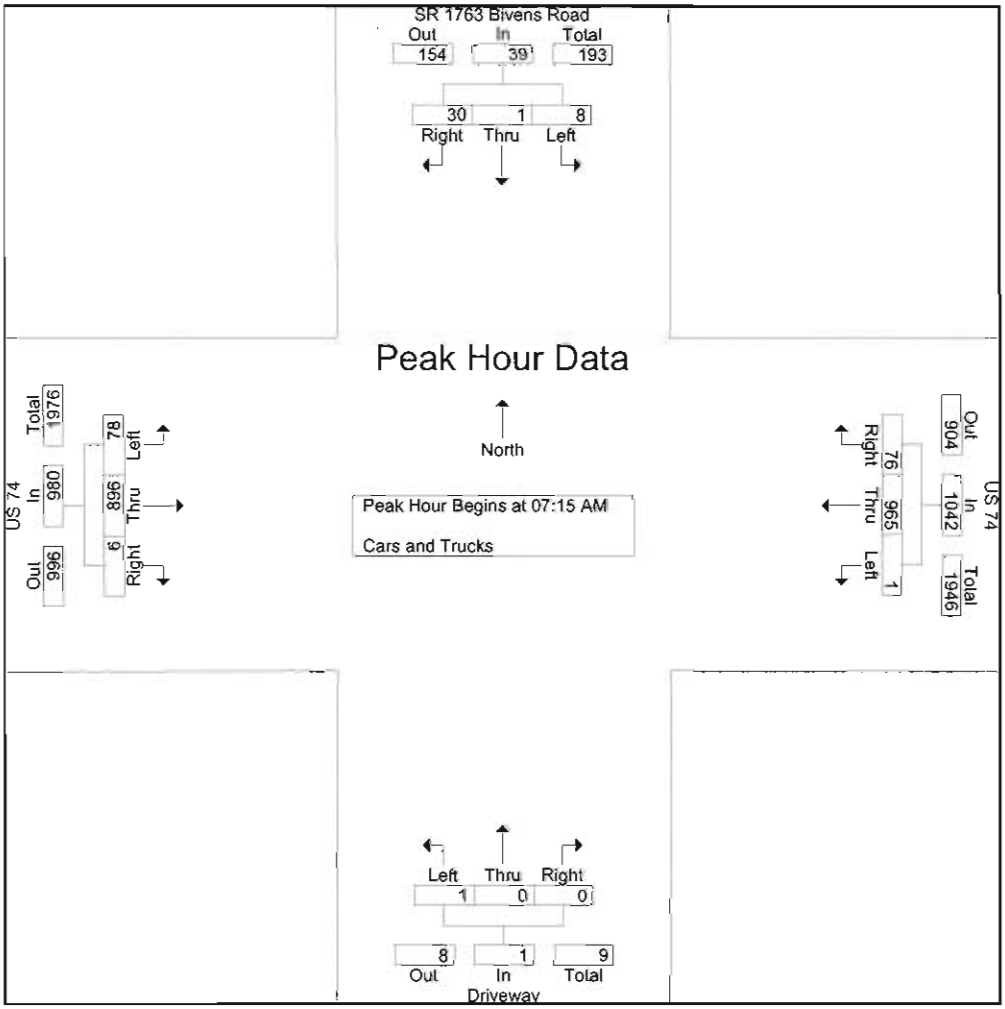
File Name : SR 1763 Bivens Rd 5038 peaks
Site Code : 00005038
Start Date : 4/2/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : SR 1763 Bivens Rd 5038 peaks
Site Code : 00005038
Start Date : 4/2/2007

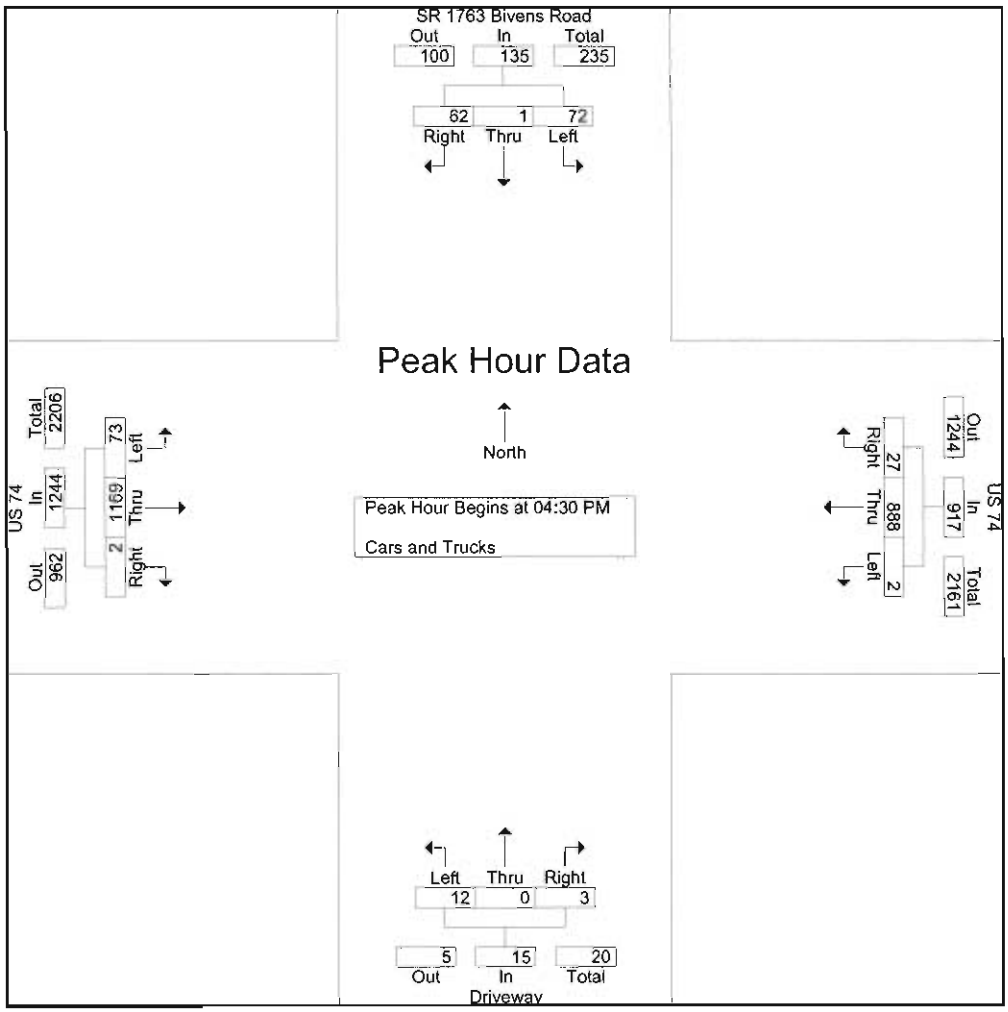
	SR 1763 Bivens Road From North				US 74 From East				Driveway From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	8	0	4	12	32	204	0	236	0	0	0	0	1	199	9	209	457
07:30 AM	4	0	1	5	9	223	0	232	0	0	0	0	0	251	22	273	510
07:45 AM	10	1	2	13	23	288	0	311	0	0	0	0	1	230	13	244	568
08:00 AM	8	0	1	9	12	250	1	263	0	0	1	1	4	216	34	254	527
Total Volume	30	1	8	39	76	965	1	1042	0	0	1	1	6	898	76	980	2062
% App. Total	76.9	2.6	20.5		7.3	92.6	0.1		0	0	100		0.6	91.4	8		
PHF	.750	.250	.500	.750	.594	.838	.250	.838	.000	.000	.250	.250	.375	.892	.574	.897	.908



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : SR 1763 Bivens Rd 5038 peaks
Site Code : 00005038
Start Date : 4/2/2007

	SR 1763 Bivens Road From North				US 74 From East				Driveway From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	14	1	32	47	9	240	0	249	0	0	0	0	0	290	22	312	608
04:45 PM	20	0	22	42	10	225	0	235	0	0	0	0	1	285	14	300	577
05:00 PM	18	0	11	29	3	197	0	200	1	0	6	7	0	276	19	295	531
05:15 PM	10	0	7	17	5	226	2	233	2	0	6	8	1	318	18	337	595
Total Volume	62	1	72	135	27	888	2	917	3	0	12	15	2	1169	73	1244	2311
% App. Total	45.9	0.7	53.3		2.9	96.8	0.2		20	0	80		0.2	94	5.9		
PHF	.775	.250	.563	.718	.675	.925	.250	.921	.375	.000	.500	.469	.500	.919	.830	.923	.950



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

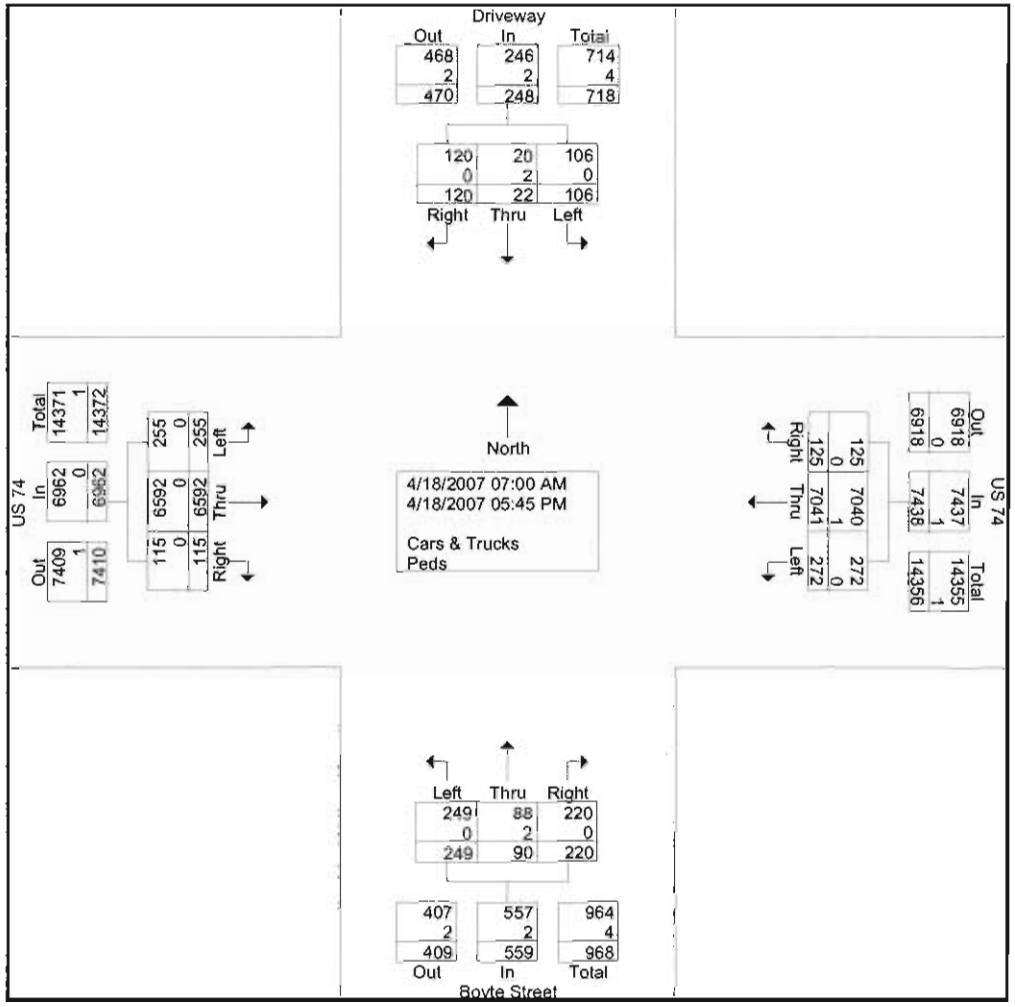
File Name : Boyte Street retail ent 5030 peaks
Site Code : 00005030
Start Date : 4/18/2007
Page No : 1

Groups Printed- Cars & Trucks - Peds

	Driveway Southbound				US 74 Westbound				Boyte Street Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	2	1	0	0	4	376	1	33	22	0	11	0	3	304	5	26	59	729	788
07:15 AM	0	0	0	0	5	399	1	35	15	1	17	0	1	331	2	44	79	772	851
07:30 AM	0	0	1	0	18	446	3	41	11	0	15	0	1	373	4	34	75	872	947
07:45 AM	0	1	0	0	13	469	4	42	14	2	16	1	10	417	1	34	77	947	1024
Total	2	2	1	0	40	1690	9	151	62	3	59	1	15	1425	12	138	290	3320	3610
08:00 AM	2	0	3	0	20	396	3	22	29	1	22	1	10	403	5	37	60	894	954
08:15 AM	2	0	7	0	21	392	4	32	12	0	12	3	10	330	1	41	76	791	867
08:30 AM	1	0	3	1	20	341	4	33	13	0	28	1	12	300	9	43	78	731	809
08:45 AM	4	5	3	0	16	332	6	37	14	1	11	1	16	378	1	36	74	787	861
Total	9	5	16	1	77	1461	17	124	68	2	73	6	48	1411	16	157	288	3203	3491
*** BREAK ***																			
04:00 PM	8	1	12	0	16	450	16	25	15	1	4	0	25	440	19	18	43	1007	1050
04:15 PM	18	2	11	0	19	515	11	36	19	10	6	0	4	449	11	26	62	1075	1137
04:30 PM	14	2	9	0	22	488	14	30	24	66	8	5	15	414	12	30	65	1088	1153
04:45 PM	9	2	10	0	29	509	8	28	9	0	9	0	41	446	10	26	54	1082	1136
Total	49	7	42	0	86	1962	49	119	67	77	27	5	85	1749	52	100	224	4252	4476
05:00 PM	8	0	18	0	15	571	11	21	8	1	20	1	29	505	7	13	35	1193	1228
05:15 PM	20	2	12	0	18	479	12	23	16	4	20	0	26	517	12	20	43	1138	1181
05:30 PM	7	2	20	0	11	476	14	29	7	0	7	0	23	503	11	15	44	1081	1125
05:45 PM	11	4	11	0	25	402	13	12	21	3	14	0	29	482	5	17	29	1020	1049
Total	46	8	61	0	69	1928	50	85	52	8	61	1	107	2007	35	65	151	4432	4583
Grand Total	106	22	120	1	272	7041	125	479	249	90	220	13	255	6592	115	460	953	15207	16160
Apprch %	42.7	8.9	48.4		3.7	94.7	1.7		44.5	16.1	39.4		3.7	94.7	1.7				
Total %	0.7	0.1	0.8		1.8	46.3	0.8		1.6	0.6	1.4		1.7	43.3	0.8		5.9	94.1	
Cars & Trucks	106	20	120		272	7040	125		249	88	220		255	6592	115		0	0	16155
% Cars & Trucks	100	90.9	100	100	100	100	100	100	100	97.8	100	100	100	100	100	100	0	0	100
Peds	0	2	0		0	1	0		0	2	0		0	0	0		0	0	5
% Peds	0	9.1	0	0	0	0	0	0	0	2.2	0	0	0	0	0	0	0	0	0

Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

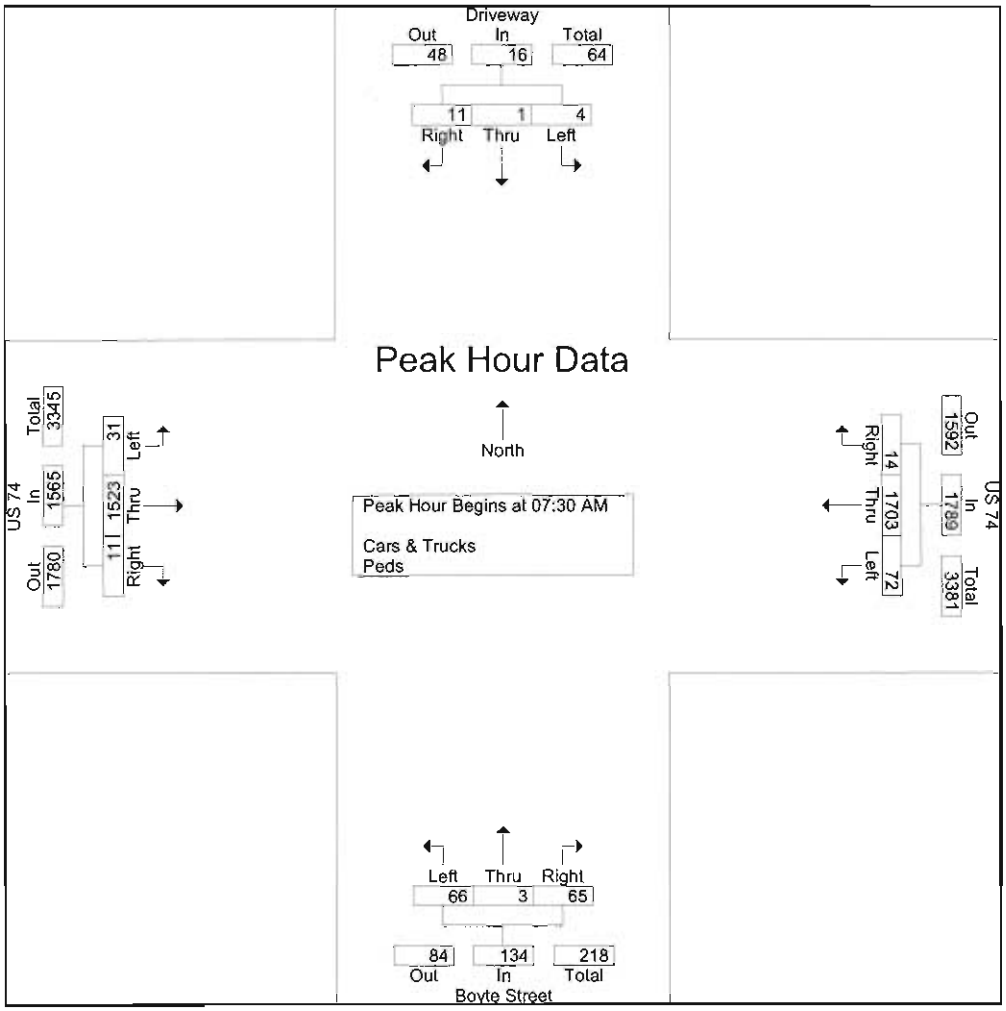
File Name : Boyte Street retail ent 5030 peaks
Site Code : 00005030
Start Date : 4/18/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Boyte Street retail ent 5030 peaks
Site Code : 00005030
Start Date : 4/18/2007
Page No : 2

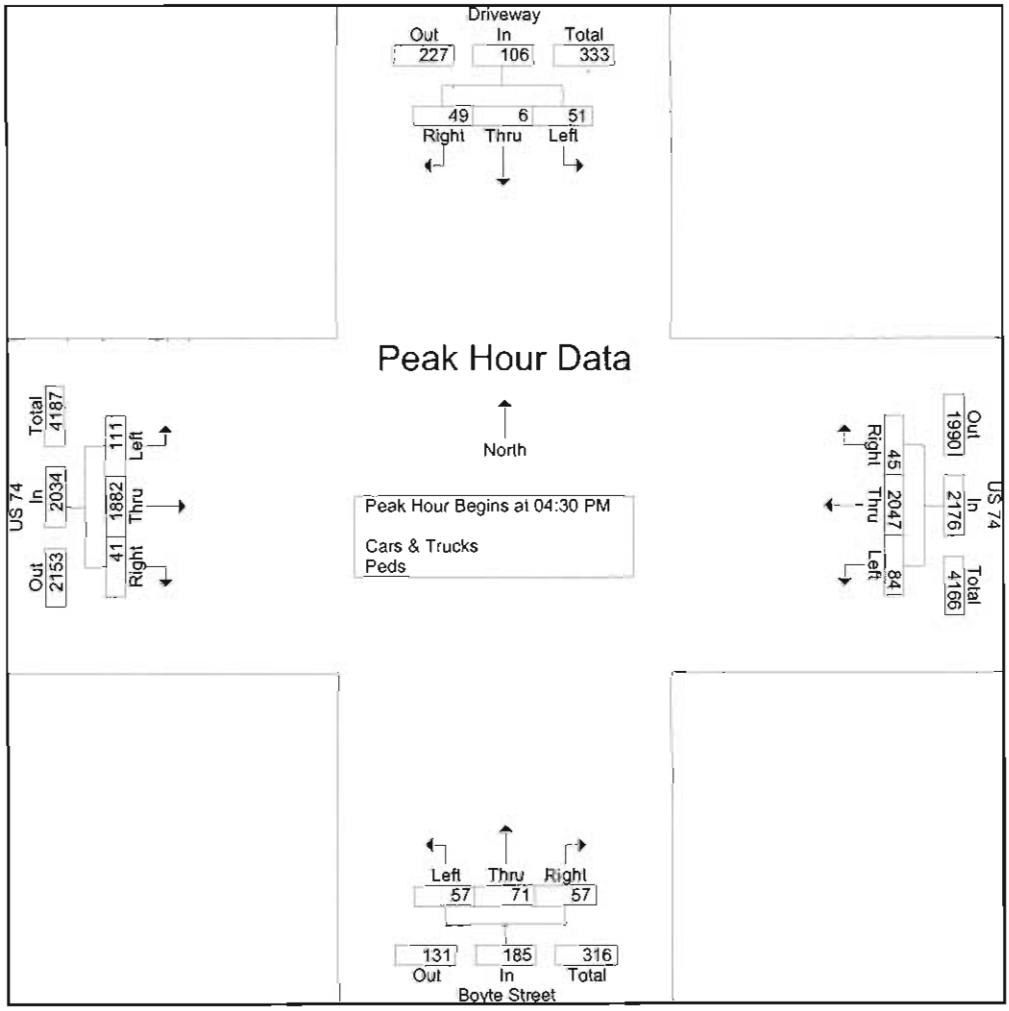
	Driveway From North				US 74 From East				Boyte Street From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	0	0	1	3	446	18	467	15	0	11	26	4	373	1	378	872
07:45 AM	0	**1**	0	1	4	**469**	13	**486**	16	**2**	14	32	1	**417**	**10**	**428**	**947**
08:00 AM	3	0	**2**	5	3	396	20	419	**22**	1	**29**	**52**	**5**	403	10	418	894
08:15 AM	7	0	2	**9**	4	392	**21**	417	12	0	12	24	1	330	10	341	791
Total Volume	11	1	4	16	14	1703	72	1789	65	3	66	134	11	1523	31	1565	3504
% App. Total	68.8	6.2	25		0.8	95.2	4		48.5	2.2	49.3		0.7	97.3	2		
PHF	.393	.250	.500	.444	.875	.908	.857	.920	.739	.375	.569	.644	.550	.913	.775	.914	.925



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Boyte Street retail ent 5030 peaks
Site Code : 00005030
Start Date : 4/18/2007
Page No : 3

	Driveway From North				US 74 From East				Boyte Street From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	9	**2**	14	25	**14**	488	22	524	8	**66**	**24**	**98**	**12**	414	15	441	1088
04:45 PM	10	2	9	21	8	**509**	**29**	546	9	0	9	18	10	446	**41**	497	1082
05:00 PM	**18**	0	8	26	11	**571**	15	**597**	**20**	1	8	29	7	505	29	541	**1193**
05:15 PM	12	2	**20**	**34**	12	479	18	509	20	4	16	40	12	**517**	26	**555**	1138
Total Volume	49	6	51	106	45	2047	84	2176	57	71	57	185	41	1882	111	2034	4501
% App. Total	46.2	5.7	48.1		2.1	94.1	3.9		30.8	38.4	30.8		2	92.5	5.5		
PHF	.681	.750	.638	.779	.804	.896	.724	.911	.713	.269	.594	.472	.854	.910	.677	.916	.943



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

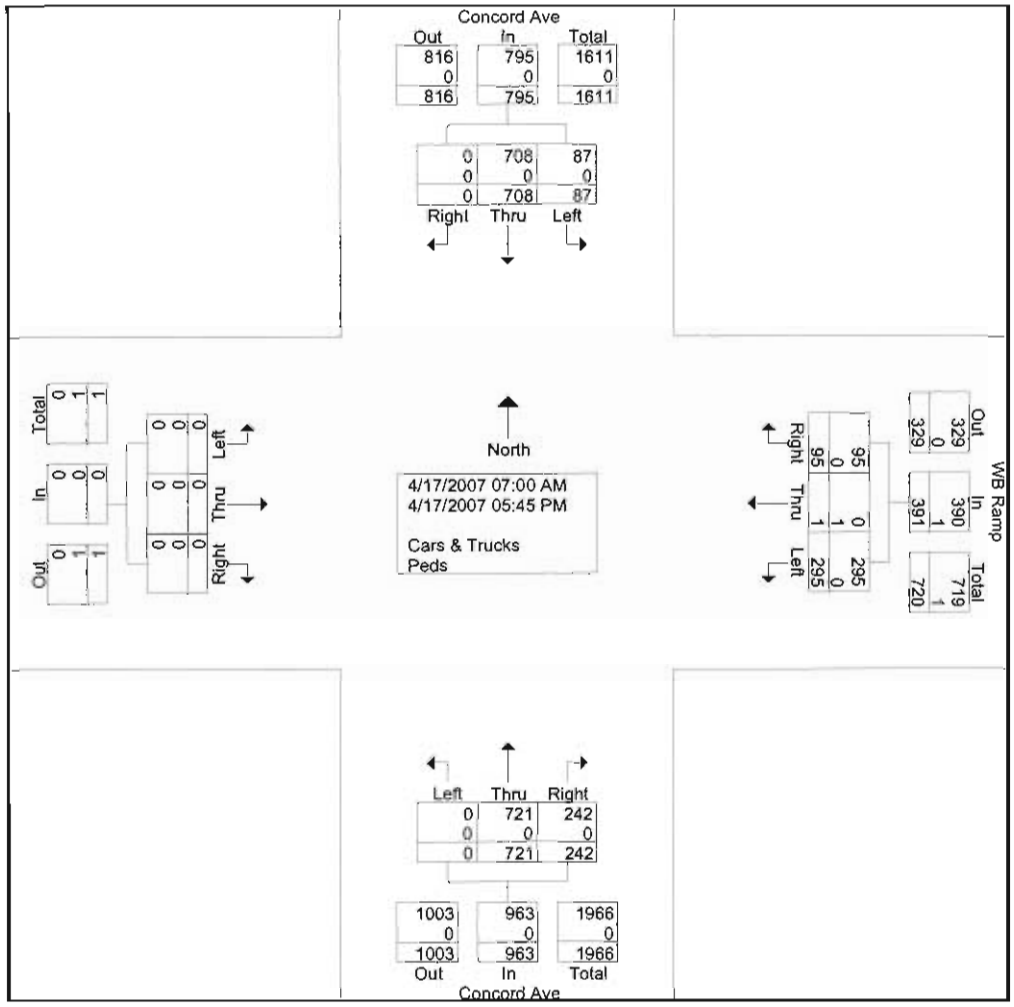
File Name : Concord Ave wb ramp 5027
Site Code : 5027
Start Date : 4/17/2007
Page No : 1

Groups Printed- Cars & Trucks - Peds

	Concord Ave Southbound				WB Ramp Westbound				Concord Ave Northbound				Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	7	43	0	0	16	0	4	0	0	39	21	0	0	0	0	0	0	130	130
07:15 AM	3	35	0	0	34	0	5	1	0	35	16	0	0	0	0	0	1	128	129
07:30 AM	3	51	0	0	20	0	5	2	0	37	20	0	0	0	0	0	2	136	138
07:45 AM	6	68	0	0	12	1	6	0	0	28	18	0	0	0	0	0	0	139	139
Total	19	197	0	0	82	1	20	3	0	139	75	0	0	0	0	0	3	533	536
08:00 AM	4	46	0	0	24	0	8	2	0	33	15	0	0	0	0	0	2	130	132
08:15 AM	6	47	0	1	8	0	2	0	0	32	12	2	0	0	0	0	3	107	110
08:30 AM	5	47	0	2	8	0	5	0	0	25	10	0	0	0	0	0	2	100	102
08:45 AM	4	31	0	0	12	0	6	1	0	27	8	0	0	0	0	0	1	88	89
Total	19	171	0	3	52	0	21	3	0	117	45	2	0	0	0	0	8	425	433
*** BREAK ***																			
04:00 PM	8	39	0	0	21	0	4	0	0	63	18	0	0	0	0	0	0	153	153
04:15 PM	7	46	0	0	25	0	7	0	0	46	14	0	0	0	0	0	0	145	145
04:30 PM	3	46	0	0	22	0	8	1	0	50	9	0	0	0	0	0	1	138	139
04:45 PM	7	51	0	1	23	0	5	0	0	84	22	0	0	0	0	0	1	192	193
Total	25	182	0	1	91	0	24	1	0	243	63	0	0	0	0	0	2	628	630
05:00 PM	10	47	0	0	18	0	10	0	0	75	22	1	0	0	0	0	1	182	183
05:15 PM	6	37	0	0	18	0	9	0	0	56	14	1	0	0	0	0	1	140	141
05:30 PM	3	39	0	0	18	0	5	0	0	42	15	0	0	0	0	0	0	122	122
05:45 PM	5	35	0	0	16	0	6	0	0	49	8	0	0	0	0	0	0	119	119
Total	24	158	0	0	70	0	30	0	0	222	59	2	0	0	0	0	2	563	565
Grand Total	87	708	0	4	295	1	95	7	0	721	242	4	0	0	0	0	15	2149	2164
Apprch %	10.9	89.1	0		75.4	0.3	24.3		0	74.9	25.1		0	0	0				
Total %	4	32.9	0		13.7	0	4.4		0	33.6	11.3		0	0	0		0.7	99.3	
Cars & Trucks	87	708	0		295	0	95		0	721	242		0	0	0		0	0	2163
% Cars & Trucks	100	100	0	100	100	0	100	100	0	100	100	100	0	0	0	0	0	0	100
Peds	0	0	0		0	1	0		0	0	0		0	0	0		0	0	1
% Peds	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0

Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

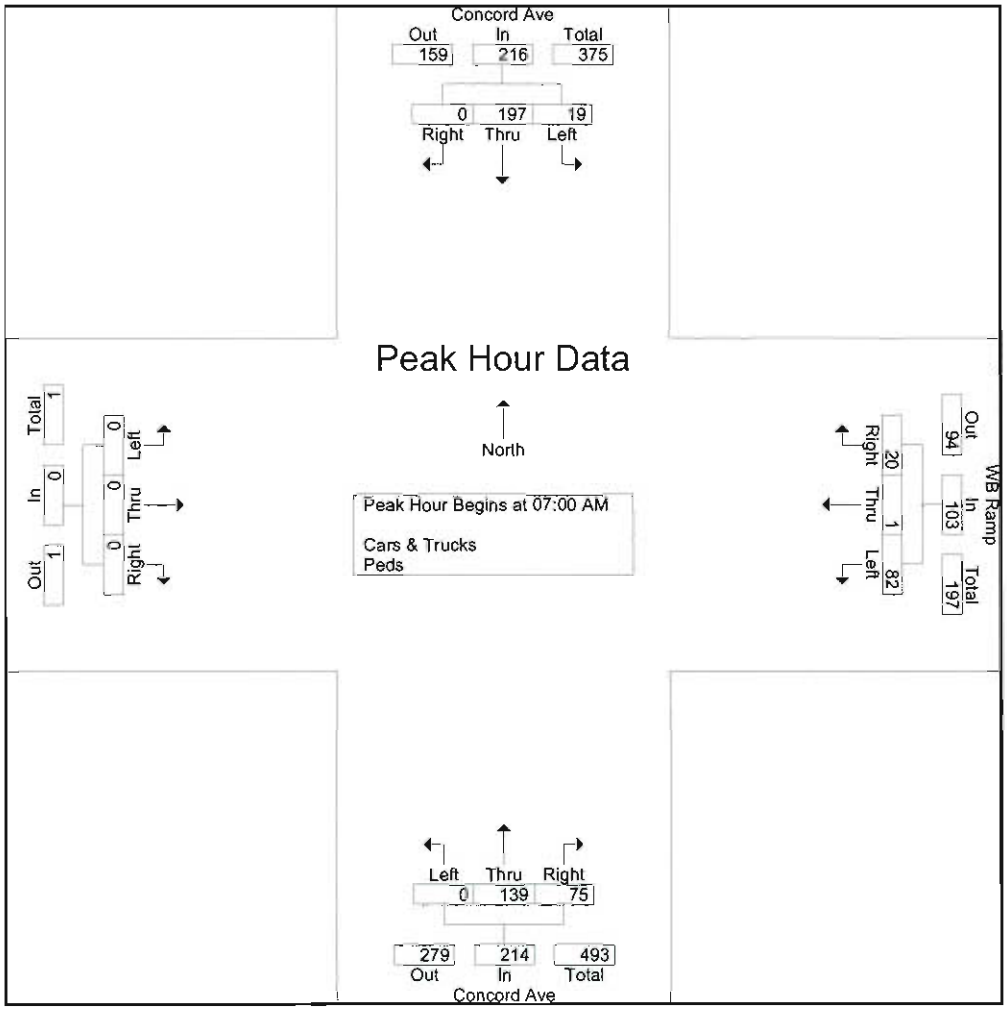
File Name : Concord Ave wb ramp 5027
Site Code : 5027
Start Date : 4/17/2007



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0320

File Name : Concord Ave wb ramp 5027 peaks
Site Code : 5027
Start Date : 4/17/2007
Page No : 2

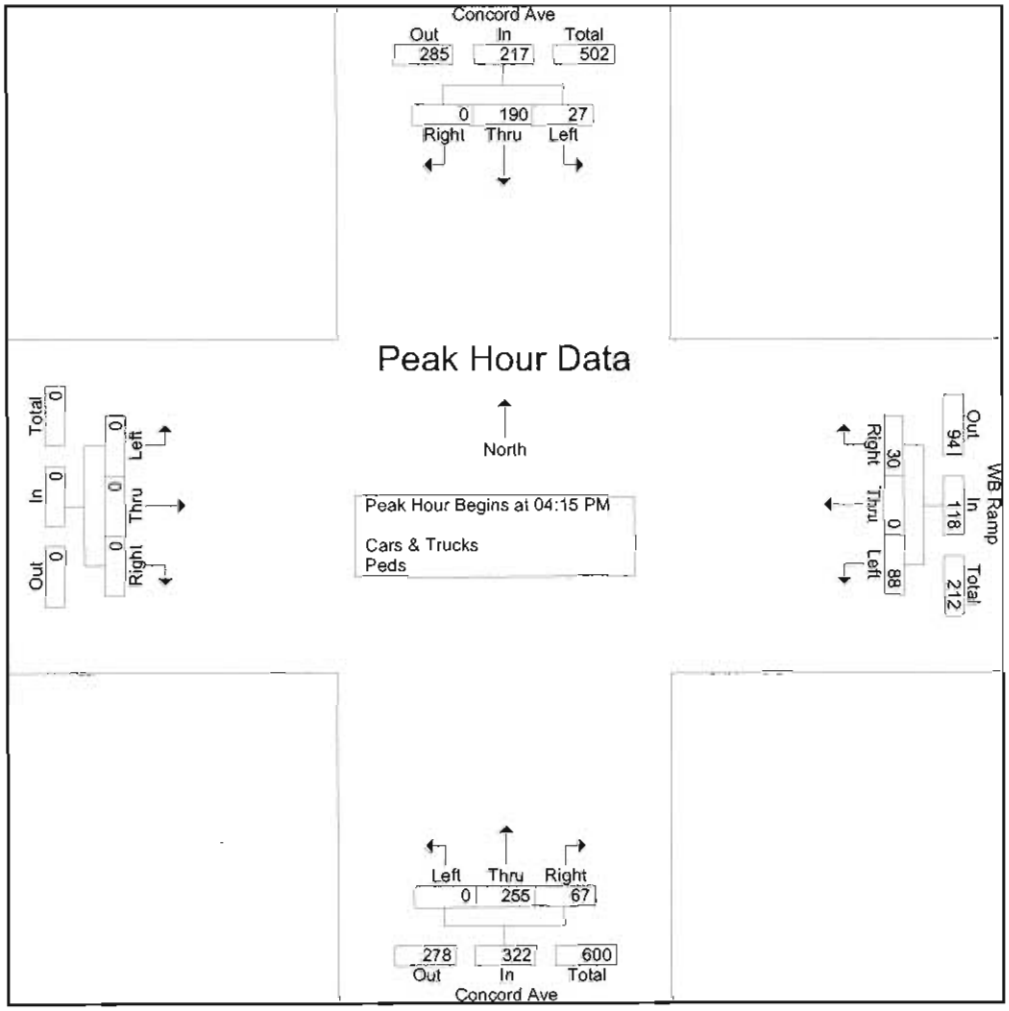
	Concord Ave From North				WB Ramp From East				Concord Ave From South				From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	43	7	50	4	0	16	20	**21**	**39**	0	**60**	0	0	0	0	130
07:15 AM	0	35	3	38	5	0	**34**	**39**	16	35	0	51	0	0	0	0	128
07:30 AM	0	51	3	54	5	0	20	25	20	37	0	57	0	0	0	0	136
07:45 AM	0	**68**	6	**74**	**6**	**1**	12	19	18	28	0	46	0	0	0	0	**139**
Total Volume	0	197	19	216	20	1	82	103	75	139	0	214	0	0	0	0	533
% App. Total	0	91.2	8.8		19.4	1	79.6		35	65	0		0	0	0		
PHF	.000	.724	.679	.730	.833	.250	.603	.660	.893	.891	.000	.892	.000	.000	.000	.000	.959



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0329

File Name : Concord Ave wb ramp 5027 peaks
Site Code : 5027
Start Date : 4/17/2007
Page No : 3

	Concord Ave From North				WB Ramp From East				Concord Ave From South				From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	46	7	53	7	0	**25**	**32**	14	46	0	60	0	0	0	0	145
04:30 PM	0	46	3	49	8	0	22	30	9	50	0	59	0	0	0	0	138
04:45 PM	0	**51**	7	**58**	5	0	23	28	**22**	**84**	0	**106**	0	0	0	0	**192**
05:00 PM	0	47	**10**	57	**10**	0	18	28	22	75	0	97	0	0	0	0	182
Total Volume	0	190	27	217	30	0	88	118	67	255	0	322	0	0	0	0	657
% App. Total	0	87.6	12.4		25.4	0	74.6		20.8	79.2	0		0	0	0		
PHF	.000	.931	.675	.935	.750	.000	.880	.922	.761	.759	.000	.759	.000	.000	.000	.000	.855



Mulkey Engineers & Consultants
6750 Tryon Road
Cary, NC 27518
919-858-1855

File Name : Williams Rd Ext 5022 peaks
Site Code : 00005022
Start Date : 4/18/2007
Page No : 1

Groups Printed- Cars & Trucks - Peds

	Driveway Southbound				US 74 Westbound				Williams Road Ext. Northbound				US 74 Eastbound						
Start Time	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Left	Thru	Right	Trk	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	2	1	6	242	3	14	4	4	11	2	13	207	5	21	38	498	536
07:15 AM	2	2	6	0	8	274	3	18	9	0	0	4	9	206	2	22	44	521	565
07:30 AM	0	2	6	0	19	270	2	27	2	6	6	0	10	242	7	19	46	572	618
07:45 AM	0	1	2	0	21	249	3	32	7	8	18	3	14	304	8	19	54	635	689
Total	2	6	16	1	54	1035	11	91	22	18	35	9	46	959	22	81	182	2226	2408
08:00 AM	2	2	6	0	14	304	7	27	5	5	5	0	23	274	10	26	53	657	710
08:15 AM	2	2	5	0	20	271	5	26	4	5	2	0	11	187	4	26	52	518	570
08:30 AM	3	2	3	1	9	220	2	23	6	5	9	1	23	371	13	41	66	666	732
08:45 AM	2	5	3	0	11	201	4	26	8	3	7	0	13	256	8	16	42	521	563
Total	9	11	17	1	54	996	18	102	23	18	23	1	70	1088	35	109	213	2362	2575
*** BREAK ***																			
04:00 PM	9	6	5	0	10	182	1	18	16	9	3	1	31	391	3	16	35	666	701
04:15 PM	8	3	16	0	12	274	2	22	3	3	3	0	30	378	2	31	53	734	787
04:30 PM	11	5	9	0	10	209	1	11	10	4	26	1	43	452	3	23	35	783	818
04:45 PM	2	3	2	0	2	179	1	10	8	10	12	1	41	394	3	17	28	657	685
Total	30	17	32	0	34	844	5	61	37	26	44	3	145	1615	11	87	151	2840	2991
05:00 PM	8	3	3	0	9	75	2	2	23	7	25	0	51	414	8	10	12	628	640
05:15 PM	16	13	17	0	13	250	5	14	14	15	19	0	47	447	3	16	30	859	889
05:30 PM	17	3	31	0	22	346	2	27	14	12	20	2	40	376	3	14	43	886	929
05:45 PM	14	14	25	1	20	237	1	17	20	14	19	1	30	432	2	7	26	828	854
Total	55	33	76	1	64	908	10	60	71	48	83	3	168	1669	16	47	111	3201	3312
Grand Total	96	67	141	3	206	3783	44	314	153	110	185	16	429	5331	84	324	657	10629	11286
Apprch %	31.6	22	46.4		5.1	93.8	1.1		34.2	24.6	41.3		7.3	91.2	1.4				
Total %	0.9	0.6	1.3		1.9	35.6	0.4		1.4	1	1.7		4	50.2	0.8		5.8	94.2	
Cars & Trucks	96	67	141		206	3783	44		153	110	185		429	5331	84		0	0	11286
% Cars & Trucks	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0	0	100
Peds	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Mulkey Engineers & Consultants
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Cary, NC 27518
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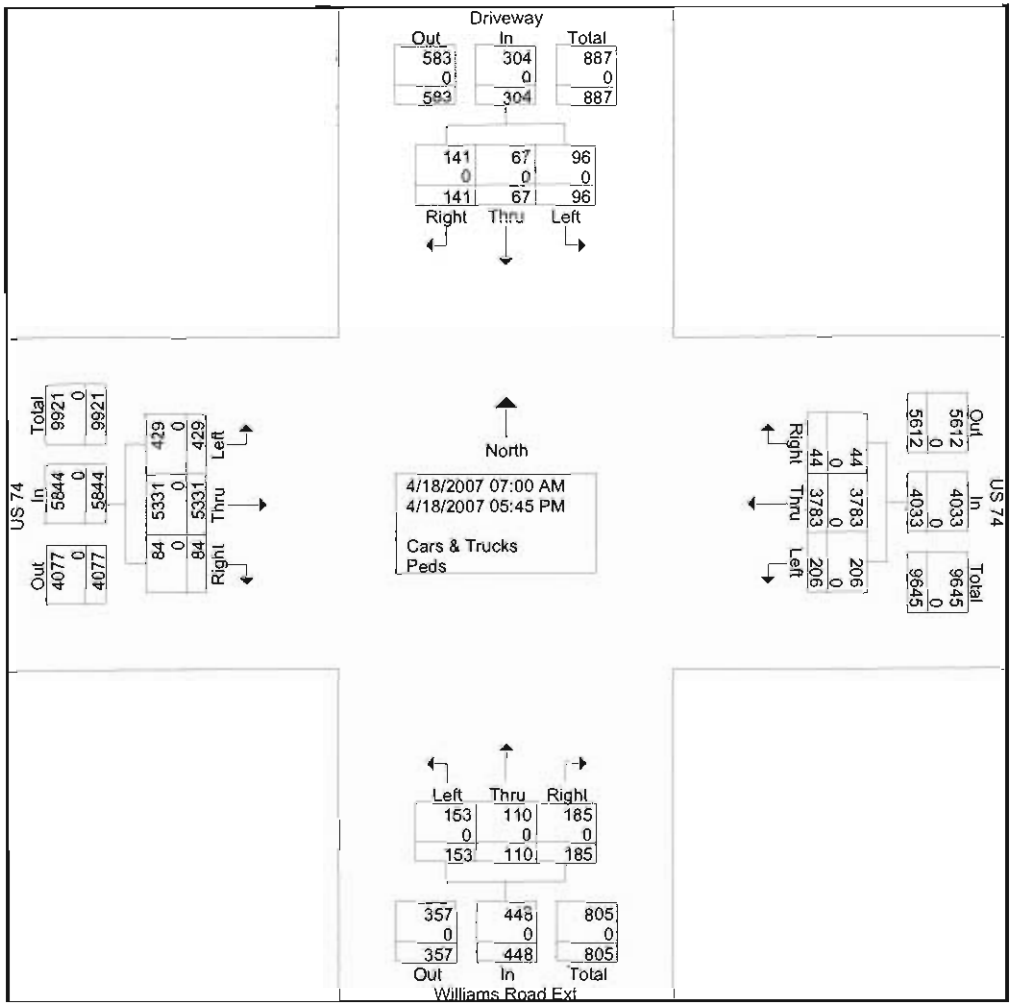
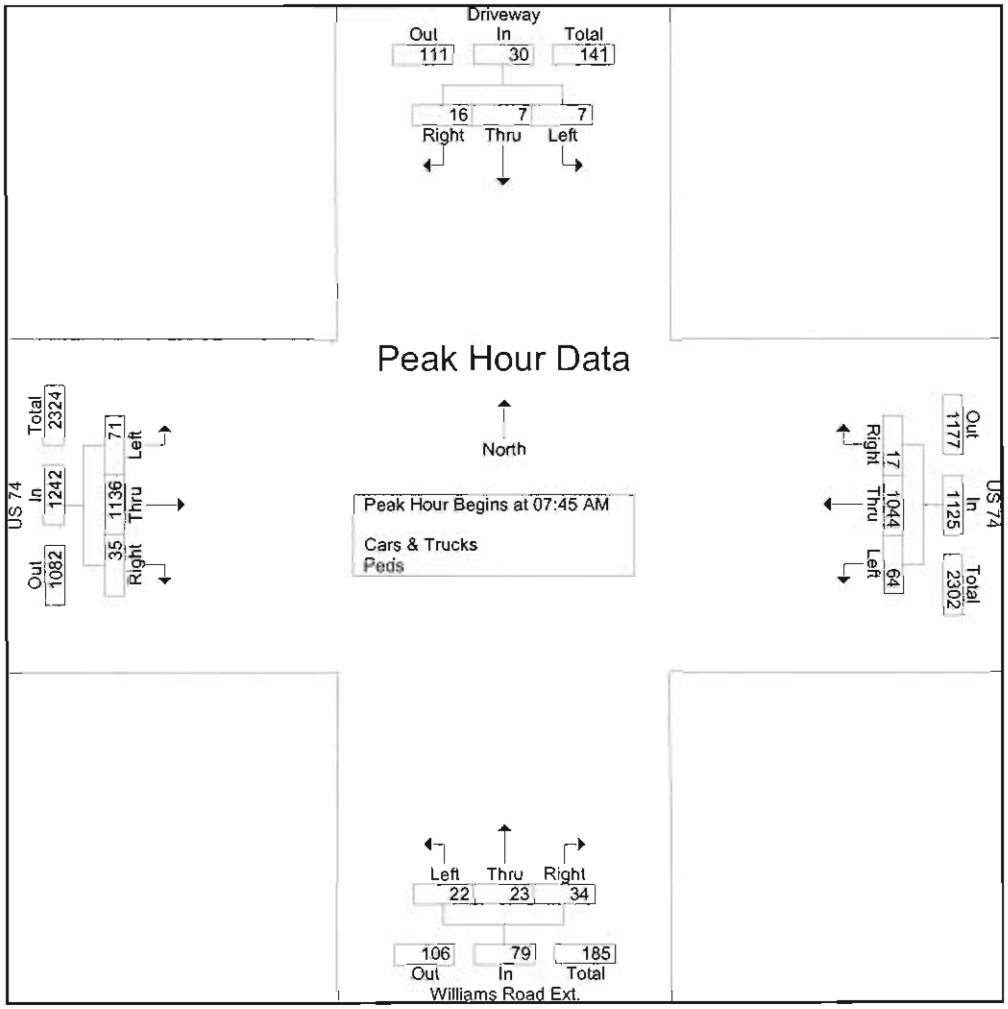
File Name : Williams Rd Ext 5022 peaks
Site Code : 00005022
Start Date : 4/18/2007
Page No : 2



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0320

File Name : Williams Rd Ext 5022 peaks
Site Code : 00005022
Start Date : 4/18/2007

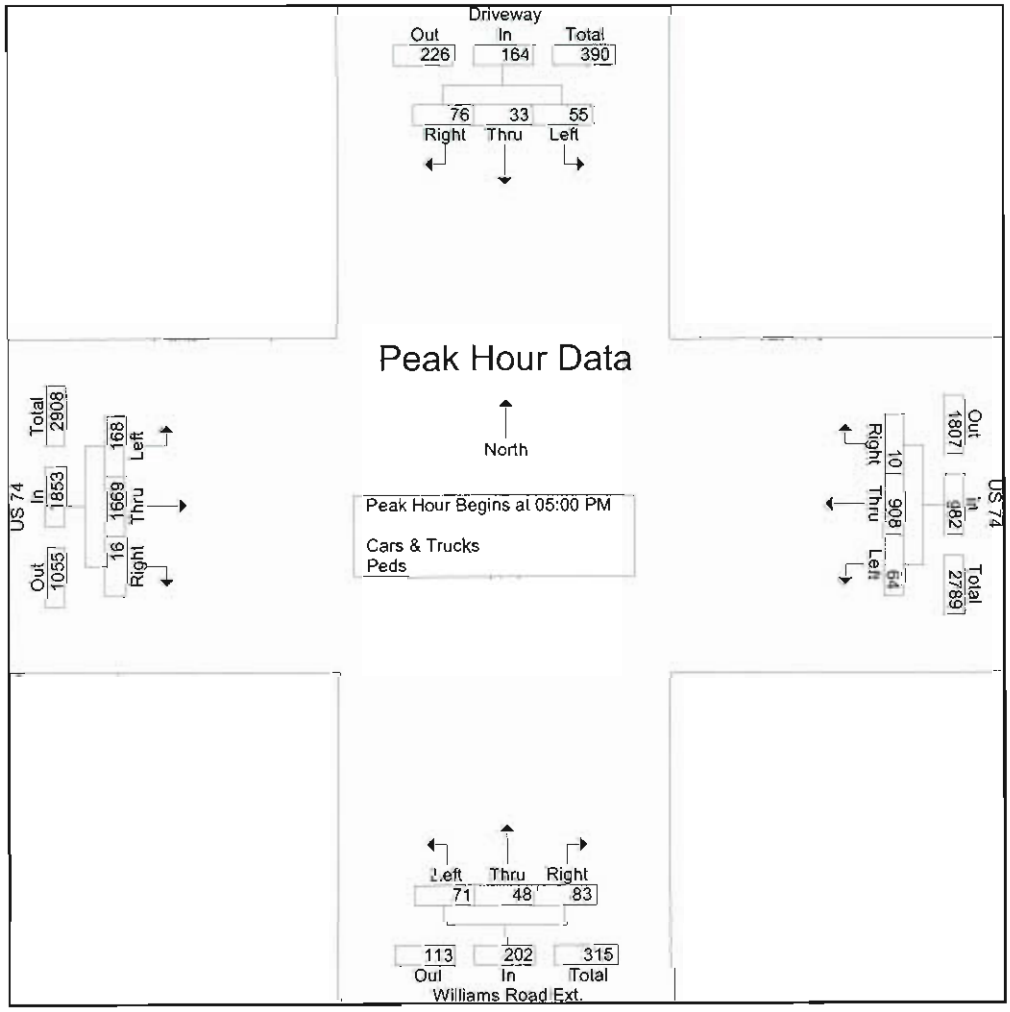
	Driveway From North				US 74 From East				Williams Road Ext. From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	2	1	0	3	3	249	21	273	18	8	7	33	8	304	14	326	635
08:00 AM	6	2	2	10	7	304	14	325	5	5	5	15	10	274	23	307	657
08:15 AM	5	2	2	9	5	271	20	296	2	5	4	11	4	187	11	202	518
08:30 AM	3	2	3	8	2	220	9	231	9	5	6	20	13	371	23	407	666
Total Volume	16	7	7	30	17	1044	64	1125	34	23	22	79	35	1136	71	1242	2476
% App. Total	53.3	23.3	23.3		1.5	92.8	5.7		43	29.1	27.8		2.8	91.5	5.7		
PHF	.667	.875	.583	.750	.607	.859	.762	.865	.472	.719	.786	.598	.673	.765	.772	.763	.929



Martin/Alexiou/Bryson, PLLC
4000 Westchase Boulevard, Suite 530
Raleigh, NC 27607
Phone: 919-829-0328; Fax: 919-829-0328

File Name : Williams Rd Ext 5022 peaks
Site Code : 00005022
Start Date : 4/18/2007

	Driveway From North				US 74 From East				Williams Road Ext. From South				US 74 From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	3	3	8	14	2	75	9	86	**25**	7	**23**	**55**	**8**	414	**51**	473	628
05:15 PM	17	13	16	46	**5**	250	13	268	19	**15**	14	48	3	**447**	47	**497**	859
05:30 PM	**31**	3	**17**	51	2	**346**	**22**	**370**	20	12	14	46	3	376	40	419	**886**
05:45 PM	25	**14**	14	**53**	1	237	20	258	19	**14**	20	53	2	432	30	464	828
Total Volume	76	33	55	164	10	908	64	982	83	48	71	202	16	1669	168	1853	3201
% App. Total	46.3	20.1	33.5		1	92.5	6.5		41.1	23.8	35.1		0.9	90.1	9.1		
PHF	.613	.589	.809	.774	.500	.656	.727	.664	.830	.800	.772	.918	.500	.933	.824	.932	.903



Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

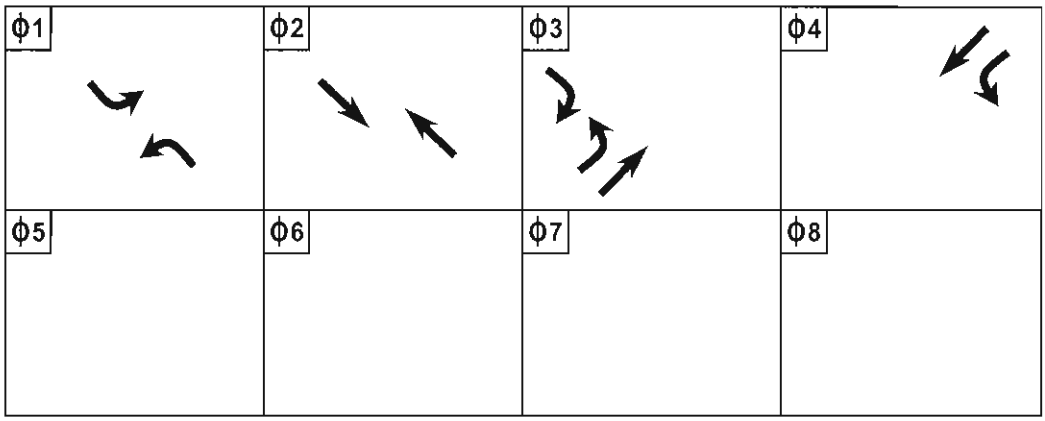
NORTH CAROLINA
Turnpike Authority

PBSJ

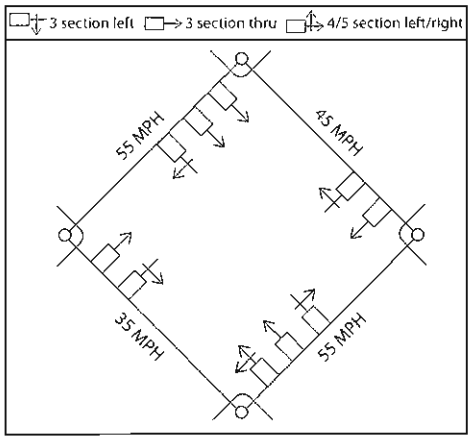
Appendix B
Intersection Data Sheets

US 74 / STALLINGS ROAD

PHASING DIAGRAM



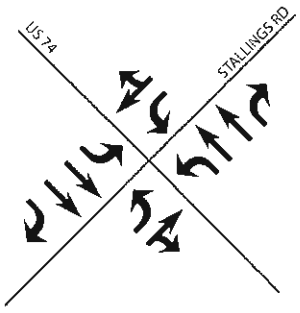
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Stallings Road

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

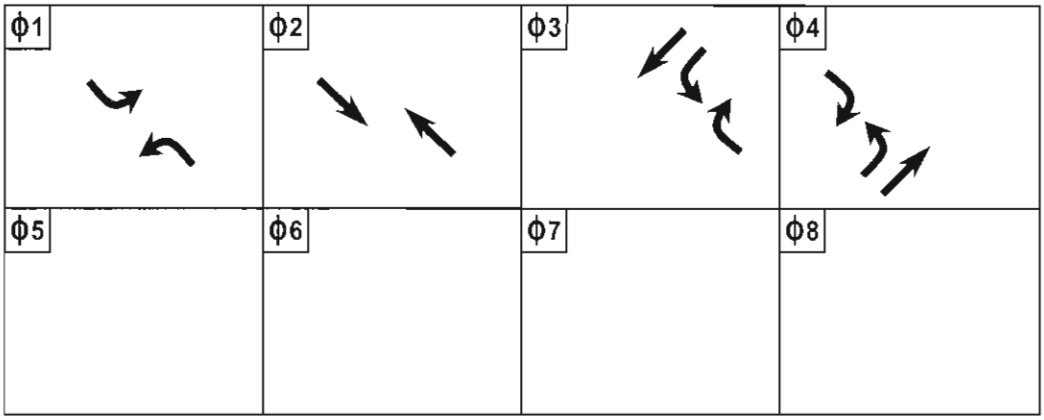
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Data Sheet B1

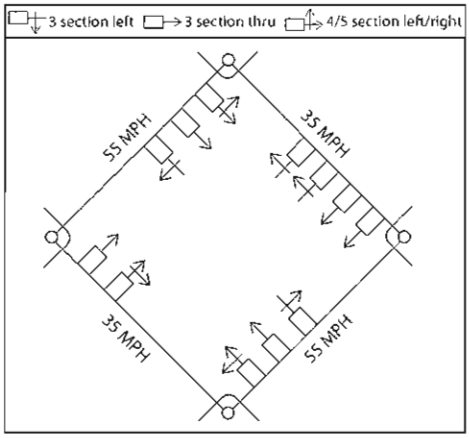
Monroe_IntDataSheets.mxd 1/17/07

US 74 / INDIAN TRAIL-FAIRVIEW ROAD

PHASING DIAGRAM



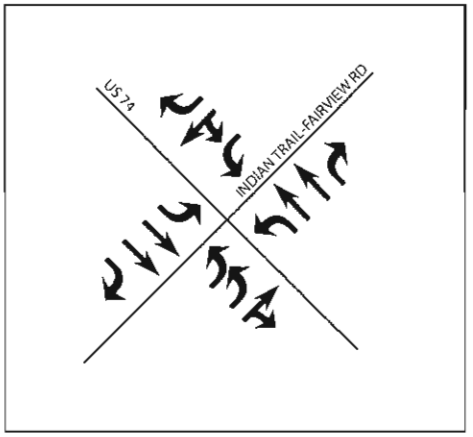
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Indian Trail-Fairview Road

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

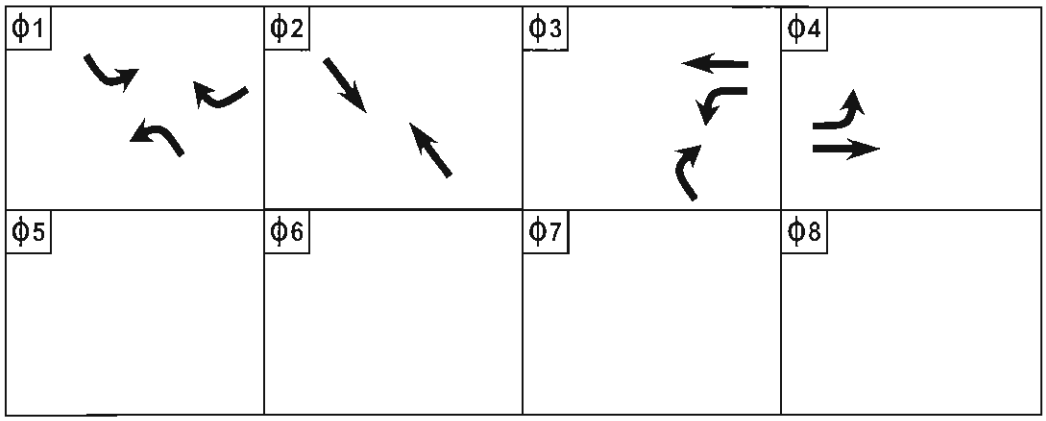
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Data Sheet B2

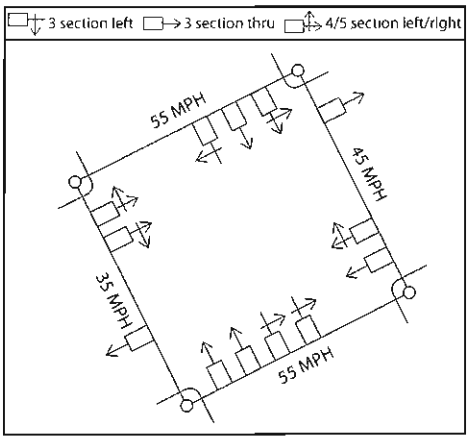
US 74 / UNIONVILLE-INDIAN TRAIL ROAD

Aerial outdated, figure below represents field verified lane geometry

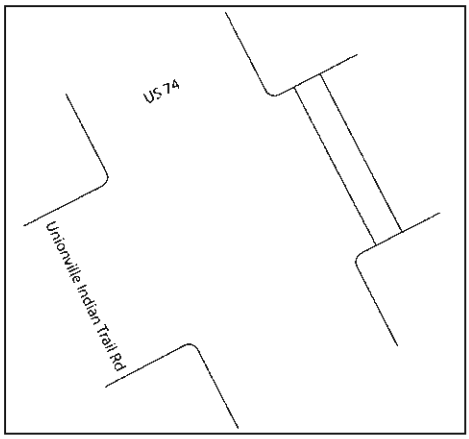
PHASING DIAGRAM



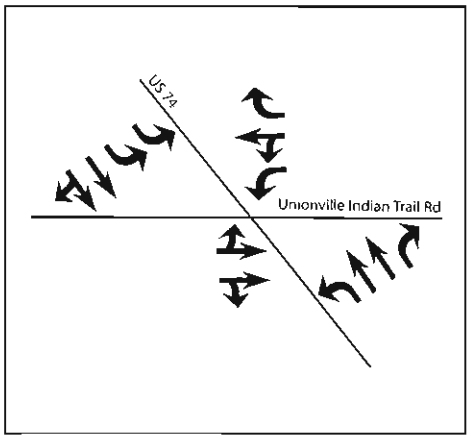
TRAFFIC CONTROL



PEDESTRIAN FACILITIES



LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

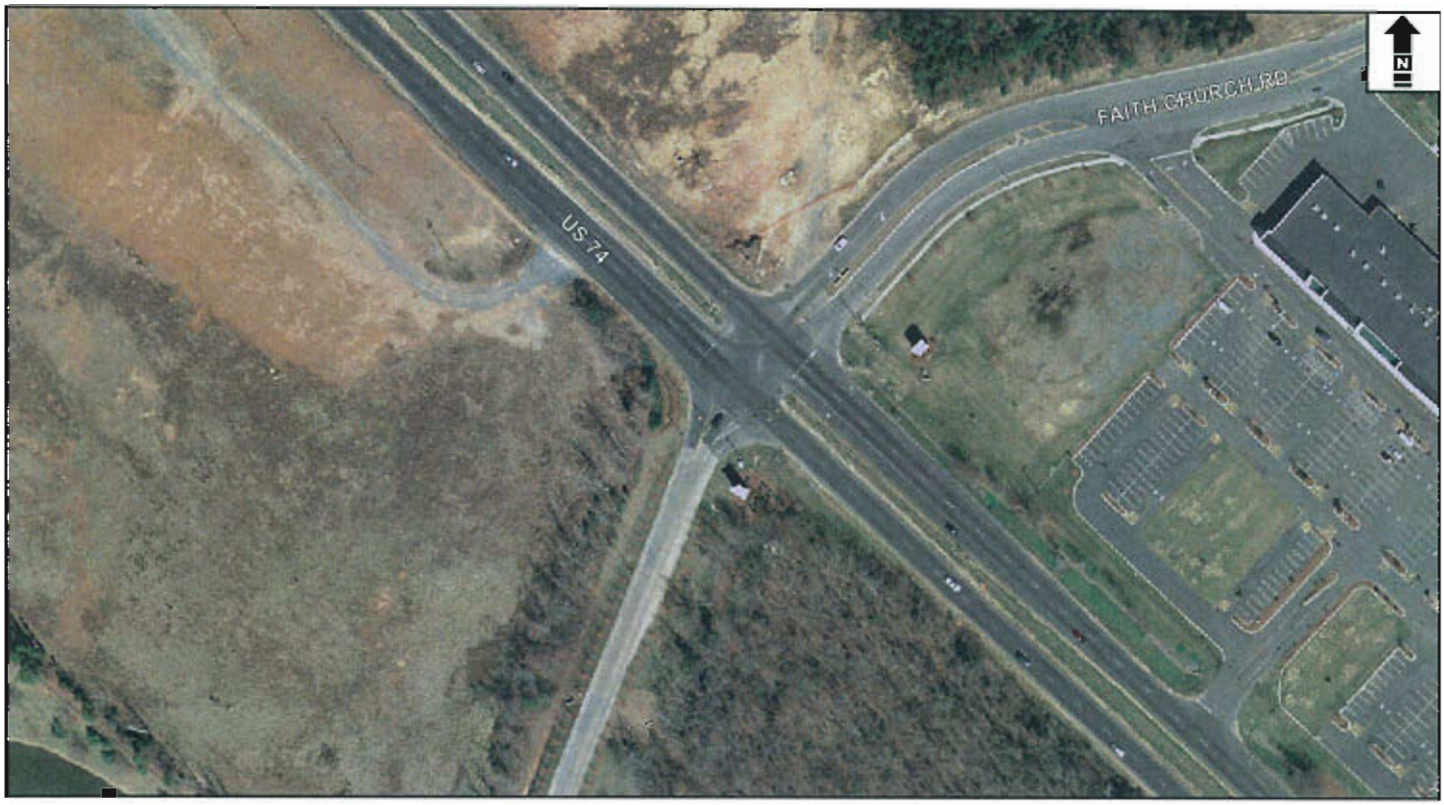
Intersection Data Sheet
US 74 and Unionville-Indian Trail Road

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

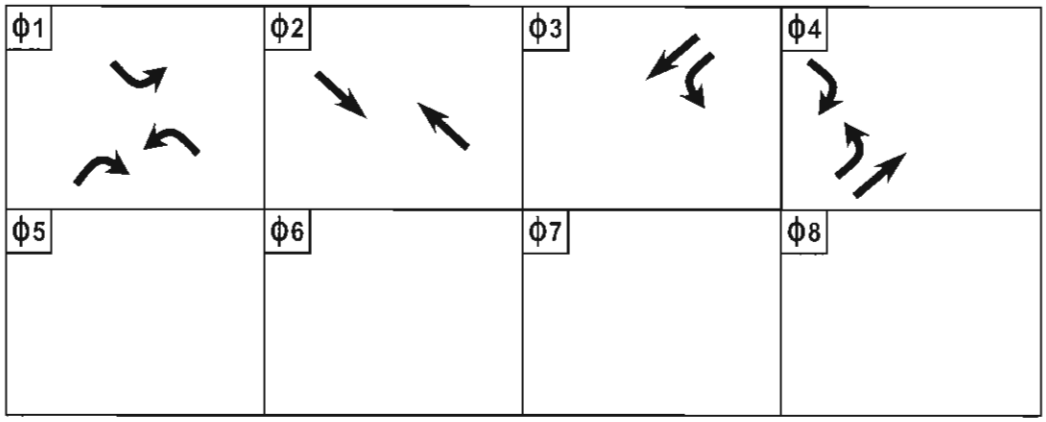
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Data Sheet B3

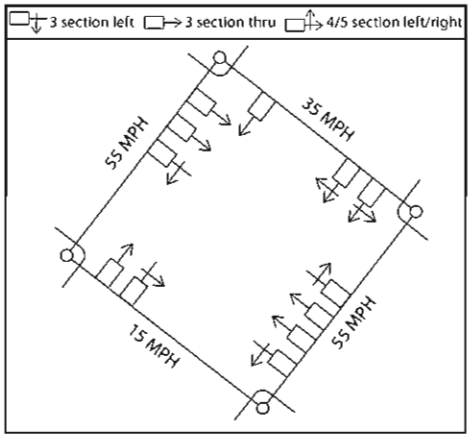
US 74 / FAITH CHURCH ROAD



PHASING DIAGRAM



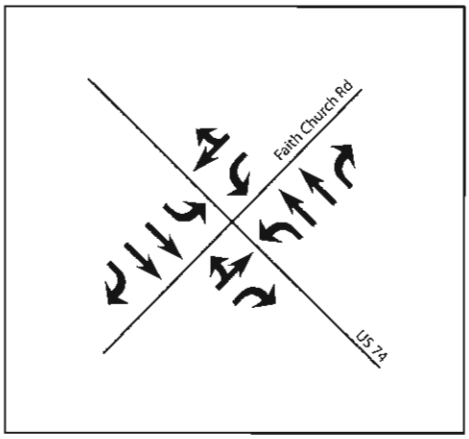
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Faith Church Road

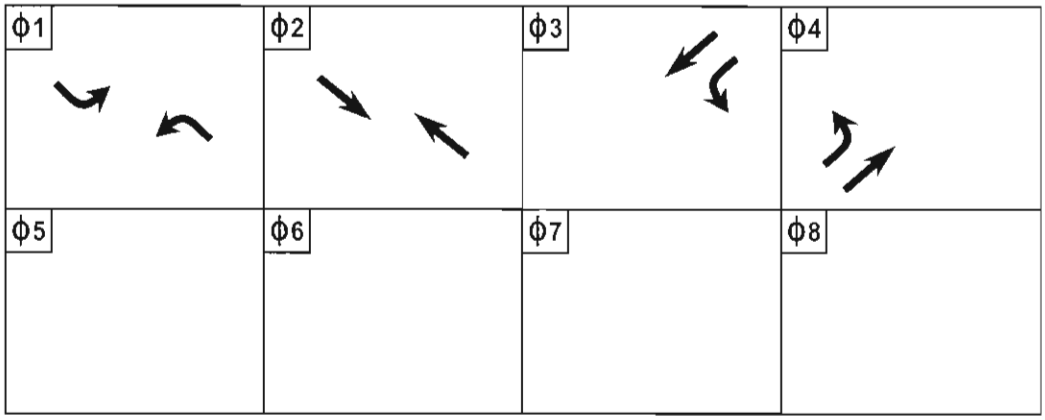
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

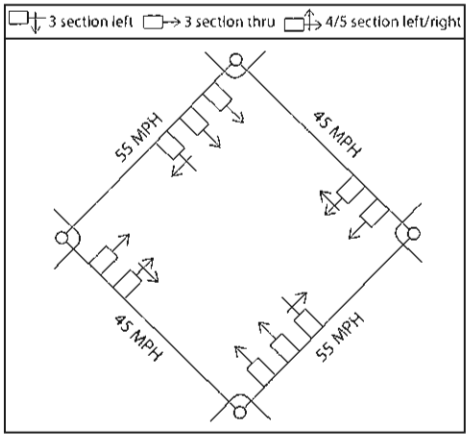
Data Sheet B4

US 74 / WESLEY CHAPEL STOUTS ROAD / SARDIS CHURCH ROAD

PHASING DIAGRAM



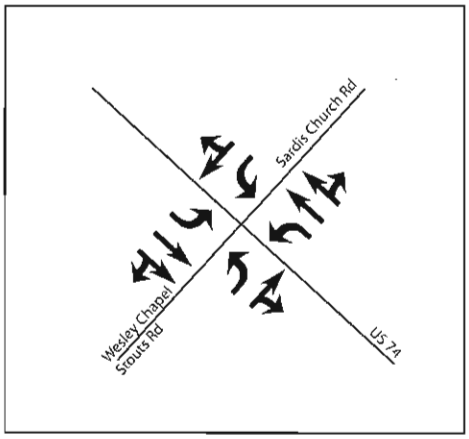
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

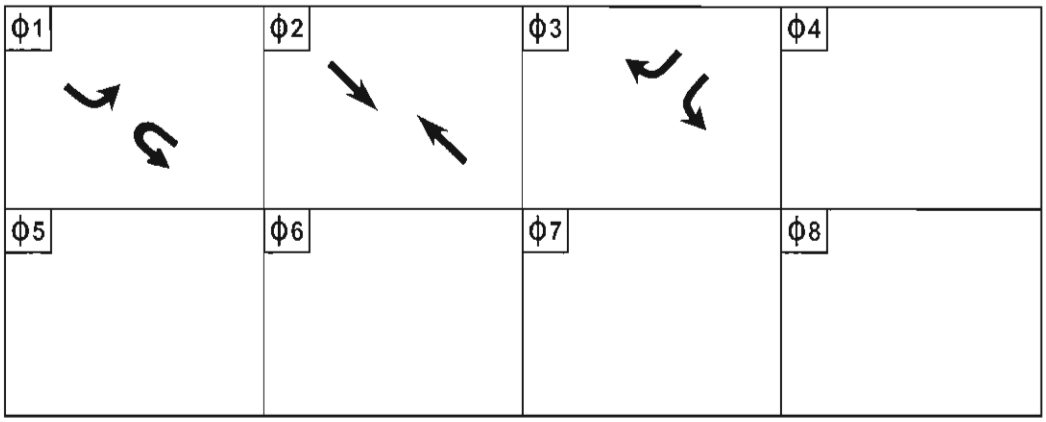
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Intersection Data Sheet
US 74 and Wesley Chapel Stouts Road / Sardis Church Road

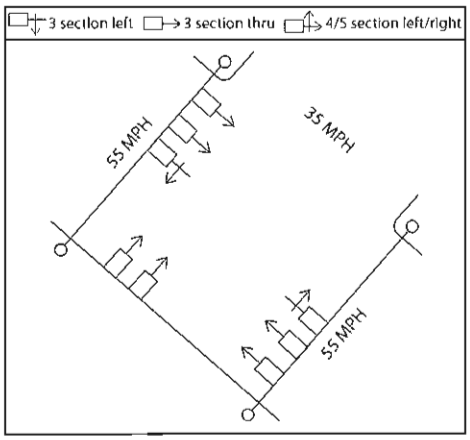
Data Sheet B5

US 74 / CHAMBER DRIVE

PHASING DIAGRAM



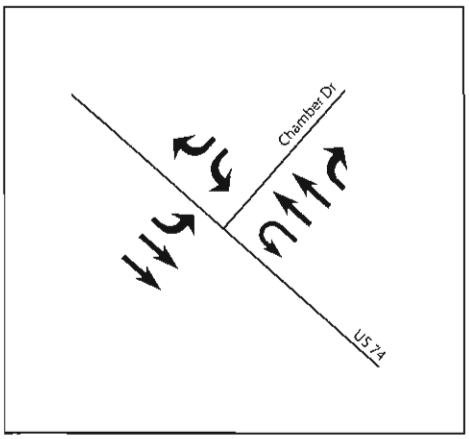
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

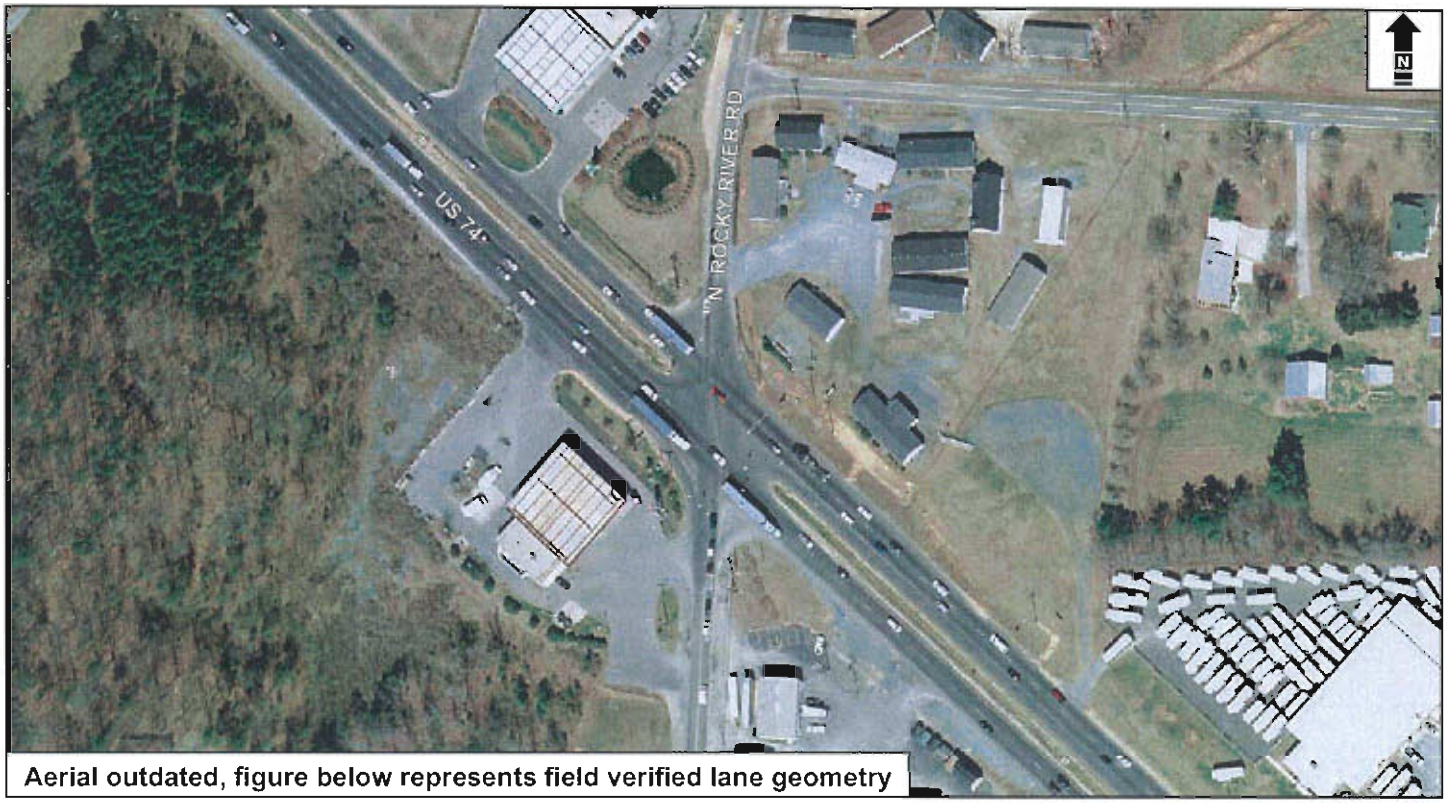
Intersection Data Sheet
US 74 and Chamber Drive

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

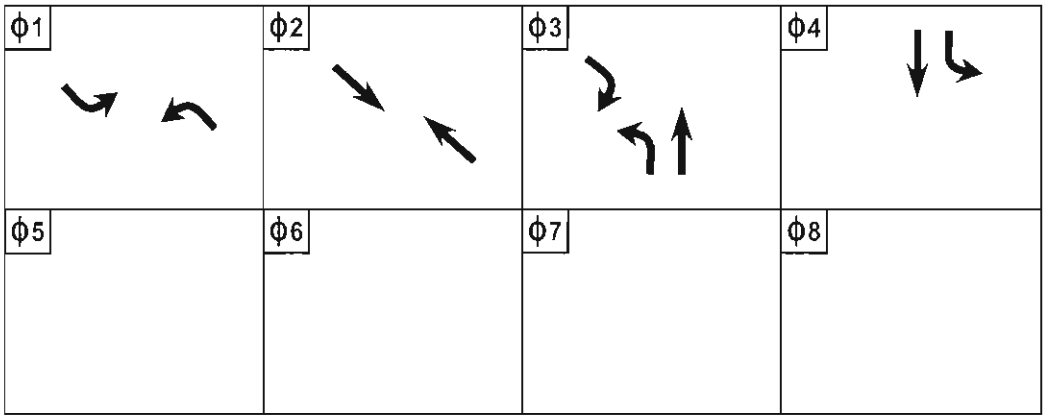
Data Sheet B6

US 74 / NORTH ROCKY RIVER ROAD

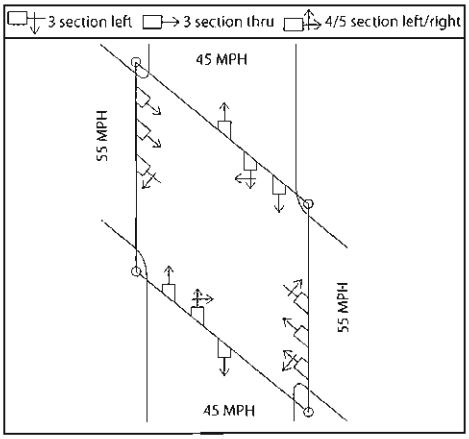


Aerial outdated, figure below represents field verified lane geometry

PHASING DIAGRAM



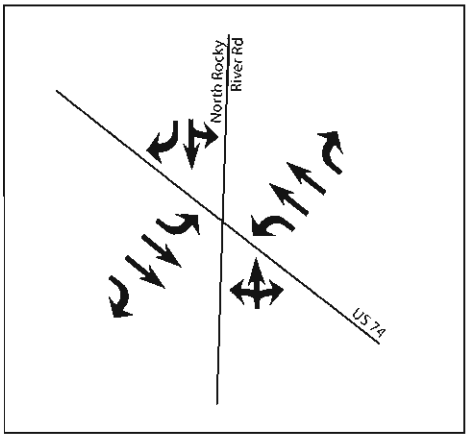
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and North Rocky River Road

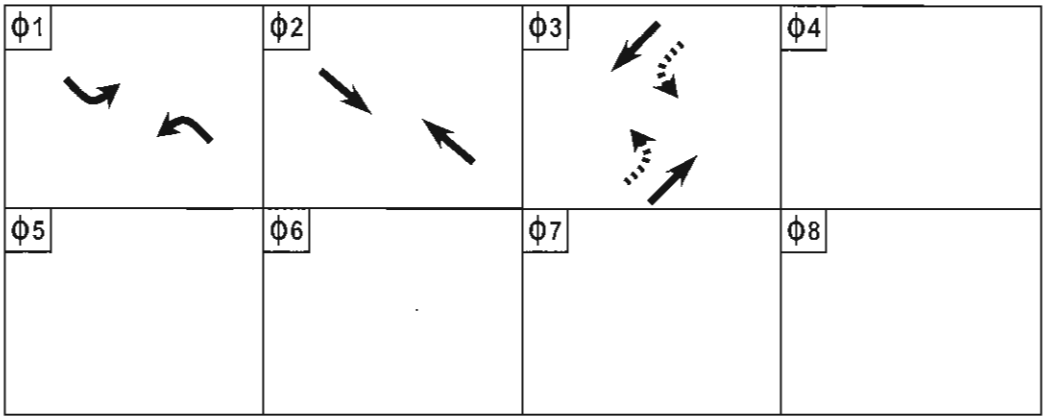
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

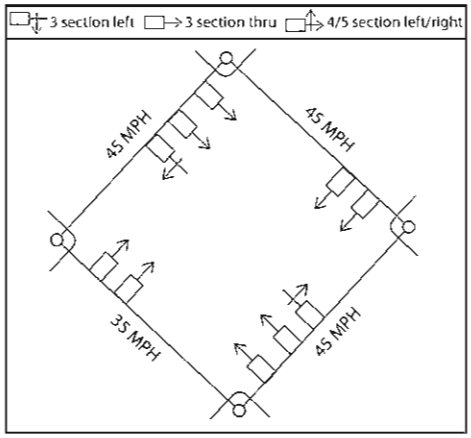
Data Sheet B7

US 74 / FOWLER-SECREST ROAD / JOHN MOORE ROAD

PHASING DIAGRAM



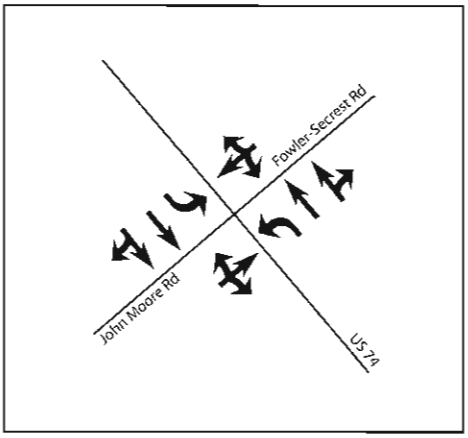
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

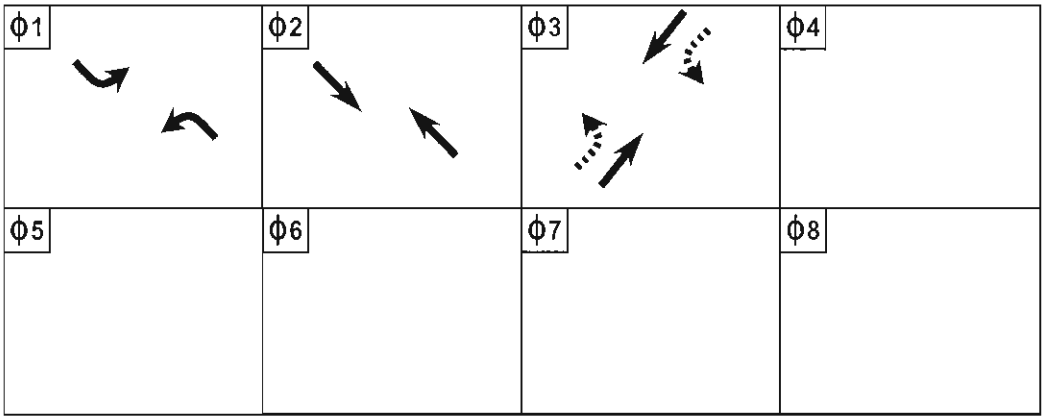
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Intersection Data Sheet
US 74 and Fowler-Secrest Road / John Moore Road

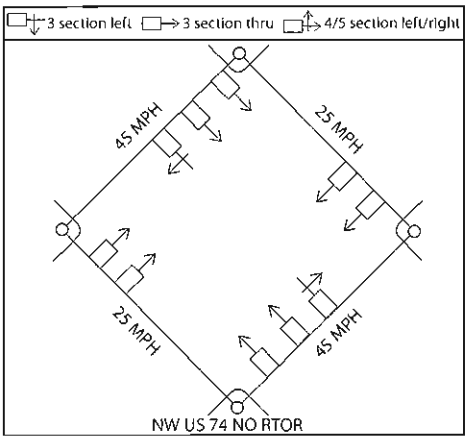
Data Sheet B8

US 74 / CARROLL STREET / ROLLING HILLS DRIVE

PHASING DIAGRAM



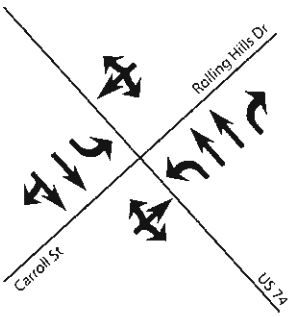
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

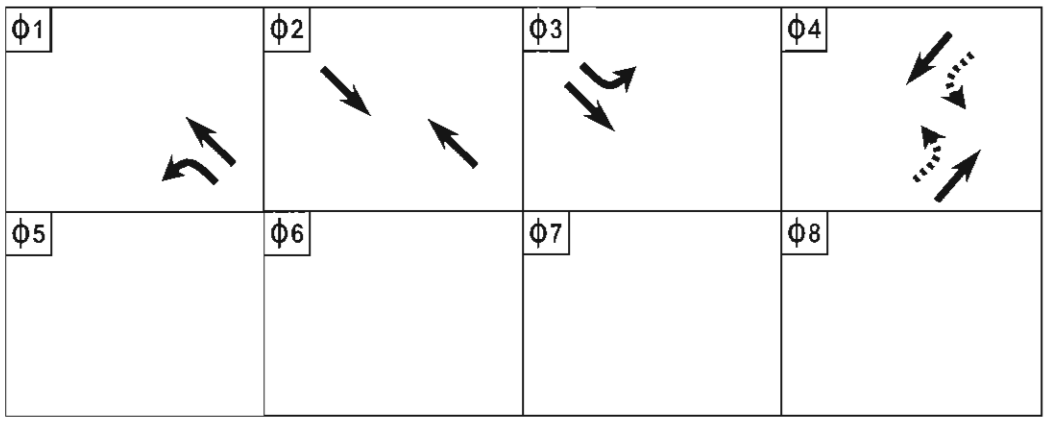
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Intersection Data Sheet
US 74 and Carroll Street / Rolling Hills Drive

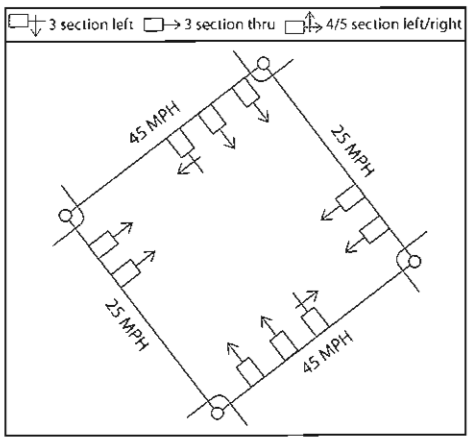
Data Sheet B9

US 74 / ROLAND DRIVE / ROUND TABLE ROAD

PHASING DIAGRAM



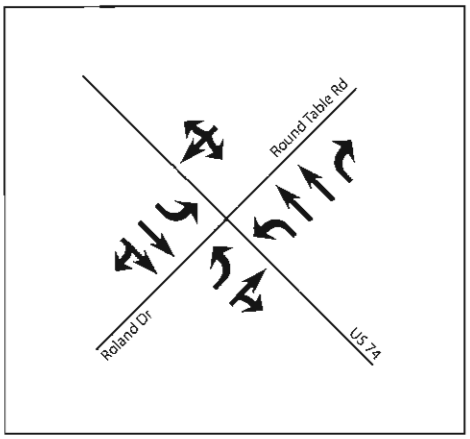
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Roland Drive / Round Table Road

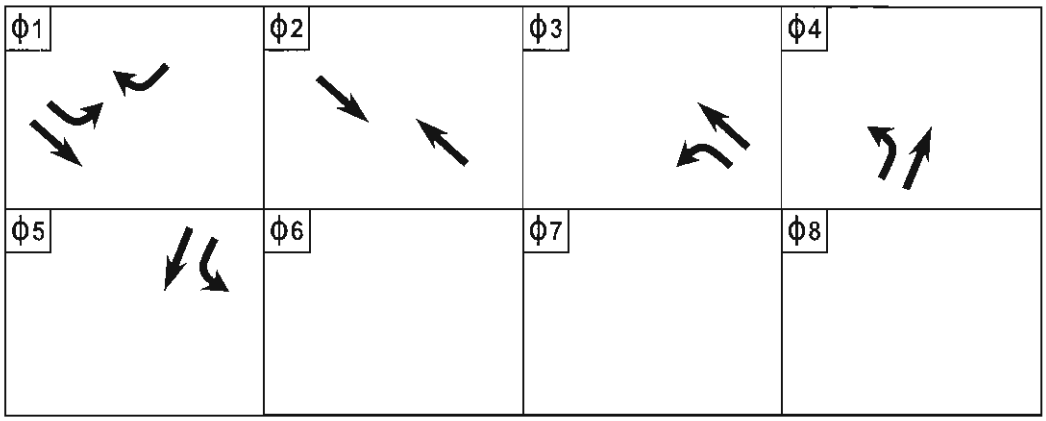
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

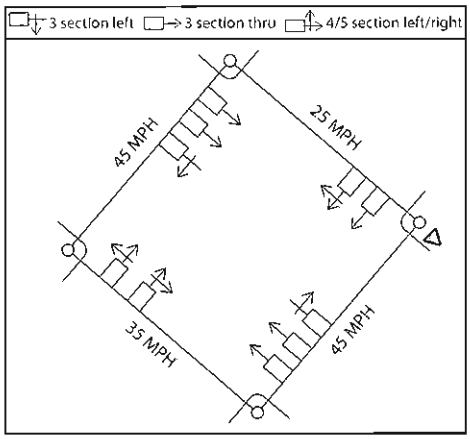
Data Sheet B10

US 74 / WILLIAMS ROAD

PHASING DIAGRAM



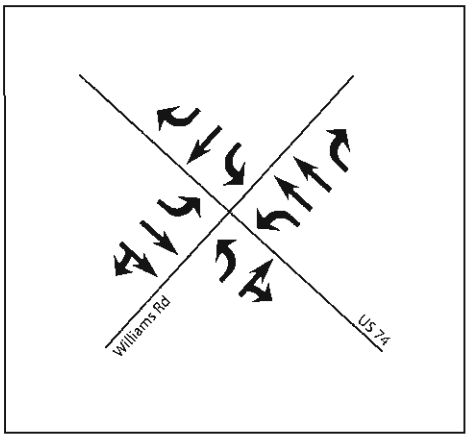
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Williams Road

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

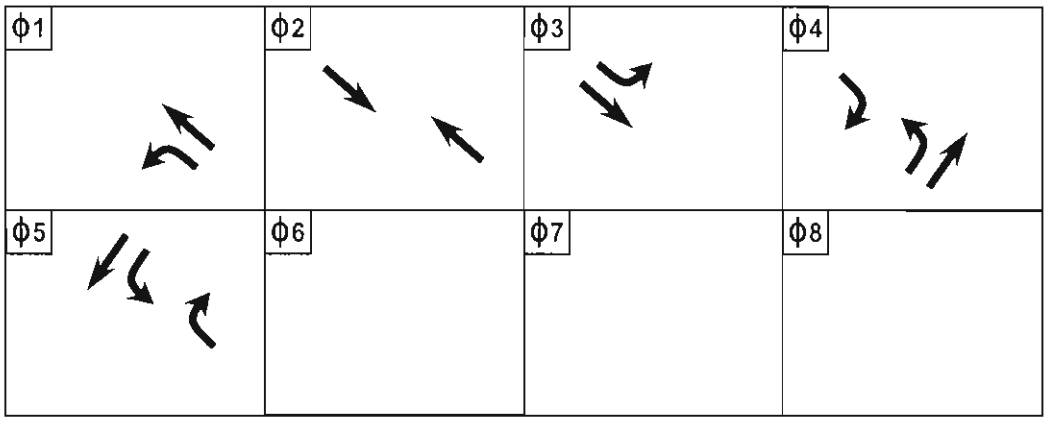
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Data Sheet B11

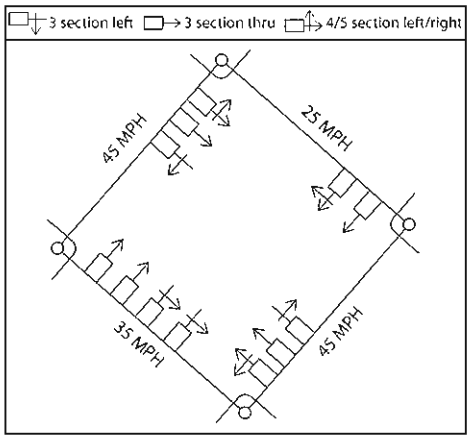
US 74 / HANOVER DRIVE

Aerial outdated, figure below represents field verified lane geometry

PHASING DIAGRAM



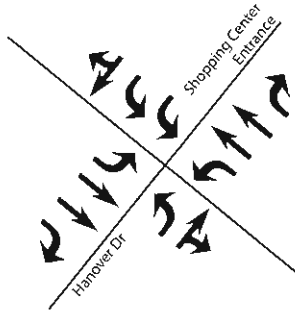
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Hanover Drive

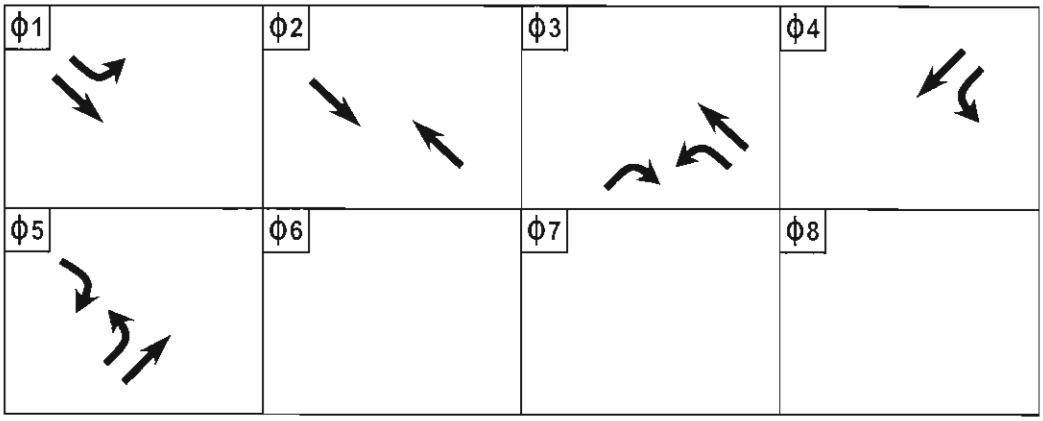
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

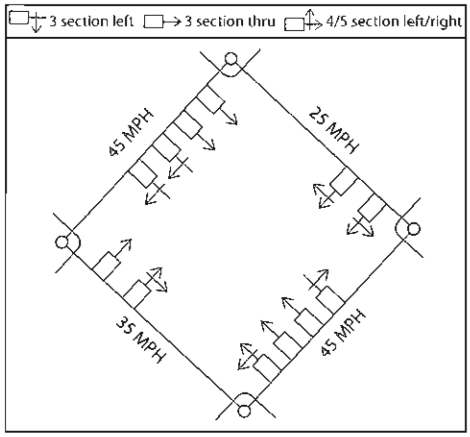
Data Sheet B12

US 74 / DICKERSON BOULEVARD

PHASING DIAGRAM



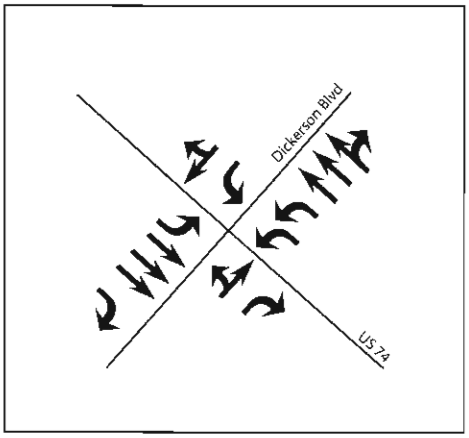
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Dickerson Boulevard

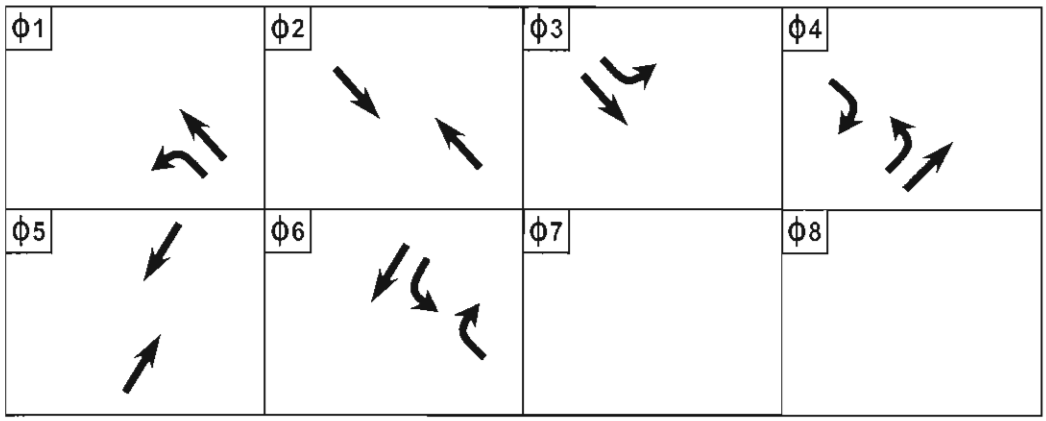
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

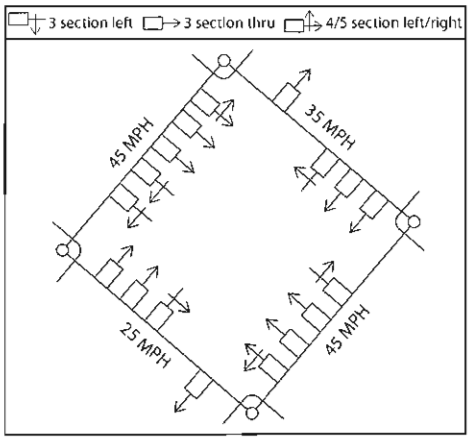
Data Sheet B13

US 74 / SECREST SHORTCUT ROAD

PHASING DIAGRAM



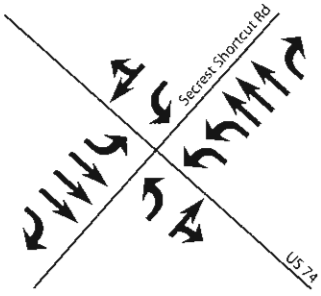
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Secrest Shortcut Road

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

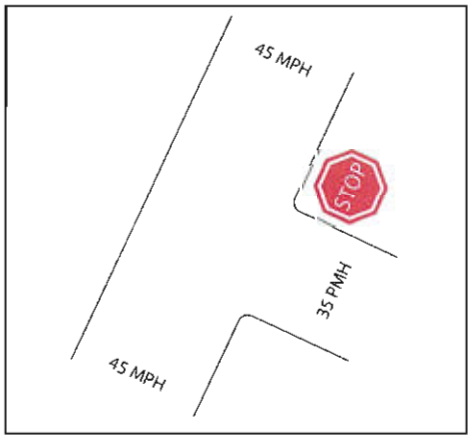
Data Sheet B14

WESTBOUND US 74 RAMPS / CONCORD AVENUE

PHASING DIAGRAM

ϕ1	ϕ2	ϕ3	ϕ4
ϕ5	ϕ6	ϕ7	ϕ8

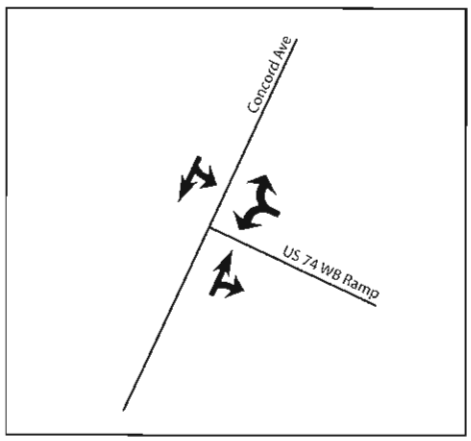
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
WB US 74 Ramps and Concord Ave

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

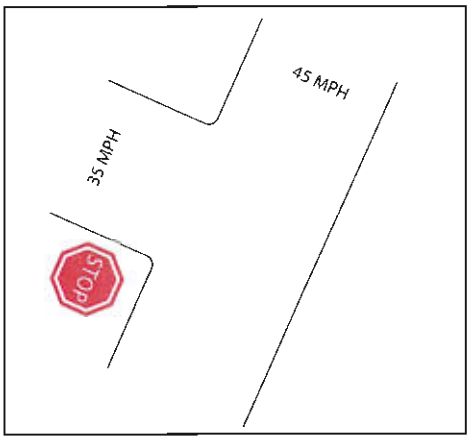
Data Shee B15

EASTBOUND US 74 RAMPS / CONCORD AVENUE

PHASING DIAGRAM

ϕ1	ϕ2	ϕ3	ϕ4
ϕ5	ϕ6	ϕ7	ϕ8

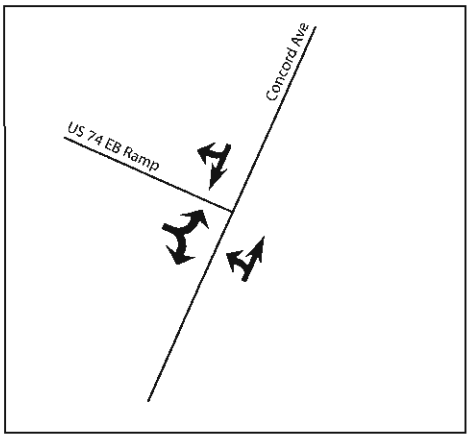
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
EB US 74 Ramps and Concord Ave

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

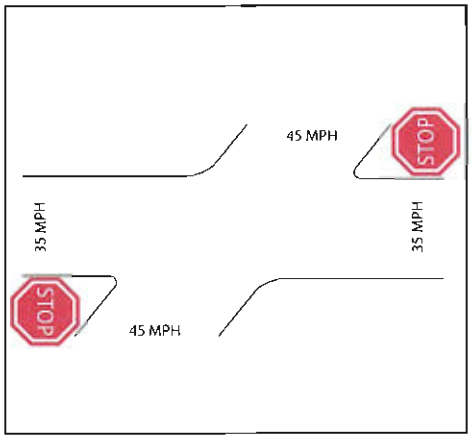
Data Sheet B16

EAST AVENUE / US 601

PHASING DIAGRAM

ϕ1	ϕ2	ϕ3	ϕ4
ϕ5	ϕ6	ϕ7	ϕ8

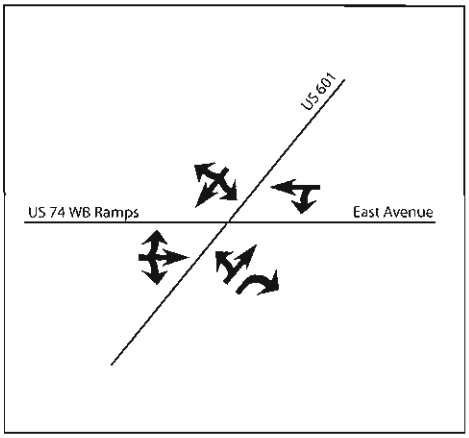
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
East Ave and US 601

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

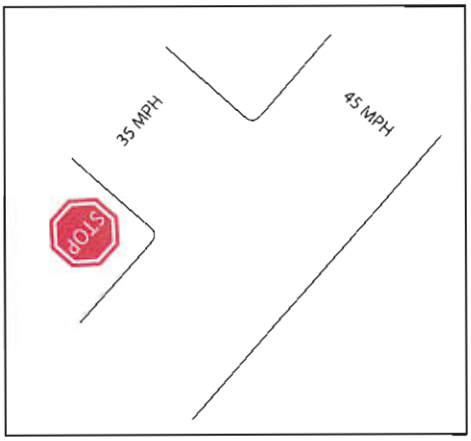
Data Sheet B17

EASTBOUND US 74 RAMPS / US 601

PHASING DIAGRAM

ϕ1	ϕ2	ϕ3	ϕ4
ϕ5	ϕ6	ϕ7	ϕ8

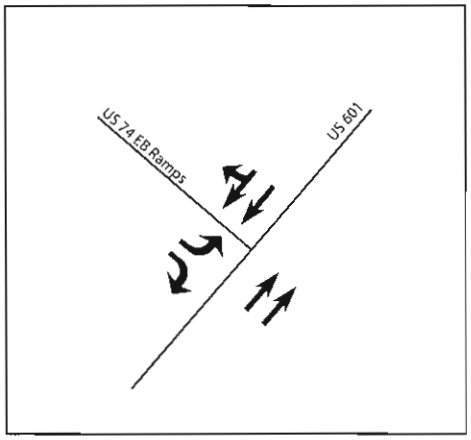
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
EB US 74 Ramps and US 601

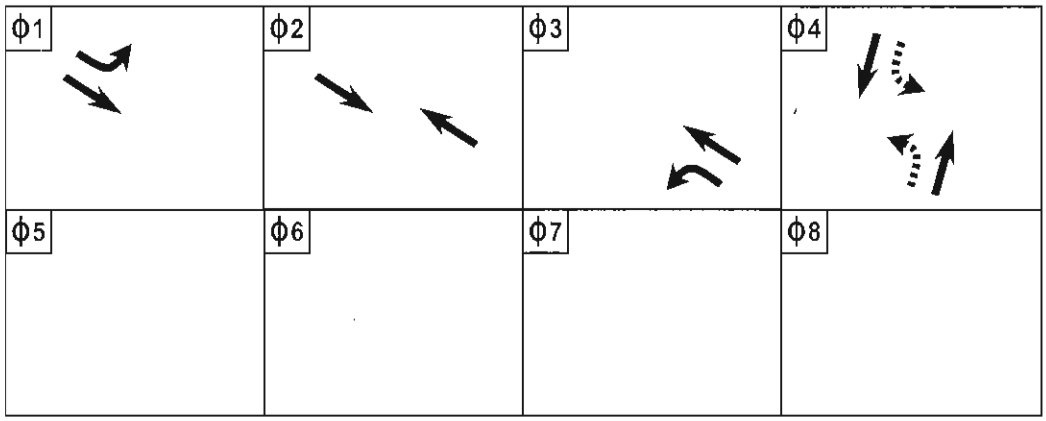
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Data Sheet B18

US 74 / STAFFORD STREET / STAFFORD STREET EXTENSION

PHASING DIAGRAM



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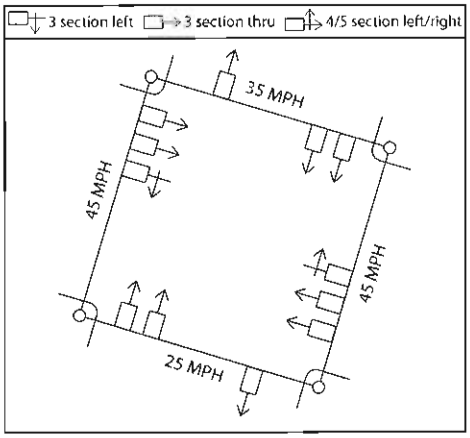
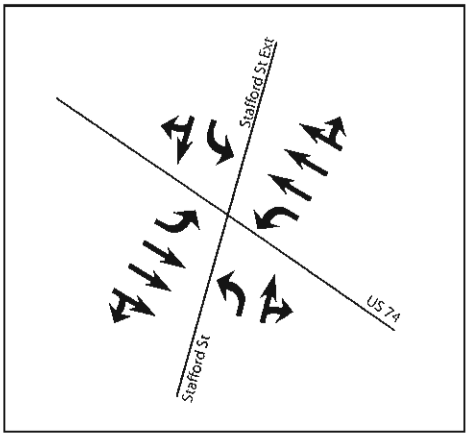


PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

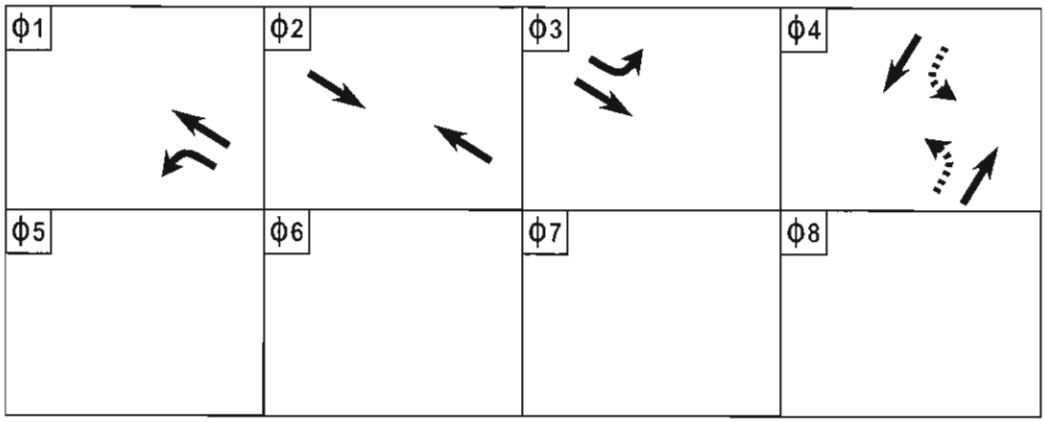
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Intersection Data Sheet
US 74 and Stafford Street / Stafford Street Extension

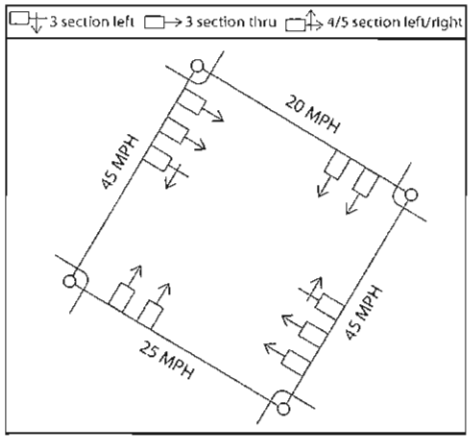
Data Sheet B19

US 74 / BOYTE STREET

PHASING DIAGRAM



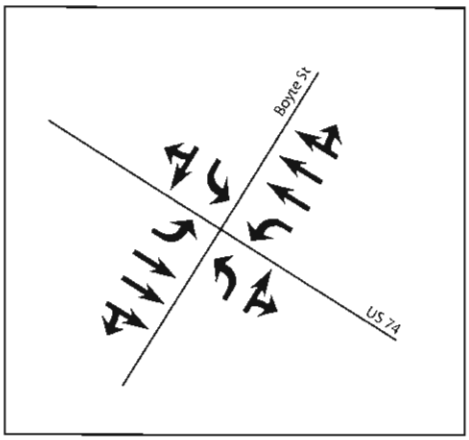
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Boyte Street

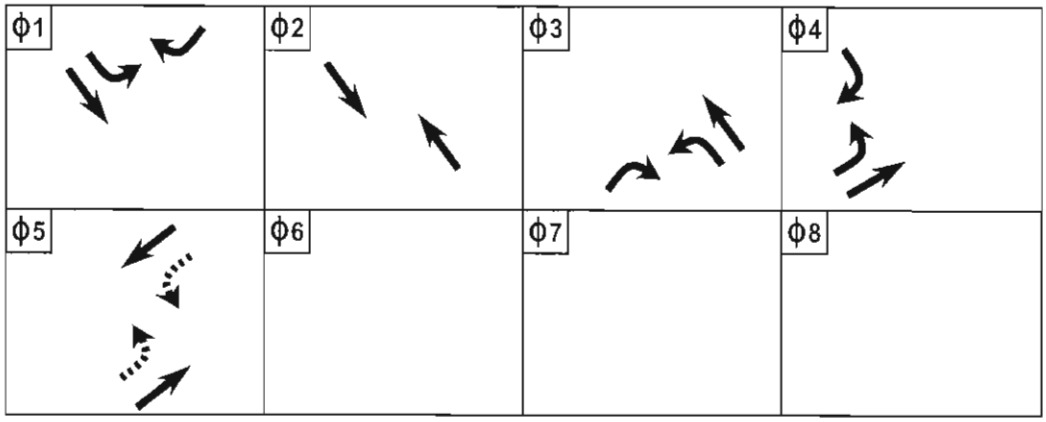
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

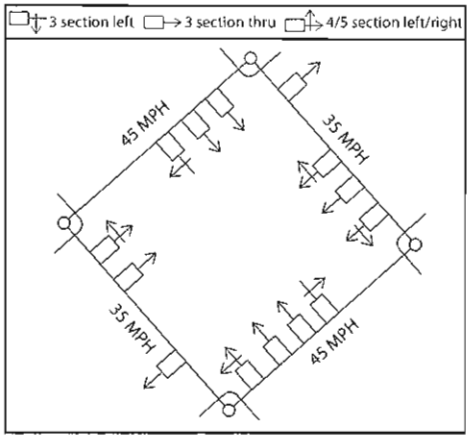
Data Sheet B20

US 74 / MORGAN MILL ROAD

PHASING DIAGRAM



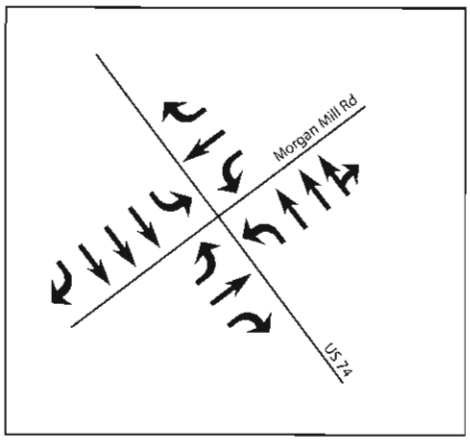
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Morgan Mill Road

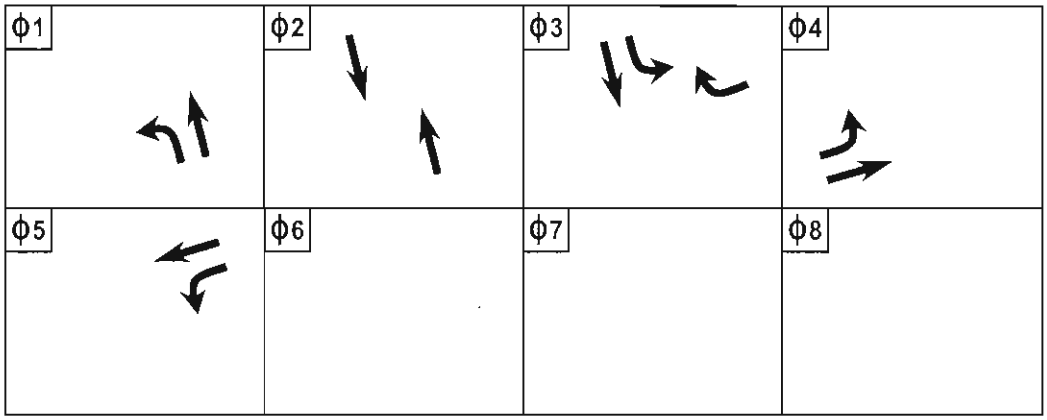
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Data Sheet B21

US 74 / WALKUP AVENUE

PHASING DIAGRAM



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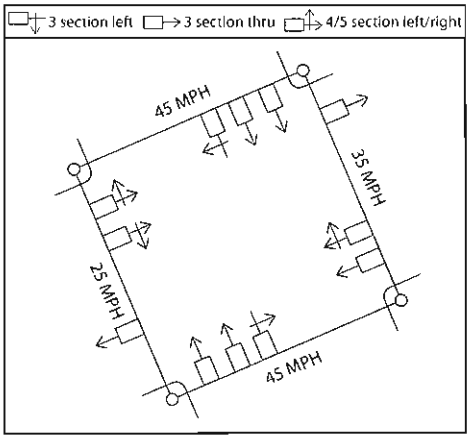
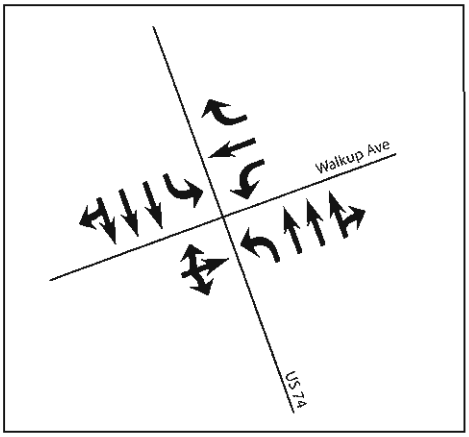


PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Walkup Avenue

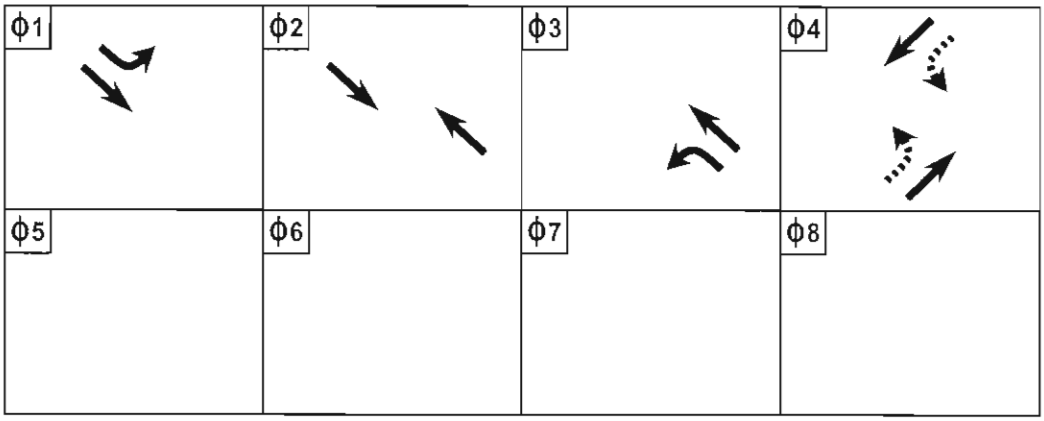
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

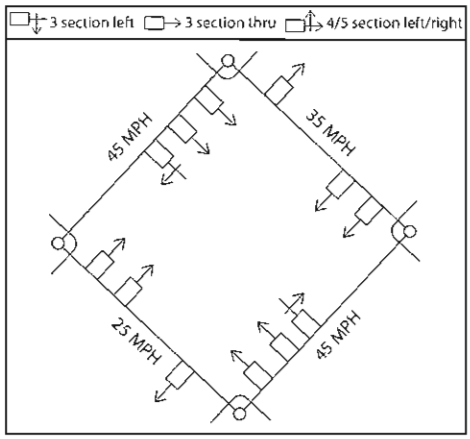
Data Sheet B22

US 74 / SUTHERLAND AVENUE

PHASING DIAGRAM



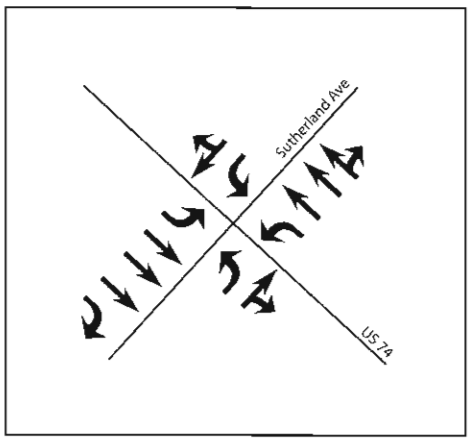
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Sutherland Avenue

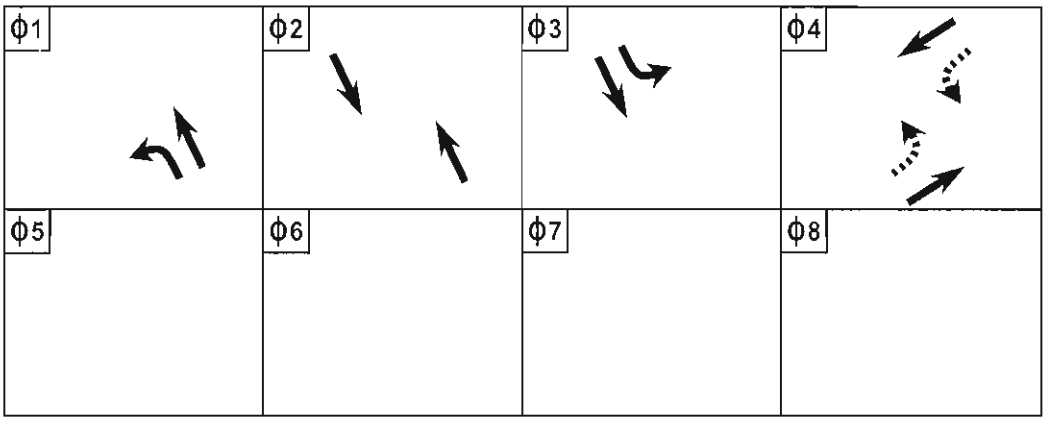
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Data Sheet B23

US 74 / DOVE STREET / VENUS STREET

PHASING DIAGRAM



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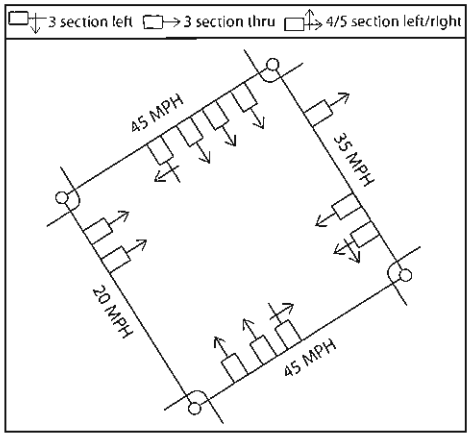
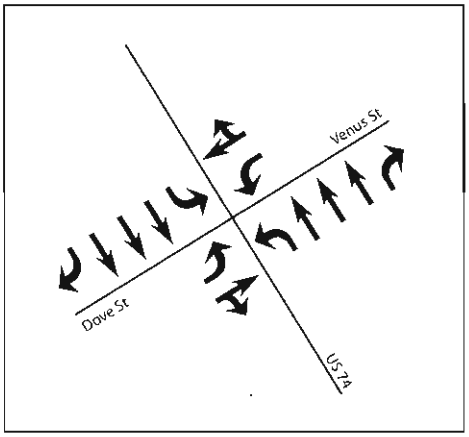


PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Dove Street / Venus Street

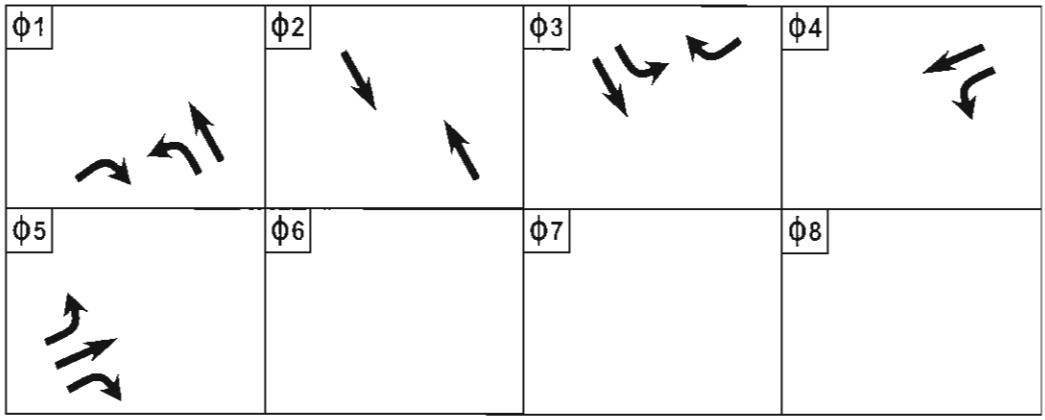
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Data Sheet B24

US 74 / EAST FRANKLIN STREET

PHASING DIAGRAM



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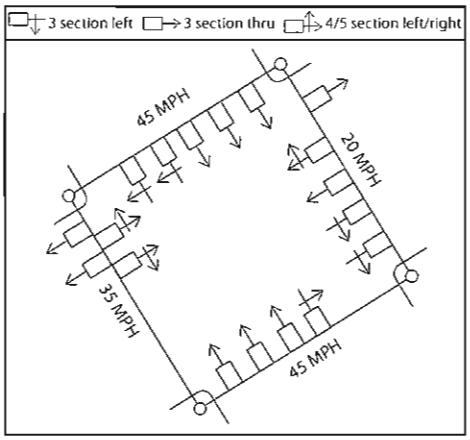
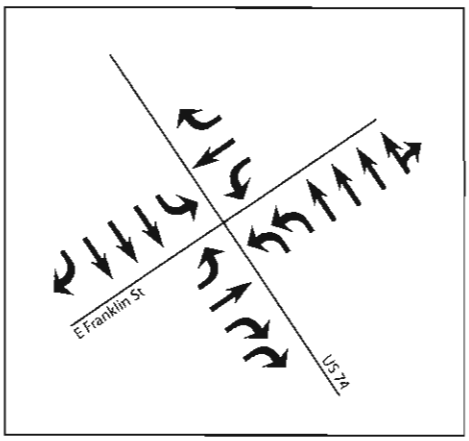


PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and East Franklin Street

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

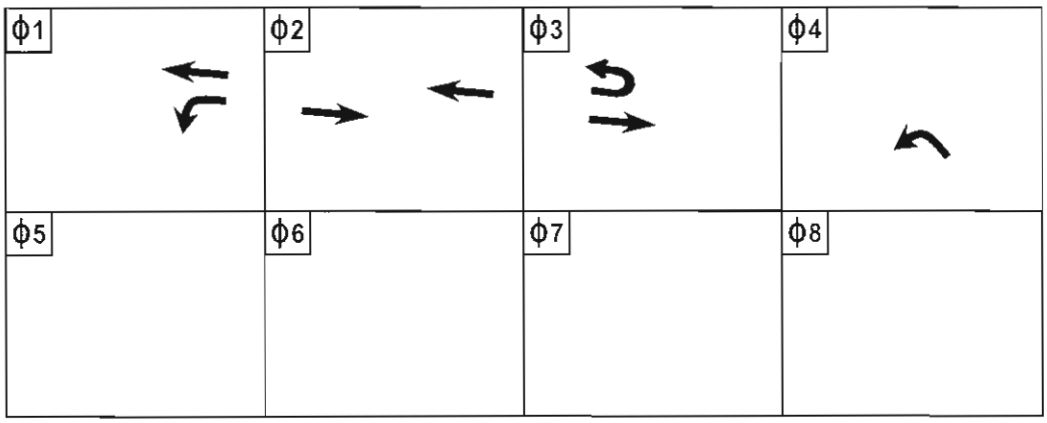
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Data Sheet B25

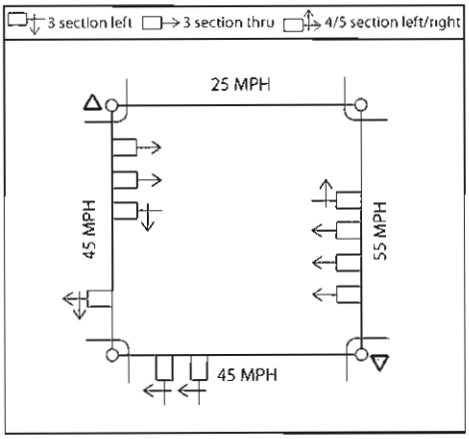
US 74 / PAGELAND HIGHWAY

Aerial outdated, figure below represents field verified lane geometry

PHASING DIAGRAM



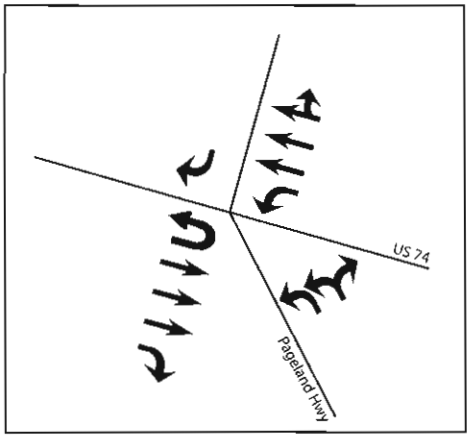
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Pageland Highway

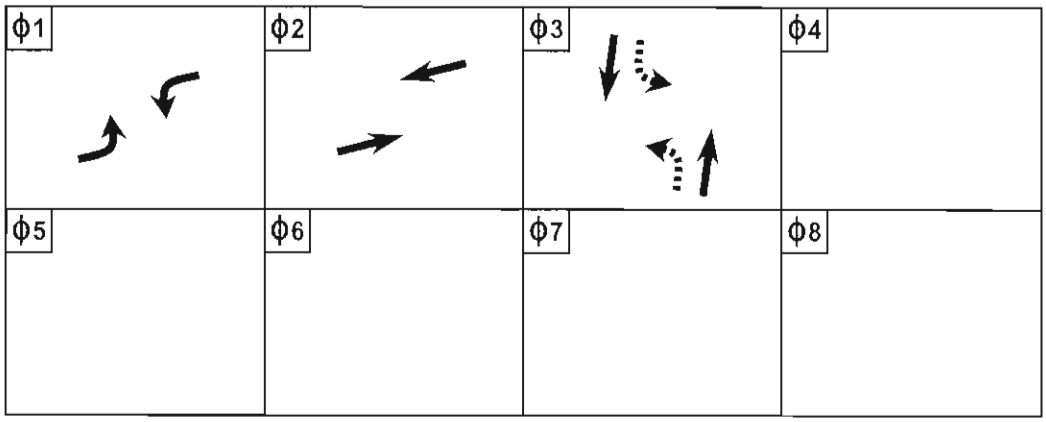
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

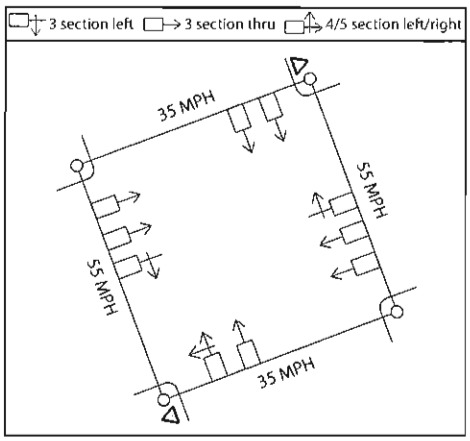
Data Sheet B26

US 74 / SOUTH SECREST AVENUE / OLD PAGELAND-MONROE ROAD

PHASING DIAGRAM



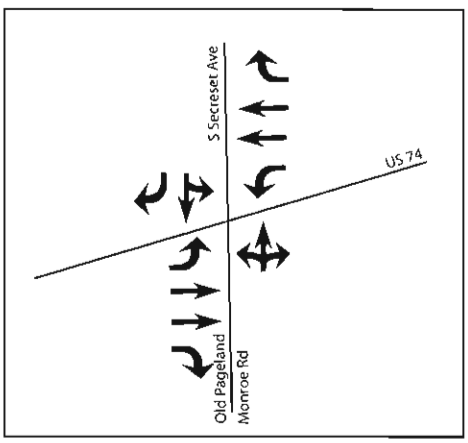
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

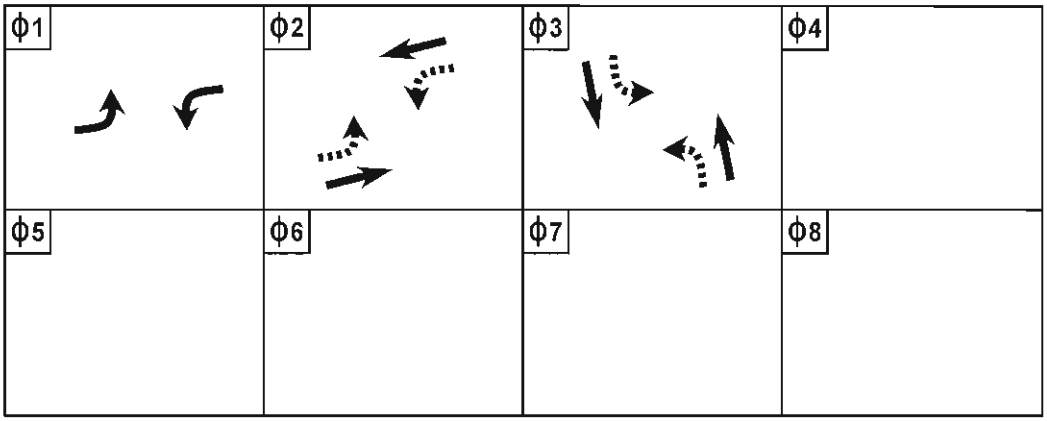
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Intersection Data Sheet
US 74 and South Secrest Avenue / Old Pageland-Monroe Road

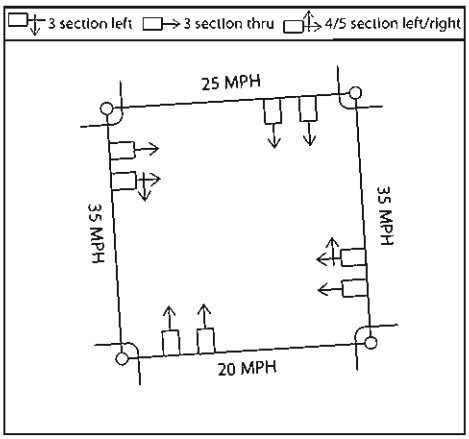
Data Sheet B27

US 74 / BIVENS STREET

PHASING DIAGRAM



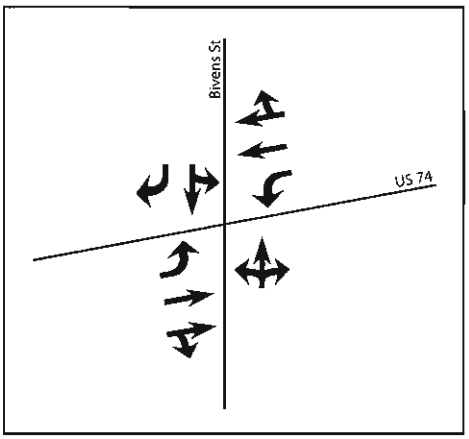
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Bivens Street

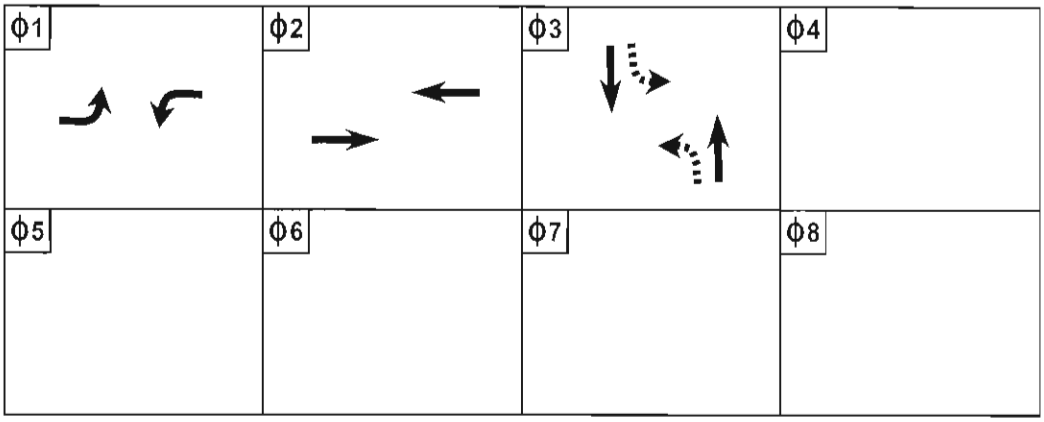
TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

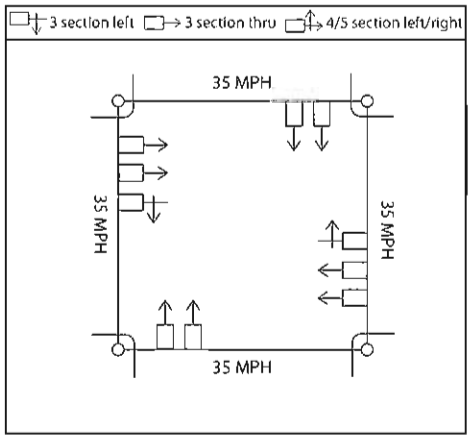
Data Sheet B28

US 74 / SOUTH MAIN STREET / NORTH MAIN STREET

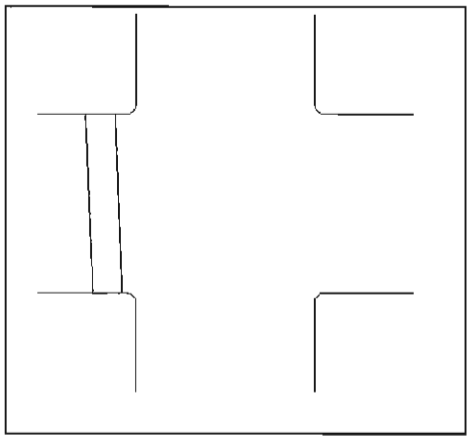
PHASING DIAGRAM



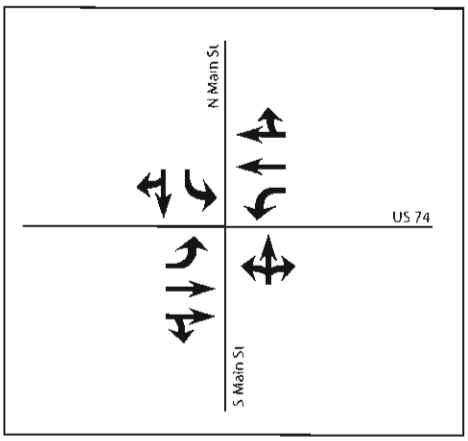
TRAFFIC CONTROL



PEDESTRIAN FACILITIES



LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

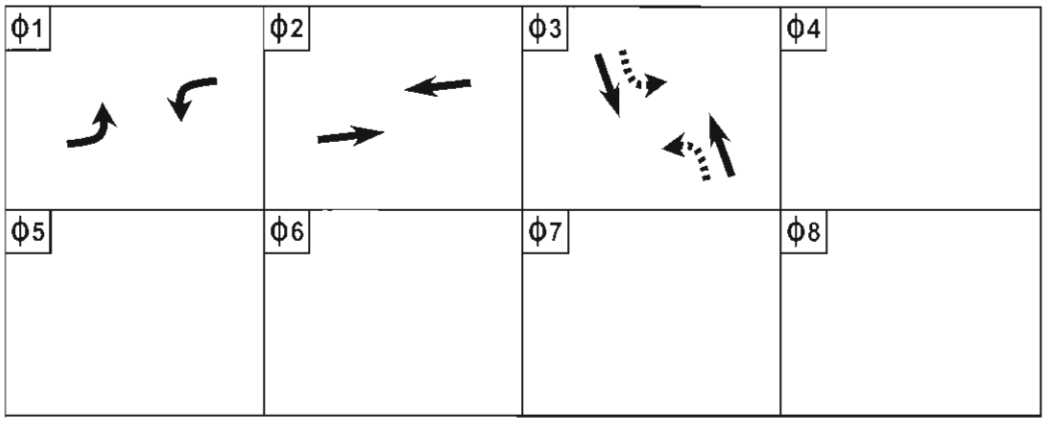
TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Intersection Data Sheet
US 74 and South Main Street / North Main Street

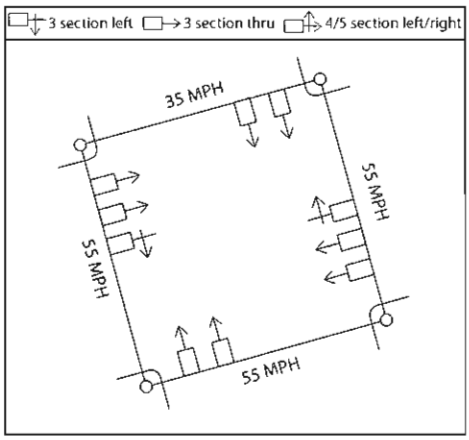
Data Sheet B29

US 74 / FOREST HILL SCHOOL ROAD

PHASING DIAGRAM



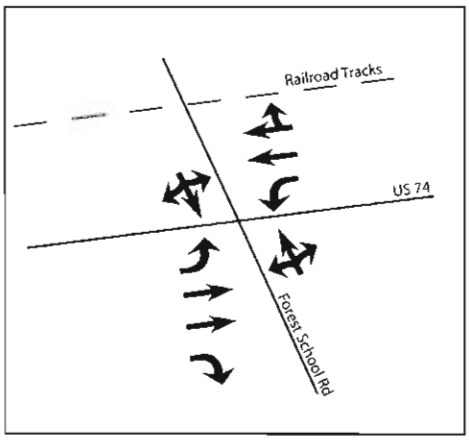
TRAFFIC CONTROL



PEDESTRIAN FACILITIES

NONE

LANE GEOMETRY



NORTH CAROLINA Turnpike Authority

Intersection Data Sheet
US 74 and Foresth Hill School Road

TIP PROJECT NO. R-2559
US 74 MONROE BYPASS
UNION AND MECKLENBURG COUNTIES

TIP PROJECT NO. R-3329
US 74 MONROE CONNECTOR
UNION AND MECKLENBURG COUNTIES

Data Sheet B30

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

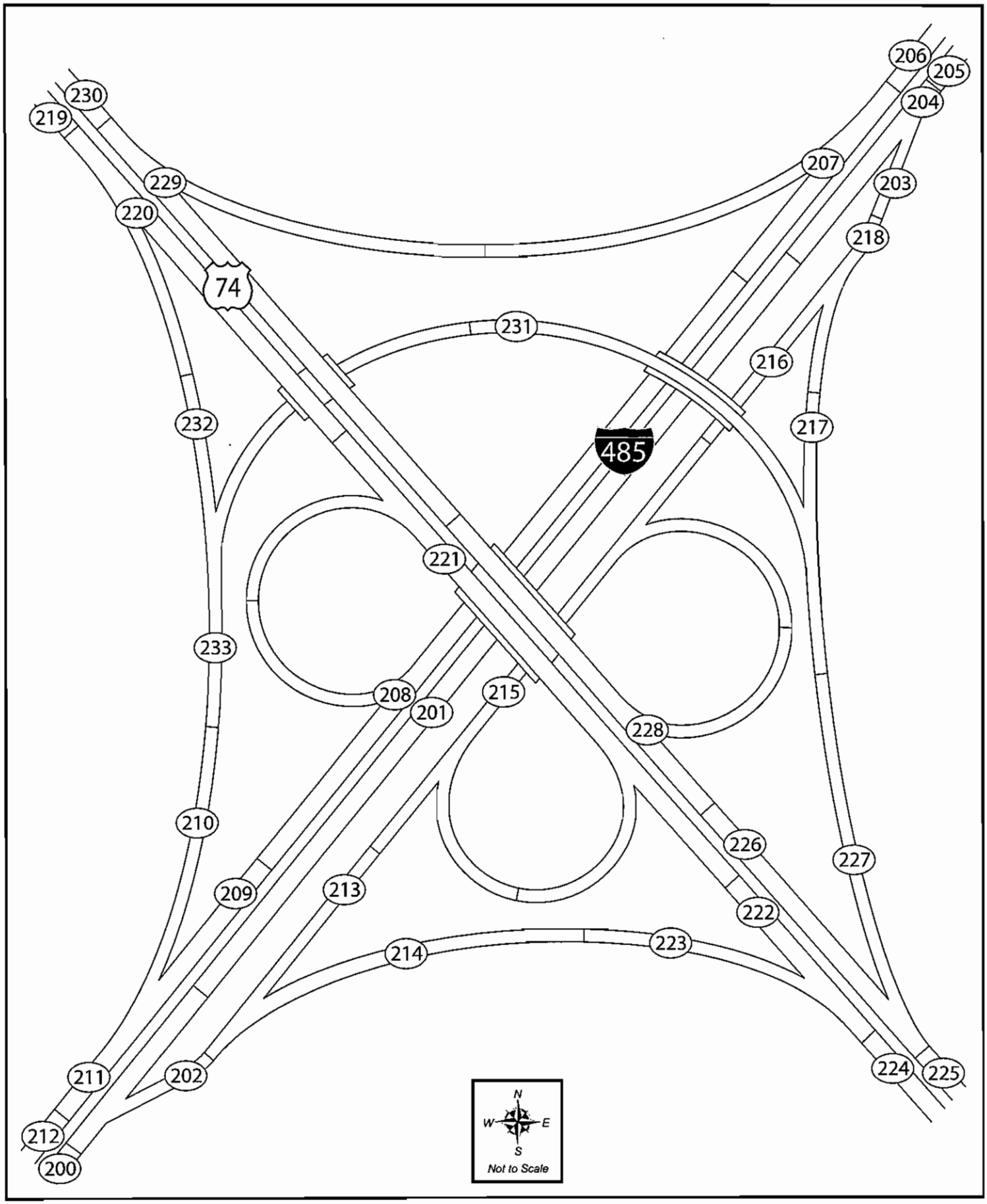
Appendix C
Individual Element Analysis Worksheets

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 and I-485 Interchange Analysis



NORTH CAROLINA
Turnpike Authority

US 74 and I-485 Key Sheet

MONROE CONNECTOR / BYPASS

TIP Project Numbers R-3329 & R-2559

Mecklenburg and Union Counties

Appendix C

485Keysheet.ai 11-29-07

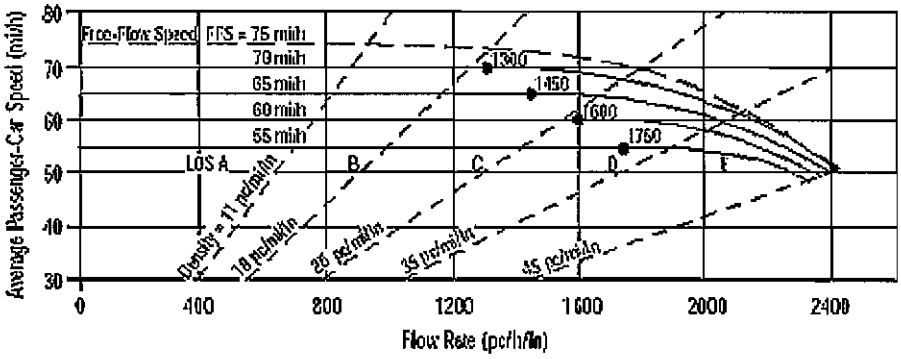
Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 and I-485
Interchange Analysis
Existing Condition

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB south of I
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	200
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2350 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

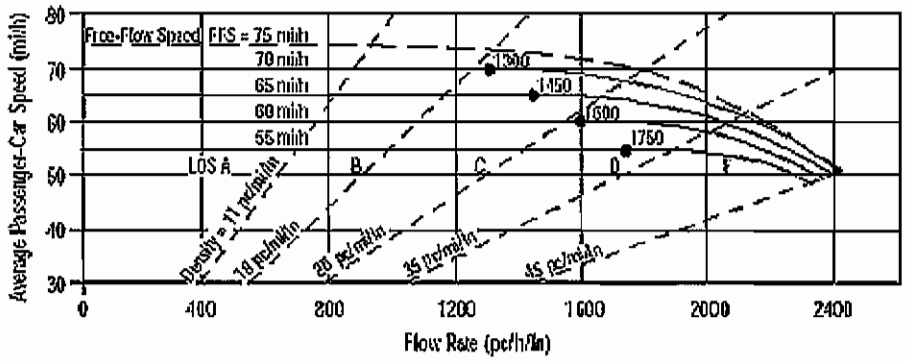
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	67.0
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	975	pc/h/ln	Design LOS
S	67.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	14.6	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB south of I
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	200
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2890 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

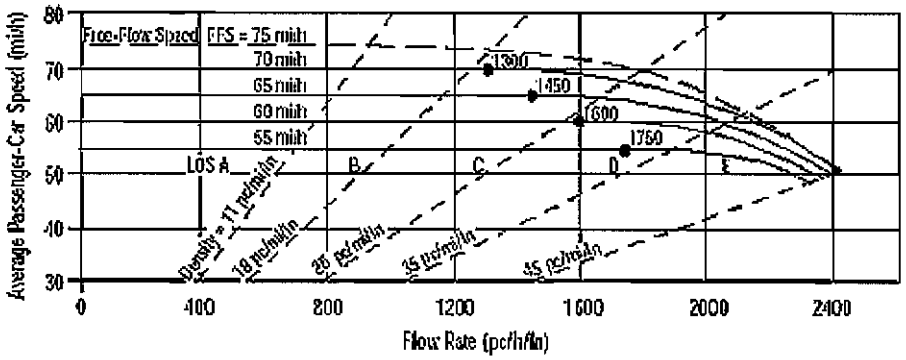
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	67.0
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1199	pc/h/ln	Design LOS
S	67.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	17.9	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB
From/To	
Jurisdiction	201
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	890 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	4.5
FFS	65.5

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	554	pc/h/ln
S	65.5	mi/h
D = v_p / S	8.5	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

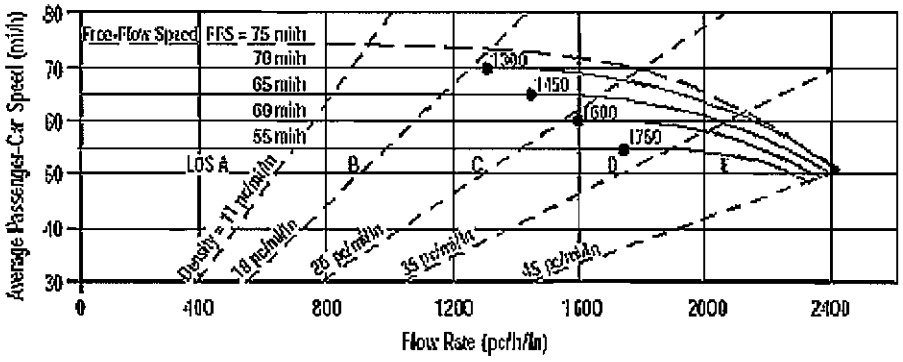
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	201
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1190 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

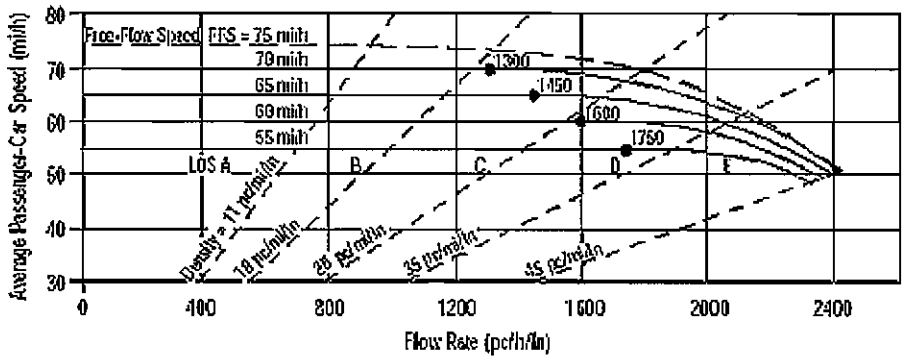
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	2		f_N	4.5
FFS (measured)		mi/h	FFS	65.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	740	pc/h/ln	Design LOS
S	65.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	11.3	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB off ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	202
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1460 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

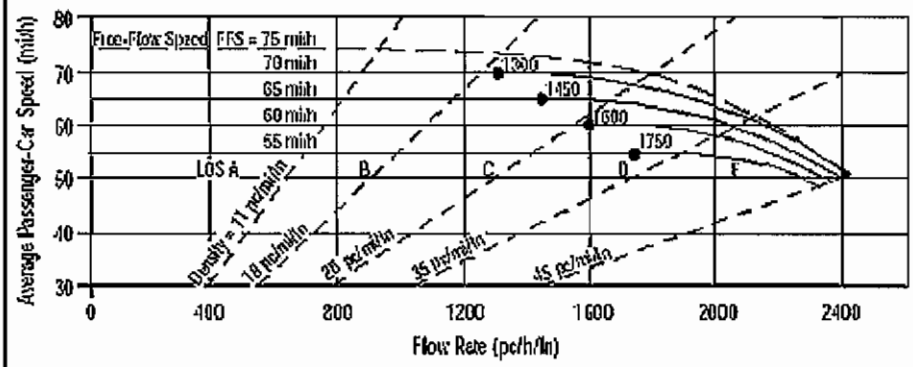
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	908	pc/h/ln	Design LOS
S	55.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	16.5	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB off ramp
From/To	
Jurisdiction	202
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	1700 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1058	pc/h/ln
S	55.0	mi/h
D = v_p / S	19.2	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	203
Analysis Year	2007

Flow Inputs

Volume, V	1780 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 2185.44$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: E

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	203
Analysis Year	2007

Flow Inputs

Volume, V	2050 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

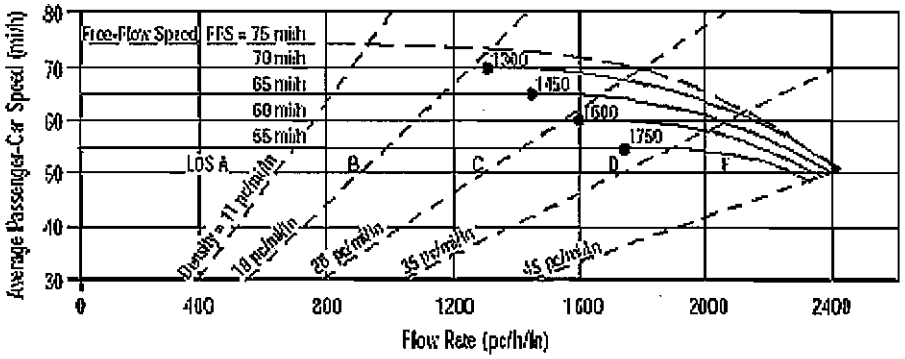
$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 2516.94$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: F

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB
From/To	
Jurisdiction	204
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2670 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	3	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	3.0
FFS	67.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1063	pc/h/ln
S	67.0	mi/h
D = v_p / S	15.9	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

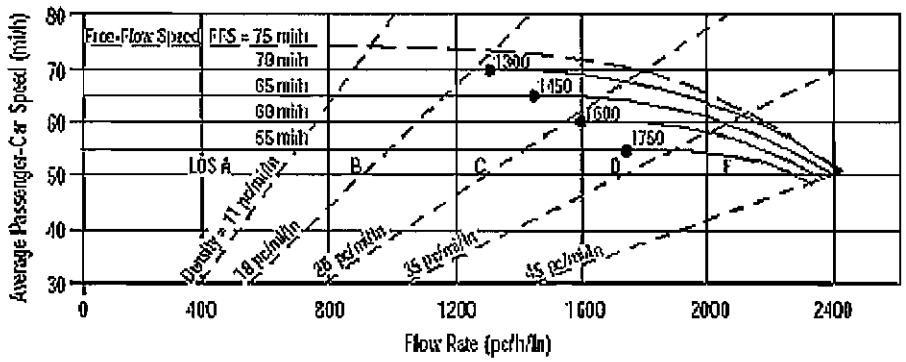
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	204
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	3240 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

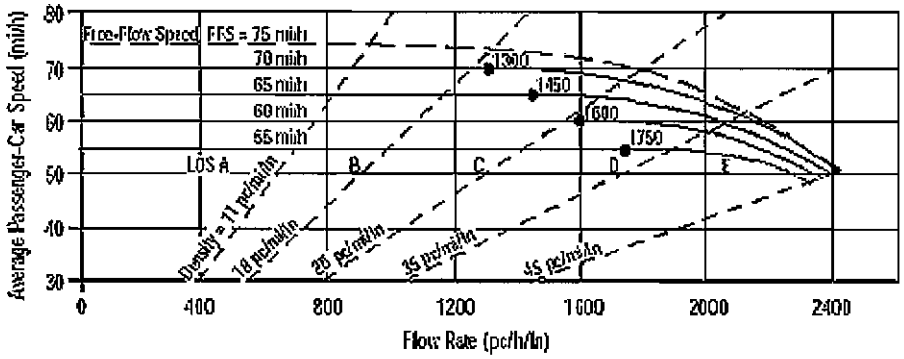
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	67.0
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1290	pc/h/ln	Design LOS
S	67.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	19.3	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	205
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2670 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

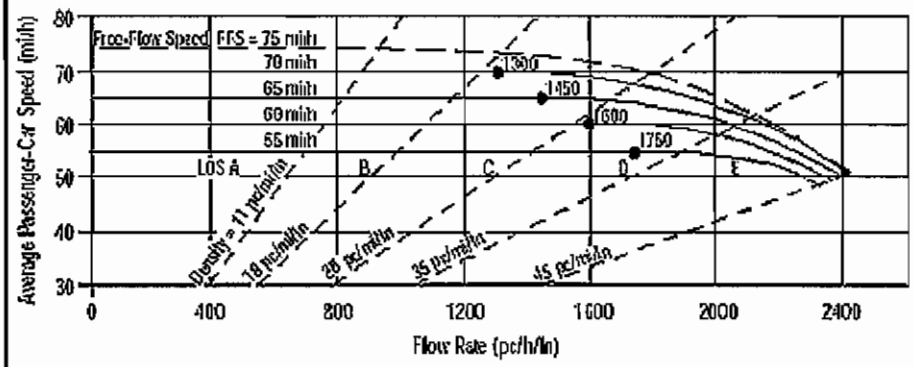
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	2		f_N	4.5
FFS (measured)		mi/h	FFS	65.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1595	pc/h/ln	Design LOS
S	65.4	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	24.4	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB
From/To	
Jurisdiction	205
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	3240 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	4.5
FFS	65.5

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1935	pc/h/ln
S	62.8	mi/h
D = v_p / S	30.8	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

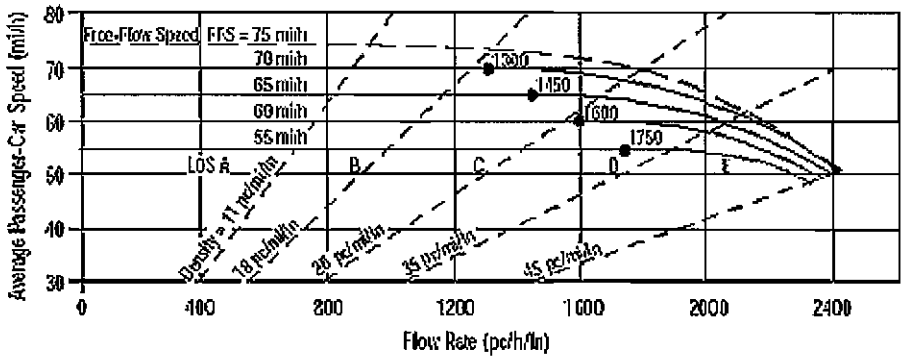
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	I-485 SB
From/To	
Jurisdiction	206
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	3240 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	4.5
FFS	65.5

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1935	pc/h/ln
S	62.8	mi/h
D = v_p / S	30.8	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

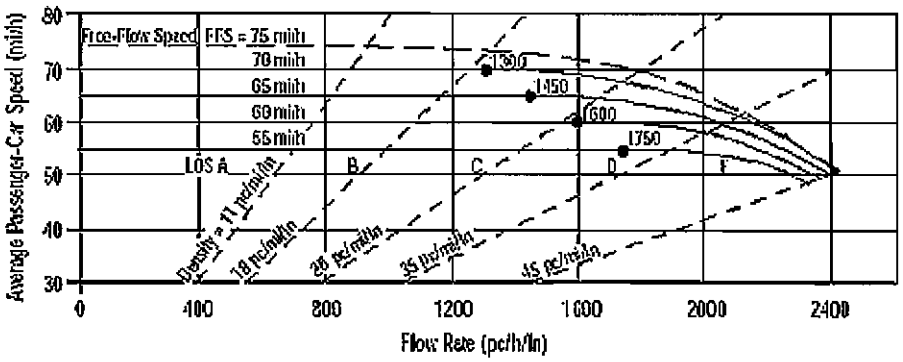
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	206
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2670 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	2		f_N	4.5
FFS (measured)		mi/h	FFS	65.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1595	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	65.4	mi/h	S
D = v_p / S	24.4	pc/mi/ln	D = v_p / S
LOS	C		Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-485 SB Off Ramp
Junction:	I-485 SB and US 74 WB
Jurisdiction:	207
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3240	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1110	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3240		1110			vph
Peak-hour factor, PHF	0.90		0.90			
Peak 15-min volume, v15	900		308			v
Trucks and buses	5		5			%
Recreational vehicles	0		0			%
Terrain type:	Rolling		Rolling			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	2.5		2.5			
Recreational vehicle PCE, ER	2.0		2.0			

Heavy vehicle adjustment, fHV			
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3870	1326	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3870 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3870	4800	No
v_{12}	3870	4400	No
$v_{FO} = v_F - v_R$	2544	4800	No
v_R	1326	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 32.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.417	
Space mean speed in ramp influence area,	S_R = 58.3	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 58.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-485 SB Off Ramp
Junction:	I-485 SB and US 74 WB
Jurisdiction:	207
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2670	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	820	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2670		820			vph
Peak-hour factor, PHF	0.90		0.90			
Peak 15-min volume, v15	742		228			v
Trucks and buses	5		5			%
Recreational vehicles	0		0			%
Terrain type:	Rolling		Rolling			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	2.5		2.5			
Recreational vehicle PCE, ER	2.0		2.0			

Driver population factor, fP	1.00	1.00	
Flow rate, vp	3189	979	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3189 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3189	4800	No
v_{12}	3189	4400	No
$v_{FO} = v_F - v_R$	2210	4800	No
v_R	979	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 26.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.386

Space mean speed in ramp influence area, S_R = 59.2 mph

Space mean speed in outer lanes, S_0 = N/A mph

Space mean speed for all vehicles, S = 59.2 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-485 SB Off Ramp
Junction:	I-485 SB and US 74 EB
Jurisdiction:	208
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2130	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	940	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2130		940			vph
Peak-hour factor, PHF	0.90		0.90			
Peak 15-min volume, v15	592		261			v
Trucks and buses	5		5			%
Recreational vehicles	0		0			%
Terrain type:	Rolling		Rolling			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	2.5		2.5			
Recreational vehicle PCE, ER	2.0		2.0			

Driver population factor, fP	1.00	1.00	
Flow rate, vp	2544	1123	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2544 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2544	4800	No
v_{12}	2544	4400	No
$v_{FO} = v_F - v_R$	1421	4800	No
v_R	1123	1900	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.659	
Space mean speed in ramp influence area,	S_R = 51.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 51.5	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-485 SB Off Ramp
Junction:	I-485 SB and US 74 EB
Jurisdiction:	208
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1850	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	960	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	1850		960			vph
Peak-hour factor, PHF	0.90		0.90			
Peak 15-min volume, v15	514		267			v
Trucks and buses	5		5			%
Recreational vehicles	0		0			%
Terrain type:	Rolling		Rolling			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	2.5		2.5			
Recreational vehicle PCE, ER	2.0		2.0			

Driver population factor, fP	1.00	1.00	
Flow rate, vp	2210	1147	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2210 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2210	4800	No
v_{12}	2210	4400	No
$v_{FO} = v_F - v_R$	1063	4800	No
v_R	1147	1900	No

Level of Service Determination (if not F)

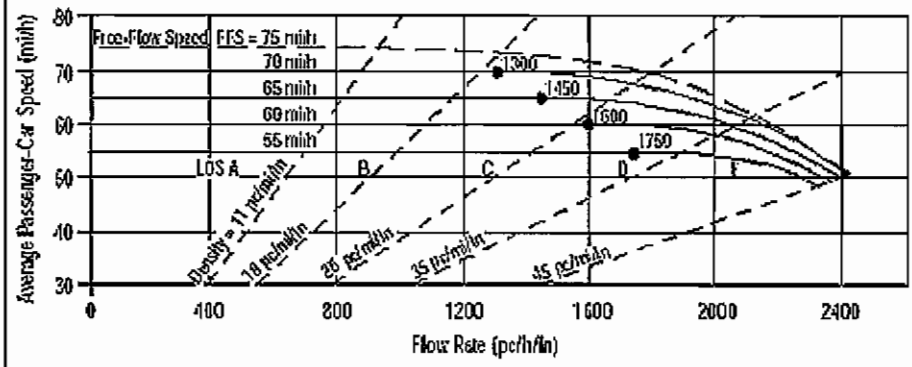
Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.661	
Space mean speed in ramp influence area,	S_R = 51.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 51.5	mph

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	209
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1190 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

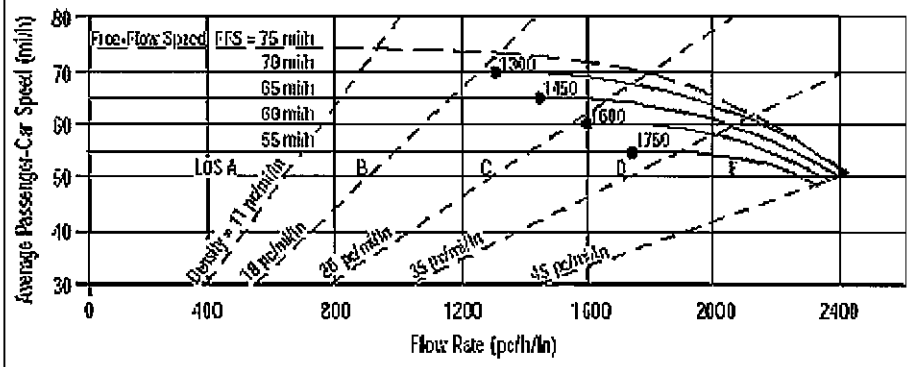
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	2		f_N	4.5
FFS (measured)		mi/h	FFS	65.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	711	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	65.5	mi/h	S
D = v_p / S	10.9	pc/mi/ln	D = v_p / S
LOS	A		Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	209
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	890 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

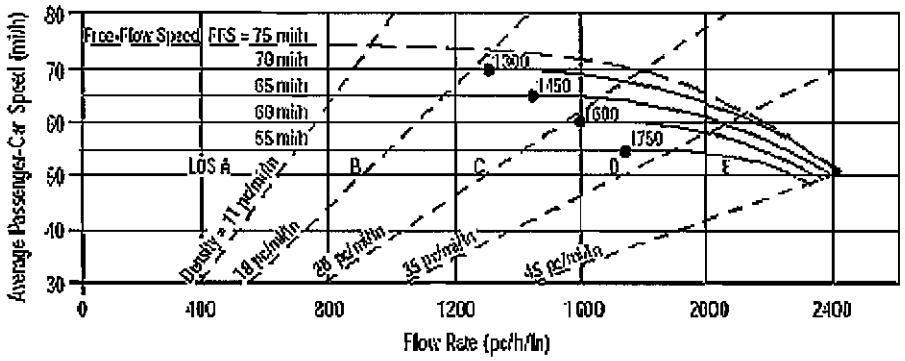
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	2		f_N	4.5
FFS (measured)		mi/h	FFS	65.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	532	pc/h/ln	Design LOS
S	65.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	8.1	pc/mi/ln	S
LOS	A		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB On Ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	210
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1700 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

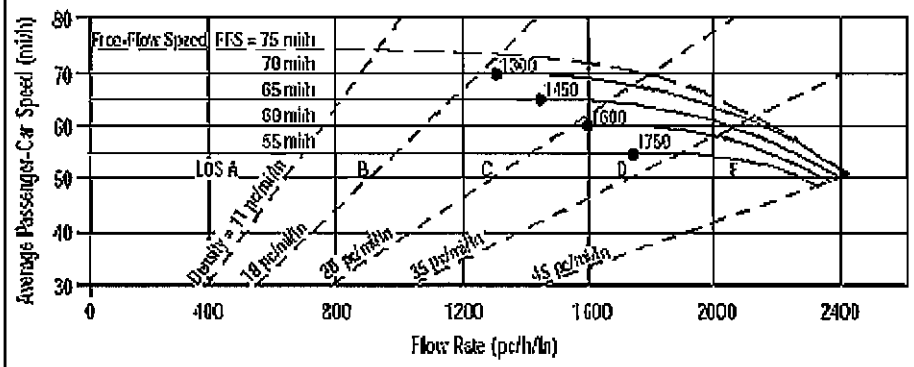
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1044	pc/h/ln	Design LOS
S	55.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	19.0	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	I-485 SB On Ramp
From/To	
Jurisdiction	210
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	1460 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	896	pc/h/ln
S	55.0	mi/h
D = v_p / S	16.3	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

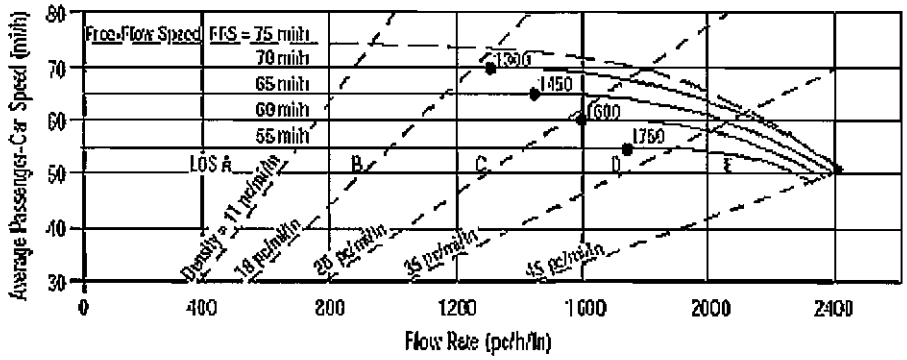
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	I-485 SB
From/To	
Jurisdiction	211
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2890 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	4	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	1.5
FFS	68.5

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	899	pc/h/ln
S	68.5	mi/h
D = v_p / S	13.1	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

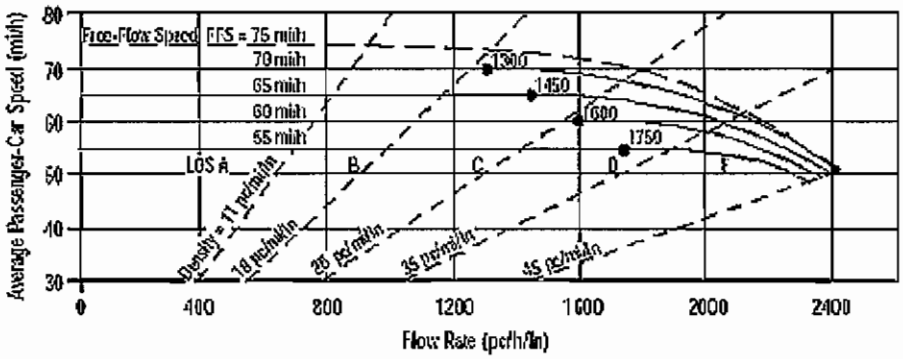
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	211
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2350 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

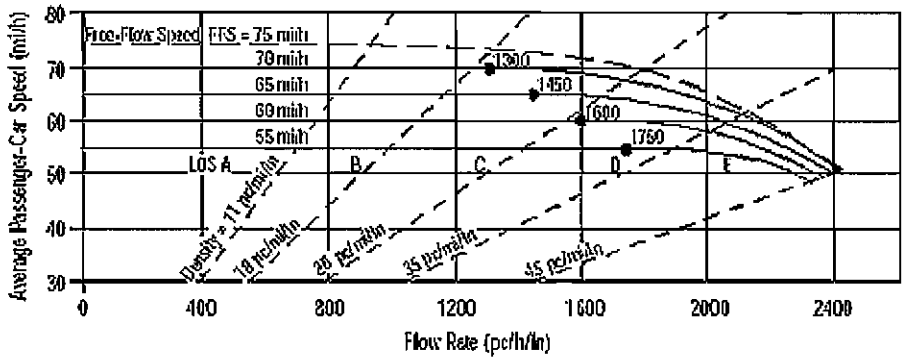
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	4		f_N	1.5
FFS (measured)		mi/h	FFS	68.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	731	pc/h/ln	Design LOS
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	68.5	mi/h	S
D = v_p / S	10.7	pc/mi/ln	D = v_p / S
LOS	A		Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	212
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2890 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

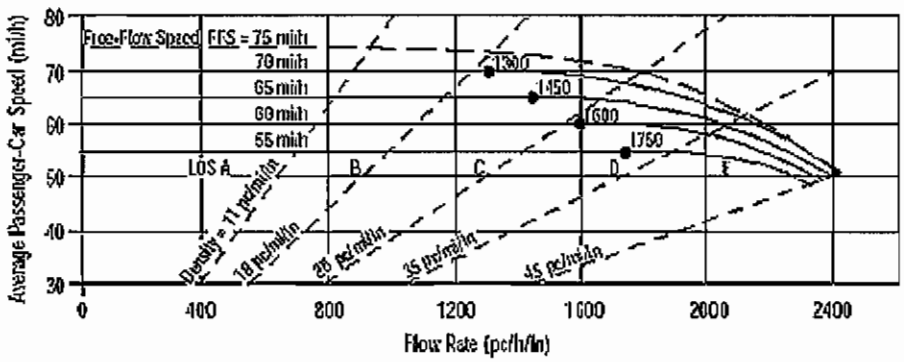
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	67.0
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1199	pc/h/ln	Design LOS
S	67.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	17.9	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		**Site Information**	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	212
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2350 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	67.0
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	975	pc/h/ln	Design LOS
S	67.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	14.6	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB Off Ramp
From/To	
Jurisdiction	213
Analysis Year	2007

Flow Inputs

Volume, V	790 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	8%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.89286$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 983.11$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: B

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB Off Ramp
From/To	
Jurisdiction	213
Analysis Year	2007

Flow Inputs

Volume, V	790 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	8%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.89286$$

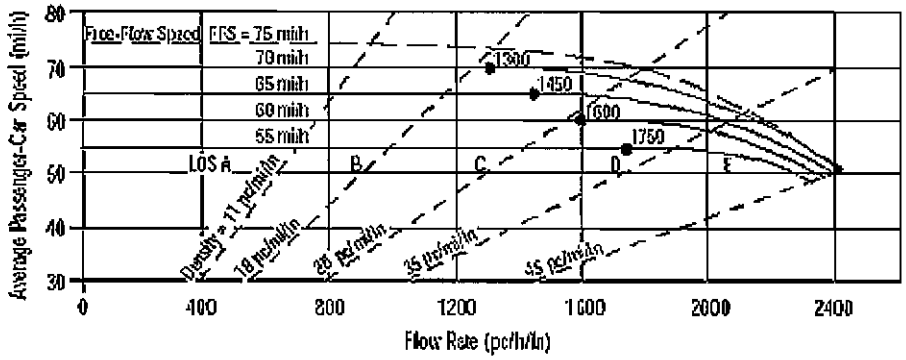
$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 983.11$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: B

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	1-485 NB Off Ramp
From/To	
Jurisdiction	214
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	670 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	417	pc/h/ln
S	55.0	mi/h
D = v_p / S	7.6	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

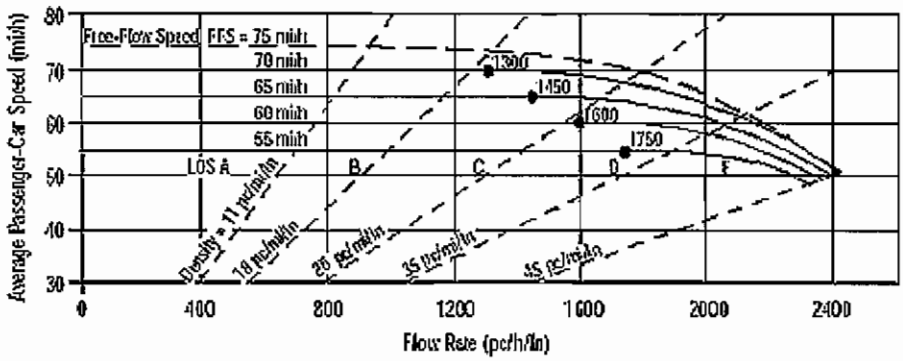
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB Off Ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	214
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	910 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	566	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	55.0	mi/h	S
D = v_p / S	10.3	pc/mi/ln	D = v_p / S
LOS	A		Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

FREEWAY WEAVING WORKSHEET

General Information

Analyst	BSL
Agency/Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Freeway/Dir of Travel	I-485 NB
Weaving Seg Location	215
Jurisdiction	
Analysis Year	2007

Inputs

Freeway free-flow speed, SFF (mi/h)	45	Weaving type	A
Weaving number of lanes, N	2	Volume ratio, VR	1.00
Weaving seg length, L (ft)	700	Weaving ratio, R	0.49
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
Vo1	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	790	0.90	8	0	2.5	2.0	0.893	1.00	983
Vw2	820	0.90	7	0	2.5	2.0	0.905	1.00	1006
Vw				1989	Vnw				0
V									1989

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.15	0.00
b (Exhibit 24-6)			4.00	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			6.89	1.85
Weaving and non-weaving speeds, Si (mi/h)			19.44	27.26

Number of lanes required for unconstrained operation, Nw: 1.71
Maximum number of lanes, Nw (max): 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	19.44
Weaving segment density, D (pc/mi/ln)	51.16
Level of service, LOS	F
Capacity of base condition, c_b (pc/h)	
Capacity as a 15-minute flow rate, c (veh/h)	
Capacity as a full-hour volume, c_h (veh/h)	

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	
Agency/Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Freeway/Dir of Travel	I-485 NB
Weaving Seg Location	215
Jurisdiction	
Analysis Year	2007

Inputs

Freeway free-flow speed, SFF (mi/h)	45	Weaving type	A
Weaving number of lanes, N	2	Volume ratio, VR	1.00
Weaving seg length, L (ft)	700	Weaving ratio, R	0.42
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
Vo1	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	790	0.90	8	0	2.5	2.0	0.893	1.00	983
Vw2	1110	0.90	7	0	2.5	2.0	0.905	1.00	1362
Vw				2345	Vnw				0
V									2345

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.15	0.00
b (Exhibit 24-6)			4.00	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			8.08	2.30
Weaving and non-weaving speeds, Si (mi/h)			18.86	25.62

Number of lanes required for unconstrained operation, Nw: 1.74
Maximum number of lanes, Nw (max): 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	18.86
Weaving segment density, D (pc/mi/ln)	62.18
Level of service, LOS	F
Capacity of base condition, c_b (pc/h)	
Capacity as a 15-minute flow rate, c (veh/h)	
Capacity as a full-hour volume, c_h (veh/h)	

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	216
Analysis Year	2007

Flow Inputs

Volume, V	820 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1006.78$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: C

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	216
Analysis Year	2007

Flow Inputs

Volume, V	1110 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1362.83$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: C

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	217
Analysis Year	2007

Flow Inputs

Volume, V	960 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1178.67$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: C

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	217
Analysis Year	2007

Flow Inputs

Volume, V	940 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

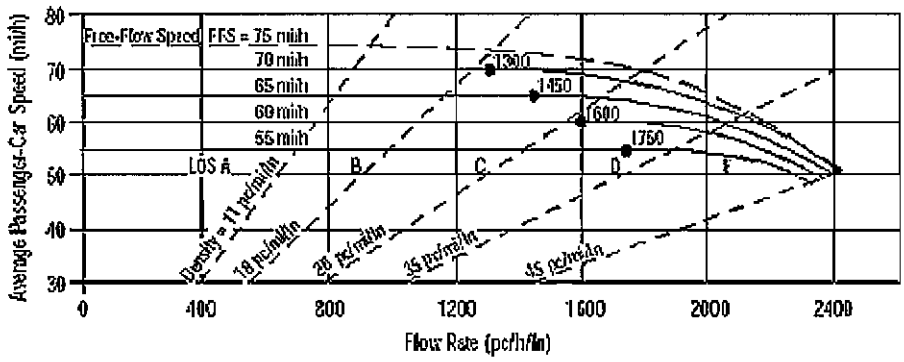
$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1154.11$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: C

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB On Ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	218
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	1780 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1093	pc/h/ln
S	55.0	mi/h
D = v_p / S	19.9	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

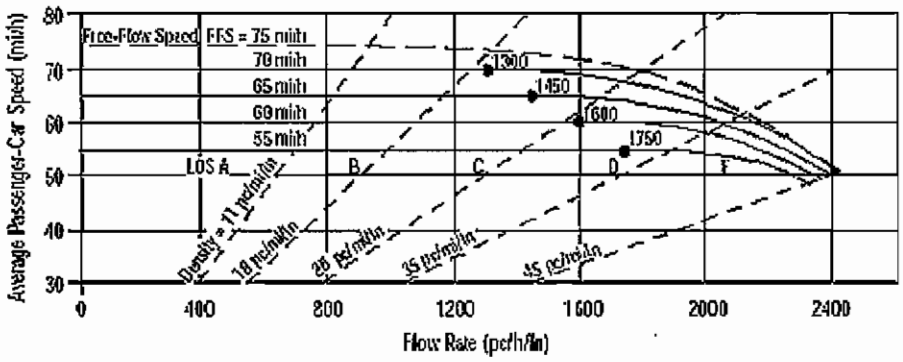
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB On Ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	218
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2050 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

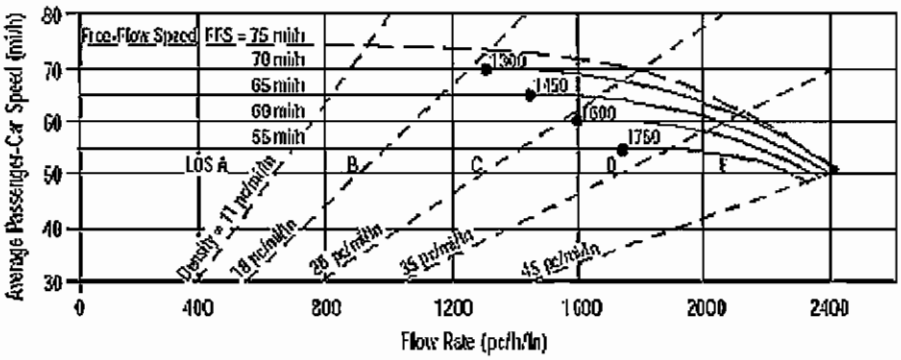
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1258	pc/h/ln	Design LOS
S	55.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	22.9	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 EB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	219
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2230 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	4	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	1.5
FFS	58.5

LOS and Performance Measures

Operational (LOS)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	684	pc/h/ln
S	58.5	mi/h
D = v_p / S	11.7	pc/mi/ln
LOS	B	

Design (N)

Design (N)	
Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

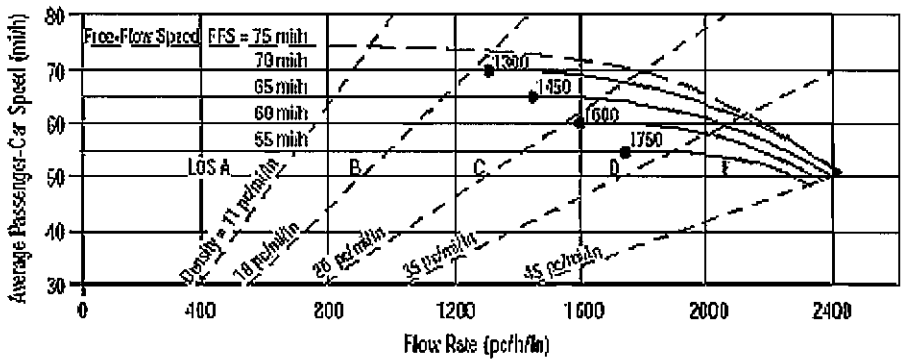
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 EB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	219
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2750 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	4		f_N	1.5
FFS (measured)		mi/h	FFS	58.5
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	844	pc/h/ln	Design LOS
S	58.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	14.4	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB Off Ramp
Junction:	US 74 EB and I-485 SB
Jurisdiction:	220
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2230	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	790	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2230	790		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	619	219		v
Trucks and buses	7	7		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		

Heavy vehicle adjustment, fHV	0.905	0.905	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2738	970	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1741 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2738	9200	No
v_{12}	1741	4400	No
$v_{FO} = v_F - v_R$	1768	9200	No
v_R	970	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.385	
Space mean speed in ramp influence area,	S_R = 53.1	mph
Space mean speed in outer lanes,	S_O = 65.8	mph
Space mean speed for all vehicles,	S = 57.1	mph

HCS2000: Ramps and Ramp Junctions Release 4.1f

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB Off Ramp
Junction:	US 74 EB and I-485 SB
Jurisdiction:	220
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2750	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	790	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2750	790		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	764	219		v
Trucks and buses	7	7		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		

Heavy vehicle adjustment, fHV	0.905	0.905	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3376	970	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2019 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3376	9200	No
v_{12}	2019	4400	No
$v_{FO} = v_F - v_R$	2406	9200	No
v_R	970	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 19.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.385	
Space mean speed in ramp influence area,	S_R = 53.1	mph
Space mean speed in outer lanes,	S_0 = 65.8	mph
Space mean speed for all vehicles,	S = 57.5	mph

FREEWAY WEAVING WORKSHEET

General Information

Analyst	
Agency/Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Freeway/Dir of Travel	I-485 NB
Weaving Seg Location	221
Jurisdiction	
Analysis Year	2007

Inputs

Freeway free-flow speed, SFF (mi/h)	60	Weaving type	A
Weaving number of lanes, N	5	Volume ratio, VR	0.74
Weaving seg length, L (ft)	700	Weaving ratio, R	0.47
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
Vo1	620	0.90	7	0	2.5	2.0	0.905	1.00	761
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	820	0.90	7	0	2.5	2.0	0.905	1.00	1006
Vw2	940	0.90	5	0	2.5	2.0	0.930	1.00	1122
Vw				2128	Vnw				761
V									2889

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.15	0.00
b (Exhibit 24-6)			4.00	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			2.98	0.52
Weaving and non-weaving speeds, Si (mi/h)			27.56	47.89

Number of lanes required for unconstrained operation, Nw: 2.96
Maximum number of lanes, Nw (max): 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	31.03
Weaving segment density, D (pc/mi/ln)	18.62
Level of service, LOS	B
Capacity of base condition, c_b (pc/h)	8580
Capacity as a 15-minute flow rate, c (veh/h)	7765
Capacity as a full-hour volume, c_h (veh/h)	6988

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	
Agency/Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Freeway/Dir of Travel	I-485 NB
Weaving Seg Location	221
Jurisdiction	
Analysis Year	2007

Inputs

Freeway free-flow speed, SFF (mi/h)	60	Weaving type	A
Weaving number of lanes, N	5	Volume ratio, VR	0.71
Weaving seg length, L (ft)	700	Weaving ratio, R	0.46
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_P	v
Vo1	850	0.90	7	0	2.5	2.0	0.905	1.00	1043
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	1110	0.90	7	0	2.5	2.0	0.905	1.00	1362
Vw2	960	0.90	5	0	2.5	2.0	0.930	1.00	1146
Vw				2508	Vnw				1043
V									3551

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.15	0.00
b (Exhibit 24-6)			4.00	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			3.50	0.63
Weaving and non-weaving speeds, Si (mi/h)			26.11	45.60

Number of lanes required for unconstrained operation, Nw: 2.96
Maximum number of lanes, Nw (max): 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	29.85
Weaving segment density, D (pc/mi/ln)	23.79
Level of service, LOS	C
Capacity of base condition, c_b (pc/h)	8580
Capacity as a 15-minute flow rate, c (veh/h)	7765
Capacity as a full-hour volume, c_h (veh/h)	6988

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios groater than 0.45. Poor operations end some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrainod by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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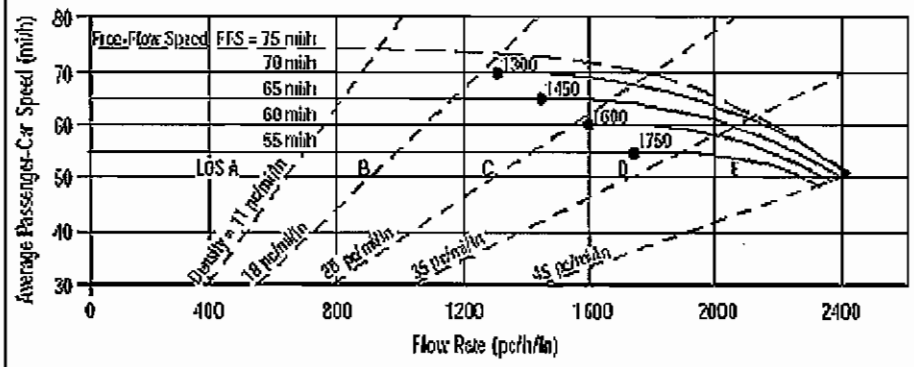
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 EB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	222
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1560 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

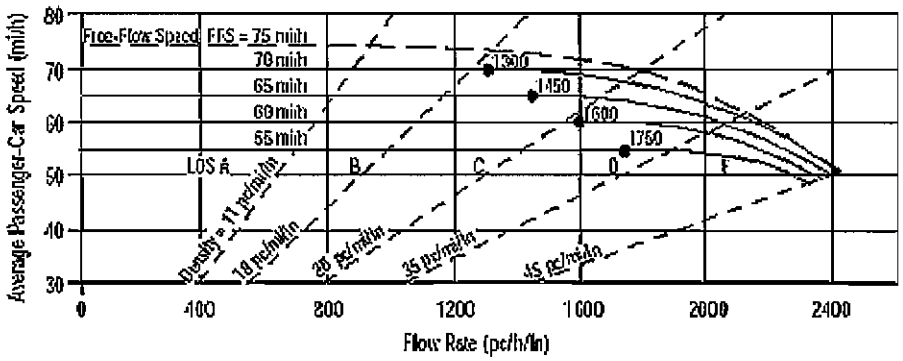
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	57.0
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	638	pc/h/ln	Design LOS
S	57.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	11.2	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 EB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	222
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1810 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	57.0
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	741	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	57.0	mi/h	S
D = v_p / S	13.0	pc/mi/ln	D = v_p / S
LOS	B		Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	US 74 SB On Ramp
From/To	
Jurisdiction	223
Analysis Year	2007

Flow Inputs

Volume, V	670 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	8%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.89286$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 833.78$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: B

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	US 74 SB On Ramp
From/To	
Jurisdiction	223
Analysis Year	2007

Flow Inputs

Volume, V	910 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	8%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.89286$$

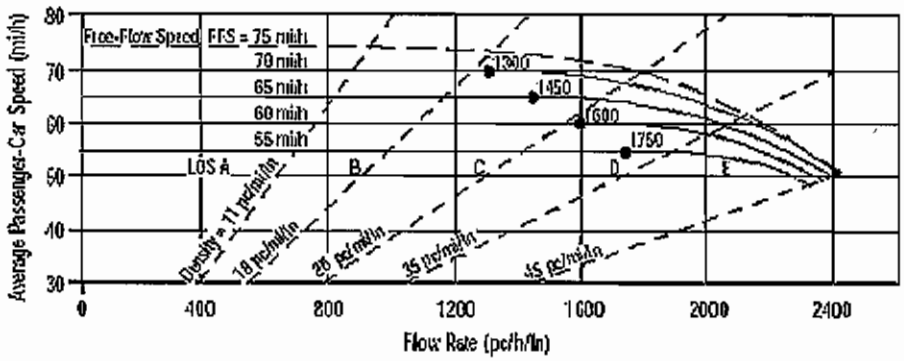
$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1132.44$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: C

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	US 74 EB
From/To	
Jurisdiction	224
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2230 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	4	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	1.5
FFS	58.5

LOS and Performance Measures

Operational (LOS)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	684	pc/h/ln
S	58.5	mi/h
D = v_p / S	11.7	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

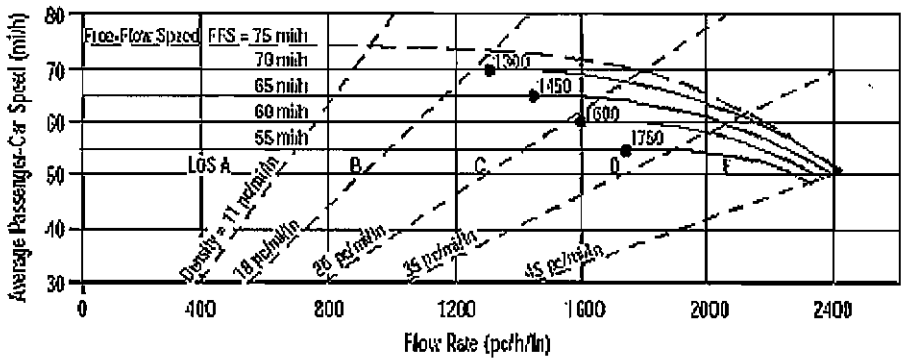
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 EB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	224
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2720 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

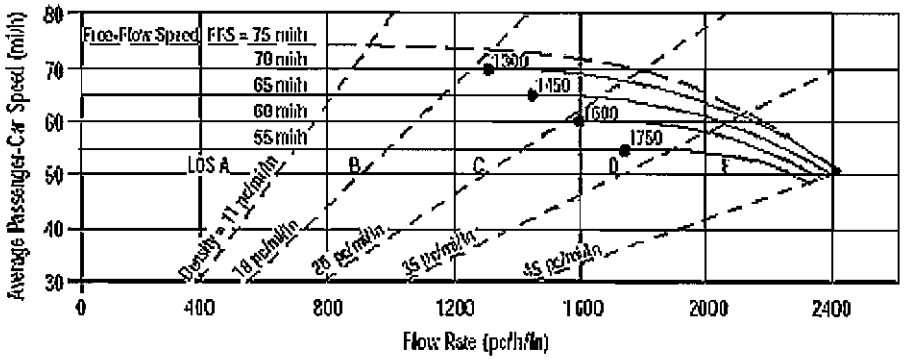
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	4		f_N	1.5
FFS (measured)		mi/h	FFS	58.5
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	835	pc/h/ln	Design LOS
S	58.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	14.3	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	225
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2720 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

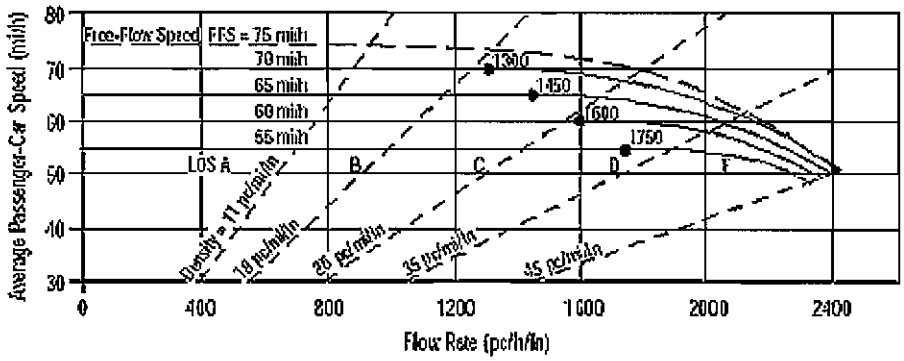
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	4		f_N	1.5
FFS (measured)		mi/h	FFS	58.5
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	835	pc/h/ln	Design LOS
S	58.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	14.3	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	225
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2230 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

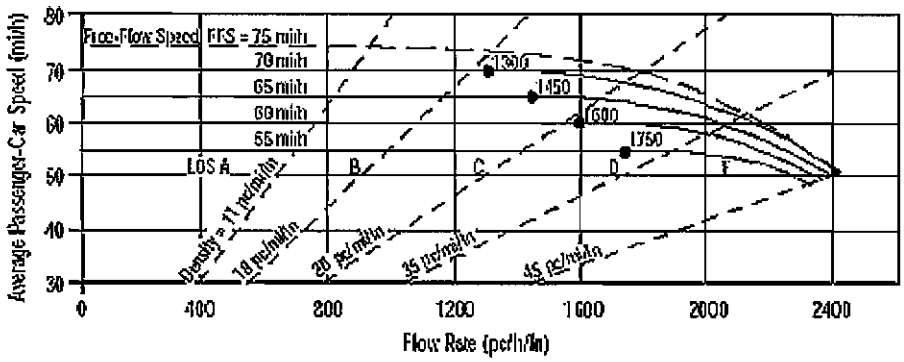
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	4		f_N	1.5
FFS (measured)		mi/h	FFS	58.5
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	684	pc/h/ln	Design LOS
S	58.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	11.7	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	226
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	850 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

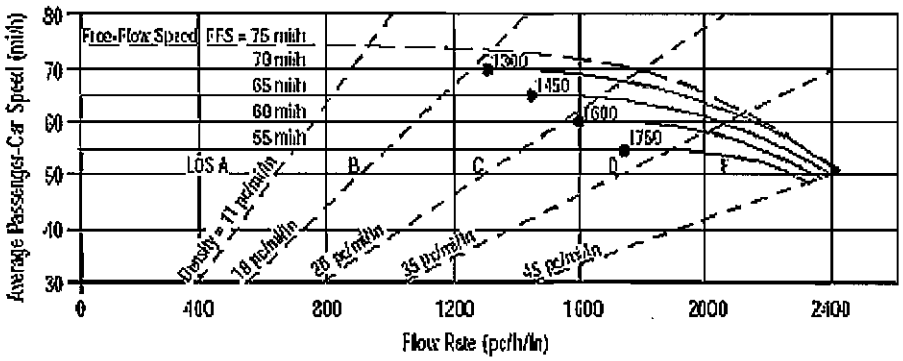
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	57.0
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	348	pc/h/ln	Design LOS
S	57.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	6.1	pc/mi/ln	S
LOS	A		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	226
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	620 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

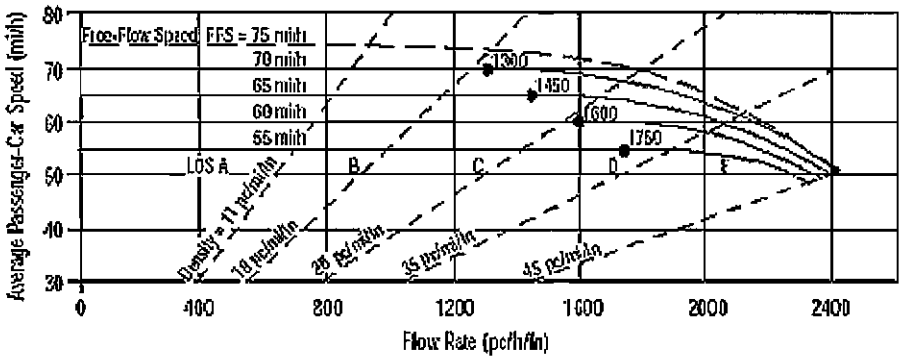
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	57.0
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	254	pc/h/ln	Design LOS
S	57.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	4.5	pc/mi/ln	S
LOS	A		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB Off Ram
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	227
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	1870 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1148	pc/h/ln
S	55.0	mi/h
D = v_p / S	20.9	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

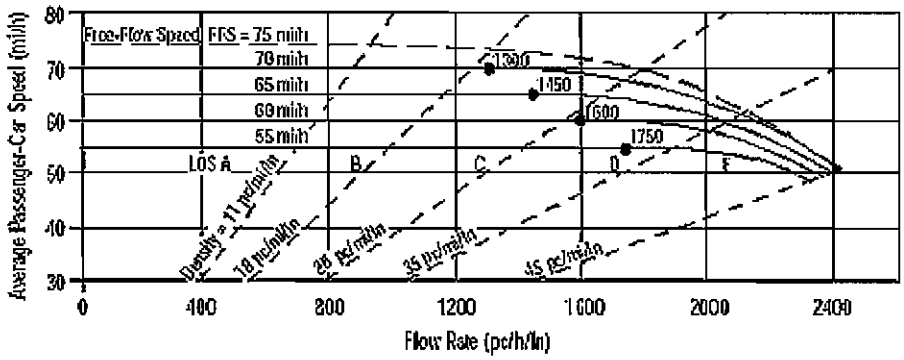
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB Off Ram
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	227
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1610 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	988	pc/h/ln	Design LOS
S	55.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	18.0	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB
Junction:	US 74 WB and I-485 NB
Jurisdiction:	228
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	850	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	790	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1110	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2150	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	850	790	1110	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	236	219	308	v
Trucks and buses	7	8	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.895	0.930	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1044	983	1326	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 629 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2027	6900	No
v_{R12}	1612	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 12.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.296	
Space mean speed in ramp influence area,	S_R = 54.7	mph
Space mean speed in outer lanes,	S_O = 60.0	mph
Space mean speed for all vehicles,	S = 55.7	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB
Junction:	US 74 WB and I-485 NB
Jurisdiction:	228
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	620	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	790	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	820	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2150	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	620	790	820	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	172	219	228	v
Trucks and buses	7	8	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.903	0.893	0.930	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	761	983	979	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 459 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1744	6900	No
v_{R12}	1442	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 10.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.292	
Space mean speed in ramp influence area,	S_R = 54.7	mph
Space mean speed in outer lanes,	S_O = 60.0	mph
Space mean speed for all vehicles,	S = 55.6	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB
Junction:	US 74 WB and I-485 SB
Jurisdiction:	229
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1640	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	1110	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	790	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2150	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1640	1110	790	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	456	308	219	v
Trucks and buses	8	5	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.893	0.990	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2041	1326	983	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.597 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1219 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3367	6900	No
v_{R12}	2545	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.308	
Space mean speed in ramp influence area,	S_R = 54.5	mph
Space mean speed in outer lanes,	S_O = 58.8	mph
Space mean speed for all vehicles,	S = 55.5	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB
Junction:	US 74 WB and I-485 SB
Jurisdiction:	229
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1410	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	820	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	790	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2150	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1410	820	790	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	392	228	219	v
Trucks and buses	8	5	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.893	0.930	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1755	979	983	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.597 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1048 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2734	6900	No
v_{R12}	2027	4600	No

Level of Service Determination (if not F)

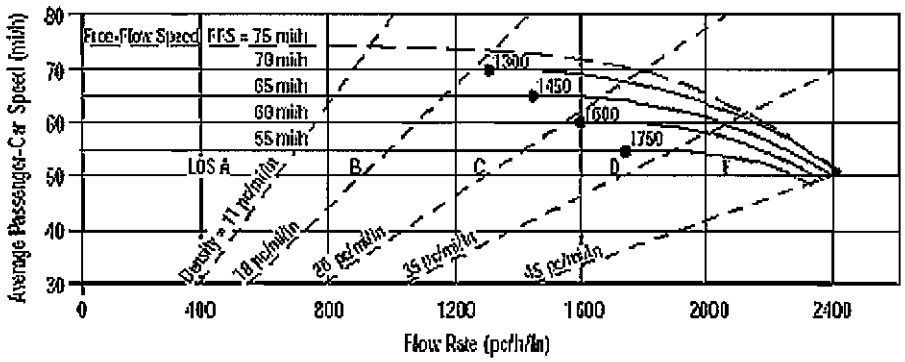
Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 16.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.288	
Space mean speed in ramp influence area,	S_R = 54.8	mph
Space mean speed in outer lanes,	S_O = 59.3	mph
Space mean speed for all vehicles,	S = 55.9	mph

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB Off Ram
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	230
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2750 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

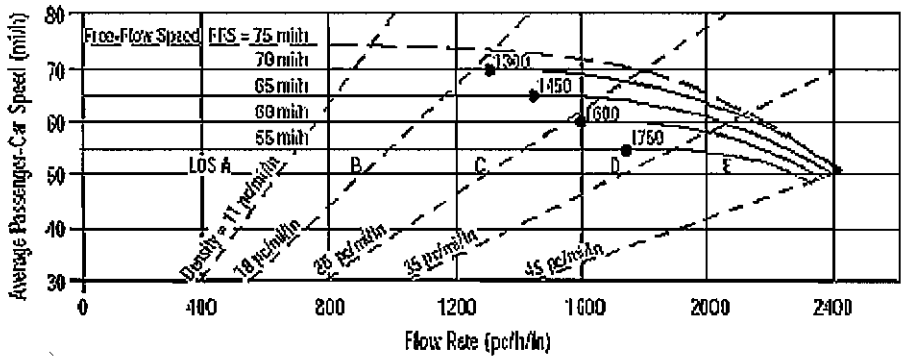
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	57.0
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1125	pc/h/ln	Design LOS
S	57.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	19.7	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB Off Ram
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	230
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2230 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

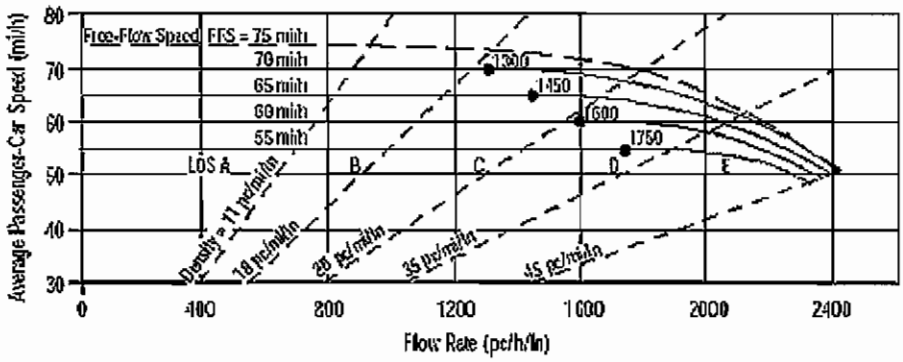
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	57.0
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	913	pc/h/ln	Design LOS
S	57.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	16.0	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	US 74 Flyover
From/To	
Jurisdiction	231
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	910 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	559	pc/h/ln
S	55.0	mi/h
D = v_p / S	10.2	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

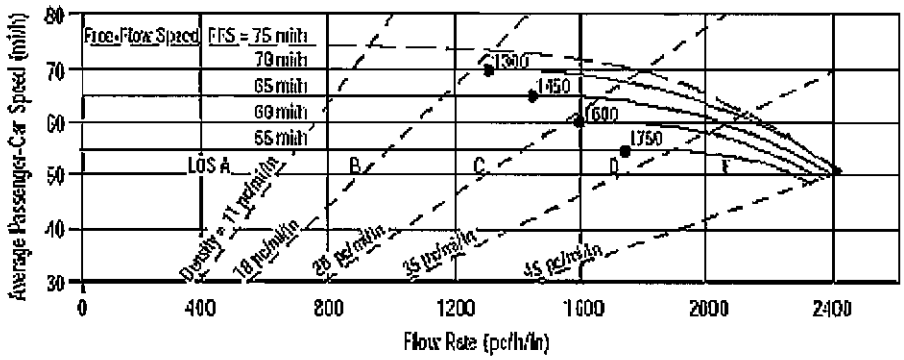
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 Flyover
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	231
Analysis Time Period	PM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	670 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	411	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	55.0	mi/h	S
D = v_p / S	7.5	pc/mi/ln	D = v_p / S
LOS	A		Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	US 74 SB Off Ramp
From/To	
Jurisdiction	232
Analysis Year	2007

Flow Inputs

Volume, V	790 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 969.94$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: B

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	US 74 SB Off Ramp
From/To	
Jurisdiction	232
Analysis Year	2007

Flow Inputs

Volume, V	790 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

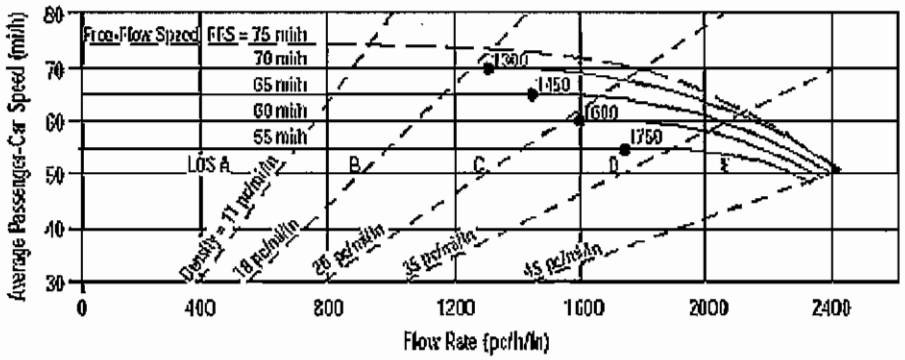
$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 969.94$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: B

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		**Site Information**	
Analyst	BSL	Highway/Direction of Travel	I-485 NB On Ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	233
Analysis Time Period	AM Peak	Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1700 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

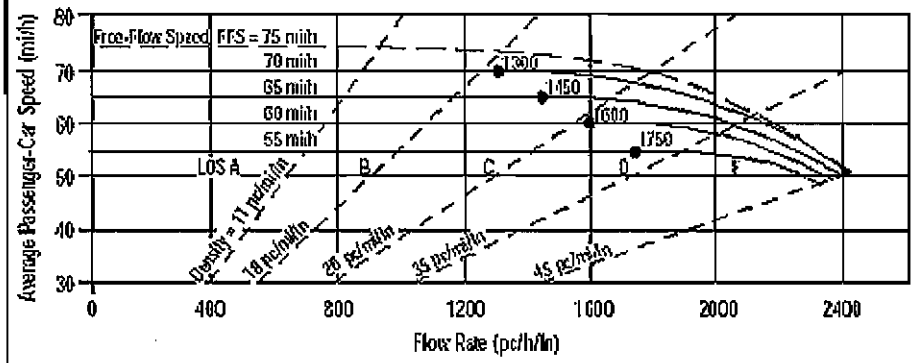
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1044	pc/h/ln	Design LOS
S	55.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	19.0	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	233
Analysis Year	2007

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	1460 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	896	pc/h/ln
S	55.0	mi/h
D = v_p / S	16.3	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

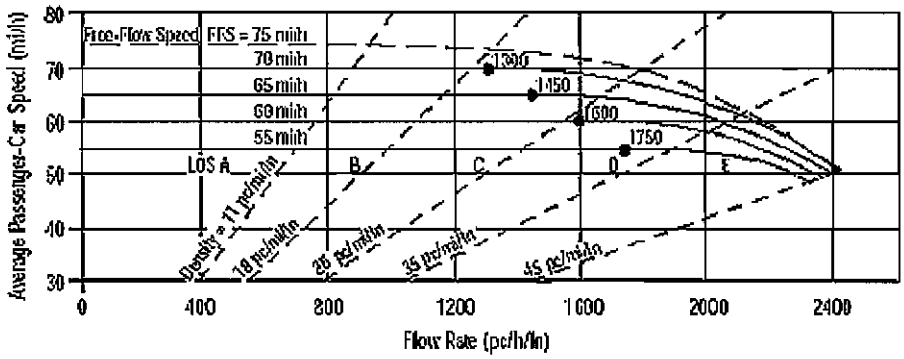
Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 and I-485
Interchange Analysis
2030 No-Build

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB south of I
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	200
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	3720 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

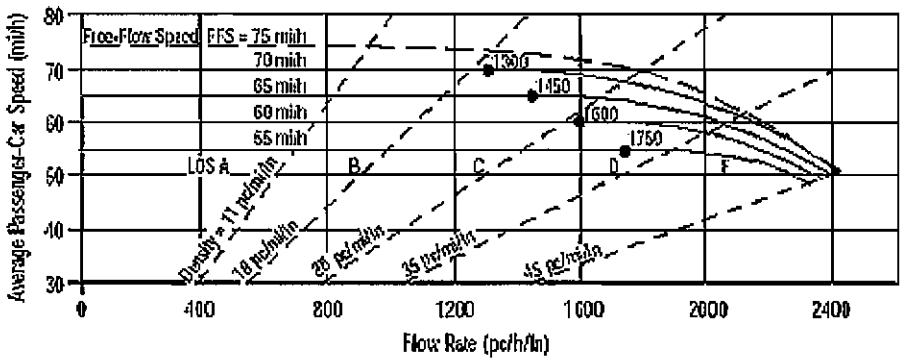
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	67.0
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1543	pc/h/ln	Design LOS
S	66.9	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	23.1	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB south of I
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	200
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	4550 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	3	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	3.0
FFS	67.0

LOS and Performance Measures

Operational (LOS)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1887	pc/h/ln
S	64.5	mi/h
D = v_p / S	29.2	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

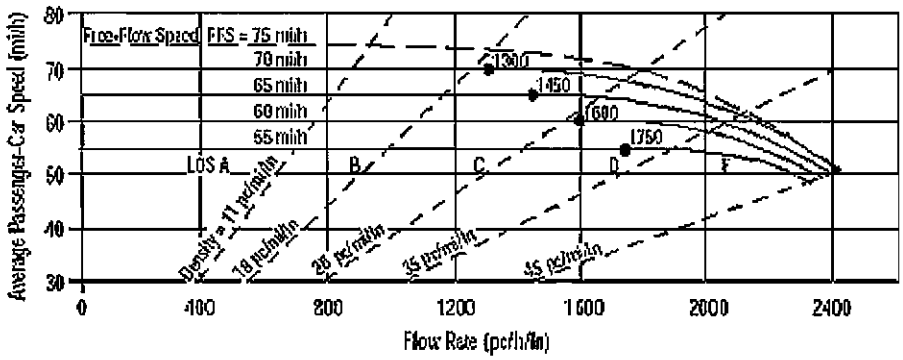
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	201
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1470 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

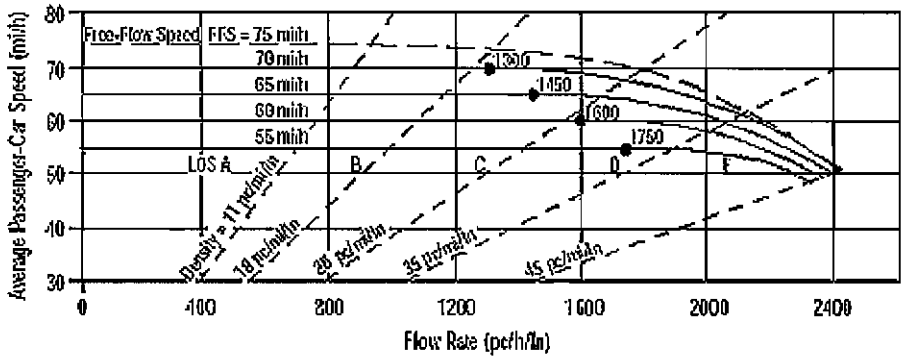
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	2		f_N	4.5
FFS (measured)		mi/h	FFS	65.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	915	pc/h/ln	Design LOS
S	65.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	14.0	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	201
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1960 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

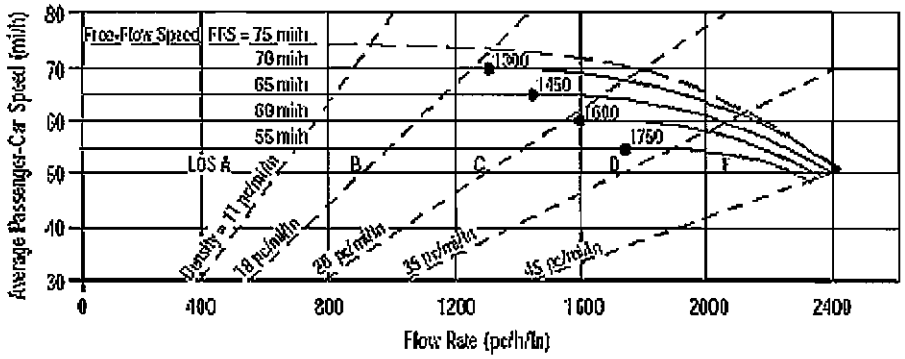
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	2		f_N	4.5
FFS (measured)		mi/h	FFS	65.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1220	pc/h/ln	Design LOS
S	65.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	18.6	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB off ramp
From/To	
Jurisdiction	202
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2250 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1400	pc/h/ln
S	55.0	mi/h
D = v_p / S	25.5	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

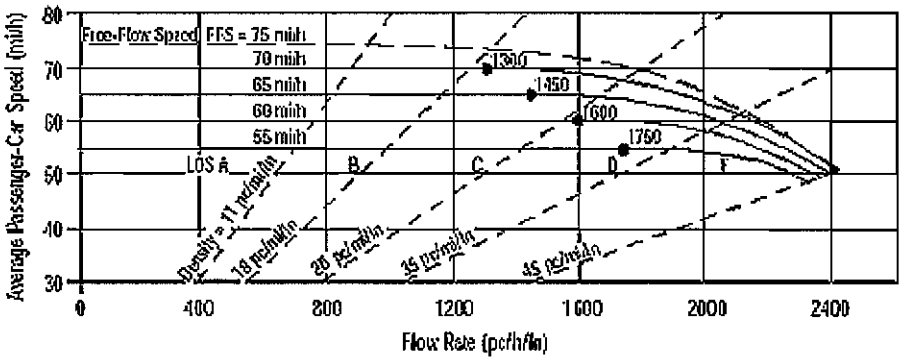
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB off ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	202
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2590 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1612	pc/h/ln
S	55.0	mi/h
D = v_p / S	29.3	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	203
Analysis Year	2030 No Build

Flow Inputs

Volume, V	2500 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 3069.44$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: F

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	203
Analysis Year	2030 No Build

Flow Inputs

Volume, V	2900 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

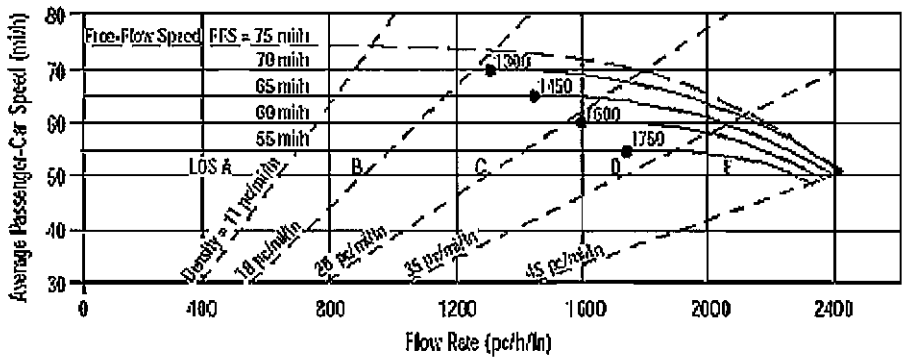
$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 3560.56$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: F

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	204
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	3970 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

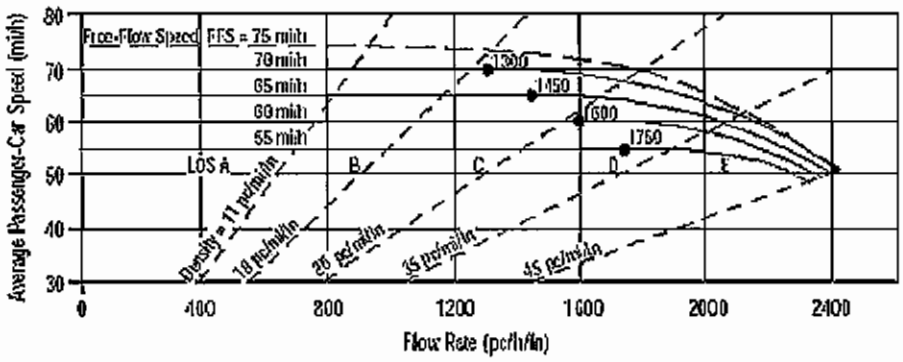
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	67.0
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = {V or DDHV) / {PHF x N x f_{HV} x f_p)	1581	pc/h/ln	Design LOS
S	66.8	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	23.7	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB
From/To	
Jurisdiction	204
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	4860 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	3	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	3.0
FFS	67.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1935	pc/h/ln
S	63.9	mi/h
D = v_p / S	30.3	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

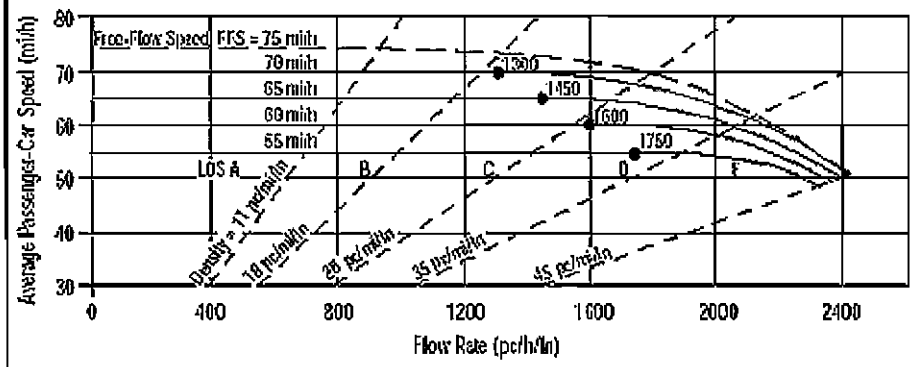
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	205
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	3970 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	4.5
FFS	65.5

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2371	pc/h/ln
S		mi/h
D = v_p / S		pc/mi/ln
LOS	F	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

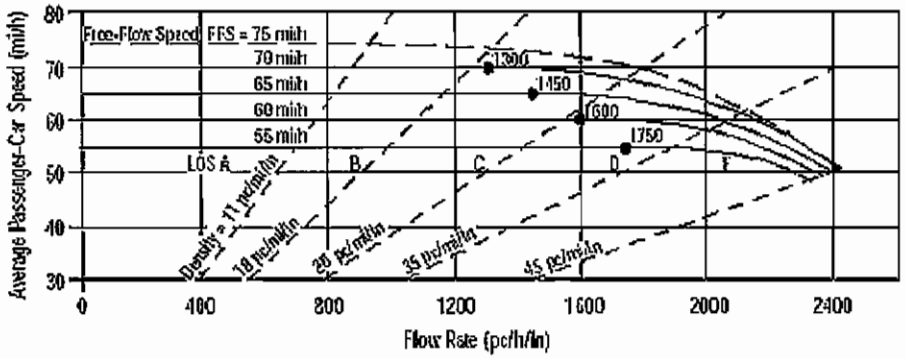
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	205
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	4860 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

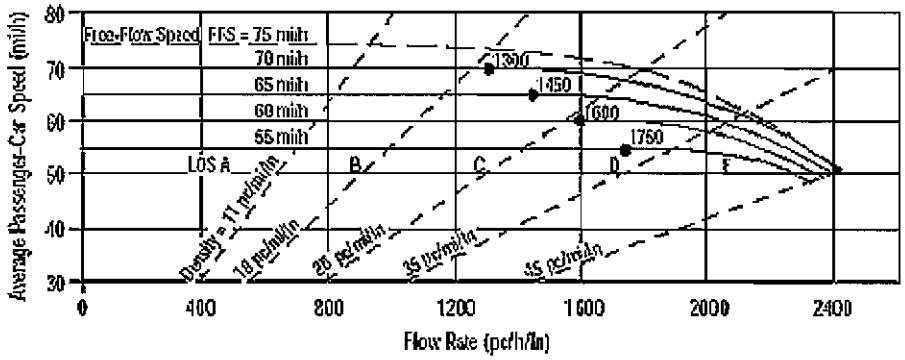
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	2		f_N	4.5
FFS (measured)		mi/h	FFS	65.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2902	pc/h/ln	Design LOS
S		mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S		pc/mi/ln	S
LOS	F		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	206
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	4860 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	4.5
FFS	65.5

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2902	pc/h/ln
S		mi/h
D = v_p / S		pc/mi/ln
LOS	F	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

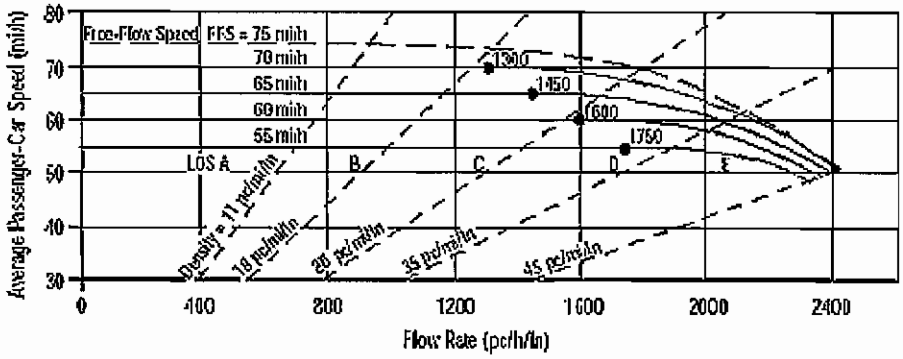
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	206
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	3970 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	2		f_N	4.5
FFS (measured)		mi/h	FFS	65.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	2371	pc/h/ln	Design LOS
S		mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S		pc/mi/ln	S
LOS	F		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-485 SB Off Ramp
Junction:	I-485 SB and US 74 WB
Jurisdiction:	207
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4860	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1650	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	4860		1650			vph
Peak-hour factor, PHF	0.90		0.90			
Peak 15-min volume, v15	1350		458			v
Trucks and buses	5		5			%
Recreational vehicles	0		0			%
Terrain type:	Rolling		Rolling			
Grade	0.00	%	0.00	%		%
Length	0.00	mi	0.00	mi		mi
Trucks and buses PCE, ET	2.5		2.5			
Recreational vehicle PCE, ER	2.0		2.0			

Heavy vehicle adjustment, fHV			
Driver population factor, fP	1.00	1.00	
Flow rate, vp	5805	1971	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5805 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5805	4800	Yes
v_{12}	5805	4400	Yes
$v_{FO} = v_F - v_R$	3834	4800	No
v_R	1971	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 48.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	D_S = 0.475	
Space mean speed in ramp influence area,	S_R = 56.7	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 56.7	mph

HCS2000: Ramps and Ramp Junctions Release 4.1f

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-485 SB Off Ramp
Junction:	I-485 SB and US 74 WB
Jurisdiction:	207
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3970	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1220	vph
Length of first accel/decel lane	600	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3970	1220		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	1103	339		v
Trucks and buses	5	5		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		

Heavy vehicle adjustment, fHV	0.930	0.930	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4742	1457	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4742 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4742	4800	No
v_{12}	4742	4400	Yes
$v_{FO} = v_F - v_R$	3285	4800	No
v_R	1457	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 39.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	D_S = 0.429	
Space mean speed in ramp influence area,	S_R = 58.0	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 58.0	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-485 SB Off Ramp
Junction:	I-485 SB and US 74 EB
Jurisdiction:	208
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3210	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	1250	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3210	1250		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	892	347		v
Trucks and buses	5	5		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		

Heavy vehicle adjustment, fHV	0.930	0.930	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3834	1493	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3834 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3834	4800	No
v_{12}	3834	4400	No
$v_{FO} = v_F - v_R$	2341	4800	No
v_R	1493	1900	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 30.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.692	
Space mean speed in ramp influence area,	S_R = 50.6	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.6	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-485 SB Off Ramp
Junction:	I-485 SB and US 74 EB
Jurisdiction:	208
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2750	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	1280	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2750	1280		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	764	356		v
Trucks and buses	5	5		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		

Heavy vehicle adjustment, fHV	0.930	0.930	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3285	1529	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD} = 3285$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3285	4800	No
v_{12}	3285	4400	No
$v_{FO} = v_F - v_R$	1756	4800	No
v_R	1529	1900	No

Level of Service Determination (if not F)

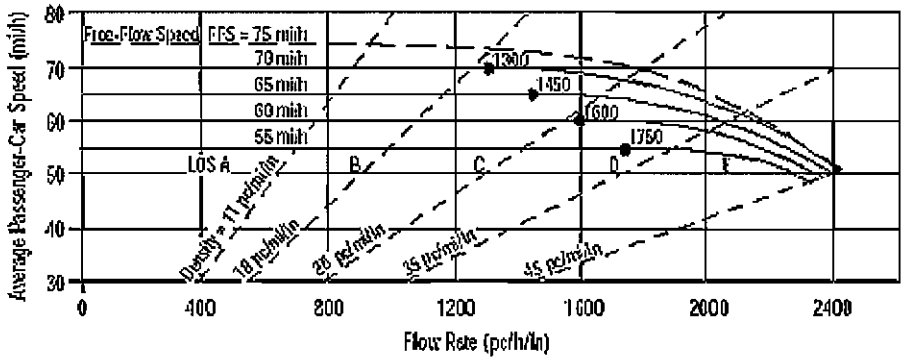
Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 26.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.696	
Space mean speed in ramp influence area,	S_R = 50.5	mph
Space mean speed in outer lanes,	S_O = N/A	mph
Space mean speed for all vehicles,	S = 50.5	mph

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	209
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1960 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

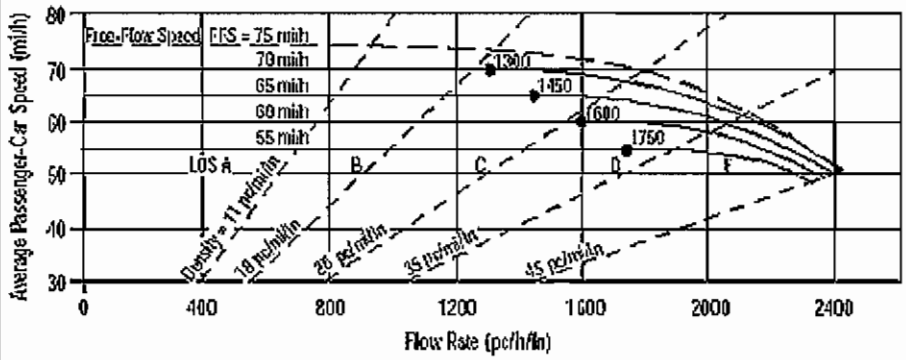
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	2		f_N	4.5
FFS (measured)		mi/h	FFS	65.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1171	pc/h/ln	Design LOS
S	65.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	17.9	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	I-485 SB
From/To	
Jurisdiction	209
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	1470 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.930

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	4.5
FFS	65.5

LOS and Performance Measures

Operational (LOS)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	878	pc/h/ln
S	65.5	mi/h
D = v_p / S	13.4	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

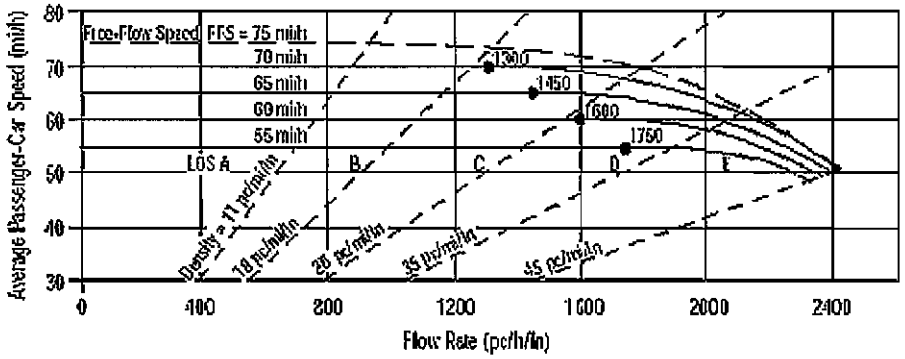
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	I-485 SB On Ramp
From/To	
Jurisdiction	210
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2590 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1590	pc/h/ln
S	55.0	mi/h
D = v_p / S	28.9	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

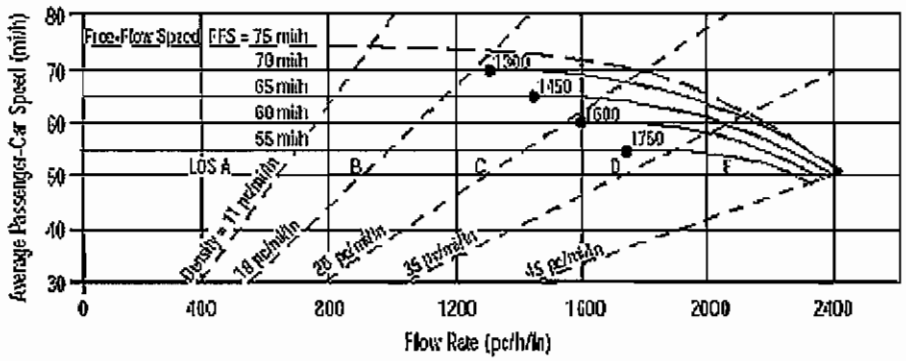
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	I-485 SB On Ramp
From/To	
Jurisdiction	210
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2250 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1381	pc/h/ln
S	55.0	mi/h
D = v_p / S	25.1	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

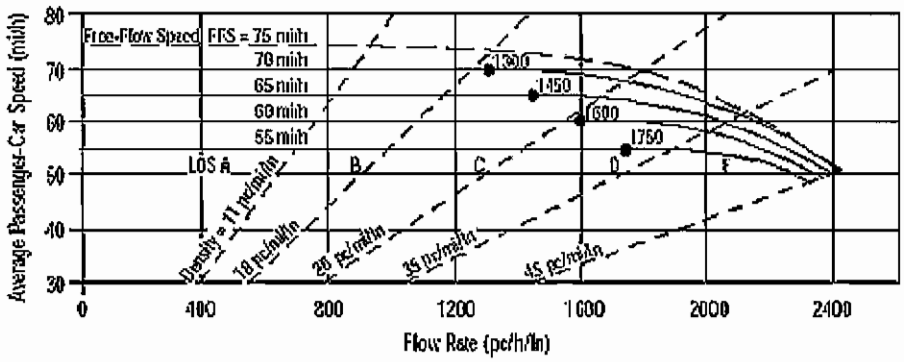
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	I-485 SB
From/To	
Jurisdiction	211
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	4550 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	4	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	1.5
FFS	68.5

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1416	pc/h/ln
S	68.5	mi/h
D = v_p / S	20.7	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

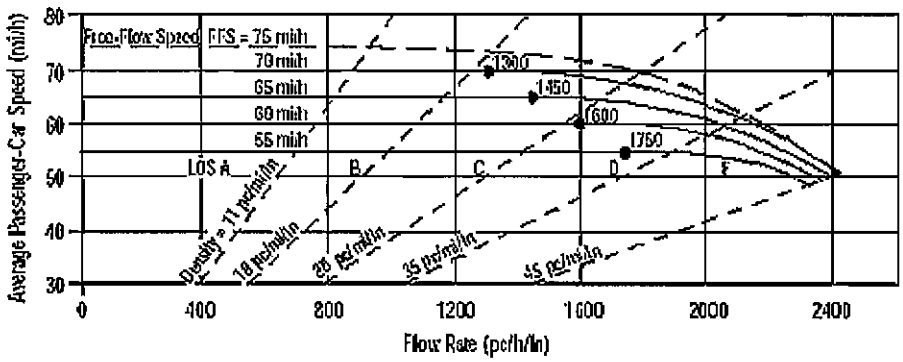
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	211
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	3720 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

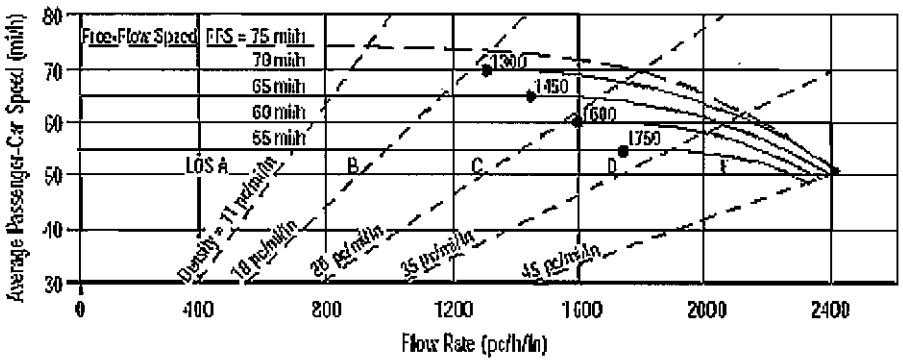
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	4		f_N	1.5
FFS (measured)		mi/h	FFS	68.5
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1157	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	68.5	mi/h	S
D = v_p / S	16.9	pc/mi/ln	D = v_p / S
LOS	B		Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	I-485 SB
From/To	
Jurisdiction	212
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	4550 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	3	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	70.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	3.0
FFS	67.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1887	pc/h/ln
S	64.5	mi/h
D = v_p / S	29.2	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

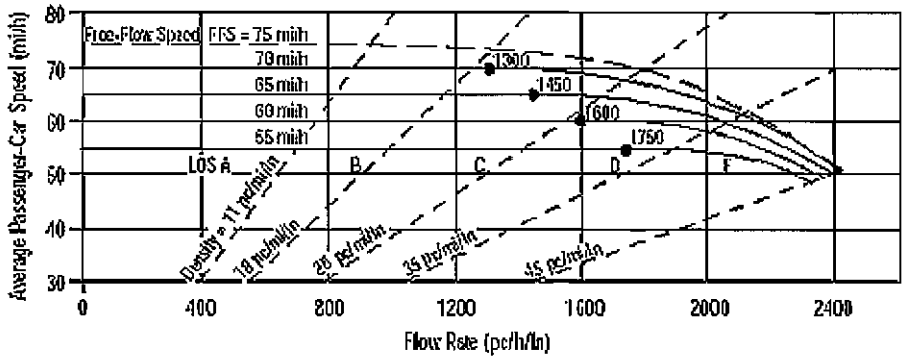
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 SB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	212
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	3720 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	67.0
Base free-flow Speed, BFFS	70.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1543	pc/h/ln	Design LOS
S	66.9	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	23.1	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB Off Ramp
From/To	
Jurisdiction	213
Analysis Year	2030 No Build

Flow Inputs

Volume, V	1280 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	8%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.89286$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1592.89$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: D

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB Off Ramp
From/To	
Jurisdiction	213
Analysis Year	2030 No Build

Flow Inputs

Volume, V	1270 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	8%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.89286$$

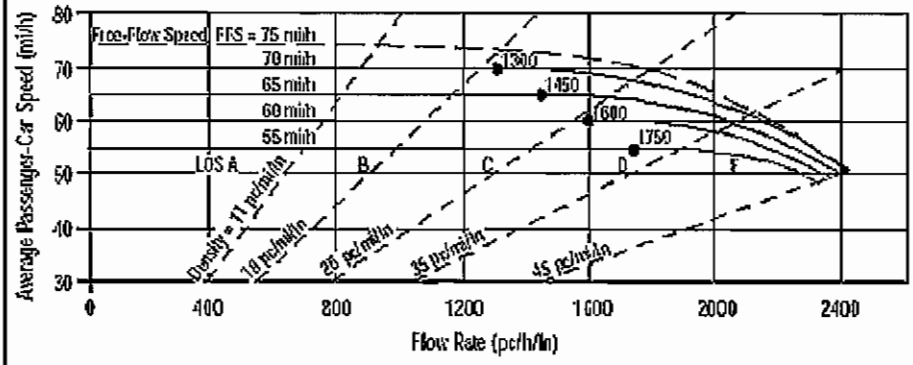
$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1580.44$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: D

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB Off Ramp
From/To	
Jurisdiction	214
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	970 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	604	pc/h/ln
S	55.0	mi/h
D = v_p / S	11.0	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

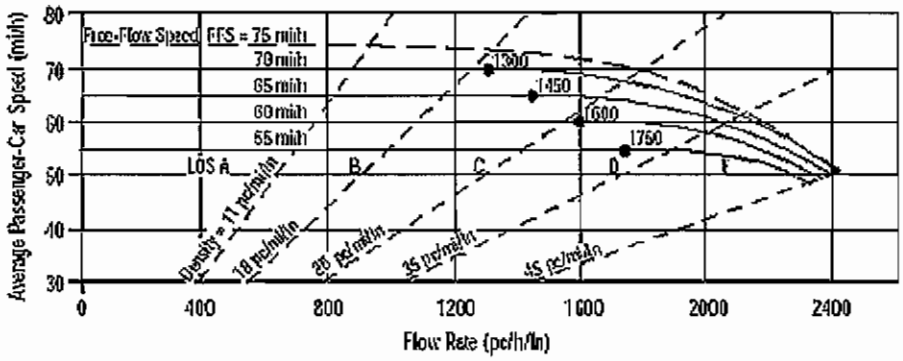
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB Off Ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	214
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	1320 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	8
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.893

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	821	pc/h/ln	Design LOS
S	55.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	14.9	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

FREEWAY WEAVING WORKSHEET

General Information

Analyst	
Agency/Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Freeway/Dir of Travel	I-485 NB
Weaving Seg Location	215
Jurisdiction	
Analysis Year	2030 No Build

Inputs

Freeway free-flow speed, SFF (mi/h)	45	Weaving type	A
Weaving number of lanes, N	2	Volume ratio, VR	1.00
Weaving seg length, L (ft)	700	Weaving ratio, R	0.48
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	fHV	fp	v
Vo1	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	1280	0.90	8	0	2.5	2.0	0.893	1.00	1592
Vw2	1220	0.90	7	0	2.5	2.0	0.905	1.00	1497
Vw				3089	Vnw				0
V									3089

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.15	0.00
b (Exhibit 24-6)			4.00	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			10.55	3.29
Weaving and non-weaving speeds, Si (mi/h)			18.03	23.16

Number of lanes required for unconstrained operation, Nw 1.79
Maximum number of lanes, Nw (max) 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	18.03
Weaving segment density, D (pc/mi/ln)	85.67
Level of service, LOS	F
Capacity of base condition, c_b (pc/h)	
Capacity as a 15-minute flow rate, c (veh/h)	
Capacity as a full-hour volume, c_h (veh/h)	

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	
Agency/Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Freeway/Dir of Travel	I-485 NB
Weaving Seg Location	215
Jurisdiction	
Analysis Year	2030 No Build

Inputs

Freeway free-flow speed, SFF (mi/h)	45	Weaving type	A
Weaving number of lanes, N	2	Volume ratio, VR	1.00
Weaving seg length, L (ft)	700	Weaving ratio, R	0.44
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
Vo1	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	1270	0.90	8	0	2.5	2.0	0.893	1.00	1580
Vw2	1650	0.90	7	0	2.5	2.0	0.905	1.00	2025
Vw				3605	Vnw				0
V									3605

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.15	0.00
b (Exhibit 24-6)			4.00	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			12.26	4.02
Weaving and non-weaving speeds, Si (mi/h)			17.64	21.98

Number of lanes required for unconstrained operation, Nw: 1.82
Maximum number of lanes, Nw (max): 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	17.64
Weaving segment density, D (pc/mi/ln)	102.18
Level of service, LOS	F
Capacity of base condition, c_b (pc/h)	
Capacity as a 15-minute flow rate, c (veh/h)	
Capacity as a full-hour volume, c_h (veh/h)	

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	216
Analysis Year	2030 No Build

Flow Inputs

Volume, V	1220 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1497.89$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: D

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	216
Analysis Year	2030 No Build

Flow Inputs

Volume, V	1650 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 2025.83$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: E

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	217
Analysis Year	2030 No Build

Flow Inputs

Volume, V	1280 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1571.56$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: D

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	I-485 NB On Ramp
From/To	
Jurisdiction	217
Analysis Year	2030 No Build

Flow Inputs

Volume, V	1250 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

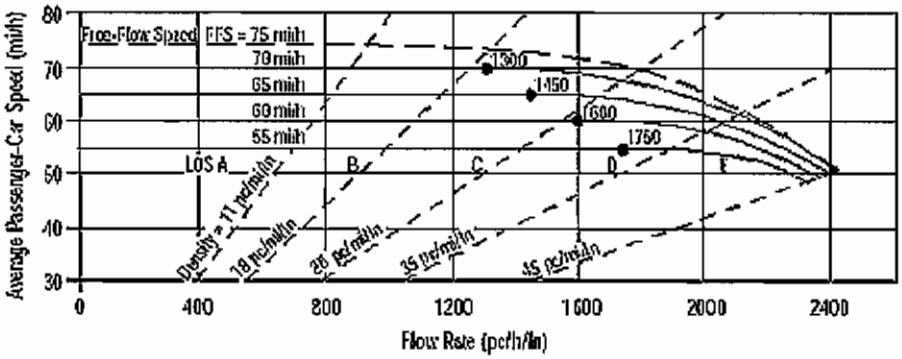
$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1534.72$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: D

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB On Ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	218
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2500 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1535	pc/h/ln
S	55.0	mi/h
D = v_p / S	27.9	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	
S	
D = v_p / S	
Required Number of Lanes, N	

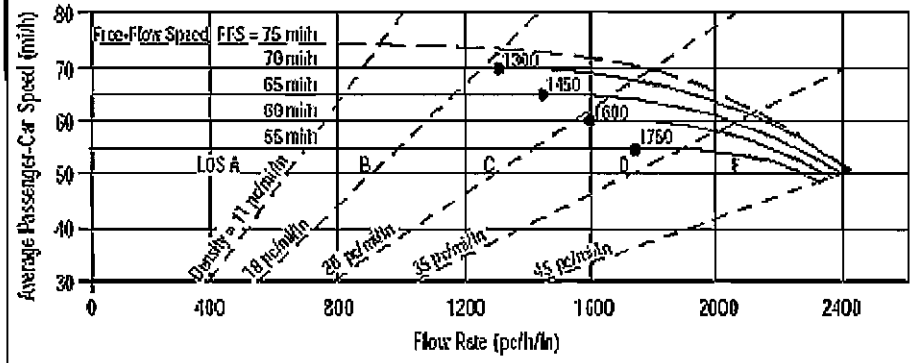
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB On Ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	218
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2900 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1780	pc/h/ln
S	55.0	mi/h
D = v_p / S	32.4	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

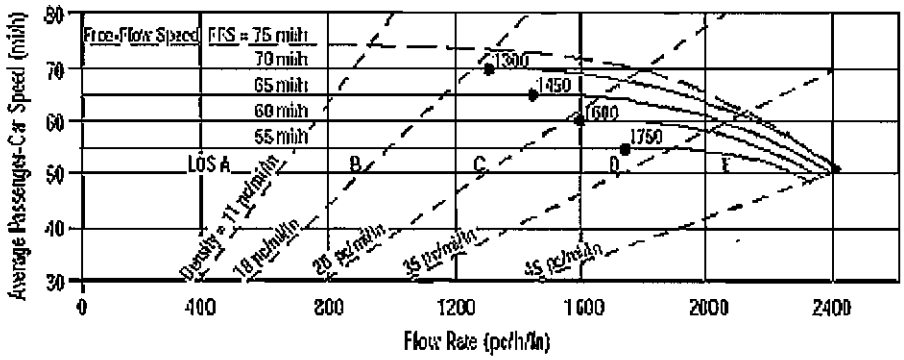
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 EB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	219
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	3290 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

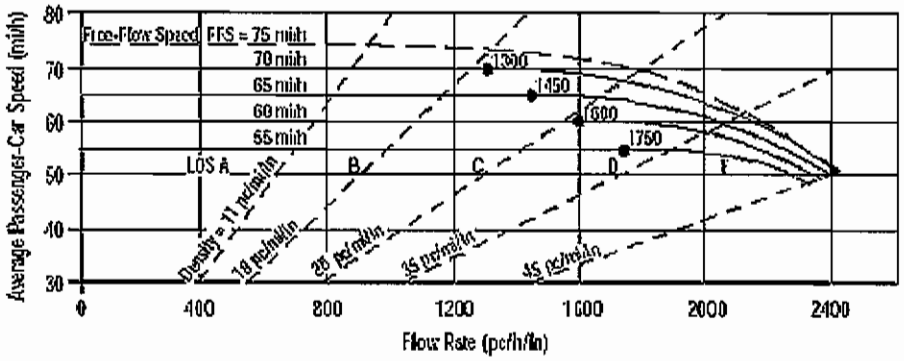
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	4		f_N	1.5
FFS (measured)		mi/h	FFS	58.5
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1010	pc/h/ln	Design LOS
S	58.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	17.3	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 EB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	219
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	4030 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	4	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	1.5
FFS	58.5

LOS and Performance Measures

Operational (LOS)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1237	pc/h/ln
S	58.5	mi/h
D = v_p / S	21.1	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB Off Ramp
Junction:	US 74 EB and I-485 SB
Jurisdiction:	220
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3290	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1270	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3290	1270		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	914	353		v
Trucks and buses	7	7		%
Recreational vehicles	0	0		%
Terrain type:	Rolling	Rolling		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	2.5	2.5		
Recreational vehicle PCE, ER	2.0	2.0		

Heavy vehicle adjustment, fHV	0.905	0.905	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4039	1559	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2640 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4039	9200	No
v_{12}	2640	4400	No
$v_{FO} = v_F - v_R$	2480	9200	No
v_R	1559	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 25.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.438

Space mean speed in ramp influence area, S_R = 52.1 mph

Space mean speed in outer lanes, S_O = 65.8 mph

Space mean speed for all vehicles, S = 56.2 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB Off Ramp
Junction:	US 74 EB and I-485 SB
Jurisdiction:	220
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4030	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1280	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	4030		1280				vph
Peak-hour factor, PHF	0.90		0.90				
Peak 15-min volume, v15	1119		356				v
Trucks and buses	7		7				%
Recreational vehicles	0		0				%
Terrain type:	Rolling		Rolling				
Grade	0.00	%	0.00	%		%	
Length	0.00	mi	0.00	mi		mi	
Trucks and buses PCE, ET	2.5		2.5				
Recreational vehicle PCE, ER	2.0		2.0				

Heavy vehicle adjustment, fHV	0.905	0.905	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4948	1572	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.436 Using Equation 8

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3044 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4948	9200	No
v_{12}	3044	4400	No
$v_{FO} = v_F - v_R$	3376	9200	No
v_R	1572	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 28.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.439	
Space mean speed in ramp influence area,	S_R = 52.1	mph
Space mean speed in outer lanes,	S_0 = 65.8	mph
Space mean speed for all vehicles,	S = 56.6	mph

FREEWAY WEAVING WORKSHEET

General Information

Analyst	
Agency/Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Freeway/Dir of Travel	I-485 NB
Weaving Seg Location	221
Jurisdiction	
Analysis Year	2030 No Build

Inputs

Freeway free-flow speed, SFF (mi/h)	60	Weaving type	A
Weaving number of lanes, N	5	Volume ratio, VR	0.75
Weaving seg length, L (ft)	700	Weaving ratio, R	0.50
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	fHV	fp	v
Vo1	800	0.90	7	0	2.5	2.0	0.905	1.00	982
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	1220	0.90	7	0	2.5	2.0	0.905	1.00	1497
Vw2	1250	0.90	5	0	2.5	2.0	0.930	1.00	1493
Vw				2990	Vnw				982
V									3972

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.15	0.00
b (Exhibit 24-6)			4.00	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			4.14	0.82
Weaving and non-weaving speeds, Si (mi/h)			24.72	42.52

Number of lanes required for unconstrained operation, Nw: 3.15
Maximum number of lanes, Nw (max): 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	27.58
Weaving segment density, D (pc/mi/ln)	28.81
Level of service, LOS	D
Capacity of base condition, c_b (pc/h)	8580
Capacity as a 15-minute flow rate, c (veh/h)	7765
Capacity as a full-hour volume, c_h (veh/h)	6988

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	
Agency/Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Freeway/Dir of Travel	I-485 NB
Weaving Seg Location	221
Jurisdiction	
Analysis Year	2030 No Build

Inputs

Freeway free-flow speed, SFF (mi/h)	60	Weaving type	A
Weaving number of lanes, N	5	Volume ratio, VR	0.72
Weaving seg length, L (ft)	700	Weaving ratio, R	0.43
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
Vo1	1100	0.90	7	0	2.5	2.0	0.905	1.00	1350
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	1650	0.90	7	0	2.5	2.0	0.905	1.00	2025
Vw2	1280	0.90	5	0	2.5	2.0	0.930	1.00	1528
Vw				3553	Vnw				1350
V									4903

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.15	0.00
b (Exhibit 24-6)			4.00	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			4.90	1.01
Weaving and non-weaving speeds, Si (mi/h)			23.47	39.91

Number of lanes required for unconstrained operation, Nw: 3.16
Maximum number of lanes, Nw (max): 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	26.47
Weaving segment density, D (pc/mi/ln)	37.04
Level of service, LOS	E
Capacity of base condition, c_b (pc/h)	8580
Capacity as a 15-minute flow rate, c (veh/h)	7765
Capacity as a full-hour volume, c_h (veh/h)	6988

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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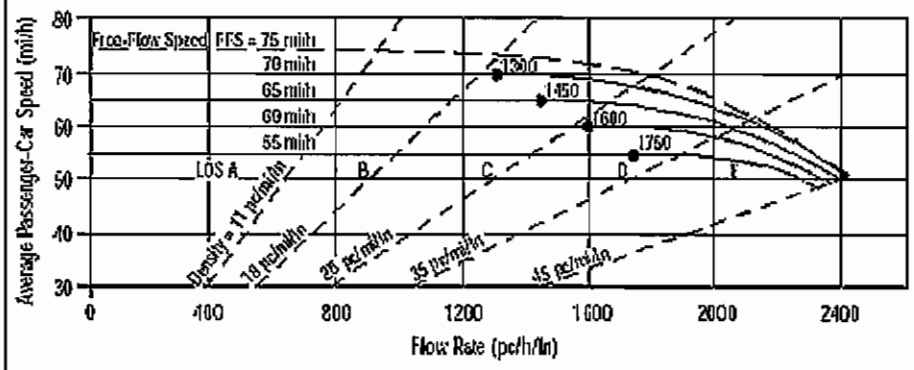
BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 EB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	222
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2050 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

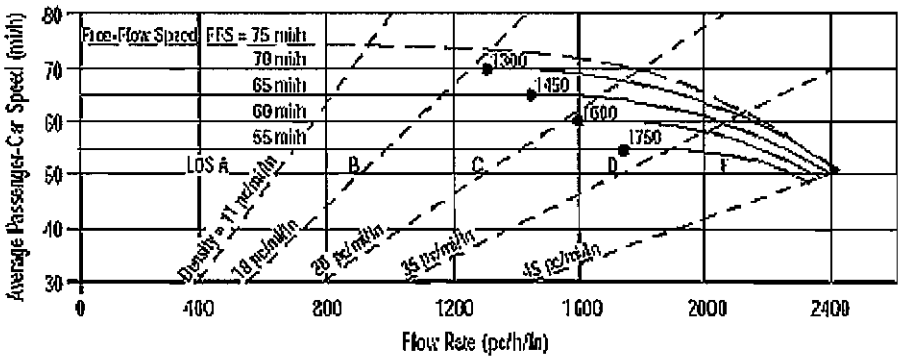
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	3		f_N	3.0
FFS (measured)		mi/h	FFS	57.0
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	839	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	57.0	mi/h	S
D = v_p / S	14.7	pc/mi/ln	D = v_p / S
LOS	B		Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	US 74 EB
From/To	
Jurisdiction	222
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2380 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	3	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	3.0
FFS	57.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	974	pc/h/ln
S	57.0	mi/h
D = v_p / S	17.1	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	US 74 SB On Ramp
From/To	
Jurisdiction	223
Analysis Year	2030 No Build

Flow Inputs

Volume, V	970 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	8%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.89286$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1207.11$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: C

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	US 74 SB On Ramp
From/To	
Jurisdiction	223
Analysis Year	2030 No Build

Flow Inputs

Volume, V	1320 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	8%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1 + P_T(E_T-1)+P_R(E_R-1)} = 0.89286$$

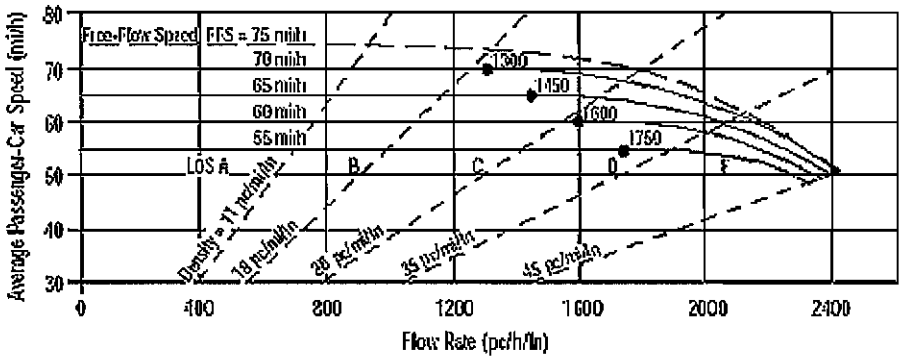
$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1642.67$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: D

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 EB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	224
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	3020 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

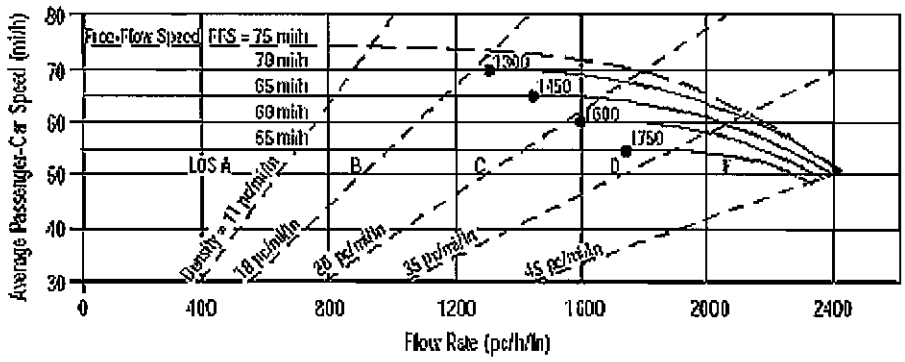
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	4		f_N	1.5
FFS (measured)		mi/h	FFS	58.5
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	927	pc/h/ln	Design LOS
S	58.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	15.8	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 EB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	224
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	3700 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

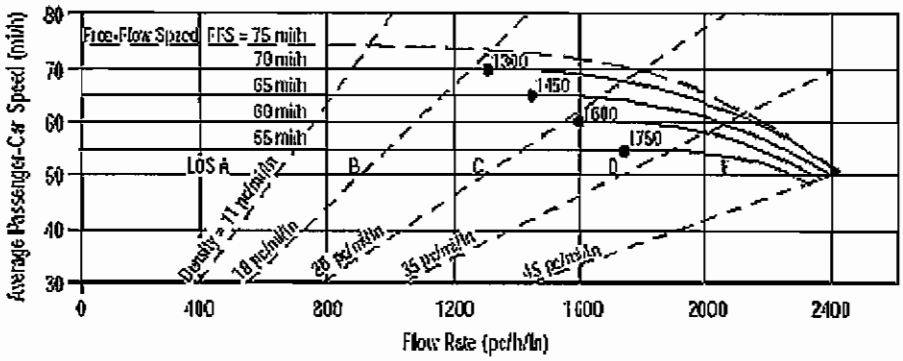
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	4		f_N	1.5
FFS (measured)		mi/h	FFS	58.5
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1136	pc/h/ln	Design LOS
S	58.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	19.4	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	US 74 WB
From/To	
Jurisdiction	225
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	3700 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	4	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	1.5
FFS	58.5

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1136	pc/h/ln
S	58.5	mi/h
D = v_p / S	19.4	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

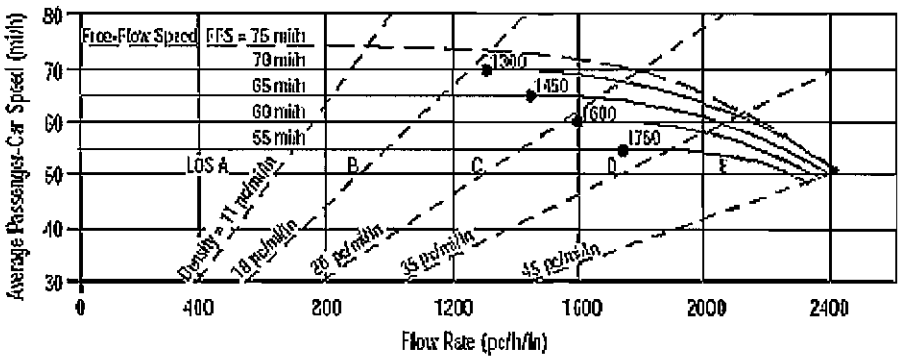
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	225
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	3020 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

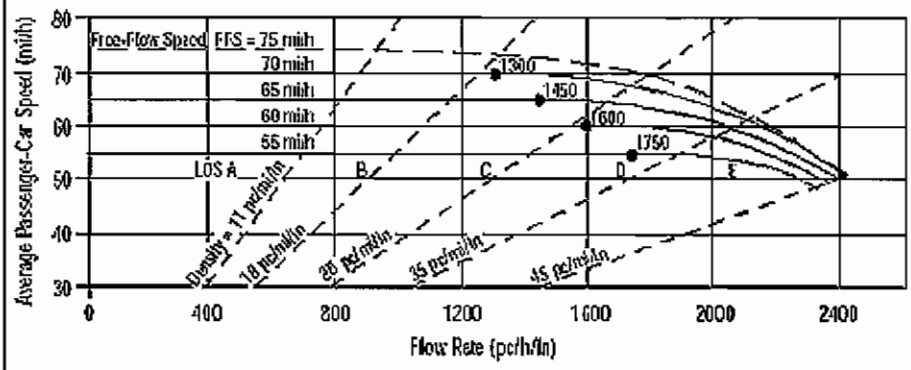
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	0.0
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	0.0
Interchange Density	0.50	I/mi	f_{ID}	0.0
Number of Lanes, N	4		f_N	1.5
FFS (measured)		mi/h	FFS	58.5
Base free-flow Speed, BFFS	60.0	mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	927	pc/h/ln	Design LOS
S	58.5	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	15.8	pc/mi/ln	S
LOS	B		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	US 74 WB
From/To	
Jurisdiction	226
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	1100 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	3	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	3.0
FFS	57.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	450	pc/h/ln
S	57.0	mi/h
D = v_p / S	7.9	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

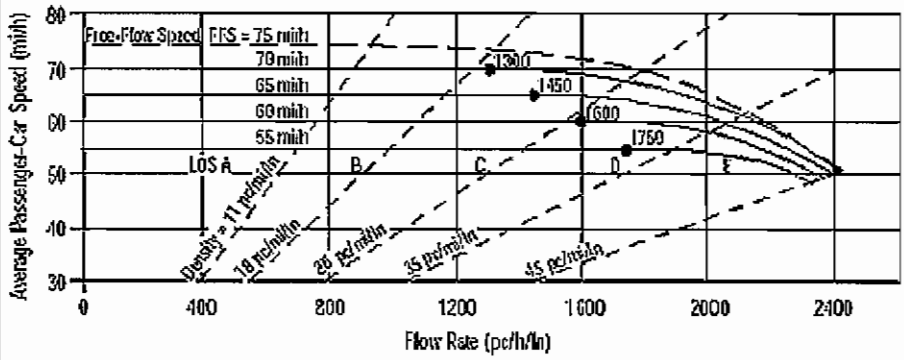
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	PM Peak

Site Information

Highway/Direction of Travel	US 74 WB
From/To	
Jurisdiction	226
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	800 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	3	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	3.0
FFS	57.0

LOS and Performance Measures

Operational (LOS)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	327	pc/h/ln
S	57.0	mi/h
D = v_p / S	5.7	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

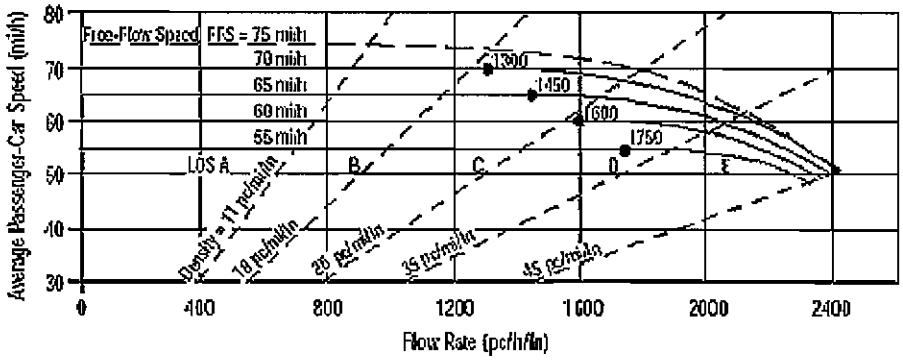
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB Off Ram
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	227
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2600 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

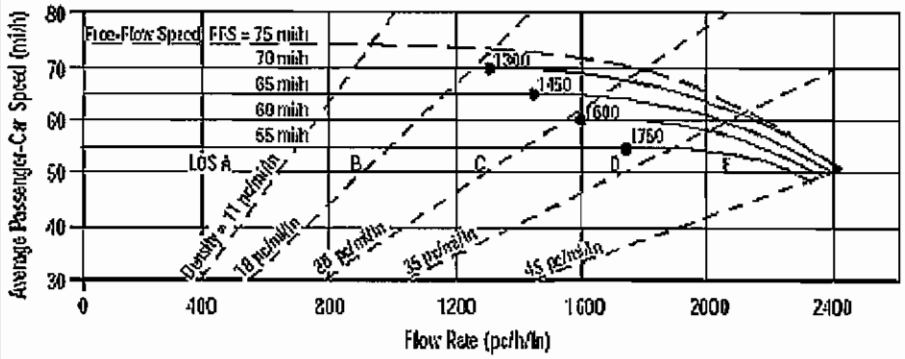
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1596	pc/h/ln	Design LOS
S	55.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	29.0	pc/mi/ln	S
LOS	D		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB Off Ram
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	227
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	2220 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1363	pc/h/ln	Design LOS v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
S	55.0	mi/h	S
D = v_p / S	24.8	pc/mi/ln	D = v_p / S
LOS	C		Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB
Junction:	US 74 WB and I-485 NB
Jurisdiction:	228
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1100	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	1280	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1650	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2150	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1100	1280	1650	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	306	356	458	v
Trucks and buses	7	8	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1351	1593	1971	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 814 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2944	6900	No
v_{R12}	2407	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 17.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.319

Space mean speed in ramp influence area, S_R = 54.3 mph

Space mean speed in outer lanes, S_O = 59.9 mph

Space mean speed for all vehicles, S = 55.2 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB
Junction:	US 74 WB and I-485 NB
Jurisdiction:	228
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	800	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	1270	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1220	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2150	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	800	1270	1220	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	222	353	339	v
Trucks and buses	7	8	5	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, HV				
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	982	1580	1457	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 592 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2562	6900	No
v_{R12}	2172	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 16.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.310	
Space mean speed in ramp influence area,	S_R = 54.4	mph
Space mean speed in outer lanes,	S_O = 60.0	mph
Space mean speed for all vehicles,	S = 55.2	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB
Junction:	US 74 WB and I-485 SB
Jurisdiction:	229
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2380	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	1650	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1280	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2150	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2380	1650	1280	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	661	458	356	v
Trucks and buses	8	5	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV				
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2962	1971	1593	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.597 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1769 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4933	6900	No
v_{R12}	3740	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 29.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.422	
Space mean speed in ramp influence area,	S_R = 52.4	mph
Space mean speed in outer lanes,	S_O = 57.5	mph
Space mean speed for all vehicles,	S = 53.6	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/19/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB
Junction:	US 74 WB and I-485 SB
Jurisdiction:	229
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2070	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	1220	vph
Length of first accel/decel lane	700	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1270	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2150	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2070	1220	1270	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	575	339	353	v
Trucks and buses	8	5	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.893	0.930	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2576	1457	1580	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.597 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1538 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4033	6900	No
v_{R12}	2995	4600	No

Level of Service Determination (if not F)

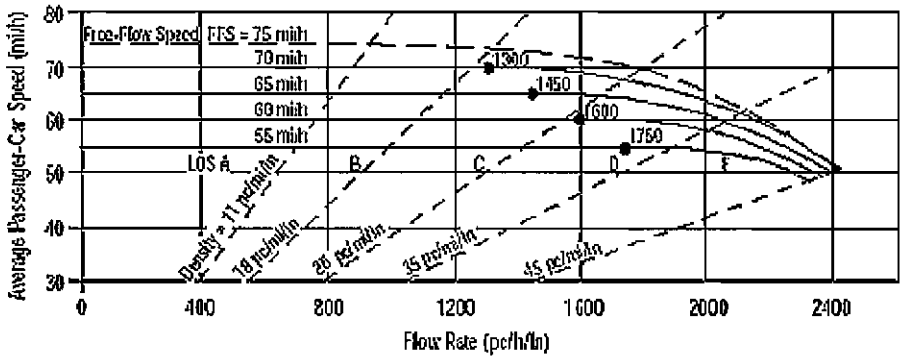
Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.336	
Space mean speed in ramp influence area,	S_R = 54.0	mph
Space mean speed in outer lanes,	S_O = 58.1	mph
Space mean speed for all vehicles,	S = 55.0	mph

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB Off Ram
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	230
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	4030 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	3	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	3.0
FFS	57.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1649	pc/h/ln
S	57.0	mi/h
D = v_p / S	28.9	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

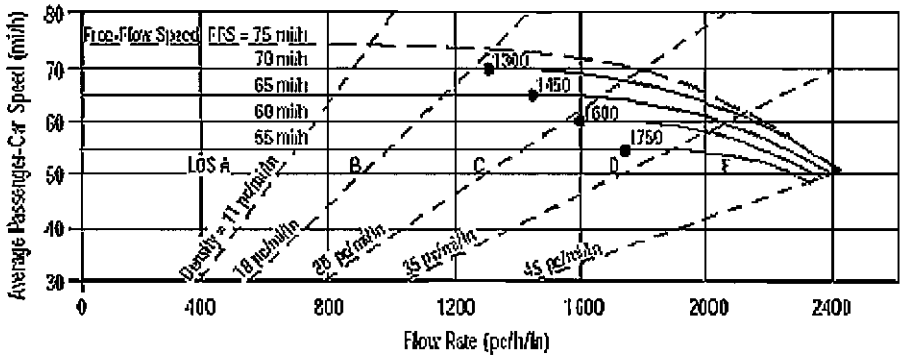
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 WB Off Ram
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	230
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	3290 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	3	
FFS (measured)		mi/h
Base free-flow Speed, BFFS	60.0	mi/h

Calc Speed Adj and FFS

f_{LW}	0.0
f_{LC}	0.0
f_{ID}	0.0
f_N	3.0
FFS	57.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1346	pc/h/ln
S	57.0	mi/h
D = v_p / S	23.6	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

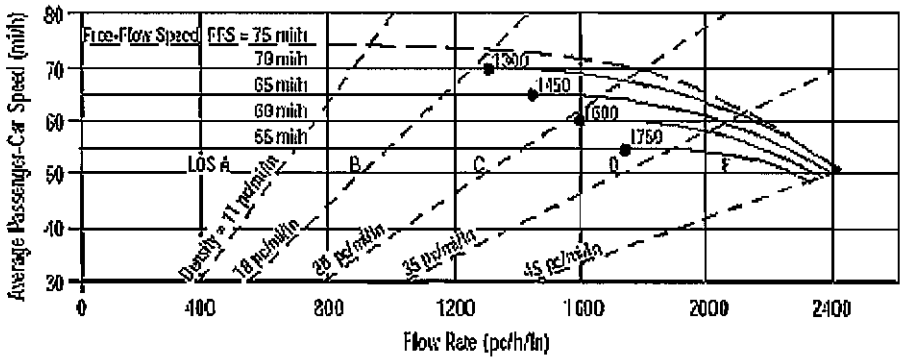
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information

Analyst	BSL
Agency or Company	PBSJ
Date Performed	11/19/2007
Analysis Time Period	AM Peak

Site Information

Highway/Direction of Travel	US 74 Flyover
From/To	
Jurisdiction	231
Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	1320 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs

Lane Width	12.0	ft
Rt-Shoulder Lat. Clearance	6.0	ft
Interchange Density	0.50	I/mi
Number of Lanes, N	2	
FFS (measured)	55.0	mi/h
Base free-flow Speed, BFFS		mi/h

Calc Speed Adj and FFS

f_{LW}	
f_{LC}	
f_{ID}	
f_N	
FFS	55.0

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	810	pc/h/ln
S	55.0	mi/h
D = v_p / S	14.7	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)

S

D = v_p / S

Required Number of Lanes, N

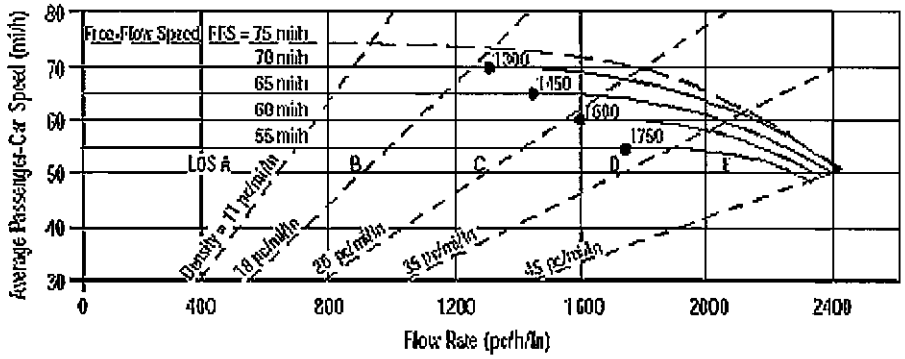
Glossary

N - Number of lanes S - Speed

Factor Location

E_R - Exhibits23-8, 23-10 f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	US 74 Flyover
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	231
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs

Volume, V	970 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	595	pc/h/ln	Design LOS
S	55.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	10.8	pc/mi/ln	S
LOS	A		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	AM Peak

Site Information

Highway/Direction of Travel	US 74 SB Off Ramp
From/To	
Jurisdiction	232
Analysis Year	2030 No Build

Flow Inputs

Volume, V	1270 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1559.28$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: D

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

SINGLE LANE
BASIC FREEWAY SEGMENT WORKSHEET

General Information

Analyst:	BSL
Agency or Company:	PBSJ
Date Performed:	11/19/2007
Analysis Time Period:	PM Peak

Site Information

Highway/Direction of Travel	US 74 SB Off Ramp
From/To	
Jurisdiction	232
Analysis Year	2030 No Build

Flow Inputs

Volume, V	1280 veh/h	Peak Hour Factor, PHF	0.90
Driver Population, f_P	1	%Trucks and Buses, P_T	7%
General Terrain	Rolling	%RVs, P_R	0%

LOS and Performance Measures

$$f_{HV} = \frac{1}{1+ P_T(E_T-1)+P_R(E_R-1)} = 0.90498$$

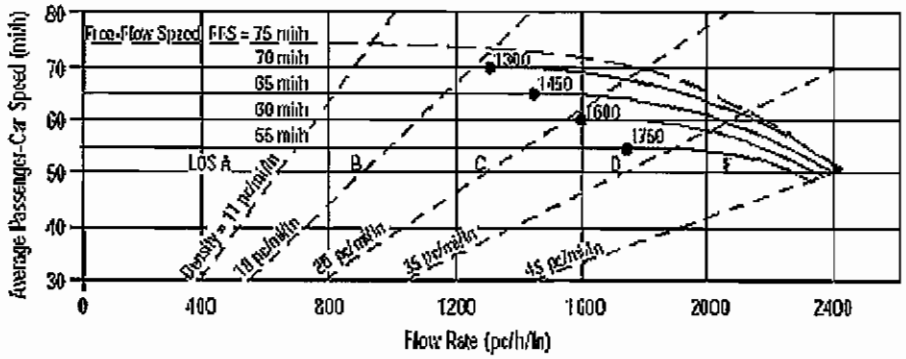
$$V_P = \frac{V}{PHF*N*f_{HV}*f_P} = 1571.56$$

LOS	V_P (pc/h/ln)
A	600
B	990
C	1430
D	1910
E	2250

LOS: D

* From Exhibit 23-2 of the 2000 HCM - Maximum Service Flow Rate for a BFS with a FFS of 55mph.

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB On Ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	233
Analysis Time Period	AM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2590 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

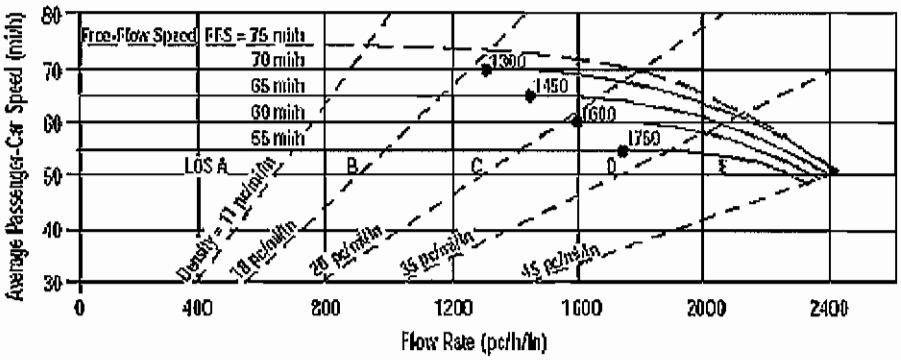
Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1590	pc/h/ln	Design LOS
S	55.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	28.9	pc/mi/ln	S
LOS	D		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input
Operational (LOS)	FFS, N, v_p
Design (N)	FFS, LOS, v_p
Design (v_p)	FFS, LOS, N
Planning (LOS)	FFS, N, AADT
Planning (N)	FFS, LOS, AADT
Planning (v_p)	FFS, LOS, N

General Information		***Site Information***	
Analyst	BSL	Highway/Direction of Travel	I-485 NB On Ramp
Agency or Company	PBSJ	From/To	
Date Performed	11/19/2007	Jurisdiction	233
Analysis Time Period	PM Peak	Analysis Year	2030 No Build

Project Description Monroe Bypass / Connector

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Dat

Flow Inputs			
Volume, V	2250 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	7
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Rolling
DDHV = AADT x K x D	veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	2.0
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.905

Speed Inputs			**Calc Speed Adj and FFS**	
Lane Width	12.0	ft	f_{LW}	
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}	
Interchange Density	0.50	I/mi	f_{ID}	
Number of Lanes, N	2		f_N	
FFS (measured)	55.0	mi/h	FFS	55.0
Base free-flow Speed, BFFS		mi/h		

LOS and Performance Measures			**Design (N)**
Operational (LOS)			Design (N)
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1381	pc/h/ln	Design LOS
S	55.0	mi/h	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)
D = v_p / S	25.1	pc/mi/ln	S
LOS	C		D = v_p / S
			Required Number of Lanes, N

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Ex

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 Intersection Analysis
Existing Condition

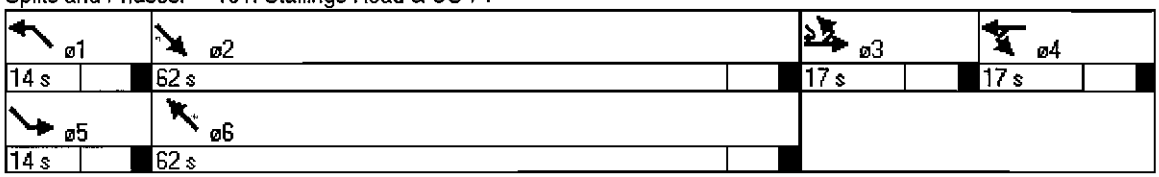
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	240	110	80	140	180	60	40	1950	240	110	2430	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.937			0.962				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1745	0	1770	1792	0	1687	3374	1509	1687	3374	1509
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1745	0	1770	1792	0	1687	3374	1509	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			45			55			55	
Link Distance (ft)		1096			1168			1536			3465	
Travel Time (s)		21.4			17.7			19.0			43.0	
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%	2%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	267	122	89	156	200	67	44	2167	267	122	2700	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	211	0	156	267	0	44	2167	267	122	2700	111
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)		0			0			0			0	
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			Split			Prot		pm+ov	Prot		Perm
Protected Phases	3	3		4	4		5	2	3	1	6	
Permitted Phases									2			6
Detector Phase	3	3		4	4		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	14.0	7.0	7.0	14.0	14.0
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	21.0	14.0	14.0	21.0	21.0
Total Split (s)	17.0	17.0	0.0	17.0	17.0	0.0	14.0	62.0	17.0	14.0	62.0	62.0
Total Split (%)	15.5%	15.5%	0.0%	15.5%	15.5%	0.0%	12.7%	56.4%	15.5%	12.7%	56.4%	56.4%
Maximum Green (s)	10.0	10.0		10.0	10.0		7.0	55.0	10.0	7.0	55.0	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
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		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	C-Max	None	None	C-Max	C-Max
Act Effct Green (s)	12.0	12.0		12.0	12.0		9.0	57.0	74.0	9.0	62.6	62.6
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.08	0.52	0.67	0.08	0.57	0.57
v/c Ratio	1.38	1.11		0.81	1.37		0.32	1.24	0.26	0.88	1.41	0.13
Control Delay	239.1	143.8		78.2	233.4		54.3	139.5	8.0	101.7	210.1	13.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	239.1	143.8		78.2	233.4		54.3	139.5	8.0	101.7	210.1	13.1
LOS	F	F		E	F		D	F	A	F	F	B
Approach Delay		197.1			176.2			123.8			198.2	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.41
Intersection Signal Delay: 167.4 Intersection LOS: F
Intersection Capacity Utilization 116.1% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 101: Stallings Road & US 74



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	240	180	110	100	110	40	60	2430	240	80	1950	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.943			0.960				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1757	0	1770	1788	0	1687	3374	1509	1687	3374	1509
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1757	0	1770	1788	0	1687	3374	1509	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			45			55			55	
Link Distance (ft)		1096			1168			1536			3465	
Travel Time (s)		21.4			17.7			19.0			43.0	
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%	2%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	267	200	122	111	122	44	67	2700	267	89	2167	156
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	322	0	111	166	0	67	2700	267	89	2167	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)		0			0			0			0	
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			Split			Prot		pm+ov	Prot		Perm
Protected Phases	3	3		4	4		5	2	3	1	6	
Permitted Phases									2			6
Detector Phase	3	3		4	4		5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	14.0	7.0	7.0	14.0	14.0
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	21.0	14.0	14.0	21.0	21.0
Total Split (s)	25.0	25.0	0.0	15.0	15.0	0.0	14.0	86.0	25.0	14.0	86.0	86.0
Total Split (%)	17.9%	17.9%	0.0%	10.7%	10.7%	0.0%	10.0%	61.4%	17.9%	10.0%	61.4%	61.4%
Maximum Green (s)	18.0	18.0		8.0	8.0		7.0	79.0	18.0	7.0	79.0	79.0
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		Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.1	3.1		3.1	3.1		3.1	3.1	3.1	3.1	3.1	3.1
Recall Mode	None	None		None	None		None	C-Max	None	None	C-Max	C-Max
Act Effct Green (s)	20.0	20.0		10.0	10.0		9.0	81.0	106.0	9.0	83.8	83.8
Actuated g/C Ratio	0.14	0.14		0.07	0.07		0.06	0.58	0.76	0.06	0.60	0.60
v/c Ratio	1.06	1.28		0.88	1.30		0.62	1.38	0.23	0.82	1.07	0.17
Control Delay	128.2	200.7		116.8	228.2		88.1	203.1	5.6	112.7	71.3	14.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	128.2	200.7		116.8	228.2		88.1	203.1	5.6	112.7	71.3	14.0
LOS	F	F		F	F		F	F	A	F	E	B
Approach Delay		167.8			183.6			183.2			69.1	
Approach LOS		F			F			F			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

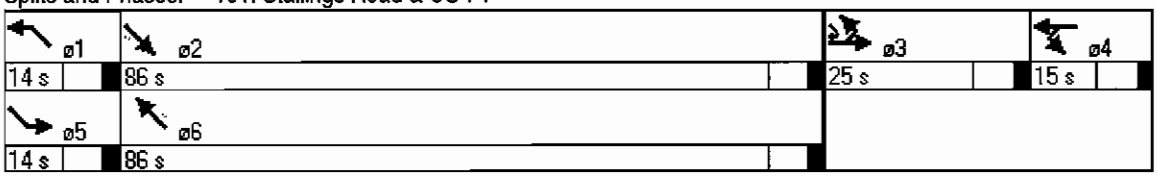
Maximum v/c Ratio: 1.38

Intersection Signal Delay: 138.2 Intersection LOS: F

Intersection Capacity Utilization 101.7% ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 101: Stallings Road & US 74



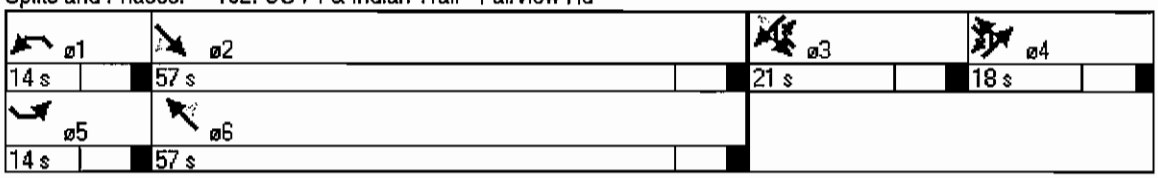
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	130	1750	250	100	2150	80	270	170	90	120	300	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.95	0.95	1.00
Frt			0.850			0.850		0.948				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.998	
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	3335	1715	0	1633	1716	1538
Flt Permitted	0.950			0.950			0.950			0.950	0.998	
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	3335	1715	0	1633	1716	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			35			35	
Link Distance (ft)		633			2380			902			1112	
Travel Time (s)		7.8			29.5			17.6			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 (%)	7%	7%	7%	7%	7%	7%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	144	1944	278	111	2389	89	300	189	100	133	333	289
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	144	1944	278	111	2389	89	300	289	0	120	346	289
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)		0			0			0			0	
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	Split			Split		Perm
Protected Phases	5	2	4	1	6	3	4	4		3	3	
Permitted Phases			2			6						3
Detector Phase	5	2	4	1	6	3	4	4		3	3	3
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	14.0	57.0	18.0	14.0	57.0	21.0	18.0	18.0	0.0	21.0	21.0	21.0
Total Split (%)	12.7%	51.8%	16.4%	12.7%	51.8%	19.1%	16.4%	16.4%	0.0%	19.1%	19.1%	19.1%
Maximum Green (s)	7.0	50.0	11.0	7.0	50.0	14.0	11.0	11.0		14.0	14.0	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
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	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag		Lead	Lead	Lead
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)	9.0	52.0	65.0	9.0	52.0	73.0	13.0	13.0		16.0	16.0	16.0
Actuated g/C Ratio	0.08	0.47	0.59	0.08	0.47	0.66	0.12	0.12		0.15	0.15	0.15
v/c Ratio	1.04	1.22	0.31	0.80	1.50	0.09	0.76	1.42		0.50	1.38	1.29
Control Delay	138.5	132.8	6.8	88.4	253.6	6.9	60.5	253.4		51.5	232.4	198.7

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	138.5	132.8	6.8	88.4	253.6	6.9	60.5	253.4		51.5	232.4	198.7
LOS	F	F	A	F	F	A	E	F		D	F	F
Approach Delay		118.3			238.0			155.2			190.8	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.50
Intersection Signal Delay: 179.6 Intersection LOS: F
Intersection Capacity Utilization 113.5% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 102: US 74 & Indian Trail - Fairview Rd



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	260	2150	270	90	1750	120	250	300	100	80	170	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.95	0.95	1.00
Frt			0.850			0.850		0.962				0.850
Flt Protected	0.950			0.950			0.950			0.950	0.998	
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	3335	1741	0	1633	1716	1538
Flt Permitted	0.950			0.950			0.950			0.950	0.998	
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	3335	1741	0	1633	1716	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			35			35	
Link Distance (ft)		2103			2380			902			1112	
Travel Time (s)		26.1			29.5			17.6			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 (%)	7%	7%	7%	7%	7%	7%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	289	2389	300	100	1944	133	278	333	111	89	189	144
Shared Lane Traffic (%)										10%		
Lane Group Flow (vph)	289	2389	300	100	1944	133	278	444	0	80	198	144
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)		0			0			0			0	
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	Split			Split		Perm
Protected Phases	5	2	4	1	6	3	4	4		3	3	
Permitted Phases			2			6						3
Detector Phase	5	2	4	1	6	3	4	4		3	3	3
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	23.0	77.0	31.0	14.0	68.0	18.0	31.0	31.0	0.0	18.0	18.0	18.0
Total Split (%)	16.4%	55.0%	22.1%	10.0%	48.6%	12.9%	22.1%	22.1%	0.0%	12.9%	12.9%	12.9%
Maximum Green (s)	16.0	70.0	24.0	7.0	61.0	11.0	24.0	24.0		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	5.0	5.0	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	3.1
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	18.0	72.0	98.0	9.0	63.0	81.0	26.0	26.0		13.0	13.0	13.0
Actuated g/C Ratio	0.13	0.51	0.70	0.06	0.45	0.58	0.19	0.19		0.09	0.09	0.09
v/c Ratio	1.33	1.38	0.28	0.93	1.28	0.15	0.45	1.37		0.53	1.25	1.01
Control Delay	222.8	203.2	4.7	132.5	165.2	14.2	53.3	229.0		73.8	202.2	139.1

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	222.8	203.2	4.7	132.5	165.2	14.2	53.3	229.0		73.8	202.2	139.1
LOS	F	F	A	F	F	B	D	F		E	F	F
Approach Delay		185.1			154.5			161.4			156.3	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

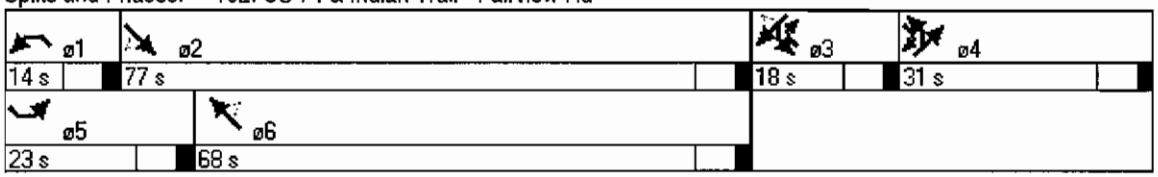
Maximum v/c Ratio: 1.38

Intersection Signal Delay: 169.9 Intersection LOS: F

Intersection Capacity Utilization 112.8% ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 102: US 74 & Indian Trail - Fairview Rd



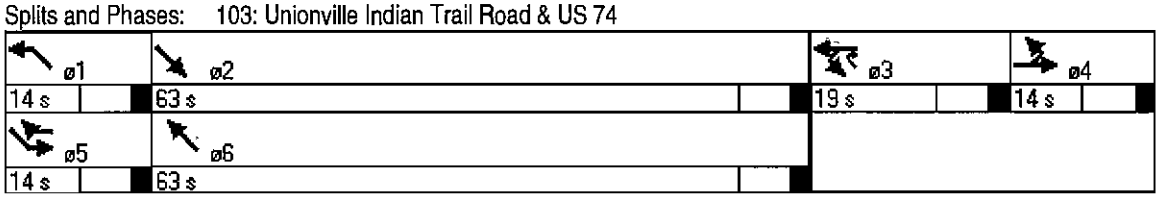
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	30	100	70	160	230	350	200	1660	40	110	2020	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Frt		0.947				0.850		0.997				0.850
Flt Protected		0.993		0.950	0.997		0.950			0.950		
Satd. Flow (prot)	0	3296	0	1665	1747	1568	3273	3364	0	1687	3374	1509
Flt Permitted		0.993		0.950	0.997		0.950			0.950		
Satd. Flow (perm)	0	3296	0	1665	1747	1568	3273	3364	0	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			45			55			55	
Link Distance (ft)		795			1304			1032			1062	
Travel Time (s)		15.5			19.8			12.8			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 (%)	3%	3%	3%	3%	3%	3%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	33	111	78	178	256	389	222	1844	44	122	2244	122
Shared Lane Traffic (%)				10%								
Lane Group Flow (vph)	0	222	0	160	274	389	222	1888	0	122	2244	122
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)		0			0			0			0	
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			Split		pm+ov	Prot			Prot		pm+ov
Protected Phases	4	4		3	3	5	5	2		1	6	3
Permitted Phases						3						6
Detector Phase	4	4		3	3	5	5	2		1	6	3
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	14.0		7.0	14.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	21.0		14.0	21.0	14.0
Total Split (s)	14.0	14.0	0.0	19.0	19.0	14.0	14.0	63.0	0.0	14.0	63.0	19.0
Total Split (%)	12.7%	12.7%	0.0%	17.3%	17.3%	12.7%	12.7%	57.3%	0.0%	12.7%	57.3%	17.3%
Maximum Green (s)	7.0	7.0		12.0	12.0	7.0	7.0	56.0		7.0	56.0	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	5.0	5.0	5.0	2.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	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	C-Max		None	C-Max	None
Act Effct Green (s)		9.0		14.0	14.0	23.0	9.0	58.0		9.0	58.0	77.0
Actuated g/C Ratio		0.08		0.13	0.13	0.21	0.08	0.53		0.08	0.53	0.70
v/c Ratio		0.82		0.75	1.23	1.19	0.83	1.06		0.88	1.26	0.12
Control Delay		74.1		69.2	179.0	141.4	75.0	67.4		101.7	148.5	5.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	74.1		69.2	179.0	141.4	75.0	67.4			101.7	148.5	5.7
LOS	E		E	F	F	E	E			F	F	A
Approach Delay	74.1			139.9			68.2				139.2	
Approach LOS	E			F			E				F	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.26
Intersection Signal Delay: 110.2 Intersection LOS: F
Intersection Capacity Utilization 96.3% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 103: Unionville Indian Trail Road & US 74



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	40	230	110	110	100	200	350	2020	30	70	1660	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Frt		0.957				0.850		0.998				0.850
Flt Protected		0.995		0.950	0.995		0.950			0.950		
Satd. Flow (prot)	0	3337	0	1665	1744	1568	3273	3367	0	1687	3374	1509
Flt Permitted		0.995		0.950	0.995		0.950			0.950		
Satd. Flow (perm)	0	3337	0	1665	1744	1568	3273	3367	0	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			45			55			55	
Link Distance (ft)		795			1304			1032			1062	
Travel Time (s)		15.5			19.8			12.8			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 (%)	3%	3%	3%	3%	3%	3%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	44	256	122	122	111	222	389	2244	33	78	1844	178
Shared Lane Traffic (%)				10%								
Lane Group Flow (vph)	0	422	0	110	123	222	389	2277	0	78	1844	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)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		0			0			0			0	
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			Split		pm+ov	Prot			Prot		pm+ov
Protected Phases	4	4		3	3	5	5	2		1	6	3
Permitted Phases						3						6
Detector Phase	4	4		3	3	5	5	2		1	6	3
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	14.0		7.0	14.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	21.0		14.0	21.0	14.0
Total Split (s)	21.0	21.0	0.0	14.0	14.0	22.0	22.0	91.0	0.0	14.0	83.0	14.0
Total Split (%)	15.0%	15.0%	0.0%	10.0%	10.0%	15.7%	15.7%	65.0%	0.0%	10.0%	59.3%	10.0%
Maximum Green (s)	14.0	14.0		7.0	7.0	15.0	15.0	84.0		7.0	76.0	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	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	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.1	3.1		3.1	3.1	3.1	3.1	3.1		3.1	3.1	3.1
Recall Mode	None	None		None	None	None	None	C-Max		None	C-Max	None
Act Effct Green (s)		16.0		9.0	9.0	26.0	17.0	86.0		9.0	78.0	92.0
Actuated g/C Ratio		0.11		0.06	0.06	0.19	0.12	0.61		0.06	0.56	0.66
v/c Ratio		1.11		1.03	1.10	0.76	0.98	1.10		0.72	0.98	0.18
Control Delay		133.8		157.1	172.2	60.4	101.1	80.8		98.3	47.1	9.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		133.8		157.1	172.2	60.4	101.1	80.8		98.3	47.1	9.9
LOS		F		F	F	E	F	F		F	D	A
Approach Delay		133.8			114.0			83.7			45.9	
Approach LOS		F			F			F			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green

Natural Cycle: 170

Control Type: Actuated-Coordinated

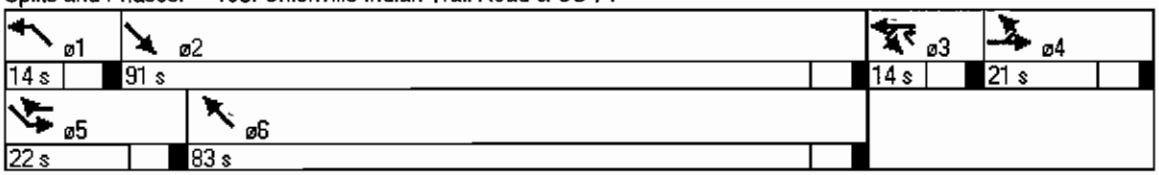
Maximum v/c Ratio: 1.11

Intersection Signal Delay: 75.8 Intersection LOS: E

Intersection Capacity Utilization 96.2% ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 103: Unionville Indian Trail Road & US 74



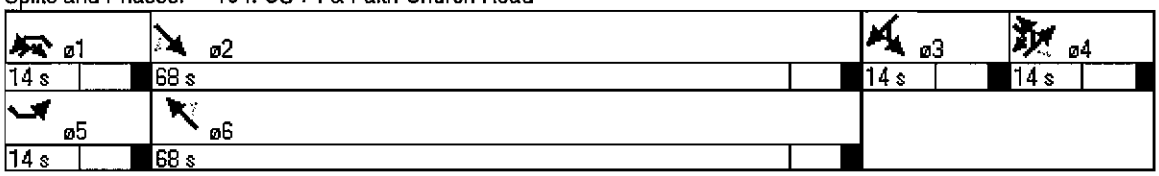
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	80	1780	20	30	2180	170	30	10	40	110	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.871	
Flt Protected	0.950			0.950				0.964		0.950		
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	0	1680	1482	1770	1622	0
Flt Permitted	0.950			0.950				0.964		0.950		
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	0	1680	1482	1770	1622	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			15			35	
Link Distance (ft)		1177			2588			625			368	
Travel Time (s)		14.6			32.1			28.4			7.2	
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 (%)	7%	7%	7%	7%	7%	7%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	89	1978	22	33	2422	189	33	11	44	122	11	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	1978	22	33	2422	189	0	44	44	122	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		0			0			0			0	
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		Perm	Split		pm+ov	Split		
Protected Phases	5	2	4	1	6		4	4	1	3	3	
Permitted Phases			2			6			4			
Detector Phase	5	2	4	1	6	6	4	4	1	3	3	
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	14.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	21.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	14.0	68.0	14.0	14.0	68.0	68.0	14.0	14.0	14.0	14.0	14.0	0.0
Total Split (%)	12.7%	61.8%	12.7%	12.7%	61.8%	61.8%	12.7%	12.7%	12.7%	12.7%	12.7%	0.0%
Maximum Green (s)	7.0	61.0	7.0	7.0	61.0	61.0	7.0	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	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	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead	
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	C-Max	None	None	None	None	None	
Act Effct Green (s)	9.0	68.6	75.8	9.0	65.8	65.8		9.0	20.2	9.0	9.0	
Actuated g/C Ratio	0.08	0.62	0.69	0.08	0.60	0.60		0.08	0.18	0.08	0.08	
v/c Ratio	0.64	0.94	0.02	0.24	1.20	0.21		0.32	0.16	0.84	0.59	
Control Delay	70.9	31.9	3.4	51.9	119.0	11.7		54.4	37.3	92.6	67.2	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	70.9	31.9	3.4	51.9	119.0	11.7		54.4	37.3	92.6	67.2	
LOS	E	C	A	D	F	B		D	D	F	E	
Approach Delay		33.3			110.5			45.9			82.7	
Approach LOS		C			F			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 76.1 Intersection LOS: E
Intersection Capacity Utilization 87.6% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 104: US 74 & Faith Church Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	2180	30	40	1780	110	20	10	30	170	10	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.866	
Flt Protected	0.950			0.950				0.968		0.950		
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	0	1687	1482	1770	1613	0
Flt Permitted	0.950			0.950				0.968		0.950		
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	0	1687	1482	1770	1613	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			15			35	
Link Distance (ft)		1177			2588			625			368	
Travel Time (s)		14.6			32.1			28.4			7.2	
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 (%)	7%	7%	7%	7%	7%	7%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	67	2422	33	44	1978	122	22	11	33	189	11	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	2422	33	44	1978	122	0	33	33	189	100	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)		0			0			0			0	
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		Perm	Split		pm+ov	Split		
Protected Phases	5	2	4	1	6		4	4	1	3	3	
Permitted Phases			2			6			4			
Detector Phase	5	2	4	1	6	6	4	4	1	3	3	
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	14.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	21.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	14.0	95.0	14.0	14.0	95.0	95.0	14.0	14.0	14.0	17.0	17.0	0.0
Total Split (%)	10.0%	67.9%	10.0%	10.0%	67.9%	67.9%	10.0%	10.0%	10.0%	12.1%	12.1%	0.0%
Maximum Green (s)	7.0	88.0	7.0	7.0	88.0	88.0	7.0	7.0	7.0	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	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	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lead	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	
Recall Mode	None	C-Max	None	None	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	9.0	95.6	102.8	9.0	95.6	95.6		9.0	20.2	12.0	12.0	
Actuated g/C Ratio	0.06	0.68	0.73	0.06	0.68	0.68		0.06	0.14	0.09	0.09	
v/c Ratio	0.62	1.05	0.03	0.41	0.86	0.12		0.31	0.15	1.24	0.72	
Control Delay	88.1	58.0	3.2	74.7	24.2	9.5		70.4	52.2	203.4	90.6	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	88.1	58.0	3.2	74.7	24.2	9.5		70.4	52.2	203.4	90.6	
LOS	F	E	A	E	C	A		E	D	F	F	
Approach Delay		58.1			24.4			61.3			164.4	
Approach LOS		E			C			E			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

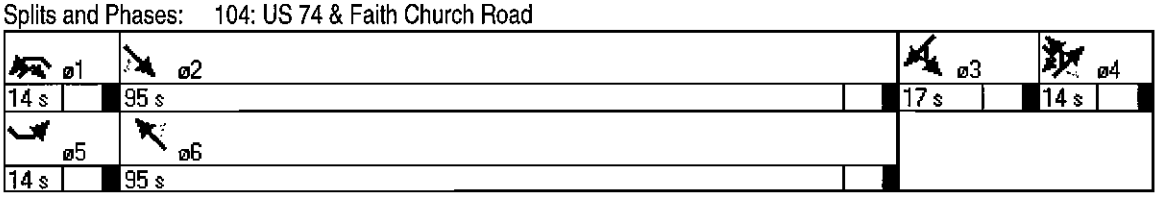
Maximum v/c Ratio: 1.24

Intersection Signal Delay: 49.8 Intersection LOS: D

Intersection Capacity Utilization 88.0% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 104: US 74 & Faith Church Road



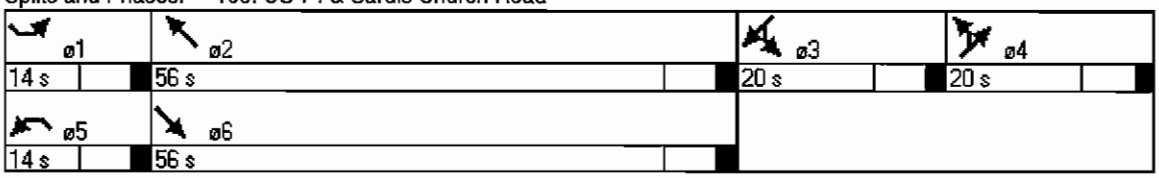
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	80	1550	310	70	1940	80	300	110	50	100	180	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.994			0.953			0.940	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3289	0	1687	3354	0	1770	1775	0	1770	1751	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3289	0	1687	3354	0	1770	1775	0	1770	1751	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		606			973			698			813	
Travel Time (s)		7.5			12.1			10.6			12.3	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	89	1722	344	78	2156	89	333	122	56	111	200	133
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	2066	0	78	2245	0	333	178	0	111	333	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)		0			0			0			0	
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			Split			Split		
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases												
Detector Phase	1	6		5	2		4	4		3	3	
Switch Phase												
Minimum Initial (s)	7.0	14.0		7.0	14.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	21.0		14.0	21.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	56.0	0.0	14.0	56.0	0.0	20.0	20.0	0.0	20.0	20.0	0.0
Total Split (%)	12.7%	50.9%	0.0%	12.7%	50.9%	0.0%	18.2%	18.2%	0.0%	18.2%	18.2%	0.0%
Maximum Green (s)	7.0	49.0		7.0	49.0		13.0	13.0		13.0	13.0	
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	Lag		Lead	Lag		Lag	Lag		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	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	53.8		9.0	51.0		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.08	0.49		0.08	0.46		0.14	0.14		0.14	0.14	
v/c Ratio	0.64	1.28		0.57	1.44		1.38	0.74		0.46	1.39	
Control Delay	70.9	160.2		65.2	230.3		232.5	64.5		50.7	237.3	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	70.9	160.2		65.2	230.3		232.5	64.5		50.7	237.3	
LOS	E	F		E	F		F	E		D	F	
Approach Delay		156.5			224.7			174.0			190.6	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.44
Intersection Signal Delay: 190.1 Intersection LOS: F
Intersection Capacity Utilization 112.1% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 105: US 74 & Sardis Church Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	120	1940	300	50	1550	100	310	180	70	80	110	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.980			0.991			0.958			0.937	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3306	0	1687	3343	0	1770	1785	0	1770	1745	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3306	0	1687	3343	0	1770	1785	0	1770	1745	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		606			973			698			813	
Travel Time (s)		7.5			12.1			10.6			12.3	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	133	2156	333	56	1722	111	344	200	78	89	122	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	133	2489	0	56	1833	0	344	278	0	89	211	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)		0			0			0			0	
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			Split			Split		
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases												
Detector Phase	1	6		5	2		4	4		3	3	
Switch Phase												
Minimum Initial (s)	7.0	14.0		7.0	14.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	21.0		14.0	21.0		14.0	14.0		14.0	14.0	
Total Split (s)	16.0	82.0	0.0	14.0	80.0	0.0	25.0	25.0	0.0	19.0	19.0	0.0
Total Split (%)	11.4%	58.6%	0.0%	10.0%	57.1%	0.0%	17.9%	17.9%	0.0%	13.6%	13.6%	0.0%
Maximum Green (s)	9.0	75.0		7.0	73.0		18.0	18.0		12.0	12.0	
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	Lag		Lead	Lag		Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.1	3.1		3.1	3.1		3.1	3.1		3.1	3.1	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	11.0	79.8		9.0	75.0		20.0	20.0		14.0	14.0	
Actuated g/C Ratio	0.08	0.57		0.06	0.54		0.14	0.14		0.10	0.10	
v/c Ratio	1.00	1.32		0.52	1.02		1.36	1.09		0.50	1.21	
Control Delay	141.4	176.4		80.8	59.7		229.4	137.1		70.3	185.6	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	141.4	176.4		80.8	59.7		229.4	137.1		70.3	185.6	
LOS	F	F		F	E		F	F		E	F	
Approach Delay		174.7			60.4			188.1			151.4	
Approach LOS		F			E			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

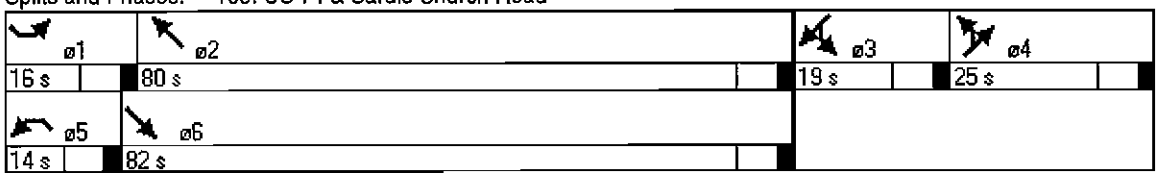
Maximum v/c Ratio: 1.36

Intersection Signal Delay: 135.2 Intersection LOS: F

Intersection Capacity Utilization 113.5% ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 105: US 74 & Sardis Church Road



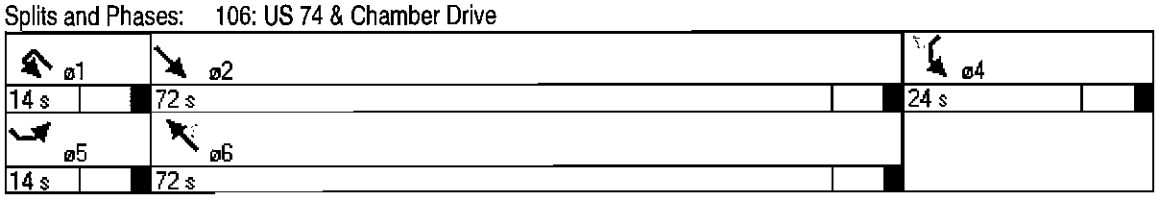
Lane Group	SEL	SET	NWU	NWT	NWR	SWL	SWR
Lane Configurations							
Volume (vph)	70	1440	10	1730	30	80	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Frt					0.850		0.850
Flt Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1687	3374	1687	3374	1509	1770	1583
Flt Permitted	0.950		0.950			0.950	
Satd. Flow (perm)	1687	3374	1687	3374	1509	1770	1583
Right Turn on Red					No		No
Satd. Flow (RTOR)							
Link Speed (mph)		55		55		35	
Link Distance (ft)		2407		1378		1258	
Travel Time (s)		29.8		17.1		24.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	7%	7%	2%	2%
Adj. Flow (vph)	78	1600	11	1922	33	89	233
Shared Lane Traffic (%)							
Lane Group Flow (vph)	78	1600	11	1922	33	89	233
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	Left	Right
Median Width(ft)		12		12		12	
Link Offset(ft)		0		0		0	
Crosswalk Width(ft)		0		0		0	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9		9	15	9
Turn Type	Prot		Prot		Perm		Perm
Protected Phases	5	2	1	6		4	
Permitted Phases					6		4
Detector Phase	5	2	1	6	6	4	4
Switch Phase							
Minimum Initial (s)	7.0	14.0	7.0	14.0	14.0	7.0	7.0
Minimum Split (s)	14.0	21.0	14.0	21.0	21.0	14.0	14.0
Total Split (s)	14.0	72.0	14.0	72.0	72.0	24.0	24.0
Total Split (%)	12.7%	65.5%	12.7%	65.5%	65.5%	21.8%	21.8%
Maximum Green (s)	7.0	65.0	7.0	65.0	65.0	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
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	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
Recall Mode	None	C-Max	None	C-Max	C-Max	None	None
Act Effct Green (s)	9.0	78.5	9.0	70.1	70.1	18.7	18.7
Actuated g/C Ratio	0.08	0.71	0.08	0.64	0.64	0.17	0.17
v/c Ratio	0.57	0.66	0.08	0.89	0.03	0.30	0.87
Control Delay	65.2	11.3	48.2	24.9	8.8	42.8	74.6

Lane Group	SEL	SET	NWU	NWT	NWR	SWL	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.2	11.3	48.2	24.9	8.8	42.8	74.6
LOS	E	B	D	C	A	D	E
Approach Delay		13.8		24.8		65.8	
Approach LOS		B		C		E	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 23.5 Intersection LOS: C
Intersection Capacity Utilization 72.0% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 106: US 74 & Chamber Drive



Lane Group	SEL	SET	NWU	NWT	NWR	SWL	SWR
Lane Configurations							
Volume (vph)	210	1730	10	1440	80	30	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Frt					0.850		0.850
Flt Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1687	3374	1687	3374	1509	1770	1583
Flt Permitted	0.950		0.950			0.950	
Satd. Flow (perm)	1687	3374	1687	3374	1509	1770	1583
Right Turn on Red					No		No
Satd. Flow (RTOR)							
Link Speed (mph)		55		55		35	
Link Distance (ft)		2407		1378		1258	
Travel Time (s)		29.8		17.1		24.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	7%	7%	2%	2%
Adj. Flow (vph)	233	1922	11	1600	89	33	78
Shared Lane Traffic (%)							
Lane Group Flow (vph)	233	1922	11	1600	89	33	78
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	Left	Right
Median Width(ft)		12		12		12	
Link Offset(ft)		0		0		0	
Crosswalk Width(ft)		0		0		0	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9		9	15	9
Turn Type	Prot		Prot		Perm		Perm
Protected Phases	5	2	1	6		4	
Permitted Phases					6		4
Detector Phase	5	2	1	6	6	4	4
Switch Phase							
Minimum Initial (s)	7.0	14.0	7.0	14.0	14.0	7.0	7.0
Minimum Split (s)	14.0	21.0	14.0	21.0	21.0	14.0	14.0
Total Split (s)	35.0	107.0	14.0	86.0	86.0	19.0	19.0
Total Split (%)	25.0%	76.4%	10.0%	61.4%	61.4%	13.6%	13.6%
Maximum Green (s)	28.0	100.0	7.0	79.0	79.0	12.0	12.0
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	Lead	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Recall Mode	None	C-Max	None	C-Max	C-Max	None	None
Act Effct Green (s)	25.6	111.7	9.0	86.7	86.7	12.7	12.7
Actuated g/C Ratio	0.18	0.80	0.06	0.62	0.62	0.09	0.09
v/c Ratio	0.75	0.71	0.10	0.77	0.10	0.20	0.54
Control Delay	69.4	9.9	64.1	23.6	12.4	61.4	74.9

Lane Group	SEL	SET	NWU	NWT	NWR	SWL	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.4	9.9	64.1	23.6	12.4	61.4	74.9
LOS	E	A	E	C	B	E	E
Approach Delay		16.4		23.3		70.9	
Approach LOS		B		C		E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

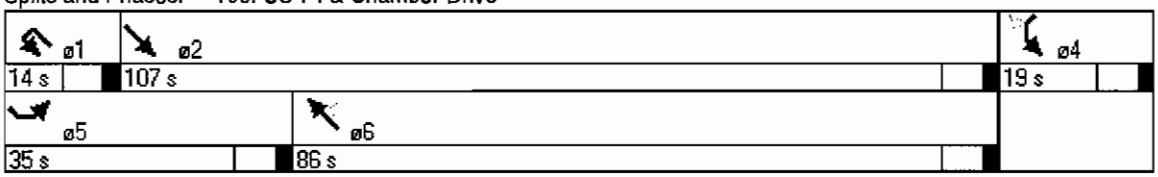
Maximum v/c Ratio: 0.77

Intersection Signal Delay: 20.8 Intersection LOS: C

Intersection Capacity Utilization 72.0% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 106: US 74 & Chamber Drive



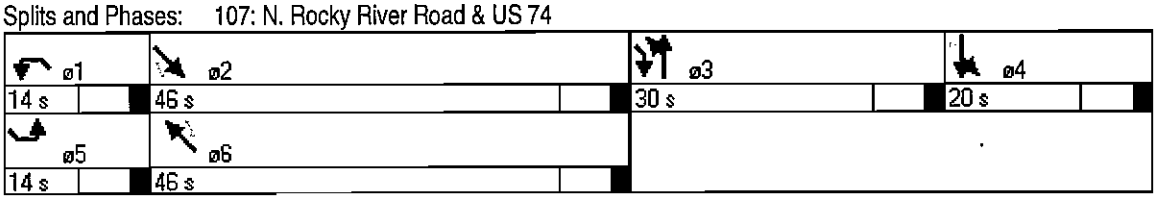
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	250	150	140	180	130	100	50	1250	110	80	1550	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.965				0.850			0.850			0.850
Flt Protected		0.977			0.972		0.950			0.950		
Satd. Flow (prot)	0	1756	0	0	1811	1583	1687	3374	1509	1687	3374	1509
Flt Permitted		0.977			0.972		0.950			0.950		
Satd. Flow (perm)	0	1756	0	0	1811	1583	1687	3374	1509	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		1176			418			3021			3350	
Travel Time (s)		17.8			6.3			37.5			41.5	
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%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	278	167	156	200	144	111	56	1389	122	89	1722	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	601	0	0	344	111	56	1389	122	89	1722	122
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)		0			0			0			0	
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			Split		Perm	Prot		pm+ov	Prot		Perm
Protected Phases	3	3		4	4		5	2	3	1	6	
Permitted Phases						4			2			6
Detector Phase	3	3		4	4	4	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	14.0	7.0	7.0	14.0	14.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	21.0	14.0	14.0	21.0	21.0
Total Split (s)	30.0	30.0	0.0	20.0	20.0	20.0	14.0	46.0	30.0	14.0	46.0	46.0
Total Split (%)	27.3%	27.3%	0.0%	18.2%	18.2%	18.2%	12.7%	41.8%	27.3%	12.7%	41.8%	41.8%
Maximum Green (s)	23.0	23.0		13.0	13.0	13.0	7.0	39.0	23.0	7.0	39.0	39.0
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	Lead	Lag	Lead	Lead	Lag	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	None		None	None	None	None	C-Max	None	None	C-Max	C-Max
Act Effct Green (s)		25.0			15.0	15.0	9.0	41.0	71.0	9.0	43.8	43.8
Actuated g/C Ratio		0.23			0.14	0.14	0.08	0.37	0.65	0.08	0.40	0.40
v/c Ratio		1.51			1.39	0.51	0.41	1.10	0.13	0.64	1.28	0.20
Control Delay		272.6			236.3	53.4	57.3	92.5	7.9	70.9	163.0	24.2

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay	0.0				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	272.6				236.3	53.4	57.3	92.5	7.9	70.9	163.0	24.2
LOS	F				F	D	E	F	A	E	F	C
Approach Delay	272.6				191.7			84.7			150.0	
Approach LOS	F				F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.51
Intersection Signal Delay: 147.9 Intersection LOS: F
Intersection Capacity Utilization 112.4% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 107: N. Rocky River Road & US 74



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	110	130	80	110	150	50	100	1550	250	140	1250	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.966				0.850			0.850			0.850
Flt Protected		0.983			0.979		0.950			0.950		
Satd. Flow (prot)	0	1769	0	0	1824	1583	1687	3374	1509	1687	3374	1509
Flt Permitted		0.983			0.979		0.950			0.950		
Satd. Flow (perm)	0	1769	0	0	1824	1583	1687	3374	1509	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		1176			418			3021			3350	
Travel Time (s)		17.8			6.3			37.5			41.5	
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%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	122	144	89	122	167	56	111	1722	278	156	1389	200
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	355	0	0	289	56	111	1722	278	156	1389	200
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)		0			0			0			0	
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			Split		Perm	Prot		pm+ov	Prot		Perm
Protected Phases	3	3		4	4		5	2	3	1	6	
Permitted Phases						4			2			6
Detector Phase	3	3		4	4	4	5	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	14.0	7.0	7.0	14.0	14.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	21.0	14.0	14.0	21.0	21.0
Total Split (s)	30.0	30.0	0.0	25.0	25.0	25.0	16.0	69.0	30.0	16.0	69.0	69.0
Total Split (%)	21.4%	21.4%	0.0%	17.9%	17.9%	17.9%	11.4%	49.3%	21.4%	11.4%	49.3%	49.3%
Maximum Green (s)	23.0	23.0		18.0	18.0	18.0	9.0	62.0	23.0	9.0	62.0	62.0
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	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.1	3.1		3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	C-Max
Act Effct Green (s)		25.0			20.0	20.0	11.0	64.0	94.0	11.0	64.0	64.0
Actuated g/C Ratio		0.18			0.14	0.14	0.08	0.46	0.67	0.08	0.46	0.46
v/c Ratio		1.12			1.11	0.25	0.83	1.12	0.27	1.17	0.90	0.29
Control Delay		139.3			141.3	56.6	106.5	98.0	10.1	185.8	44.3	25.2

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		139.3			141.3	56.6	106.5	98.0	10.1	185.8	44.3	25.2
LOS		F			F	E	F	F	B	F	D	C
Approach Delay		139.3			127.5			86.9			54.8	
Approach LOS		F			F			F			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

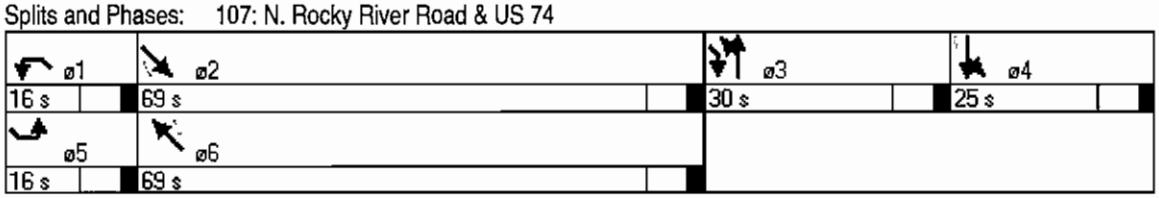
Maximum V/c Ratio: 1.17

Intersection Signal Delay: 81.7 Intersection LOS: F

Intersection Capacity Utilization 99.1% ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 107: N. Rocky River Road & US 74



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	10	1460	20	70	1800	70	10	20	50	100	40	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.994			0.915			0.983	
Flt Protected	0.950			0.950				0.994			0.970	
Satd. Flow (prot)	1687	3367	0	1687	3354	0	0	1694	0	0	1776	0
Flt Permitted	0.950			0.950				0.946			0.718	
Satd. Flow (perm)	1687	3367	0	1687	3354	0	0	1612	0	0	1315	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			45	
Link Distance (ft)		2601			2354			277			1205	
Travel Time (s)		39.4			35.7			5.4			18.3	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	11	1622	22	78	2000	78	11	22	56	111	44	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1644	0	78	2078	0	0	89	0	0	177	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)		0			0			0			0	
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		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Detector Phase	1	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	77.0	0.0	14.0	77.0	0.0	19.0	19.0	0.0	19.0	19.0	0.0
Total Split (%)	12.7%	70.0%	0.0%	12.7%	70.0%	0.0%	17.3%	17.3%	0.0%	17.3%	17.3%	0.0%
Maximum Green (s)	7.0	70.0		7.0	70.0		12.0	12.0		12.0	12.0	
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	Lag		Lead	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	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	74.8		9.0	83.2			14.0			14.0	
Actuated g/C Ratio	0.08	0.68		0.08	0.76			0.13			0.13	
v/c Ratio	0.08	0.72		0.57	0.82			0.43			1.06	
Control Delay	48.2	14.1		65.2	13.5			51.7			133.4	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	48.2	14.1		65.2	13.5			51.7			133.4	
LOS	D	B		E	B			D			F	
Approach Delay		14.3			15.3			51.7			133.4	
Approach LOS		B			B			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 20.8 Intersection LOS: C
Intersection Capacity Utilization 82.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 108: US 74 & Fowler-Secrest Rd

ø1	ø2	ø4
14 s	77 s	19 s
ø5	ø6	ø8
14 s	77 s	19 s

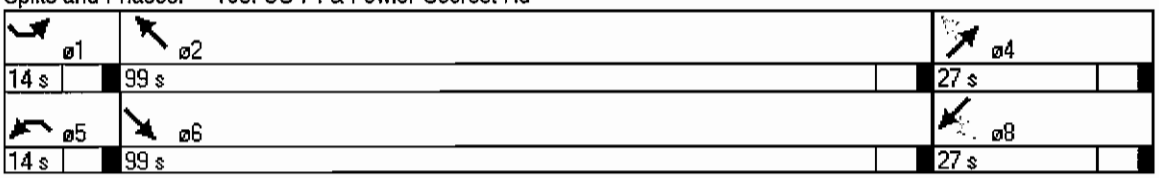
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	20	1800	10	50	1460	100	20	40	70	70	20	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.990			0.927			0.987	
Flt Protected	0.950			0.950				0.992			0.966	
Satd. Flow (prot)	1687	3370	0	1687	3340	0	0	1713	0	0	1776	0
Flt Permitted	0.950			0.950				0.942			0.509	
Satd. Flow (perm)	1687	3370	0	1687	3340	0	0	1627	0	0	936	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			45	
Link Distance (ft)		2601			2354			277			1205	
Travel Time (s)		39.4			35.7			5.4			18.3	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	22	2000	11	56	1622	111	22	44	78	78	22	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2011	0	56	1733	0	0	144	0	0	111	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)		0			0			0			0	
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		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Detector Phase	1	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		21.0	21.0	
Total Split (s)	14.0	99.0	0.0	14.0	99.0	0.0	27.0	27.0	0.0	27.0	27.0	0.0
Total Split (%)	10.0%	70.7%	0.0%	10.0%	70.7%	0.0%	19.3%	19.3%	0.0%	19.3%	19.3%	0.0%
Maximum Green (s)	7.0	92.0		7.0	92.0		20.0	20.0		20.0	20.0	
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	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.1	3.1		3.1	3.1		3.1	3.1		3.1	3.1	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	98.4		9.3	101.5			20.1			20.1	
Actuated g/C Ratio	0.06	0.70		0.07	0.72			0.14			0.14	
v/c Ratio	0.20	0.85		0.50	0.72			0.62			0.83	
Control Delay	66.9	21.5		79.1	14.8			67.7			99.5	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	66.9	21.5		79.1	14.8			67.7			99.5	
LOS	E	C		E	B			E			F	
Approach Delay		22.0			16.8			67.7			99.5	
Approach LOS		C			B			E			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 23.4 Intersection LOS: C
Intersection Capacity Utilization 70.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 108: US 74 & Fowler-Secrest Rd



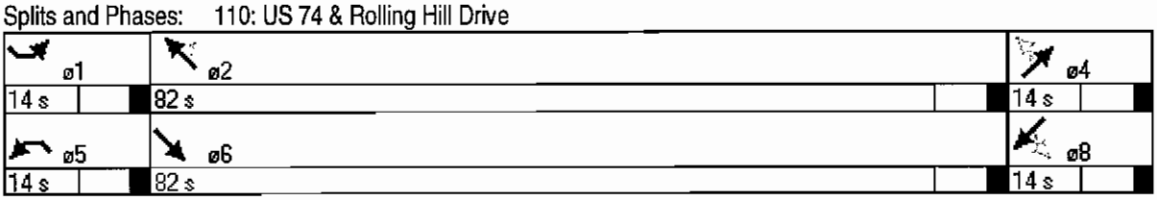
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	30	1630	60	10	1980	10	80	10	10	10	10	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850		0.987			0.910	
Flt Protected	0.950			0.950				0.961			0.992	
Satd. Flow (prot)	1687	3357	0	1687	3374	1509	0	1767	0	0	1682	0
Flt Permitted	0.950			0.950				0.747			0.949	
Satd. Flow (perm)	1687	3357	0	1687	3374	1509	0	1373	0	0	1609	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		309			978			474			425	
Travel Time (s)		4.7			14.8			12.9			11.6	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	33	1811	67	11	2200	11	89	11	11	11	11	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	1878	0	11	2200	11	0	111	0	0	66	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)		0			0			0			0	
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			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases						2	4			8		
Detector Phase	1	6		5	2	2	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	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	
Total Split (s)	14.0	82.0	0.0	14.0	82.0	82.0	14.0	14.0	0.0	14.0	14.0	0.0
Total Split (%)	12.7%	74.5%	0.0%	12.7%	74.5%	74.5%	12.7%	12.7%	0.0%	12.7%	12.7%	0.0%
Maximum Green (s)	7.0	75.0		7.0	75.0	75.0	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	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lead	Lag		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	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	9.0	88.2		9.0	82.6	82.6		9.0			9.0	
Actuated g/C Ratio	0.08	0.80		0.08	0.75	0.75		0.08			0.08	
v/c Ratio	0.24	0.70		0.08	0.87	0.01		0.99			0.50	
Control Delay	51.9	7.6		48.2	16.6	5.0		134.6			62.1	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	51.9	7.6		48.2	16.6	5.0		134.6			62.1	
LOS	D	A		D	B	A		F			E	
Approach Delay		8.4			16.7			134.6			62.1	
Approach LOS		A			B			F			E	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 16.7 Intersection LOS: B
Intersection Capacity Utilization 75.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 110: US 74 & Rolling Hill Drive



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	40	1980	80	10	1630	10	60	10	10	10	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994				0.850		0.983			0.919	
Flt Protected	0.950			0.950				0.964			0.990	
Satd. Flow (prot)	1687	3354	0	1687	3374	1509	0	1765	0	0	1695	0
Flt Permitted	0.950			0.950				0.743			0.930	
Satd. Flow (perm)	1687	3354	0	1687	3374	1509	0	1360	0	0	1592	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		309			978			474			425	
Travel Time (s)		4.7			14.8			12.9			11.6	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	44	2200	89	11	1811	11	67	11	11	11	11	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	2289	0	11	1811	11	0	89	0	0	55	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)		0			0			0			0	
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			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases						2	4			8		
Detector Phase	1	6		5	2	2	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	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	
Total Split (s)	14.0	110.0	0.0	14.0	110.0	110.0	16.0	16.0	0.0	16.0	16.0	0.0
Total Split (%)	10.0%	78.6%	0.0%	10.0%	78.6%	78.6%	11.4%	11.4%	0.0%	11.4%	11.4%	0.0%
Maximum Green (s)	7.0	103.0		7.0	103.0	103.0	9.0	9.0		9.0	9.0	
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	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Vehicle Extension (s)	3.1	3.1		3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	9.0	113.4		9.0	107.8	107.8		11.0			11.0	
Actuated g/C Ratio	0.06	0.81		0.06	0.77	0.77		0.08			0.08	
v/c Ratio	0.41	0.84		0.10	0.70	0.01		0.83			0.44	
Control Delay	74.7	13.5		64.1	10.4	4.4		113.3			73.2	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	74.7	13.5		64.1	10.4	4.4		113.3			73.2	
LOS	E	B		E	B	A		F			E	
Approach Delay		14.6			10.7			113.3			73.2	
Approach LOS		B			B			F			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 100

Control Type: Actuated-Coordinated

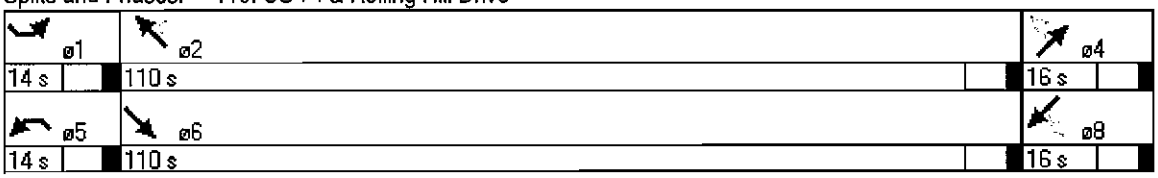
Maximum v/c Ratio: 0.84

Intersection Signal Delay: 15.7 Intersection LOS: B

Intersection Capacity Utilization 76.7% ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 110: US 74 & Rolling Hill Drive



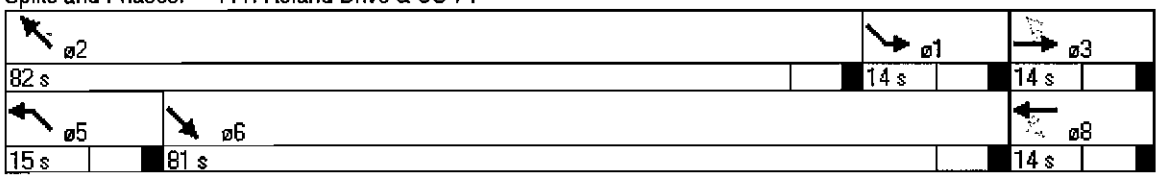
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	60	10	50	20	10	40	50	1530	70	70	1880	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.875			0.923			0.993				0.850
Flt Protected	0.950				0.986		0.950			0.950		
Satd. Flow (prot)	1770	1630	0	0	1695	0	1687	3350	0	1687	3374	1509
Flt Permitted	0.672				0.880		0.950			0.950		
Satd. Flow (perm)	1252	1630	0	0	1513	0	1687	3350	0	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		510			371			748			991	
Travel Time (s)		13.9			10.1			11.3			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 (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	67	11	56	22	11	44	56	1700	78	78	2089	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	67	0	0	77	0	56	1778	0	78	2089	33
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)		0			0			0			0	
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		Perm
Protected Phases		3			8		1	6		5	2	
Permitted Phases	3			8								2
Detector Phase	3	3		8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	12.0
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0		14.0	19.0	19.0
Total Split (s)	14.0	14.0	0.0	14.0	14.0	0.0	14.0	81.0	0.0	15.0	82.0	82.0
Total Split (%)	12.7%	12.7%	0.0%	12.7%	12.7%	0.0%	12.7%	73.6%	0.0%	13.6%	74.5%	74.5%
Maximum Green (s)	7.0	7.0		7.0	7.0		7.0	74.0		8.0	75.0	75.0
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	2.0	5.0	5.0	5.0
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	3.0
Recall Mode	Max	Max		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	9.0	9.0			9.0		9.0	79.0		9.8	79.8	79.8
Actuated g/C Ratio	0.08	0.08			0.08		0.08	0.72		0.09	0.73	0.73
v/c Ratio	0.66	0.50			0.62		0.41	0.74		0.52	0.85	0.03
Control Delay	78.9	62.1			71.1		57.3	12.6		60.8	16.6	5.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	78.9	62.1		71.1	57.3		12.6			60.8	16.6	5.2
LOS	E	E		E	E		B			E	B	A
Approach Delay		70.5			71.1			14.0			18.0	
Approach LOS		E			E			B			B	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 18.9 Intersection LOS: B
Intersection Capacity Utilization 77.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 111: Roland Drive & US 74



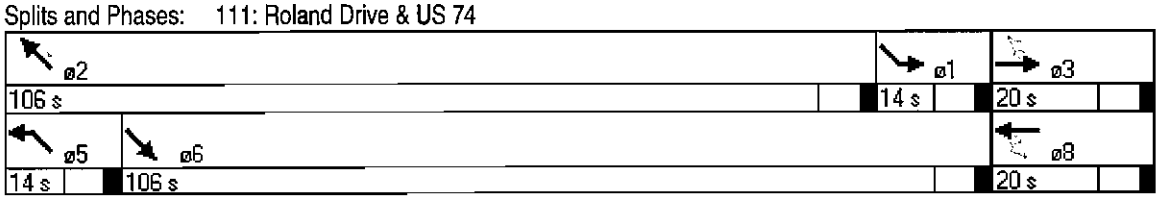
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	70	10	70	30	10	50	40	1880	60	50	1530	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.869			0.924			0.995				0.850
Flt Protected	0.950				0.984		0.950			0.950		
Satd. Flow (prot)	1770	1619	0	0	1694	0	1687	3357	0	1687	3374	1509
Flt Permitted	0.563				0.770		0.950			0.950		
Satd. Flow (perm)	1049	1619	0	0	1325	0	1687	3357	0	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		510			371			748			991	
Travel Time (s)		13.9			10.1			11.3			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 (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	78	11	78	33	11	56	44	2089	67	56	1700	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	89	0	0	100	0	44	2156	0	56	1700	22
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)		0			0			0			0	
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		Perm
Protected Phases		3			8		1	6		5	2	
Permitted Phases	3			8								2
Detector Phase	3	3		8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	12.0
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0		14.0	19.0	19.0
Total Split (s)	20.0	20.0	0.0	20.0	20.0	0.0	14.0	106.0	0.0	14.0	106.0	106.0
Total Split (%)	14.3%	14.3%	0.0%	14.3%	14.3%	0.0%	10.0%	75.7%	0.0%	10.0%	75.7%	75.7%
Maximum Green (s)	13.0	13.0		13.0	13.0		7.0	99.0		7.0	99.0	99.0
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	2.0	5.0	5.0	5.0
Lead/Lag							Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?								Yes		Yes		
Vehicle Extension (s)	3.1	3.1		3.1	3.1		3.1	3.1		3.1	3.1	3.1
Recall Mode	Max	Max		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0			15.0		9.0	103.8		9.0	103.8	103.8
Actuated g/C Ratio	0.11	0.11			0.11		0.06	0.74		0.06	0.74	0.74
v/c Ratio	0.70	0.51			0.70		0.41	0.87		0.52	0.68	0.02
Control Delay	91.1	70.3			86.2		74.7	19.0		80.8	11.8	5.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	91.1	70.3			86.2		74.7	19.0		80.8	11.8	5.6
LOS	F	E			F		E	B		F	B	A
Approach Delay		80.0			86.2			20.1			13.9	
Approach LOS		F			F			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 21.4 Intersection LOS: C
Intersection Capacity Utilization 74.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 111: Roland Drive & US 74



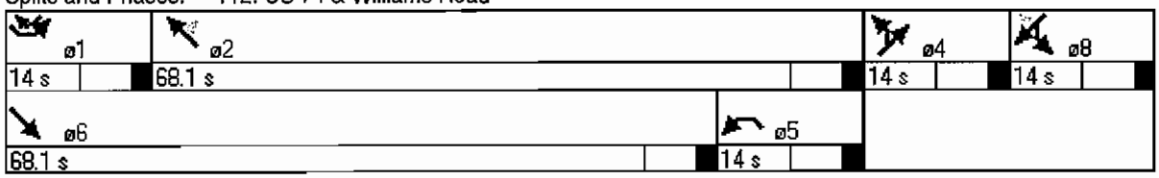
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	1540	10	120	1870	70	10	20	70	90	40	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.883				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3370	0	1687	3374	1509	1770	1645	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3370	0	1687	3374	1509	1770	1645	0	1770	1863	1583
Right Turn on Red			No			Yes			No			No
Satd. Flow (RTOR)						60						
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		822			734			281			279	
Travel Time (s)		12.5			11.1			5.5			7.6	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	67	1711	11	133	2078	78	11	22	78	100	44	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	1722	0	133	2078	78	11	100	0	100	44	111
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)		0			0			0			0	
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	Split			Split		pm+ov
Protected Phases	1	6		5	2		4	4		8	8	1
Permitted Phases						2						8
Detector Phase	1	6		5	2	2	4	4		8	8	1
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)	14.0	68.1	0.0	14.0	68.1	68.1	14.0	14.0	0.0	14.0	14.0	14.0
Total Split (%)	12.7%	61.9%	0.0%	12.7%	61.9%	61.9%	12.7%	12.7%	0.0%	12.7%	12.7%	12.7%
Maximum Green (s)	7.0	61.1		7.0	61.1	61.1	7.0	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	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	Lead		Lag	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	Max	C-Max		None	C-Max	C-Max	None	None		Max	Max	Max
Act Effct Green (s)	9.0	63.1		9.0	63.1	63.1	9.0	9.0		9.0	9.0	23.0
Actuated g/C Ratio	0.08	0.57		0.08	0.57	0.57	0.08	0.08		0.08	0.08	0.21
v/c Ratio	0.49	0.89		0.96	1.07	0.09	0.08	0.75		0.69	0.29	0.34
Control Delay	60.8	27.9		119.2	68.2	4.1	48.1	81.6		73.8	52.9	40.4

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	60.8	27.9		119.2	68.2	4.1	48.1	81.6		73.8	52.9	40.4
LOS	E	C		F	E	A	D	F		E	D	D
Approach Delay		29.2			69.0			78.3			55.7	
Approach LOS		C			E			E			E	

Intersection Summary

Area Type: Other
Cycle Length: 110.1
Actuated Cycle Length: 110.1
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 52.4 Intersection LOS: D
Intersection Capacity Utilization 81.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 112: US 74 & Williams Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	100	1870	10	70	1540	90	10	40	120	70	20	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.887				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3370	0	1687	3374	1509	1770	1652	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3370	0	1687	3374	1509	1770	1652	0	1770	1863	1583
Right Turn on Red			No			Yes			No			No
Satd. Flow (RTOR)						78						
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		822			734			281			279	
Travel Time (s)		12.5			11.1			5.5			7.6	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	111	2078	11	78	1711	100	11	44	133	78	22	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	2089	0	78	1711	100	11	177	0	78	22	67
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)		0			0			0			0	
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	Split			Split		pm+ov
Protected Phases	1	6		5	2		4	4		8	8	1
Permitted Phases						2						6
Detector Phase	1	6		5	2	2	4	4		8	8	1
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)	17.0	92.0	0.0	14.0	89.0	89.0	20.0	20.0	0.0	14.0	14.0	17.0
Total Split (%)	12.1%	65.7%	0.0%	10.0%	63.6%	63.6%	14.3%	14.3%	0.0%	10.0%	10.0%	12.1%
Maximum Green (s)	10.0	85.0		7.0	82.0	82.0	13.0	13.0		7.0	7.0	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	Lead		Lag	Lag	Lag						Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						Yes
Vehicle Extension (s)	3.1	3.1		3.1	3.1	3.1	3.1	3.1		3.1	3.1	3.1
Recall Mode	Max	C-Max		None	C-Max	C-Max	None	None		Max	Max	Max
Act Effct Green (s)	12.0	87.0		9.0	84.0	84.0	15.0	15.0		9.0	9.0	26.0
Actuated g/C Ratio	0.09	0.62		0.06	0.60	0.60	0.11	0.11		0.06	0.06	0.19
v/c Ratio	0.77	1.00		0.72	0.85	0.11	0.06	1.00		0.68	0.18	0.23
Control Delay	94.0	45.6		98.3	27.8	3.9	57.1	129.2		92.8	65.8	50.9

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	94.0	45.6		98.3	27.8	3.9	57.1	129.2		92.8	65.8	50.9
LOS	F	D		F	C	A	E	F		F	E	D
Approach Delay		48.0			29.5			125.0			72.4	
Approach LOS		D			C			F			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 130

Control Type: Actuated-Coordinated

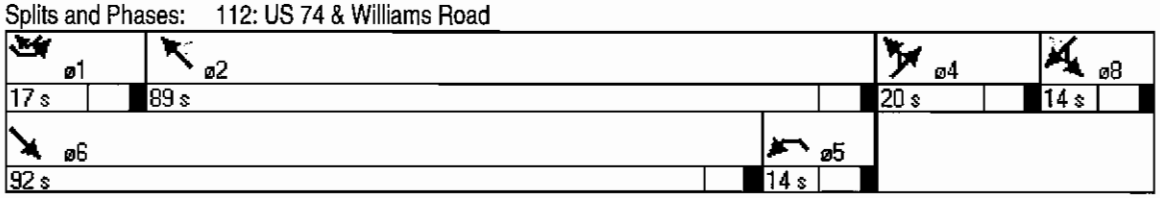
Maximum v/c Ratio: 1.00

Intersection Signal Delay: 44.3 Intersection LOS: D

Intersection Capacity Utilization 89.8% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 112: US 74 & Williams Road



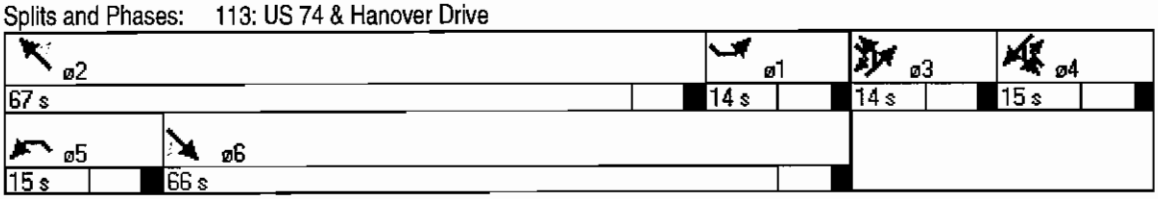
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	10	1640	50	140	2000	430	50	50	110	340	50	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850		0.897			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	1752	1655	0	3400	1799	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	1752	1655	0	3400	1799	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		338			529			376			313	
Travel Time (s)		5.1			8.0			7.3			8.5	
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 (%)	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	11	1822	56	156	2222	478	56	56	122	378	56	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	1822	56	156	2222	478	56	178	0	378	67	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)		0			0			0			0	
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	Split			Split		
Protected Phases	1	6	3	5	2	4	3	3		4	4	
Permitted Phases			6			2						
Detector Phase	1	6	3	5	2	4	3	3		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	7.0	
Minimum Split (s)	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	66.0	14.0	15.0	67.0	15.0	14.0	14.0	0.0	15.0	15.0	0.0
Total Split (%)	12.7%	60.0%	12.7%	13.6%	60.9%	13.6%	12.7%	12.7%	0.0%	13.6%	13.6%	0.0%
Maximum Green (s)	7.0	59.0	7.0	8.0	60.0	8.0	7.0	7.0		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	
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	Lead	Lead	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	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effct Green (s)	9.0	61.0	75.0	10.0	73.2	88.2	9.0	9.0		10.0	10.0	
Actuated g/C Ratio	0.08	0.55	0.68	0.09	0.67	0.80	0.08	0.08		0.09	0.09	
v/c Ratio	0.08	0.97	0.05	1.02	0.99	0.40	0.39	1.32		1.22	0.41	
Control Delay	48.2	39.9	6.0	128.4	35.8	5.0	56.5	226.2		168.5	55.3	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	48.2	39.9	6.0	128.4	35.8	5.0	56.5	226.2		168.5	55.3	
LOS	D	D	A	F	D	A	E	F		F	E	
Approach Delay		38.9			35.7			185.6			151.4	
Approach LOS		D			D			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 52.8 Intersection LOS: D
Intersection Capacity Utilization 96.9% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 113: US 74 & Hanover Drive



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	10	2000	50	110	1640	350	50	50	140	430	50	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850		0.890			0.975	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	1752	1642	0	3400	1799	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	1752	1642	0	3400	1799	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		338			529			376			313	
Travel Time (s)		5.1			8.0			7.3			8.5	
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 (%)	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	11	2222	56	122	1822	389	56	56	156	478	56	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	2222	56	122	1822	389	56	212	0	478	67	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)		0			0			0			0	
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	Split			Split		
Protected Phases	1	6	3	5	2	4	3	3		4	4	
Permitted Phases			6			2						
Detector Phase	1	6	3	5	2	4	3	3		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	7.0	
Minimum Split (s)	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	85.0	20.0	14.0	85.0	21.0	20.0	20.0	0.0	21.0	21.0	0.0
Total Split (%)	10.0%	60.7%	14.3%	10.0%	60.7%	15.0%	14.3%	14.3%	0.0%	15.0%	15.0%	0.0%
Maximum Green (s)	7.0	78.0	13.0	7.0	78.0	14.0	13.0	13.0		14.0	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	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effct Green (s)	9.0	80.0	100.0	9.0	88.4	109.4	15.0	15.0		16.0	16.0	
Actuated g/C Ratio	0.06	0.57	0.71	0.06	0.63	0.78	0.11	0.11		0.11	0.11	
v/c Ratio	0.10	1.15	0.05	1.13	0.86	0.33	0.30	1.20		1.28	0.33	
Control Delay	64.1	104.5	6.1	182.3	27.1	6.1	62.3	184.7		173.6	61.8	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	64.1	104.5	6.1	182.3	27.1	6.1	62.3	184.7		173.6	61.8	
LOS	E	F	A	F	C	A	E	F		F	E	
Approach Delay		101.9			31.7			159.2			159.9	
Approach LOS		F			C			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

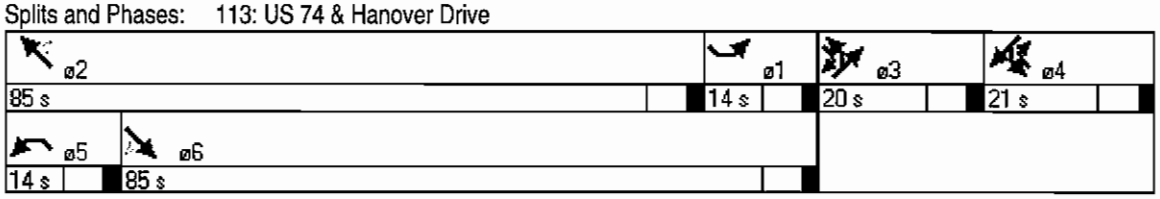
Maximum v/c Ratio: 1.23

Intersection Signal Delay: 80.4 Intersection LOS: F

Intersection Capacity Utilization 101.6% ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 113: US 74 & Hanover Drive



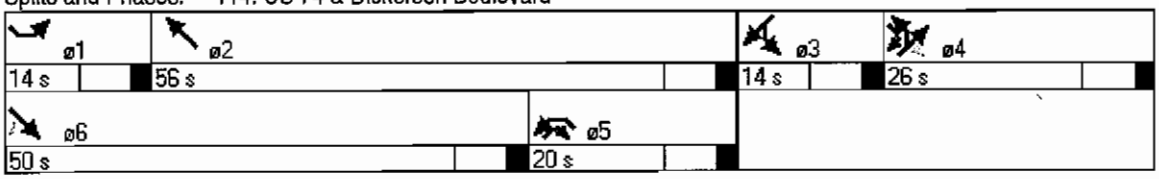
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	1720	360	400	2140	10	290	40	250	10	60	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999				0.850		0.919	
Flt Protected	0.950			0.950				0.958		0.950		
Satd. Flow (prot)	1687	4848	1509	3273	4843	0	0	1734	1538	1770	1712	0
Flt Permitted	0.950			0.950				0.958		0.950		
Satd. Flow (perm)	1687	4848	1509	3273	4843	0	0	1734	1538	1770	1712	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		858			915			405			209	
Travel Time (s)		13.0			13.9			7.9			5.7	
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 (%)	7%	7%	7%	7%	7%	7%	5%	5%	5%	2%	2%	2%
Adj. Flow (vph)	67	1911	400	444	2378	11	322	44	278	11	67	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	1911	400	444	2389	0	0	366	278	11	145	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)		0			0			0			0	
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		pm+ov	Split		
Protected Phases	1	6	4	5	2		4	4	5	3	3	
Permitted Phases			6						4			
Detector Phase	1	6	4	5	2		4	4	5	3	3	
Switch Phase												
Minimum Initial (s)	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	19.0	14.0	14.0	19.0		14.0	14.0	14.0	14.0	14.0	
Total Split (s)	14.0	50.0	26.0	20.0	56.0	0.0	26.0	26.0	20.0	14.0	14.0	0.0
Total Split (%)	12.7%	45.5%	23.6%	18.2%	50.9%	0.0%	23.6%	23.6%	18.2%	12.7%	12.7%	0.0%
Maximum Green (s)	7.0	43.0	19.0	13.0	49.0		19.0	19.0	13.0	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	2.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag		Lag	Lag	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	C-Max	None	None	C-Max		None	None	None	None	None	
Act Effct Green (s)	9.0	45.0	71.0	15.0	53.8			21.0	36.0	9.0	9.0	
Actuated g/C Ratio	0.08	0.41	0.65	0.14	0.49			0.19	0.33	0.08	0.08	
v/c Ratio	0.49	0.96	0.41	1.00	1.01			1.11	0.55	0.08	1.04	
Control Delay	60.8	45.4	11.0	89.7	49.9			123.1	24.4	48.1	136.0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	60.8	45.4	11.0	89.7	49.9			123.1	24.4	48.1	136.0	
LOS	E	D	B	F	D			F	C	D	F	
Approach Delay		40.1			56.2			80.5			129.8	
Approach LOS		D			E			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 54.3 Intersection LOS: D
Intersection Capacity Utilization 89.7% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 114: US 74 & Dickerson Boulevard



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	70	2140	290	250	1720	10	360	60	400	10	40	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999				0.850		0.909	
Flt Protected	0.950			0.950				0.959		0.950		
Satd. Flow (prot)	1687	4848	1509	3273	4843	0	0	1735	1538	1770	1693	0
Flt Permitted	0.950			0.950				0.959		0.950		
Satd. Flow (perm)	1687	4848	1509	3273	4843	0	0	1735	1538	1770	1693	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		858			915			405			209	
Travel Time (s)		13.0			13.9			7.9			5.7	
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 (%)	7%	7%	7%	7%	7%	7%	5%	5%	5%	2%	2%	2%
Adj. Flow (vph)	78	2378	322	278	1911	11	400	67	444	11	44	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	2378	322	278	1922	0	0	467	444	11	111	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)		0			0			0			0	
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		pm+ov	Split		
Protected Phases	1	6	4	5	2		4	4	5	3	3	
Permitted Phases			6						4			
Detector Phase	1	6	4	5	2		4	4	5	3	3	
Switch Phase												
Minimum Initial (s)	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	19.0	14.0	14.0	19.0		14.0	14.0	14.0	14.0	14.0	
Total Split (s)	14.0	71.0	39.0	16.0	73.0	0.0	39.0	39.0	16.0	14.0	14.0	0.0
Total Split (%)	10.0%	50.7%	27.9%	11.4%	52.1%	0.0%	27.9%	27.9%	11.4%	10.0%	10.0%	0.0%
Maximum Green (s)	7.0	64.0	32.0	9.0	66.0		32.0	32.0	9.0	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	2.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lead	Lead	Lag	Lag	Lag		Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.1	3.1	3.1	3.1	3.1		3.1	3.1	3.1	3.1	3.1	
Recall Mode	None	C-Max	None	None	C-Max		None	None	None	None	None	
Act Effct Green (s)	9.0	66.0	105.0	11.0	68.0			34.0	45.0	9.0	9.0	
Actuated g/C Ratio	0.06	0.47	0.75	0.08	0.49			0.24	0.32	0.06	0.06	
v/c Ratio	0.72	1.04	0.28	1.08	0.82			1.11	0.90	0.10	1.02	
Control Delay	98.3	66.7	6.3	138.3	34.3			125.1	62.5	63.8	154.2	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay	98.3	66.7	6.3	138.3	34.3			125.1	62.5	63.8	154.2	
LOS	F	E	A	F	C			F	E	E	F	
Approach Delay		60.6			47.5			94.6			146.0	
Approach LOS		E			D			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

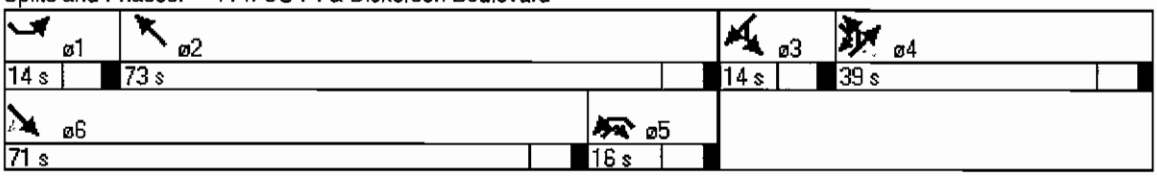
Maximum v/c Ratio: 1.11

Intersection Signal Delay: 62.7 Intersection LOS: E

Intersection Capacity Utilization 90.7% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 114: US 74 & Dickerson Boulevard



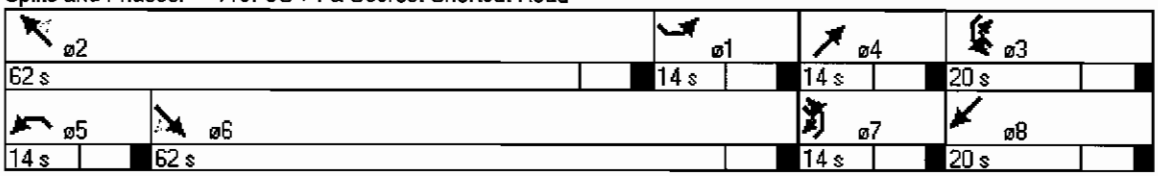
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	1920	40	110	2380	200	40	30	90	230	50	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.887			0.904	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	3273	4848	1509	1770	1652	0	1770	1684	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	4848	1509	3273	4848	1509	1770	1652	0	1770	1684	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		413			1354			238			233	
Travel Time (s)		6.3			20.5			6.5			4.5	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	67	2133	44	122	2644	222	44	33	100	256	56	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	2133	44	122	2644	222	44	133	0	256	156	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)		0			0			0			0	
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		
Protected Phases	1	6	7	5	2	3	7	4		3	8	
Permitted Phases			6			2						
Detector Phase	1	6	7	5	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	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	19.0	14.0	14.0	19.0	14.0	14.0	14.0		14.0	14.0	
Total Split (s)	14.0	62.0	14.0	14.0	62.0	20.0	14.0	14.0	0.0	20.0	20.0	0.0
Total Split (%)	12.7%	56.4%	12.7%	12.7%	56.4%	18.2%	12.7%	12.7%	0.0%	18.2%	18.2%	0.0%
Maximum Green (s)	7.0	55.0	7.0	7.0	55.0	13.0	7.0	7.0		13.0	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	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag	Lead	Lead	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	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effct Green (s)	9.0	57.0	71.0	9.0	59.8	79.8	9.0	9.0		15.0	17.8	
Actuated g/C Ratio	0.08	0.52	0.65	0.08	0.54	0.73	0.08	0.08		0.14	0.16	
v/c Ratio	0.49	0.85	0.05	0.46	1.00	0.20	0.30	0.99		1.06	0.57	
Control Delay	60.8	27.0	7.3	54.0	44.7	6.0	53.5	125.4		121.5	53.6	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	60.8	27.0	7.3	54.0	44.7	6.0	53.5	125.4		121.5	53.6	
LOS	E	C	A	D	D	A	D	F		F	D	
Approach Delay		27.6			42.2			107.5			95.8	
Approach LOS		C			D			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 42.4 Intersection LOS: D
Intersection Capacity Utilization 82.2% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 115: US 74 & Secrest Shortcut Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	90	2380	40	90	1920	230	40	50	110	200	30	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.897			0.900	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	3273	4848	1509	1770	1671	0	1770	1676	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	4848	1509	3273	4848	1509	1770	1671	0	1770	1676	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		413			1354			238			233	
Travel Time (s)		6.3			20.5			6.5			4.5	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	100	2644	44	100	2133	256	44	56	122	222	33	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	2644	44	100	2133	256	44	178	0	222	100	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)		0			0			0			0	
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		
Protected Phases	1	6	7	5	2	3	7	4		3	8	
Permitted Phases			6			2						
Detector Phase	1	6	7	5	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	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	19.0	14.0	14.0	19.0	14.0	14.0	14.0		14.0	14.0	
Total Split (s)	16.0	83.0	14.0	14.0	81.0	23.0	14.0	20.0	0.0	23.0	29.0	0.0
Total Split (%)	11.4%	59.3%	10.0%	10.0%	57.9%	16.4%	10.0%	14.3%	0.0%	16.4%	20.7%	0.0%
Maximum Green (s)	9.0	76.0	7.0	7.0	74.0	16.0	7.0	13.0		16.0	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	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effct Green (s)	11.0	78.0	92.0	9.0	76.0	99.0	9.0	15.0		18.0	26.8	
Actuated g/C Ratio	0.08	0.56	0.66	0.06	0.54	0.71	0.06	0.11		0.13	0.19	
v/c Ratio	0.75	0.98	0.04	0.48	0.81	0.24	0.39	0.99		0.97	0.31	
Control Delay	95.2	43.3	8.7	71.2	29.3	7.9	73.2	127.4		113.3	53.5	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	95.2	43.3	8.7	71.2	29.3	7.9	73.2	127.4		113.3	53.5	
LOS	F	D	A	E	C	A	E	F		F	D	
Approach Delay		44.6			28.8			116.6			94.7	
Approach LOS		D			C			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

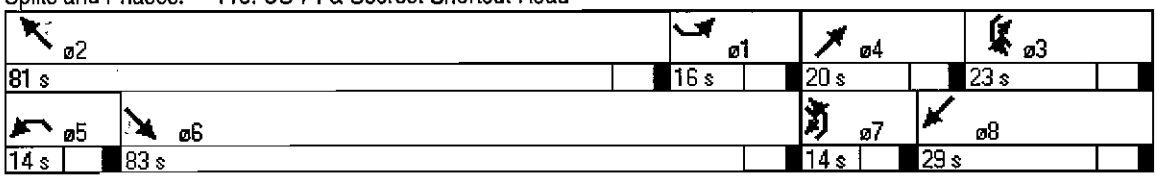
Maximum v/c Ratio: 0.99

Intersection Signal Delay: 43.4 Intersection LOS: D

Intersection Capacity Utilization 89.0% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 115: US 74 & Secrest Shortcut Road



TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*116*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*8/16/2007*	Analysis Year	*2007*
Analysis Time Period	*AM Peak*		
Project Description	*R-3329/R-2559*		
East/West Street:	*WB US 74 Ramp*	North/South Street:	*Concord Ave.*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*150*	*50*	*40*	*180*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*166*	*55*	*44*	*200*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*80*	*0*	*30*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*88*	*0*	*33*	*0*	*0*	*0*
Percent Heavy Vehicles	*7*	*0*	*7*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*44*		*121*				
C (m) (vph)		*1336*		*576*				
v/c		*0.03*		*0.21*				
95% queue length		*0.10*		*0.79*				
Control Delay		*7.8*		*12.9*				
LOS		*A*		*B*				
Approach Delay	--	--	*12.9*					
Approach LOS	--	--	*B*					

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Version 4.1f

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*116*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*6/13/2007*	Analysis Year	*2007*
Analysis Time Period	*PM Peak*		
Project Description	*R-3329/R-2559*		
East/West Street:	*WB US 74 Ramp*	North/South Street:	*Concord Ave.*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*190*	*50*	*40*	*140*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*211*	*55*	*44*	*155*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	*7*	8	9	10	11	12
	L	T	R	L	T	R
Volume	*60*	*0*	*30*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*66*	*0*	*33*	*0*	*0*	*0*
Percent Heavy Vehicles	*7*	*0*	*7*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*44*		*99*				
C (m) (vph)		*1286*		*584*				
v/c		*0.03*		*0.17*				
95% queue length		*0.11*		*0.61*				
Control Delay		*7.9*		*12.4*				
LOS		*A*		*B*				
Approach Delay	--	--	*12.4*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*117*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*8/16/2007*	Analysis Year	*2007*
Analysis Time Period	*AM Peak*		
Project Description	*R-3329/R-2559*		
East/West Street:	*EB US 74 Ramp*	North/South Street:	*Concord Ave.*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*60*	*160*			*230*	*30*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*66*	*177*	*0*	*0*	*255*	*33*
Percent Heavy Vehicles	*4*	--	--		--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*		*40*	*0*	*50*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*44*	*0*	*55*
Percent Heavy Vehicles		*0*		*7*	*0*	*7*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*66*						*99*	
C (m) (vph)	*1263*						*576*	
v/c	*0.05*						*0.17*	
95% queue length	*0.17*						*0.62*	
Control Delay	*8.0*						*12.5*	
LOS	*A*						*B*	
Approach Delay	--	--				*12.5*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*117*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*8/16/2007*	Analysis Year	*2007*
Analysis Time Period	*PM Peak*		
Project Description	*R-3329/R-2559*		
East/West Street:	*EB US 74 Ramp*	North/South Street:	*Concord Ave.*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*80*	*200*		*0*	*180*	*30*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*88*	*222*	*0*	*0*	*200*	*33*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*		*40*	*0*	*50*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*44*	*0*	*55*
Percent Heavy Vehicles		*0*		*7*	*0*	*7*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*88*						*99*	
C (m) (vph)	*1323*						*571*	
v/c	*0.07*						*0.17*	
95% queue length	*0.21*						*0.62*	
Control Delay	*7.9*						*12.6*	
LOS	*A*						*B*	
Approach Delay	--	--				*12.6*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*118*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*6/27/2007*	Analysis Year	*2007*
Analysis Time Period	*AM Peak Hour*		
Project Description	*Monroe Connector*		
East/West Street:	*East Ave.*	North/South Street:	*US 601 (Skyway Dr.)*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*10*	*250*	*90*	*70*	*190*	*350*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*11*	*277*	*100*	*77*	*211*	*388*
Percent Heavy Vehicles	*8*	--	--	*8*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*0*
Lanes	*0*	*1*	*1*	*0*	*1*	*0*
Configuration	*LT*		*R*	*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*70*	*10*	*0*	*10*	*10*	*10*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*77*	*11*	*0*	*11*	*11*	*11*
Percent Heavy Vehicles	*7*	*7*	*0*	*7*	*7*	*7*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*				*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LTR*	*LT*				*LTR*	
v (vph)	*11*	*77*	*88*				*33*	
C (m) (vph)	*949*	*1252*	*228*				*299*	
v/c	*0.01*	*0.06*	*0.39*				*0.11*	
95% queue length	*0.04*	*0.20*	*1.72*				*0.37*	
Control Delay	*8.8*	*8.1*	*30.4*				*18.5*	
LOS	*A*	*A*	*D*				*C*	
Approach Delay	--	--	*30.4*			*18.5*		
Approach LOS	--	--	*D*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*118*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*6/27/2007*	Analysis Year	*2007*
Analysis Time Period	*PM Peak Hour*		
Project Description	*Monroe Connector*		
East/West Street:	*East Ave.*	North/South Street:	*US 601 (Skyway Dr.)*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*10*	*320*	*70*	*100*	*240*	*290*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*11*	*355*	*77*	*111*	*266*	*322*
Percent Heavy Vehicles	*8*	--	--	*8*	--	--
Median Type	*Undivided*					
RT Channelized			*1*			*0*
Lanes	*0*	*1*	*1*	*0*	*1*	*0*
Configuration	*LT*		*R*	*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*90*	*10*	*0*	*10*	*10*	*10*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*100*	*11*	*0*	*11*	*11*	*11*
Percent Heavy Vehicles	*7*	*7*	*0*	*7*	*7*	*7*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*				*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LTR*	*LT*				*LTR*	
v (vph)	*11*	*111*	*111*				*33*	
C (m) (vph)	*958*	*1171*	*168*				*232*	
v/c	*0.01*	*0.09*	*0.66*				*0.14*	
95% queue length	*0.03*	*0.31*	*3.81*				*0.49*	
Control Delay	*8.8*	*8.4*	*60.5*				*23.1*	
LOS	*A*	*A*	*F*				*C*	
Approach Delay	--	--	*60.5*			*23.1*		
Approach LOS	--	--	*F*			*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*118A*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*6/27/2007*	Analysis Year	*2007*
Analysis Time Period	*AM Peak Hour*		
Project Description	*Monroe Connector*		
East/West Street:	*East Ave.*	North/South Street:	*US 74 Off Ramp*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*10*	*280*	*10*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*11*	*311*	*11*	*0*	*0*	*0*
Percent Heavy Vehicles	*7*	--	--		--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration	*LTR*					
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*70*	*70*	*10*	*160*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*77*	*77*	*11*	*177*	*0*
Percent Heavy Vehicles		*7*	*7*	*7*	*7*	
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*				*TR*	*LT*		
v (vph)	*11*				*154*	*188*		
C (m) (vph)	*1591*				*634*	*555*		
v/c	*0.01*				*0.24*	*0.34*		
95% queue length	*0.02*				*0.95*	*1.49*		
Control Delay	*7.3*				*12.5*	*14.8*		
LOS	*A*				*B*	*B*		
Approach Delay	--	--	*12.5*			*14.8*		
Approach LOS	--	--	*B*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*118A*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*6/27/2007*	Analysis Year	*2007*
Analysis Time Period	*PM Peak Hour*		
Project Description	*Monroe Connector*		
East/West Street:	*East Ave.*	North/South Street:	*US 74 Off Ramp*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*10*	*230*	*10*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*11*	*255*	*11*	*0*	*0*	*0*
Percent Heavy Vehicles	*7*	--	--		--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration	*LTR*					
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*90*	*90*	*10*	*180*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*100*	*100*	*11*	*200*	*0*
Percent Heavy Vehicles		*7*	*7*	*7*	*7*	
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*				*TR*	*LT*		
v (vph)	*11*				*200*	*211*		
C (m) (vph)	*1591*				*681*	*596*		
v/c	*0.01*				*0.29*	*0.35*		
95% queue length	*0.02*				*1.22*	*1.59*		
Control Delay	*7.3*				*12.5*	*14.3*		
LOS	*A*				*B*	*B*		
Approach Delay	--	--	*12.5*			*14.3*		
Approach LOS	--	--	*B*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*119*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*6/27/2007*	Analysis Year	*2007*
Analysis Time Period	*AM Peak Hour*		
Project Description	*Monroe Connector*		
East/West Street:	*US 74*	North/South Street:	*US 601 (Skyway Dr.)*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*410*	*0*	*0*	*320*	*230*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*455*	*0*	*0*	*355*	*255*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*290*	*0*	*300*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*322*	*0*	*333*
Percent Heavy Vehicles	*0*	*0*	*0*	*7*	*0*	*7*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration						*L*		*R*
v (vph)						*322*		*333*
C (m) (vph)						*358*		*676*
v/c						*0.90*		*0.49*
95% queue length						*8.97*		*2.74*
Control Delay						*60.1*		*15.4*
LOS						*F*		*C*
Approach Delay	--	--				*37.4*		
Approach LOS	--	--				*E*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*119*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*6/27/2007*	Analysis Year	*2007*
Analysis Time Period	*PM Peak Hour*		
Project Description	*Monroe Connector*		
East/West Street:	*US 74*	North/South Street:	*US 601 (Skyway Dr.)*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*340*	*0*	*0*	*280*	*280*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*377*	*0*	*0*	*311*	*311*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*350*	*0*	*370*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*388*	*0*	*411*
Percent Heavy Vehicles	*0*	*0*	*0*	*7*	*0*	*7*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration						*L*		*R*
v (vph)						*388*		*411*
C (m) (vph)						*388*		*670*
v/c						*1.00*		*0.61*
95% queue length						*12.06*		*4.21*
Control Delay						*78.9*		*18.5*
LOS						*F*		*C*
Approach Delay	--	--				*47.8*		
Approach LOS	--	--				*E*		

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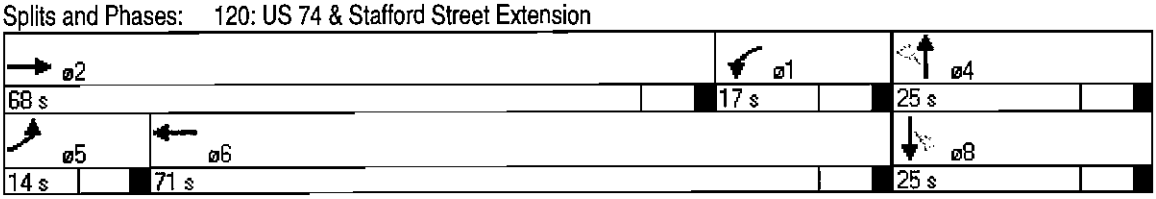
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	1900	60	120	2350	40	100	60	170	50	50	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.998			0.889			0.888	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4823	0	1687	4838	0	1770	1656	0	1770	1654	0
Flt Permitted	0.950			0.950			0.373			0.295		
Satd. Flow (perm)	1687	4823	0	1687	4838	0	695	1656	0	550	1654	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		443			590			549			636	
Travel Time (s)		6.7			8.9			15.0			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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	122	2111	67	133	2611	44	111	67	189	56	56	167
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	2178	0	133	2655	0	111	256	0	56	223	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	68.0	0.0	17.0	71.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Split (%)	12.7%	61.8%	0.0%	15.5%	64.5%	0.0%	22.7%	22.7%	0.0%	22.7%	22.7%	0.0%
Maximum Green (s)	7.0	61.0		10.0	64.0		18.0	18.0		18.0	18.0	
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	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	9.4	63.4		12.0	66.0		19.6	19.6		19.6	19.6	
Actuated g/C Ratio	0.09	0.58		0.11	0.60		0.18	0.18		0.18	0.18	
v/c Ratio	0.85	0.78		0.72	0.91		0.90	0.87		0.57	0.76	
Control Delay	94.1	20.7		70.1	25.8		103.2	72.1		65.3	60.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	94.1	20.7		70.1	25.8		103.2	72.1		65.3	60.1	
LOS	F	C		E	C		F	E		E	E	
Approach Delay		24.6			27.9			81.5			61.1	
Approach LOS		C			C			F			E	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
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: 0.91
Intersection Signal Delay: 31.6 Intersection LOS: C
Intersection Capacity Utilization 88.5% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 120: US 74 & Stafford Street Extension



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	2350	100	170	1900	50	60	50	120	40	60	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.996			0.894			0.903	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4819	0	1687	4828	0	1770	1665	0	1770	1682	0
Flt Permitted	0.950			0.950			0.335			0.335		
Satd. Flow (perm)	1687	4819	0	1687	4828	0	624	1665	0	624	1682	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		443			590			549			636	
Travel Time (s)		6.7			8.9			15.0			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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	167	2611	111	189	2111	56	67	56	133	44	67	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	2722	0	189	2167	0	67	189	0	44	189	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	28.0	90.0	0.0	25.0	87.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Split (%)	20.0%	64.3%	0.0%	17.9%	62.1%	0.0%	17.9%	17.9%	0.0%	17.9%	17.9%	0.0%
Maximum Green (s)	21.0	83.0		18.0	80.0		18.0	18.0		18.0	18.0	
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)	3.1	3.1		3.1	3.1		3.1	3.1		3.1	3.1	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	20.0	85.7		20.0	85.7		19.3	19.3		19.3	19.3	
Actuated g/C Ratio	0.14	0.61		0.14	0.61		0.14	0.14		0.14	0.14	
v/c Ratio	0.70	0.92		0.78	0.73		0.78	0.82		0.51	0.81	
Control Delay	72.2	31.0		80.4	21.6		108.0	85.8		77.4	84.7	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	72.2	31.0		80.4	21.6		108.0	85.8		77.4	84.7	
LOS	E	C		F	C		F	F		E	F	
Approach Delay		33.3			26.3			91.6			83.4	
Approach LOS		C			C			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

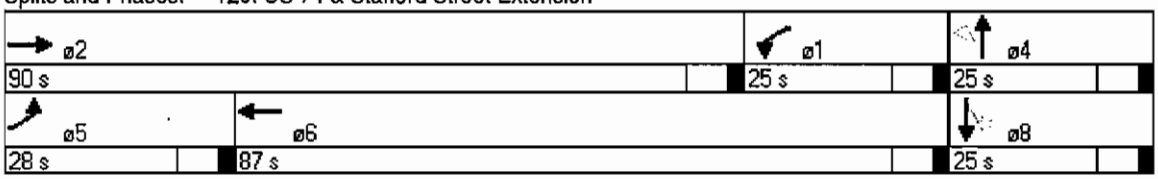
Maximum v/c Ratio: 0.92

Intersection Signal Delay: 35.1 Intersection LOS: D

Intersection Capacity Utilization 89.6% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 120: US 74 & Stafford Street Extension



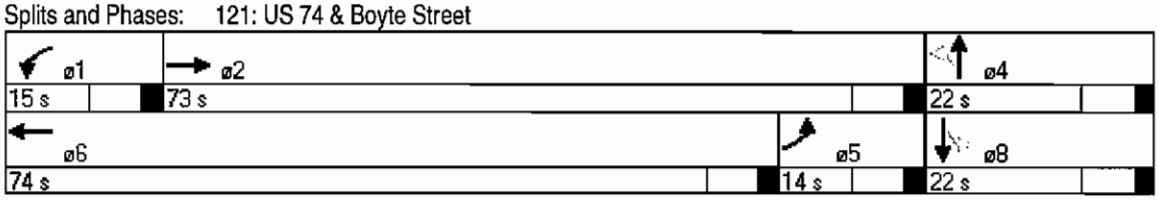
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	1940	80	70	2370	30	60	10	50	60	20	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.998			0.875			0.869	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4819	0	1687	4838	0	1770	1630	0	1770	1619	0
Flt Permitted	0.950			0.950			0.434			0.713		
Satd. Flow (perm)	1687	4819	0	1687	4838	0	808	1630	0	1328	1619	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			20	
Link Distance (ft)		493			536			238			211	
Travel Time (s)		7.5			8.1			6.5			7.2	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	67	2156	89	78	2633	33	67	11	56	67	22	156
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	2245	0	78	2666	0	67	67	0	67	178	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	73.0	0.0	15.0	74.0	0.0	22.0	22.0	0.0	22.0	22.0	0.0
Total Split (%)	12.7%	66.4%	0.0%	13.6%	67.3%	0.0%	20.0%	20.0%	0.0%	20.0%	20.0%	0.0%
Maximum Green (s)	7.0	66.0		8.0	67.0		15.0	15.0		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	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	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	71.8		9.8	72.6		16.2	16.2		16.2	16.2	
Actuated g/C Ratio	0.08	0.65		0.09	0.66		0.15	0.15		0.15	0.15	
v/c Ratio	0.49	0.71		0.52	0.84		0.56	0.28		0.34	0.74	
Control Delay	60.8	15.1		60.8	18.5		62.2	44.6		47.0	64.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	60.8	15.1		60.8	18.5		62.2	44.6		47.0	64.4	
LOS	E	B		E	B		E	D		D	E	
Approach Delay		16.5			19.7			53.4			59.6	
Approach LOS		B			B			D			E	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 21.0 Intersection LOS: C
Intersection Capacity Utilization 84.5% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 121: US 74 & Boyte Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	2370	60	50	1940	60	80	20	70	30	10	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.995			0.883			0.871	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4828	0	1687	4823	0	1770	1645	0	1770	1622	0
Flt Permitted	0.950			0.950			0.676			0.586		
Satd. Flow (perm)	1687	4828	0	1687	4823	0	1259	1645	0	1092	1622	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			20	
Link Distance (ft)		493			536			238			211	
Travel Time (s)		7.5			8.1			6.5			7.2	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	156	2633	67	56	2156	67	89	22	78	33	11	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	156	2700	0	56	2223	0	89	100	0	33	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width (ft)		0			0			0			0	
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		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	27.0	103.0	0.0	15.0	91.0	0.0	22.0	22.0	0.0	22.0	22.0	0.0
Total Split (%)	19.3%	73.6%	0.0%	10.7%	65.0%	0.0%	15.7%	15.7%	0.0%	15.7%	15.7%	0.0%
Maximum Green (s)	20.0	96.0		8.0	84.0		15.0	15.0		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	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)	3.1	3.1		3.1	3.1		3.1	3.1		3.1	3.1	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	22.0	102.7		9.9	87.8		15.2	15.2		15.2	15.2	
Actuated g/C Ratio	0.16	0.73		0.07	0.63		0.11	0.11		0.11	0.11	
v/c Ratio	0.59	0.76		0.47	0.78		0.65	0.56		0.28	0.44	
Control Delay	64.8	14.3		75.8	20.2		81.5	71.1		62.7	66.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	64.8	14.3		75.8	20.2		81.5	71.1		62.7	66.0	
LOS	E	B		E	C		F	E		E	E	
Approach Delay		17.1			21.6			76.0			65.0	
Approach LOS		B			C			E			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

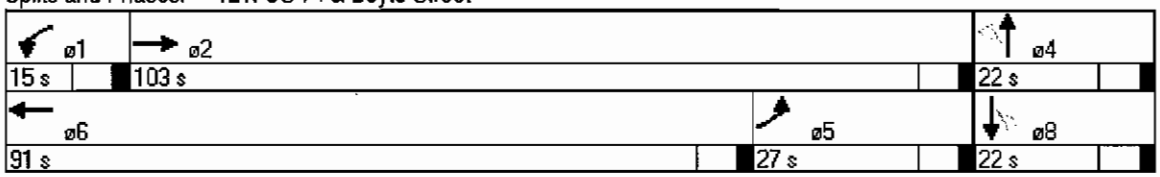
Maximum v/c Ratio: 0.76

Intersection Signal Delay: 22.0 Intersection LOS: C

Intersection Capacity Utilization 76.6% ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 121: US 74 & Boyte Street



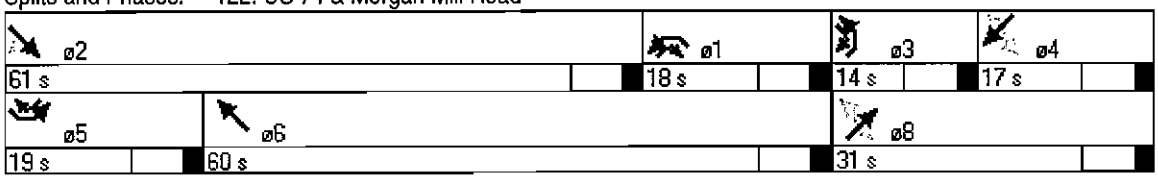
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	190	1630	200	90	2010	70	200	110	70	90	170	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.995				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	1687	4823	0	1687	1776	1509	1687	1776	1509
Flt Permitted	0.950			0.950			0.235			0.679		
Satd. Flow (perm)	1687	4848	1509	1687	4823	0	417	1776	1509	1206	1776	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		515			499			502			475	
Travel Time (s)		7.8			7.6			9.8			9.3	
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
Adj. Flow (vph)	211	1811	222	100	2233	78	222	122	78	100	189	322
Shared Lane Traffic (%)												
Lane Group Flow (vph)	211	1811	222	100	2311	0	222	122	78	100	189	322
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)		0			0			0			0	
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+pt		pm+ov	Perm		pm+ov
Protected Phases	5	2	3	1	6		3	8	1		4	5
Permitted Phases			2				8		8	4		4
Detector Phase	5	2	3	1	6		3	8	1	4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0		7.0	7.0	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	14.0	14.0
Total Split (s)	19.0	61.0	14.0	18.0	60.0	0.0	14.0	31.0	18.0	17.0	17.0	19.0
Total Split (%)	17.3%	55.5%	12.7%	16.4%	54.5%	0.0%	12.7%	28.2%	16.4%	15.5%	15.5%	17.3%
Maximum Green (s)	12.0	54.0	7.0	11.0	53.0		7.0	24.0	11.0	10.0	10.0	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
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	Lead	Lead	Lead	Lag	Lag		Lead		Lag	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	3.0
Recall Mode	None	C-Max	None	None	C-Max		None	None	None	None	None	None
Act Effct Green (s)	14.0	56.0	65.0	13.0	55.0		26.0	26.0	44.0	12.0	12.0	31.0
Actuated g/C Ratio	0.13	0.51	0.59	0.12	0.50		0.24	0.24	0.40	0.11	0.11	0.28
v/c Ratio	0.98	0.73	0.25	0.50	0.96		1.10	0.29	0.13	0.76	0.97	0.76
Control Delay	105.8	23.4	6.2	55.0	37.7		129.9	36.7	21.7	81.8	108.2	49.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	105.8	23.4	6.2	55.0	37.7		129.9	36.7	21.7	81.8	108.2	49.0
LOS	F	C	A	D	D		F	D	C	F	F	D
Approach Delay		29.4			38.4			83.0			72.7	
Approach LOS		C			D			F			E	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 41.9 Intersection LOS: D
Intersection Capacity Utilization 87.6% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 122: US 74 & Morgan Mill Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	290	2010	200	70	1630	90	200	170	90	70	110	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.992				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	1687	4809	0	1687	1776	1509	1687	1776	1509
Flt Permitted	0.950			0.950			0.307			0.639		
Satd. Flow (perm)	1687	4848	1509	1687	4809	0	545	1776	1509	1135	1776	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		515			499			502			475	
Travel Time (s)		7.8			7.6			9.8			9.3	
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
Adj. Flow (vph)	322	2233	222	78	1811	100	222	189	100	78	122	211
Shared Lane Traffic (%)												
Lane Group Flow (vph)	322	2233	222	78	1911	0	222	189	100	78	122	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)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		0			0			0			0	
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+pt		pm+ov	Perm		pm+ov
Protected Phases	5	2	3	1	6		3	8	1		4	5
Permitted Phases			2				8		8	4		4
Detector Phase	5	2	3	1	6		3	8	1	4	4	5
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0		7.0	7.0	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	14.0	14.0
Total Split (s)	36.0	84.0	21.0	18.0	66.0	0.0	21.0	38.0	18.0	17.0	17.0	36.0
Total Split (%)	25.7%	60.0%	15.0%	12.9%	47.1%	0.0%	15.0%	27.1%	12.9%	12.1%	12.1%	25.7%
Maximum Green (s)	29.0	77.0	14.0	11.0	59.0		14.0	31.0	11.0	10.0	10.0	29.0
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	Lead	Lead	Lead	Lag	Lag		Lead		Lag	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.1	3.1	3.1	3.1	3.1		3.1	3.1	3.1	3.1	3.1	3.1
Recall Mode	None	C-Max	None	None	C-Max		None	None	None	None	None	None
Act Effct Green (s)	30.0	79.0	95.0	13.0	62.0		33.0	33.0	51.0	12.0	12.0	47.0
Actuated g/C Ratio	0.21	0.56	0.68	0.09	0.44		0.24	0.24	0.36	0.09	0.09	0.34
v/c Ratio	0.89	0.82	0.22	0.50	0.90		0.86	0.45	0.18	0.80	0.80	0.42
Control Delay	79.7	27.8	4.8	71.9	43.0		77.1	49.9	31.5	111.7	97.4	38.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	79.7	27.8	4.8	71.9	43.0		77.1	49.9	31.5	111.7	97.4	38.7
LOS	E	C	A	E	D		E	D	C	F	F	D
Approach Delay		32.0			44.2			58.1			70.0	
Approach LOS		C			D			E			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

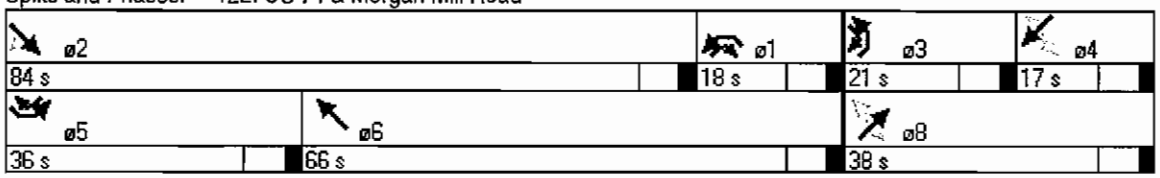
Maximum v/c Ratio: 0.90

Intersection Signal Delay: 41.3 Intersection LOS: D

Intersection Capacity Utilization 83.1% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 122: US 74 & Morgan Mill Road



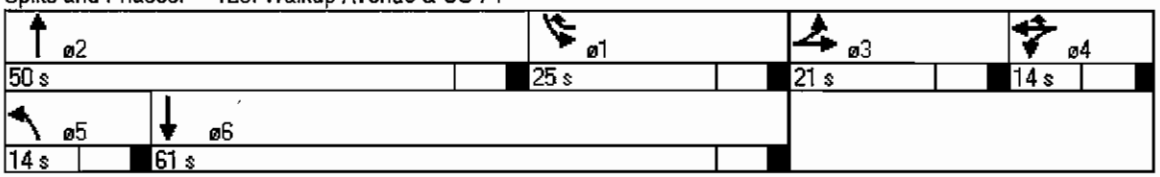
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	150	40	20	110	260	50	1830	20	290	1460	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.979				0.850		0.998			0.994	
Flt Protected		0.987		0.950			0.950			0.950		
Satd. Flow (prot)	0	1800	0	1770	1863	1583	1687	4838	0	1687	4819	0
Flt Permitted		0.987		0.950			0.950			0.950		
Satd. Flow (perm)	0	1800	0	1770	1863	1583	1687	4838	0	1687	4819	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		443			502			602			356	
Travel Time (s)		12.1			9.8			9.1			5.4	
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%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	78	167	44	22	122	289	56	2033	22	322	1622	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	289	0	22	122	289	56	2055	0	322	1689	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)		0			0			0			0	
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			Split		pt+ov	Prot			Prot		
Protected Phases	3	3		4	4	4 1	5	2		1	6	
Permitted Phases												
Detector Phase	3	3		4	4	4 1	5	2		1	6	
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)	21.0	21.0	0.0	14.0	14.0	39.0	14.0	50.0	0.0	25.0	61.0	0.0
Total Split (%)	19.1%	19.1%	0.0%	12.7%	12.7%	35.5%	12.7%	45.5%	0.0%	22.7%	55.5%	0.0%
Maximum Green (s)	14.0	14.0		7.0	7.0		7.0	43.0		18.0	54.0	
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	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lead	Lead		Lag	Lag		Lead	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	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		16.0		9.0	9.0	29.0	9.0	45.0		20.0	58.8	
Actuated g/C Ratio		0.15		0.08	0.08	0.26	0.08	0.41		0.18	0.53	
v/c Ratio		1.10		0.15	0.80	0.69	0.41	1.04		1.05	0.66	
Control Delay		130.3		49.6	85.3	30.3	57.3	63.5		109.1	20.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		130.3		49.6	85.3	30.3	57.3	63.5		109.1	20.6	
LOS		F		D	F	C	E	E		F	C	
Approach Delay		130.3			46.8			63.3			34.8	
Approach LOS		F			D			E			C	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 54.0 Intersection LOS: D
Intersection Capacity Utilization 85.2% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 123: Walkup Avenue & US 74



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	110	40	20	150	290	40	1460	20	260	1830	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.975				0.850		0.998			0.994	
Flt Protected		0.986		0.950			0.950			0.950		
Satd. Flow (prot)	0	1791	0	1770	1863	1583	1687	4838	0	1687	4819	0
Flt Permitted		0.986		0.950			0.950			0.950		
Satd. Flow (perm)	0	1791	0	1770	1863	1583	1687	4838	0	1687	4819	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		443			502			602			356	
Travel Time (s)		12.1			9.8			9.1			5.4	
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%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	67	122	44	22	167	322	44	1622	22	289	2033	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	233	0	22	167	322	44	1644	0	289	2111	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)		0			0			0			0	
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			Split		pt+ov	Prot			Prot		
Protected Phases	3	3		4	4	4 1	5	2		1	6	
Permitted Phases												
Detector Phase	3	3		4	4	4 1	5	2		1	6	
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)	26.0	26.0	0.0	21.0	21.0	54.0	14.0	60.0	0.0	33.0	79.0	0.0
Total Split (%)	18.6%	18.6%	0.0%	15.0%	15.0%	38.6%	10.0%	42.9%	0.0%	23.6%	56.4%	0.0%
Maximum Green (s)	19.0	19.0		14.0	14.0		7.0	53.0		26.0	72.0	
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	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.1	3.1		3.1	3.1		3.1	3.1		3.1	3.1	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		20.7		15.7	15.7	43.7	9.0	55.6		28.0	77.4	
Actuated g/C Ratio		0.15		0.11	0.11	0.31	0.06	0.40		0.20	0.55	
v/c Ratio		0.88		0.11	0.80	0.65	0.41	0.86		0.86	0.79	
Control Delay		89.5		57.2	87.3	30.4	74.7	44.2		77.9	28.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		89.5		57.2	87.3	30.4	74.7	44.2		77.9	28.6	
LOS		F		E	F	C	E	D		E	C	
Approach Delay		89.5			50.1			45.0			34.6	
Approach LOS		F			D			D			C	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

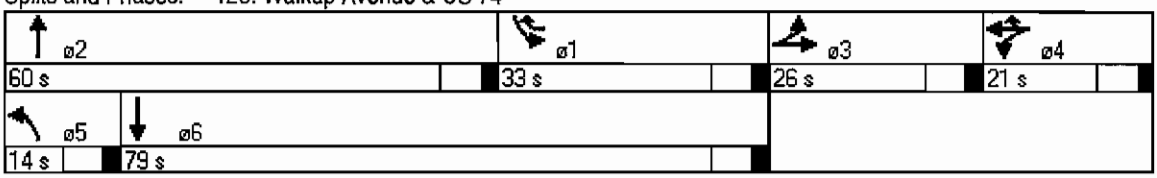
Maximum v/c Ratio: 0.88

Intersection Signal Delay: 42.5 Intersection LOS: D

Intersection Capacity Utilization 79.2% ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 123: Walkup Avenue & US 74



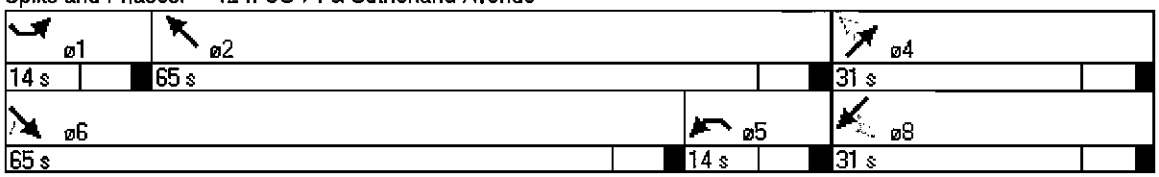
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	50	1350	160	30	1680	100	130	110	20	60	110	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.992			0.977			0.960	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	1687	4809	0	1752	1802	0	1752	1771	0
Flt Permitted	0.950			0.950			0.529			0.580		
Satd. Flow (perm)	1687	4848	1509	1687	4809	0	976	1802	0	1070	1771	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		425			487			426			331	
Travel Time (s)		6.4			7.4			11.6			6.4	
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 (%)	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	56	1500	178	33	1867	111	144	122	22	67	122	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	1500	178	33	1978	0	144	144	0	67	166	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)		0			0			0			0	
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			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6				4			8		
Detector Phase	1	6	6	5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0	19.0	14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	65.0	65.0	14.0	65.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Split (%)	12.7%	59.1%	59.1%	12.7%	59.1%	0.0%	28.2%	28.2%	0.0%	28.2%	28.2%	0.0%
Maximum Green (s)	7.0	58.0	58.0	7.0	58.0		24.0	24.0		24.0	24.0	
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	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	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Act Effct Green (s)	9.5	70.3	70.3	9.0	67.0		21.3	21.3		21.3	21.3	
Actuated g/C Ratio	0.09	0.64	0.64	0.08	0.61		0.19	0.19		0.19	0.19	
v/c Ratio	0.38	0.48	0.18	0.24	0.68		0.76	0.41		0.32	0.48	
Control Delay	55.7	12.8	11.1	51.9	17.5		66.2	41.4		40.8	43.3	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	55.7	12.8	11.1	51.9	17.5		66.2	41.4		40.8	43.3	
LOS	E	B	B	D	B		E	D		D	D	
Approach Delay		14.0			18.1			53.8			42.6	
Approach LOS		B			B			D			D	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 69.5% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 124: US 74 & Sutherland Avenue



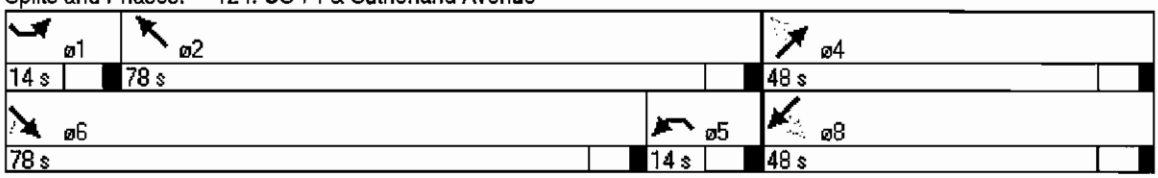
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	40	1680	130	20	1350	60	160	110	30	100	110	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.994			0.968			0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	1687	4819	0	1752	1786	0	1752	1758	0
Flt Permitted	0.950			0.950			0.504			0.549		
Satd. Flow (perm)	1687	4848	1509	1687	4819	0	930	1786	0	1013	1758	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		425			487			426			331	
Travel Time (s)		6.4			7.4			11.6			6.4	
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 (%)	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	44	1867	144	22	1500	67	178	122	33	111	122	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1867	144	22	1567	0	178	155	0	111	178	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)		0			0			0			0	
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			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6				4			8		
Detector Phase	1	6	6	5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0	12.0	7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0	19.0	14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	78.0	78.0	14.0	78.0	0.0	48.0	48.0	0.0	48.0	48.0	0.0
Total Split (%)	10.0%	55.7%	55.7%	10.0%	55.7%	0.0%	34.3%	34.3%	0.0%	34.3%	34.3%	0.0%
Maximum Green (s)	7.0	71.0	71.0	7.0	71.0		41.0	41.0		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	5.0	5.0	5.0	2.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.1	3.1	3.1	3.1	3.1		3.1	3.1		3.1	3.1	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None		None	None	
Act Effct Green (s)	10.3	90.1	90.1	9.0	86.0		31.5	31.5		31.5	31.5	
Actuated g/C Ratio	0.07	0.64	0.64	0.06	0.61		0.22	0.22		0.22	0.22	
v/c Ratio	0.35	0.60	0.15	0.20	0.53		0.85	0.39		0.49	0.45	
Control Delay	70.0	18.0	13.3	66.9	18.3		83.3	47.0		52.6	48.7	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	70.0	18.0	13.3	66.9	18.3		83.3	47.0		52.6	48.7	
LOS	E	B	B	E	B		F	D		D	D	
Approach Delay		18.8			18.9			66.4			50.2	
Approach LOS		B			B			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 24.7 Intersection LOS: C
Intersection Capacity Utilization 63.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 124: US 74 & Sutherland Avenue



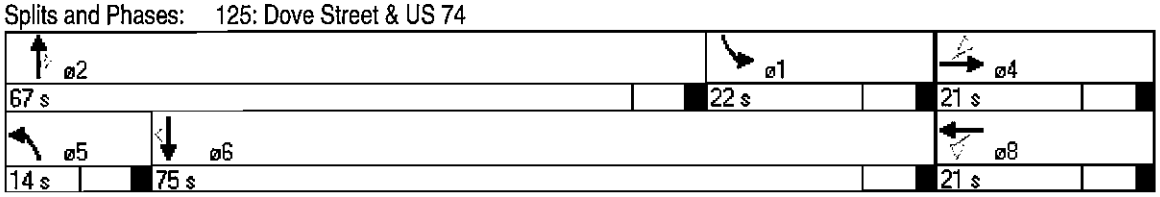
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	10	10	10	10	90	10	1630	10	110	1300	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt		0.925			0.865				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1723	0	1770	1611	0	1687	4848	1509	1687	4848	1509
Flt Permitted	0.620			0.743			0.950			0.950		
Satd. Flow (perm)	1155	1723	0	1384	1611	0	1687	4848	1509	1687	4848	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			45			45	
Link Distance (ft)		163			218			356			257	
Travel Time (s)		5.6			4.2			5.4			3.9	
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%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	44	11	11	11	11	100	11	1811	11	122	1444	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	22	0	11	111	0	11	1811	11	122	1444	78
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)		0			0			0			0	
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	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	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	19.0	19.0	14.0	19.0	19.0
Total Split (s)	21.0	21.0	0.0	21.0	21.0	0.0	14.0	67.0	67.0	22.0	75.0	75.0
Total Split (%)	19.1%	19.1%	0.0%	19.1%	19.1%	0.0%	12.7%	60.9%	60.9%	20.0%	68.2%	68.2%
Maximum Green (s)	14.0	14.0		14.0	14.0		7.0	60.0	60.0	15.0	68.0	68.0
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	Lead	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	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	13.8	13.8		13.8	13.8		9.0	64.2	64.2	17.0	83.4	83.4
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.08	0.58	0.58	0.15	0.76	0.76
v/c Ratio	0.30	0.10		0.06	0.55		0.08	0.64	0.01	0.47	0.39	0.07
Control Delay	48.5	42.4		41.8	55.1		48.2	16.9	10.6	49.0	5.7	4.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	42.4		41.8	55.1		48.2	16.9	10.6	49.0	5.7	4.9
LOS	D	D		D	E		D	B	B	D	A	A
Approach Delay		46.5			53.9			17.0			8.9	
Approach LOS		D			D			B			A	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 15.1 Intersection LOS: B
Intersection Capacity Utilization 59.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 125: Dove Street & US 74



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	10	10	10	10	110	10	1300	10	90	1620	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt		0.925			0.862				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1593	1551	0	1593	1445	0	1518	4363	1358	1518	4363	1358
Flt Permitted	0.520			0.743			0.950			0.950		
Satd. Flow (perm)	872	1551	0	1246	1445	0	1518	4363	1358	1518	4363	1358
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			45			45	
Link Distance (ft)		163			218			356			257	
Travel Time (s)		5.6			4.2			5.4			3.9	
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%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	78	11	11	11	11	122	11	1444	11	100	1800	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	22	0	11	133	0	11	1444	11	100	1800	44
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)		0			0			0			0	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	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	19.0	19.0	14.0	19.0	19.0
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	14.0	82.0	82.0	26.0	94.0	94.0
Total Split (%)	22.9%	22.9%	0.0%	22.9%	22.9%	0.0%	10.0%	58.6%	58.6%	18.6%	67.1%	67.1%
Maximum Green (s)	25.0	25.0		25.0	25.0		7.0	75.0	75.0	19.0	87.0	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	2.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag							Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.1	3.1		3.1	3.1		3.1	3.1	3.1	3.1	3.1	3.1
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	20.2	20.2		20.2	20.2		9.1	83.8	83.8	21.0	104.2	104.2
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.06	0.60	0.60	0.15	0.74	0.74
v/c Ratio	0.62	0.10		0.06	0.64		0.11	0.55	0.01	0.44	0.55	0.04
Control Delay	76.3	50.3		49.3	69.7		64.4	18.5	13.3	61.0	10.2	7.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.3	50.3		49.3	69.7		64.4	18.5	13.3	61.0	10.2	7.4
LOS	E	D		D	E		E	B	B	E	B	A
Approach Delay		70.5			68.2			18.8			12.8	
Approach LOS		E			E			B			B	

Intersection Summary

Area Type: CBD

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

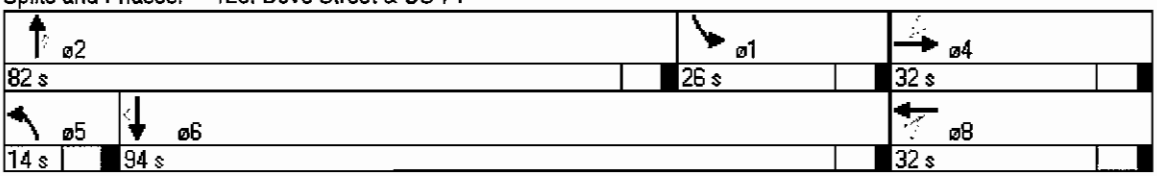
Maximum v/c Ratio: 0.64

Intersection Signal Delay: 19.0 Intersection LOS: B

Intersection Capacity Utilization 64.1% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 125: Dove Street & US 74



Lane Group	NBU	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Volume (vph)	10	430	1450	100	60	1130	90	130	90	480	110	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.86	0.97	0.86	0.86	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00
Frt			0.990				0.850			0.850		
Flt Protected		0.950			0.950			0.950			0.950	
Satd. Flow (prot)	0	3273	6047	0	1687	4848	1509	1752	1845	2760	1752	1845
Flt Permitted		0.950			0.950			0.950			0.950	
Satd. Flow (perm)	0	3273	6047	0	1687	4848	1509	1752	1845	2760	1752	1845
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			45			35			20
Link Distance (ft)			341			436			391			335
Travel Time (s)			5.2			6.6			7.6			11.4
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 (%)	7%	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%
Adj. Flow (vph)	11	478	1611	111	67	1256	100	144	100	533	122	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	489	1722	0	67	1256	100	144	100	533	122	100
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	Left	Left	Right	Left	Left
Median Width(ft)			24			24			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			0			0			0			0
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		Perm	Split		Prot	Split	
Protected Phases	5	5	2		1	6		4	4	4	3	3
Permitted Phases							6					
Detector Phase	5	5	2		1	6	6	4	4	4	3	3
Switch Phase												
Minimum Initial (s)	7.0	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	14.0	19.0		14.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	25.0	25.0	49.0	0.0	15.0	39.0	39.0	30.0	30.0	30.0	16.0	16.0
Total Split (%)	22.7%	22.7%	44.5%	0.0%	13.6%	35.5%	35.5%	27.3%	27.3%	27.3%	14.5%	14.5%
Maximum Green (s)	18.0	18.0	42.0		8.0	32.0	32.0	23.0	23.0	23.0	9.0	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	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	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead
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	None	C-Max		None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)		19.7	44.6		10.0	34.9	34.9	24.5	24.5	24.5	10.9	10.9
Actuated g/C Ratio		0.18	0.41		0.09	0.32	0.32	0.22	0.22	0.22	0.10	0.10
v/c Ratio		0.83	0.70		0.44	0.82	0.21	0.37	0.24	0.87	0.71	0.55
Control Delay		57.1	29.2		56.9	40.1	29.5	39.2	36.7	57.0	70.2	59.1

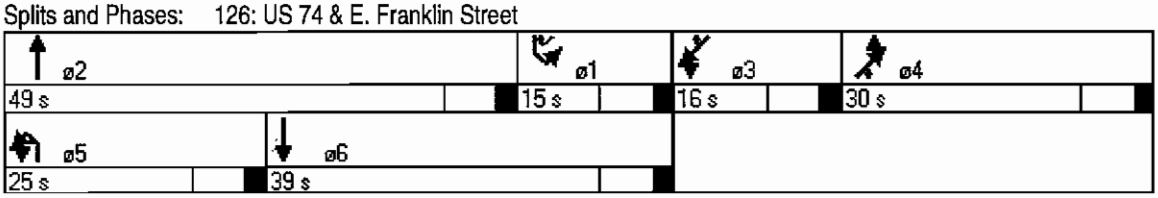
Lane Group	SWR
Lane Configurations	↱
Volume (vph)	90
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1568
Flt Permitted	
Satd. Flow (perm)	1568
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Adj. Flow (vph)	100
Shared Lane Traffic (%)	
Lane Group Flow (vph)	100
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	pt+ov
Protected Phases	3 1
Permitted Phases	
Detector Phase	3 1
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	31.0
Total Split (%)	28.2%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	25.9
Actuated g/C Ratio	0.24
v/c Ratio	0.27
Control Delay	36.7

Lane Group	NBU	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		57.1	29.2		56.9	40.1	29.5	39.2	36.7	57.0	70.2	59.1
LOS		E	C		E	D	C	D	D	E	E	E
Approach Delay			35.4			40.1			51.1			56.4
Approach LOS			D			D			D			E

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
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: 0.87
Intersection Signal Delay: 40.8 Intersection LOS: D
Intersection Capacity Utilization 73.9% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 126: US 74 & E. Franklin Street



Lane Group	SWR
Queue Delay	0.0
Total Delay	36.7
LOS	D
Approach Delay	
Approach LOS	

Intersection Summary

Lane Group	NBU	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Volume (vph)	10	480	1130	110	90	1450	130	90	90	430	100	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.86	0.97	0.86	0.86	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00
Frt			0.987				0.850			0.850		
Flt Protected		0.950			0.950			0.950			0.950	
Satd. Flow (prot)	0	3273	6029	0	1687	4848	1509	1752	1845	2760	1752	1845
Flt Permitted		0.950			0.950			0.950			0.950	
Satd. Flow (perm)	0	3273	6029	0	1687	4848	1509	1752	1845	2760	1752	1845
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			45			35			20
Link Distance (ft)			341			436			391			335
Travel Time (s)			5.2			6.6			7.6			11.4
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 (%)	7%	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%
Adj. Flow (vph)	11	533	1256	122	100	1611	144	100	100	478	111	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	544	1378	0	100	1611	144	100	100	478	111	100
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	Left	Left	Right	Left	Left
Median Width (ft)			24			24			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width (ft)			0			0			0			0
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		Perm	Split		Prot	Split	
Protected Phases	5	5	2		1	6		4	4	4	3	3
Permitted Phases							6					
Detector Phase	5	5	2		1	6	6	4	4	4	3	3
Switch Phase												
Minimum Initial (s)	7.0	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	14.0	19.0		14.0	19.0	19.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	32.0	32.0	69.0	0.0	21.0	58.0	58.0	33.0	33.0	33.0	17.0	17.0
Total Split (%)	22.9%	22.9%	49.3%	0.0%	15.0%	41.4%	41.4%	23.6%	23.6%	23.6%	12.1%	12.1%
Maximum Green (s)	25.0	25.0	62.0		14.0	51.0	51.0	26.0	26.0	26.0	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	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	Lead		Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.1	3.1	3.1		3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Recall Mode	None	None	C-Max		None	C-Max	C-Max	None	None	None	None	None
Act Effct Green (s)		26.5	64.7		16.0	54.1	54.1	27.4	27.4	27.4	11.9	11.9
Actuated g/C Ratio		0.19	0.46		0.11	0.39	0.39	0.20	0.20	0.20	0.08	0.08
v/c Ratio		0.88	0.49		0.52	0.86	0.25	0.29	0.28	0.88	0.74	0.64
Control Delay		71.2	27.2		68.7	45.4	31.0	50.4	50.0	73.4	91.1	80.7

Lane Group	SWR
Lane Configurations	
Volume (vph)	60
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
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%
Adj. Flow (vph)	67
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	pt+ov
Protected Phases	3 1
Permitted Phases	
Detector Phase	3 1
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	38.0
Total Split (%)	27.1%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	32.9
Actuated g/C Ratio	0.24
v/c Ratio	0.18
Control Delay	44.4

Lane Group	NBU	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		71.2	27.2		68.7	45.4	31.0	50.4	50.0	73.4	91.1	80.7
LOS		E	C		E	D	C	D	D	E	F	F
Approach Delay			39.6			45.6			66.5			76.1
Approach LOS			D			D			E			E

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

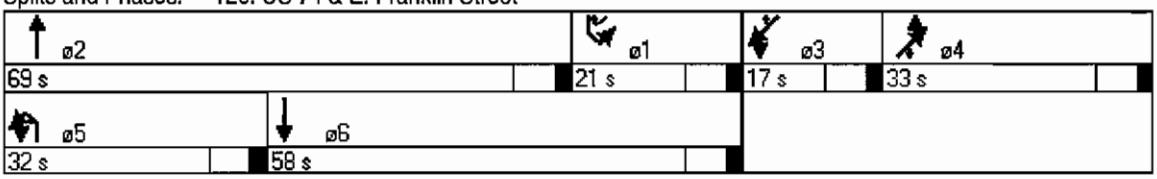
Maximum v/c Ratio: 0.88

Intersection Signal Delay: 48.0 Intersection LOS: D

Intersection Capacity Utilization 79.5% ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 126: US 74 & E. Franklin Street



Lane Group	SWR
Queue Delay	0.0
Total Delay	44.4
LOS	D
Approach Delay	
Approach LOS	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	0	1120	480	40	1280	10	820	0	60	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.999			0.979			
Flt Protected	0.950				0.950			0.950	0.959			
Satd. Flow (prot)	1687	0	4841	1509	1687	4843	0	1504	1487	0	0	0
Flt Permitted	0.950				0.950			0.950	0.959			
Satd. Flow (perm)	1687	0	4841	1509	1687	4843	0	1504	1487	0	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			55			45			25
Link Distance (ft)			239			375			459			149
Travel Time (s)			3.6			4.6			7.0			4.1
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 (%)	7%	7%	7%	7%	7%	7%	7%	14%	14%	14%	2%	2%
Bus Blockages (#/hr)	0	0	1	0	0	0	0	0	0	0	0	0
Adj. Flow (vph)	11	0	1244	533	44	1422	11	911	0	67	0	0
Shared Lane Traffic (%)								46%				
Lane Group Flow (vph)	11	0	1244	533	44	1433	0	492	486	0	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	Left	Left	Right	Left	Left
Median Width(ft)			12			12			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			0			0			0			0
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			Split				
Protected Phases	5		2		1	6		8	8			
Permitted Phases				2								
Detector Phase	5		2	2	1	6		8	8			
Switch Phase												
Minimum Initial (s)	7.0		12.0	12.0	7.0	14.0		7.0	7.0			
Minimum Split (s)	14.0		19.0	19.0	14.0	21.0		14.0	14.0			
Total Split (s)	14.0	0.0	50.0	50.0	14.0	50.0	0.0	46.0	46.0	0.0	0.0	0.0
Total Split (%)	12.7%	0.0%	45.5%	45.5%	12.7%	45.5%	0.0%	41.8%	41.8%	0.0%	0.0%	0.0%
Maximum Green (s)	7.0		43.0	43.0	7.0	43.0		39.0	39.0			
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	5.0	2.0	2.0	2.0
Lead/Lag	Lag		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	3.0			
Recall Mode	None		C-Max	C-Max	None	C-Max		None	None			
Act Effct Green (s)	9.0		52.1	52.1	9.0	57.7		39.5	39.5			
Actuated g/C Ratio	0.08		0.47	0.47	0.08	0.52		0.36	0.36			
v/c Ratio	0.08		0.54	0.75	0.32	0.56		0.91	0.91			

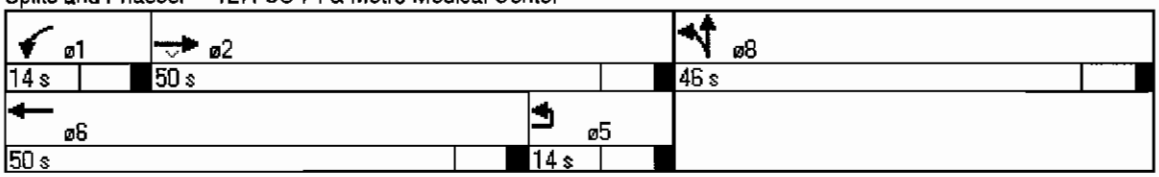
Lane Group	SBR
Lane Configurations	
Volume (vph)	20
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1611
Flt Permitted	
Satd. Flow (perm)	1611
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Bus Blockages (#/hr)	0
Adj. Flow (vph)	22
Shared Lane Traffic (%)	
Lane Group Flow (vph)	22
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	Free
Protected Phases	
Permitted Phases	Free
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)	110.0
Actuated g/C Ratio	1.00
v/c Ratio	0.01

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Control Delay	48.2		23.1	34.0	54.3	19.9		56.2	56.4			
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0	0.0			
Total Delay	48.2		23.1	34.0	54.3	19.9		56.2	56.4			
LOS	D		C	C	D	B		E	E			
Approach Delay			26.5			20.9			56.3			
Approach LOS			C			C			E			

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
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: 0.91
Intersection Signal Delay: 31.3 Intersection LOS: C
Intersection Capacity Utilization 66.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 127: US 74 & Metro Medical Center



Lane Group	SBR
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	0	1300	820	60	1110	20	480	0	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.997			0.977			
Flt Protected	0.950				0.950			0.950	0.959			
Satd. Flow (prot)	1687	0	4848	1509	1687	4833	0	1504	1483	0	0	0
Flt Permitted	0.950				0.950			0.950	0.959			
Satd. Flow (perm)	1687	0	4848	1509	1687	4833	0	1504	1483	0	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			55			45			25
Link Distance (ft)			239			375			459			168
Travel Time (s)			3.6			4.6			7.0			4.6
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 (%)	7%	7%	7%	7%	7%	7%	7%	14%	14%	14%	2%	2%
Adj. Flow (vph)	11	0	1444	911	67	1233	22	533	0	44	0	0
Shared Lane Traffic (%)								45%				
Lane Group Flow (vph)	11	0	1444	911	67	1255	0	293	284	0	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	Left	Left	Right	Left	Left
Median Width (ft)			12			12			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width (ft)			0			0			0			0
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			Split				
Protected Phases	5		2		1	6		8	8			
Permitted Phases				2								
Detector Phase	5		2	2	1	6		8	8			
Switch Phase												
Minimum Initial (s)	7.0		12.0	12.0	7.0	14.0		7.0	7.0			
Minimum Split (s)	14.0		19.0	19.0	14.0	21.0		14.0	14.0			
Total Split (s)	14.0	0.0	93.0	93.0	14.0	93.0	0.0	33.0	33.0	0.0	0.0	0.0
Total Split (%)	10.0%	0.0%	66.4%	66.4%	10.0%	66.4%	0.0%	23.6%	23.6%	0.0%	0.0%	0.0%
Maximum Green (s)	7.0		86.0	86.0	7.0	86.0		26.0	26.0			
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	5.0	2.0	2.0	2.0
Lead/Lag	Lag		Lag	Lag	Lead	Lead						
Lead-Lag Optimize?			Yes	Yes		Yes						
Vehicle Extension (s)	3.1		3.1	3.1	3.1	3.1		3.1	3.1			
Recall Mode	None		C-Max	C-Max	None	C-Max		None	None			
Act Effct Green (s)	9.0		90.8	90.8	9.0	96.4		28.0	28.0			
Actuated g/C Ratio	0.06		0.65	0.65	0.06	0.69		0.20	0.20			
v/c Ratio	0.10		0.46	0.93	0.62	0.38		0.97	0.96			
Control Delay	64.1		13.4	40.0	88.1	10.2		100.8	97.3			

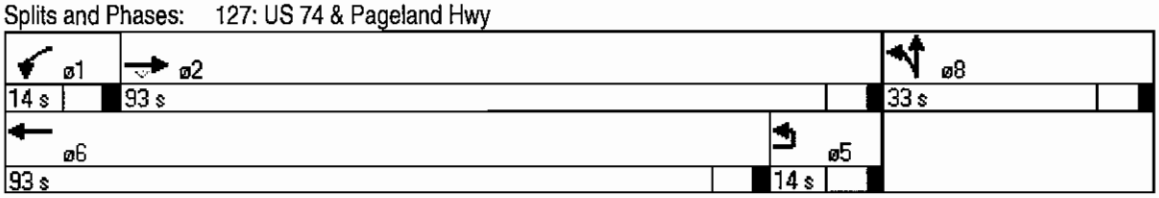
Lane Group	SBR
Lane Configurations	↱
Volume (vph)	10
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1611
Flt Permitted	
Satd. Flow (perm)	1611
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	2%
Adj. Flow (vph)	11
Shared Lane Traffic (%)	
Lane Group Flow (vph)	11
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	Free
Protected Phases	
Permitted Phases	Free
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)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.01
Control Delay	0.0

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0	0.0			
Total Delay	64.1		13.4	40.0	88.1	10.2		100.8	97.3			
LOS	E		B	D	F	B		F	F			
Approach Delay			23.9			14.2			99.1			
Approach LOS			C			B			F			

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 31.0 Intersection LOS: C
Intersection Capacity Utilization 64.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 127: US 74 & Pageland Hwy



Lane Group	SBR
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	

Intersection Summary

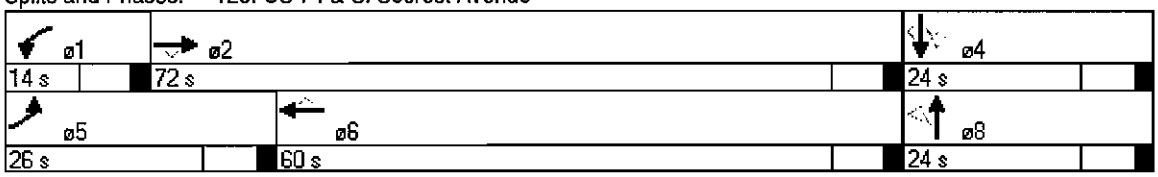
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	970	20	10	1210	140	30	100	10	60	40	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.990				0.850
Flt Protected	0.950			0.950				0.989			0.971	
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	0	1824	0	0	1809	1583
Flt Permitted	0.950			0.950				0.901			0.583	
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	0	1662	0	0	1086	1583
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)			22			156						
Link Speed (mph)		55			55			35			35	
Link Distance (ft)		411			374			242			283	
Travel Time (s)		5.1			4.6			4.7			5.5	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	200	1078	22	11	1344	156	33	111	11	67	44	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	1078	22	11	1344	156	0	155	0	0	111	100
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)		0			0			0			0	
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		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	2	1	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	14.0	14.0	7.0	14.0	14.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	21.0	21.0	14.0	21.0	21.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	26.0	72.0	72.0	14.0	60.0	60.0	24.0	24.0	0.0	24.0	24.0	24.0
Total Split (%)	23.6%	65.5%	65.5%	12.7%	54.5%	54.5%	21.8%	21.8%	0.0%	21.8%	21.8%	21.8%
Maximum Green (s)	19.0	65.0	65.0	7.0	53.0	53.0	17.0	17.0		17.0	17.0	17.0
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	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	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	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Time Before Reduce (s)	0.0	25.0	25.0	0.0	25.0	25.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	None
Act Effct Green (s)	18.7	80.7	80.7	9.0	59.8	59.8		16.5			16.5	16.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.17	0.73	0.73	0.08	0.54	0.54	0.15			0.15	0.15	
v/c Ratio	0.70	0.44	0.02	0.08	0.73	0.17	0.62			0.68	0.42	
Control Delay	56.2	7.4	2.8	48.2	23.1	2.9	54.7			64.8	47.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	
Total Delay	56.2	7.4	2.8	48.2	23.1	2.9	54.7			64.8	47.3	
LOS	E	A	A	D	C	A	D			E	D	
Approach Delay		14.8			21.2		54.7			56.5		
Approach LOS		B			C		D			E		

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 22.6 Intersection LOS: C
Intersection Capacity Utilization 70.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 128: US 74 & S. Secrest Avenue



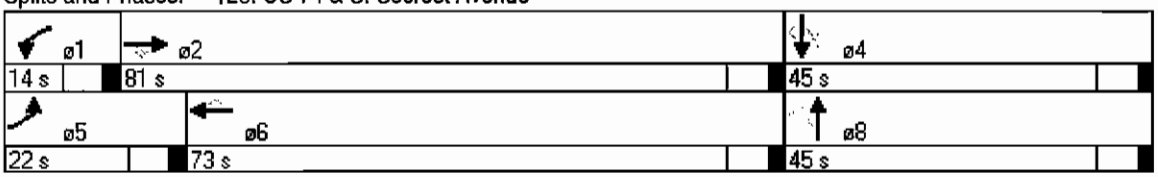
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	1210	30	10	970	60	20	40	10	140	100	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.981				0.850
Flt Protected	0.950			0.950				0.986			0.972	
Satd. Flow (prot)	1518	3036	1358	1518	3036	1358	0	1622	0	0	1630	1425
Flt Permitted	0.950			0.950				0.781			0.775	
Satd. Flow (perm)	1518	3036	1358	1518	3036	1358	0	1284	0	0	1299	1425
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)			29			65						
Link Speed (mph)		55			55			35			35	
Link Distance (ft)		411			374			242			283	
Travel Time (s)		5.1			4.6			4.7			5.5	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	100	1344	33	11	1078	67	22	44	11	156	111	200
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	1344	33	11	1078	67	0	77	0	0	267	200
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)		0			0			0			0	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		Perm	Prot		Perm	Perm				Perm	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	2	1	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	14.0	14.0	7.0	14.0	14.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	21.0	21.0	14.0	21.0	21.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	22.0	81.0	81.0	14.0	73.0	73.0	45.0	45.0	0.0	45.0	45.0	45.0
Total Split (%)	15.7%	57.9%	57.9%	10.0%	52.1%	52.1%	32.1%	32.1%	0.0%	32.1%	32.1%	32.1%
Maximum Green (s)	15.0	74.0	74.0	7.0	66.0	66.0	38.0	38.0		38.0	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
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	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1		3.1	3.1	3.1
Minimum Gap (s)	0.2	3.0	3.0	0.2	3.0	3.0	0.2	0.2		0.2	0.2	0.2
Time Before Reduce (s)	0.0	25.0	25.0	0.0	25.0	25.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	None
Act Effct Green (s)	15.1	90.0	90.0	9.0	75.6	75.6		34.4			34.4	34.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.11	0.64	0.64	0.06	0.54	0.54		0.25			0.25	0.25
v/c Ratio	0.61	0.69	0.04	0.11	0.66	0.09		0.24			0.84	0.57
Control Delay	75.5	20.9	5.6	64.6	26.9	4.8		42.7			72.1	52.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	75.5	20.9	5.6	64.6	26.9	4.8		42.7			72.1	52.2
LOS	E	C	A	E	C	A		D			E	D
Approach Delay		24.2			26.0			42.7			63.6	
Approach LOS		C			C			D			E	

Intersection Summary

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
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: 0.84
Intersection Signal Delay: 31.1 Intersection LOS: C
Intersection Capacity Utilization 76.6% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 128: US 74 & S. Secrest Avenue



TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*US 74 and Bivens Road*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*11/26/2007*	Analysis Year	*2007*
Analysis Time Period	*AM Peak*		

Project Description *Monroe Bypass / Connector*

East/West Street: *US 74*	North/South Street: *Bivens Road*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*60*	*1010*	*10*	*10*	*1240*	*50*
Peak-hour factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate (veh/h)	*66*	*1122*	*11*	*11*	*1377*	*55*
Proportion of heavy vehicles, P_{HV}	*7*	--	--	*7*	--	--
Median type	*Undivided*					
RT Channelized?			*0*			*1*
Lanes	*1*	*2*	*1*	*1*	*2*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*10*	*10*	*10*	*40*	*10*	*60*
Peak-hour factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate (veh/h)	*11*	*11*	*11*	*44*	*11*	*66*
Proportion of heavy vehicles, P_{HV}	*2*	*2*	*2*	*2*	*2*	*2*
Percent grade (%)		*0*			*0*	
Flared approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized?			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
Volume, v (vph)	*66*	*11*		*33*			*121*	
Capacity, c_m (vph)	*469*	*584*		*25*			*31*	
v/c ratio	*0.14*	*0.02*		*1.32*			*3.90*	
Queue length (95%)	*0.49*	*0.06*		*4.05*			*14.40*	
Control Delay (s/veh)	*13.9*	*11.3*		*522.2*			*1569*	

LOS	*B*	*B*		*F*			*F*	
Approach delay (s/veh)	--	--	*522.2*			*1569*		
Approach LOS	--	--	*F*			*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BSL*
Agency/Co.	*PBS&J*
Date Performed	*11/26/2007*
Analysis Time Period	*PM Peak*

Site Information

Intersection	*US 74 and Bivens Road*
Jurisdiction	
Analysis Year	*2007*

Project Description *Monroe Bypass / Connector*

East/West Street: *US 74* | North/South Street: *Bivens Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*60*	*1240*	*10*	*10*	*1010*	*40*
Peak-hour factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate (veh/h)	*66*	*1377*	*11*	*11*	*1122*	*44*
Proportion of heavy vehicles, P_{HV}	*7*	--	--	*7*	--	--
Median type	*Undivided*					
RT Channelized?			*0*			*1*
Lanes	*1*	*2*	*1*	*1*	*2*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*10*	*10*	*10*	*50*	*10*	*70*
Peak-hour factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate (veh/h)	*11*	*11*	*11*	*55*	*11*	*77*
Proportion of heavy vehicles, P_{HV}	*2*	*2*	*2*	*2*	*2*	*2*
Percent grade (%)		*0*			*0*	
Flared approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized?			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
Volume, v (vph)	*66*	*11*		*33*			*143*	
Capacity, c_m (vph)	*590*	*464*		*22*			*38*	
v/c ratio	*0.11*	*0.02*		*1.50*			*3.76*	
Queue length (95%)	*0.38*	*0.07*		*4.27*			*16.40*	
Control Delay (s/veh)	*11.9*	*12.9*		*632.0*			*1461*	

LOS	*B*	*B*		*F*			*F*	
Approach delay (s/veh)	--	--	*632.0*			*1461*		
Approach LOS	--	--	*F*			*F*		

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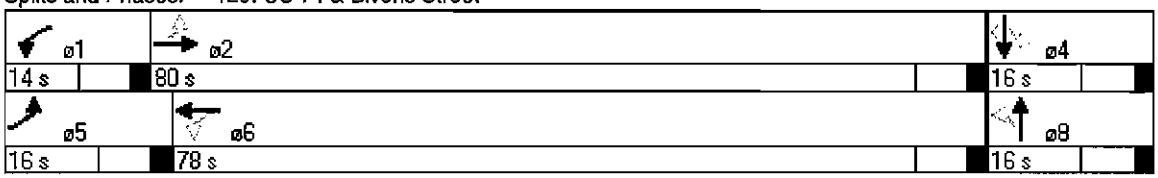
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	990	30	10	1220	50	20	10	10	30	10	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.994			0.966				0.850
Flt Protected	0.950			0.950				0.976			0.964	
Satd. Flow (prot)	1687	3360	0	1687	3354	0	0	1756	0	0	1796	1583
Flt Permitted	0.139			0.236				0.819			0.822	
Satd. Flow (perm)	247	3360	0	419	3354	0	0	1474	0	0	1531	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			20			25	
Link Distance (ft)		251			259			175			292	
Travel Time (s)		4.9			5.0			6.0			8.0	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	56	1100	33	11	1356	56	22	11	11	33	11	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	1133	0	11	1412	0	0	44	0	0	44	44
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)		0			0			0			0	
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	pm+pt			pm+pt			Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	14.0
Total Split (s)	16.0	80.0	0.0	14.0	78.0	0.0	16.0	16.0	0.0	16.0	16.0	16.0
Total Split (%)	14.5%	72.7%	0.0%	12.7%	70.9%	0.0%	14.5%	14.5%	0.0%	14.5%	14.5%	14.5%
Maximum Green (s)	9.0	73.0		7.0	71.0		9.0	9.0		9.0	9.0	9.0
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	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	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	3.0
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None
Act Effct Green (s)	90.8	90.0		87.7	81.5			11.0			11.0	11.0
Actuated g/C Ratio	0.83	0.82		0.80	0.74			0.10			0.10	0.10
v/c Ratio	0.17	0.41		0.03	0.57			0.30			0.29	0.28
Control Delay	3.6	5.0		2.7	9.9			50.5			50.0	49.6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0			0.0	0.0	
Total Delay	3.6	5.0		2.7	9.9		50.5			50.0	49.6	
LOS	A	A		A	A		D			D	D	
Approach Delay		4.9			9.8		50.5			49.8		
Approach LOS		A			A		D			D		

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 9.6 Intersection LOS: A
Intersection Capacity Utilization 59.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 129: US 74 & Bivens Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1220	20	10	990	30	30	10	10	50	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.996			0.973				0.850
Flt Protected	0.950			0.950				0.971			0.960	
Satd. Flow (prot)	1687	3367	0	1687	3360	0	0	1760	0	0	1788	1583
Flt Permitted	0.213			0.167				0.777			0.748	
Satd. Flow (perm)	378	3367	0	297	3360	0	0	1408	0	0	1393	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			20			25	
Link Distance (ft)		251			259			175			292	
Travel Time (s)		4.9			5.0			6.0			8.0	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	44	1356	22	11	1100	33	33	11	11	56	11	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	1378	0	11	1133	0	0	55	0	0	67	56
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)		0			0			0			0	
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	pm+pt			pm+pt			Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8			4		4
Detector Phase	5	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	14.0
Total Split (s)	16.0	101.0	0.0	15.0	100.0	0.0	24.0	24.0	0.0	24.0	24.0	24.0
Total Split (%)	11.4%	72.1%	0.0%	10.7%	71.4%	0.0%	17.1%	17.1%	0.0%	17.1%	17.1%	17.1%
Maximum Green (s)	9.0	94.0		8.0	93.0		17.0	17.0		17.0	17.0	17.0
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	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.1	3.1		3.1	3.1		3.1	3.1		3.1	3.1	3.1
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None
Act Effct Green (s)	113.8	110.2		111.8	104.6			14.2			14.2	14.2
Actuated g/C Ratio	0.81	0.79		0.80	0.75			0.10			0.10	0.10
v/c Ratio	0.11	0.52		0.03	0.45			0.38			0.48	0.35
Control Delay	3.3	7.5		3.0	8.3			65.4			69.5	63.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	3.3	7.5		3.0	8.3			65.4			69.5	63.3
LOS	A	A		A	A			E			E	E
Approach Delay		7.4			8.3			65.4			66.6	
Approach LOS		A			A			E			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

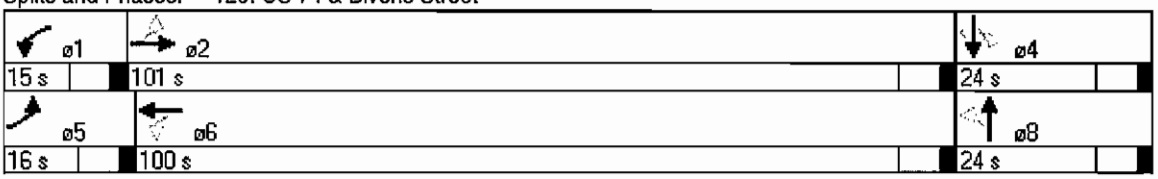
Maximum v/c Ratio: 0.52

Intersection Signal Delay: 11.6 Intersection LOS: B

Intersection Capacity Utilization 52.5% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 129: US 74 & Bivens Street



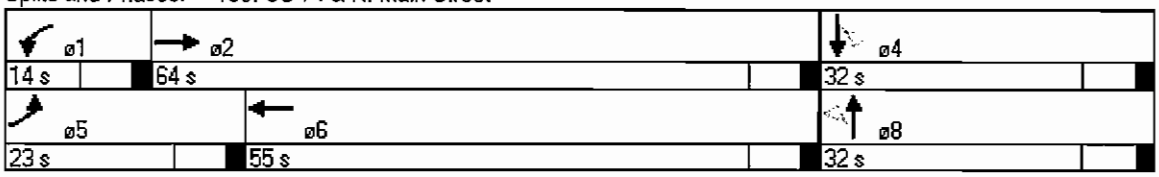
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	810	70	20	1010	50	80	50	20	40	40	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.993			0.982			0.881	
Flt Protected	0.950			0.950				0.974		0.950		
Satd. Flow (prot)	1687	3333	0	1687	3350	0	0	1782	0	1770	1641	0
Flt Permitted	0.950			0.950				0.519		0.617		
Satd. Flow (perm)	1687	3333	0	1687	3350	0	0	949	0	1149	1641	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		282			333			173			197	
Travel Time (s)		5.5			6.5			3.4			3.8	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	178	900	78	22	1122	56	89	56	22	44	44	167
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	978	0	22	1178	0	0	167	0	44	211	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	23.0	64.0	0.0	14.0	55.0	0.0	32.0	32.0	0.0	32.0	32.0	0.0
Total Split (%)	20.9%	58.2%	0.0%	12.7%	50.0%	0.0%	29.1%	29.1%	0.0%	29.1%	29.1%	0.0%
Maximum Green (s)	16.0	57.0		7.0	48.0		25.0	25.0		25.0	25.0	
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	Lag		Lead	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	C-Max		None	None		None	None		None	None	
Act Effct Green (s)	16.7	71.3		9.0	55.2			23.1		23.1	23.1	
Actuated g/C Ratio	0.15	0.65		0.08	0.50			0.21		0.21	0.21	
v/c Ratio	0.70	0.45		0.16	0.70			0.84		0.18	0.61	
Control Delay	58.9	12.3		50.0	25.2			73.8		35.7	46.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0			0.0	0.0	
Total Delay	58.9	12.3		50.0	25.2		73.8			35.7	46.6	
LOS	E	B		D	C		E			D	D	
Approach Delay		19.5			25.6		73.8				44.7	
Approach LOS		B			C		E				D	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 27.7 Intersection LOS: C
Intersection Capacity Utilization 74.7% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 130: US 74 & N. Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1010	80	20	810	40	70	40	20	50	50	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.993			0.979			0.886	
Flt Protected	0.950			0.950				0.974		0.950		
Satd. Flow (prot)	1687	3337	0	1687	3350	0	0	1776	0	1770	1650	0
Flt Permitted	0.950			0.950				0.410		0.628		
Satd. Flow (perm)	1687	3337	0	1687	3350	0	0	748	0	1170	1650	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		282			333			173			197	
Travel Time (s)		5.5			6.5			3.4			3.8	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	167	1122	89	22	900	44	78	44	22	56	56	178
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	1211	0	22	944	0	0	144	0	56	234	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	31.0	83.0	0.0	14.0	66.0	0.0	43.0	43.0	0.0	43.0	43.0	0.0
Total Split (%)	22.1%	59.3%	0.0%	10.0%	47.1%	0.0%	30.7%	30.7%	0.0%	30.7%	30.7%	0.0%
Maximum Green (s)	24.0	76.0		7.0	59.0		36.0	36.0		36.0	36.0	
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	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.1	3.1		3.1	3.1		3.1	3.1		3.1	3.1	
Recall Mode	None	C-Max		None	None		None	None		None	None	
Act Effct Green (s)	20.8	93.3		9.4	76.3			27.9		27.9	27.9	
Actuated g/C Ratio	0.15	0.67		0.07	0.54			0.20		0.20	0.20	
v/c Ratio	0.67	0.54		0.19	0.52			0.97		0.24	0.71	
Control Delay	68.8	15.6		66.0	23.4			120.3		47.2	63.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	68.8	15.6		66.0	23.4			120.3		47.2	63.6	
LOS	E	B		E	C			F		D	E	
Approach Delay		22.0			24.4			120.3			60.4	
Approach LOS		C			C			F			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

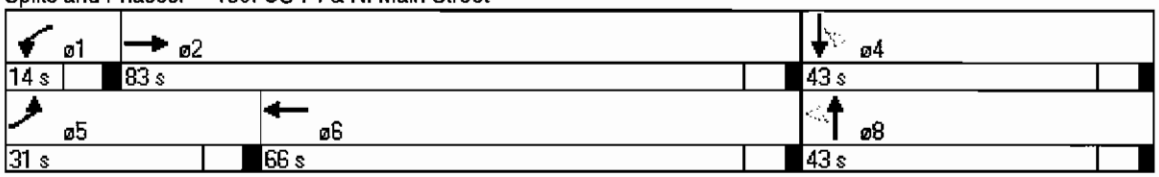
Maximum v/c Ratio: 0.97

Intersection Signal Delay: 31.9 Intersection LOS: C

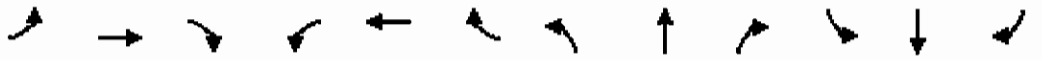
Intersection Capacity Utilization 72.6% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 130: US 74 & N. Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	660	140	10	850	10	80	10	10	20	40	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.998			0.987			0.955	
Flt Protected	0.950			0.950				0.961			0.989	
Satd. Flow (prot)	1687	3374	1509	1687	3367	0	0	1684	0	0	1726	0
Flt Permitted	0.950			0.950				0.665			0.922	
Satd. Flow (perm)	1687	3374	1509	1687	3367	0	0	1165	0	0	1609	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			55			35	
Link Distance (ft)		576			646			376			353	
Travel Time (s)		7.1			8.0			4.7			6.9	
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 (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	4%	4%	4%
Adj. Flow (vph)	11	733	156	11	944	11	89	11	11	22	44	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	733	156	11	955	0	0	111	0	0	99	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)		0			0			0			0	
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			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	14.0	14.0	7.0	14.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	21.0	21.0	14.0	21.0		14.0	14.0		14.0	14.0	
Total Split (s)	16.0	63.0	63.0	16.0	63.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Split (%)	14.5%	57.3%	57.3%	14.5%	57.3%	0.0%	28.2%	28.2%	0.0%	28.2%	28.2%	0.0%
Maximum Green (s)	9.0	56.0	56.0	9.0	56.0		24.0	24.0		24.0	24.0	
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	Lead	Lag	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	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Act Effct Green (s)	9.1	79.8	79.8	9.1	79.8			17.2			17.2	
Actuated g/C Ratio	0.08	0.73	0.73	0.08	0.73			0.16			0.16	
v/c Ratio	0.08	0.30	0.14	0.08	0.39			0.61			0.39	
Control Delay	47.8	7.1	6.9	47.8	7.9			56.3			44.8	

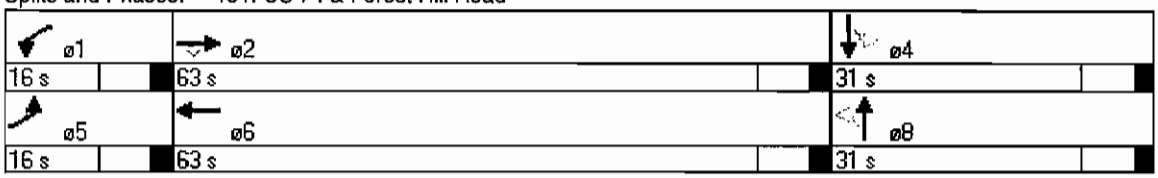


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	47.8	7.1	6.9	47.8	7.9			56.3			44.8	
LOS	D	A	A	D	A			E			D	
Approach Delay		7.6			8.3			56.3			44.8	
Approach LOS		A			A			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 12.3 Intersection LOS: B
Intersection Capacity Utilization 44.4% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 131: US 74 & Forest Hill Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	850	80	10	670	20	140	40	10	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.996			0.993			0.955	
Flt Protected	0.950			0.950				0.964			0.984	
Satd. Flow (prot)	1687	3374	1509	1687	3360	0	0	1700	0	0	1717	0
Flt Permitted	0.950			0.950				0.761			0.897	
Satd. Flow (perm)	1687	3374	1509	1687	3360	0	0	1342	0	0	1565	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			55			35	
Link Distance (ft)		576			646			376			353	
Travel Time (s)		7.1			8.0			4.7			6.9	
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 (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	4%	4%	4%
Adj. Flow (vph)	33	944	89	11	744	22	156	44	11	11	11	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	944	89	11	766	0	0	211	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			0			0	
Crosswalk Width (ft)		0			0			0			0	
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			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	14.0	14.0	7.0	14.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	21.0	21.0	14.0	21.0		14.0	14.0		14.0	14.0	
Total Split (s)	16.0	73.0	73.0	16.0	73.0	0.0	51.0	51.0	0.0	51.0	51.0	0.0
Total Split (%)	11.4%	52.1%	52.1%	11.4%	52.1%	0.0%	36.4%	36.4%	0.0%	36.4%	36.4%	0.0%
Maximum Green (s)	9.0	66.0	66.0	9.0	66.0		44.0	44.0		44.0	44.0	
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	Lead	Lag	Lag	Lead	Lag							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.1	3.1	3.1	3.1	3.1		3.1	3.1		3.1	3.1	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Act Effct Green (s)	10.6	94.5	94.5	9.3	90.4			29.6			29.6	
Actuated g/C Ratio	0.08	0.68	0.68	0.07	0.65			0.21			0.21	
v/c Ratio	0.26	0.41	0.09	0.10	0.35			0.74			0.10	
Control Delay	65.5	13.1	11.1	63.3	14.2			66.7			41.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	65.5	13.1	11.1	63.3	14.2			66.7			41.8	
LOS	E	B	B	E	B			E			D	
Approach Delay		14.5			14.9			66.7			41.8	
Approach LOS		B			B			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 20.4 Intersection LOS: C
Intersection Capacity Utilization 50.4% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 131: US 74 & Forest Hill Road

ø1	ø2	ø4
16 s	73 s	51 s
ø5	ø6	ø8
16 s	73 s	51 s

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 Intersection Analysis
2030 No-Build

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	330	170	110	210	270	90	50	2630	340	130	3290	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1687	3374	1509	1687	3374	1509
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1687	3374	1509	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			45			55			55	
Link Distance (ft)		1096			1168			1536			3465	
Travel Time (s)		21.4			17.7			19.0			43.0	
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%	2%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	367	189	122	233	300	100	56	2922	378	144	3656	178
Shared Lane Traffic (%)												
Lane Group Flow (vph)	367	189	122	233	300	100	56	2922	378	144	3656	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			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		0			0			0			0	
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	7	4	5	3	8	1	1	6	7	5	2	3
Permitted Phases			4			8			6			2
Detector Phase	7	4	5	3	8	1	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	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0
Total Split (s)	17.0	15.0	14.0	16.0	14.0	14.0	14.0	95.0	17.0	14.0	95.0	16.0
Total Split (%)	12.1%	10.7%	10.0%	11.4%	10.0%	10.0%	10.0%	67.9%	12.1%	10.0%	67.9%	11.4%
Maximum Green (s)	10.0	8.0	7.0	9.0	7.0	7.0	7.0	88.0	10.0	7.0	88.0	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	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	Lag	Lead	Lead	Lag	Lead	Lead	Lag	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)	12.0	10.0	24.0	11.0	9.0	23.0	9.0	90.0	107.0	9.0	90.0	106.0
Actuated g/C Ratio	0.09	0.07	0.17	0.08	0.06	0.16	0.06	0.64	0.76	0.06	0.64	0.76
v/c Ratio	1.25	0.75	0.45	0.86	1.32	0.38	0.52	1.35	0.33	1.33	1.69	0.16
Control Delay	187.3	82.0	58.1	92.2	218.2	57.2	80.8	184.6	6.1	247.7	333.8	5.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
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
Total Delay	187.3	82.0	58.1	92.2	218.2	57.2	80.8	184.6	6.1	247.7	333.8	5.0
LOS	F	F	E	F	F	E	F	F	A	F	F	A
Approach Delay		134.7			146.4			162.8			316.0	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.69
Intersection Signal Delay: 229.9 — Intersection LOS: F
Intersection Capacity Utilization 130.3% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 101: Stallings Road & US 74

ø1	ø2	ø3	ø4
14 s	95 s	16 s	15 s

ø5	ø6	ø7	ø8
14 s	95 s	17 s	14 s

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	340	270	130	160	170	50	90	3290	330	110	2630	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1687	3374	1509	1687	3374	1509
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1687	3374	1509	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			45			55			55	
Link Distance (ft)		1096			1168			1536			3465	
Travel Time (s)		21.4			17.7			19.0			43.0	
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%	2%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	378	300	144	178	189	56	100	3656	367	122	2922	233
Shared Lane Traffic (%)												
Lane Group Flow (vph)	378	300	144	178	189	56	100	3656	367	122	2922	233
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)		0			0			0			0	
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	7	4	5	3	8	1	1	6	7	5	2	3
Permitted Phases			4			8			6			2
Detector Phase	7	4	5	3	8	1	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	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0
Total Split (s)	17.0	17.0	14.0	14.0	14.0	14.0	14.0	95.0	17.0	14.0	95.0	14.0
Total Split (%)	12.1%	12.1%	10.0%	10.0%	10.0%	10.0%	10.0%	67.9%	12.1%	10.0%	67.9%	10.0%
Maximum Green (s)	10.0	10.0	7.0	7.0	7.0	7.0	7.0	88.0	10.0	7.0	88.0	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	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	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)	12.0	12.0	26.0	9.0	9.0	23.0	9.0	90.0	107.0	9.0	90.0	104.0
Actuated g/C Ratio	0.09	0.09	0.19	0.06	0.06	0.16	0.06	0.64	0.76	0.06	0.64	0.74
v/c Ratio	1.29	0.99	0.49	0.81	0.83	0.22	0.93	1.69	0.32	1.13	1.35	0.21
Control Delay	200.8	112.4	57.5	90.5	92.6	53.3	132.5	333.8	6.0	182.3	184.6	6.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
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
Total Delay	200.8	112.4	57.5	90.5	92.6	53.3	132.5	333.8	6.0	182.3	184.6	6.0
LOS	F	F	E	F	F	D	F	F	A	F	F	A
Approach Delay		143.4			86.5			299.7			171.8	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.69
Intersection Signal Delay: 226.0 Intersection LOS: F
Intersection Capacity Utilization 119.4% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 101: Stallings Road & US 74

ø1	ø2	ø3	ø4
14 s	95 s	14 s	17 s

ø5	ø6	ø7	ø8
14 s	95 s	17 s	14 s

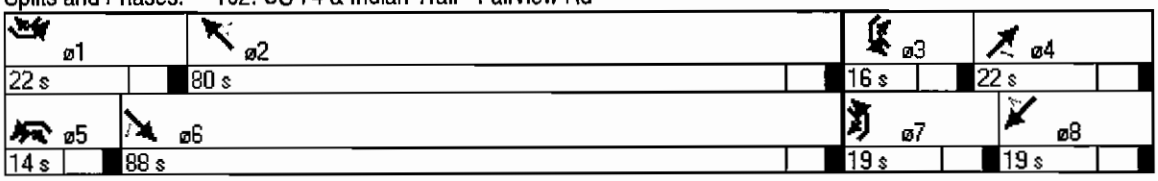
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	260	2220	420	80	2710	90	430	230	70	140	420	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3273	3374	1509	1687	3374	1509	3335	3438	1538	3335	3438	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3273	3374	1509	1687	3374	1509	3335	3438	1538	3335	3438	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			35			35	
Link Distance (ft)		2103			2380			902			1112	
Travel Time (s)		26.1			29.5			17.6			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 (%)	7%	7%	7%	7%	7%	7%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	289	2467	467	89	3011	100	478	256	78	156	467	556
Shared Lane Traffic (%)												
Lane Group Flow (vph)	289	2467	467	89	3011	100	478	256	78	156	467	556
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)		0			0			0			0	
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	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Detector Phase	1	6	7	5	2	3	7	4	5	3	8	1
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.5	21.0	14.0	14.0	21.0	14.0	14.0	14.0	14.0	14.0	14.0	14.5
Total Split (s)	22.0	88.0	19.0	14.0	80.0	16.0	19.0	22.0	14.0	16.0	19.0	22.0
Total Split (%)	15.7%	62.9%	13.6%	10.0%	57.1%	11.4%	13.6%	15.7%	10.0%	11.4%	13.6%	15.7%
Maximum Green (s)	15.0	81.0	12.0	7.0	73.0	9.0	12.0	15.0	7.0	9.0	12.0	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	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	Lag	Lead	Lead	Lag	Lead	Lead	Lag	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)	17.0	83.0	102.0	9.0	75.0	90.9	14.0	17.1	31.1	10.9	14.0	36.0
Actuated g/C Ratio	0.12	0.59	0.73	0.06	0.54	0.65	0.10	0.12	0.22	0.08	0.10	0.26
v/c Ratio	0.73	1.23	0.42	0.82	1.67	0.10	1.43	0.61	0.23	0.60	1.36	1.41
Control Delay	70.8	137.6	8.9	112.7	328.0	9.5	253.9	65.2	46.8	72.7	224.6	236.6

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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
Total Delay	70.8	137.6	8.9	112.7	328.0	9.5	253.9	65.2	46.8	72.7	224.6	236.6
LOS	E	F	A	F	F	A	F	E	D	E	F	F
Approach Delay		112.9			312.1			174.5			210.1	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.67
Intersection Signal Delay: 208.2 — Intersection LOS: F
Intersection Capacity Utilization 130.6% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 102: US 74 & Indian Trail - Fairview Rd



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	500	2710	430	70	2220	140	420	420	80	90	230	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3273	3374	1509	1687	3374	1509	3335	3438	1538	3335	3438	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3273	3374	1509	1687	3374	1509	3335	3438	1538	3335	3438	1538
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			35			35	
Link Distance (ft)		2103			2380			902			1112	
Travel Time (s)		26.1			29.5			17.6			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 (%)	7%	7%	7%	7%	7%	7%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	556	3011	478	78	2467	156	467	467	89	100	256	289
Shared Lane Traffic (%)												
Lane Group Flow (vph)	556	3011	478	78	2467	156	467	467	89	100	256	289
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)		0			0			0			0	
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	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Detector Phase	1	6	7	5	2	3	7	4	5	3	8	1
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	23.0	93.0	19.0	14.0	84.0	14.0	19.0	19.0	14.0	14.0	14.0	23.0
Total Split (%)	16.4%	66.4%	13.6%	10.0%	60.0%	10.0%	13.6%	13.6%	10.0%	10.0%	10.0%	16.4%
Maximum Green (s)	16.0	86.0	12.0	7.0	77.0	7.0	12.0	12.0	7.0	7.0	7.0	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	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	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)	18.0	88.0	107.0	9.0	79.0	93.0	14.0	14.0	28.0	9.0	9.0	32.0
Actuated g/C Ratio	0.13	0.63	0.76	0.06	0.56	0.66	0.10	0.10	0.20	0.06	0.06	0.23
v/c Ratio	1.32	1.42	0.41	0.72	1.30	0.16	1.40	1.36	0.29	0.47	1.16	0.82
Control Delay	206.1	217.1	6.9	98.3	165.8	9.3	240.9	224.6	50.6	70.7	165.3	70.8

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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
Total Delay	206.1	217.1	6.9	98.3	165.8	9.3	240.9	224.6	50.6	70.7	165.3	70.8
LOS	F	F	A	F	F	A	F	F	D	E	F	E
Approach Delay		190.7			154.8			216.9			108.3	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

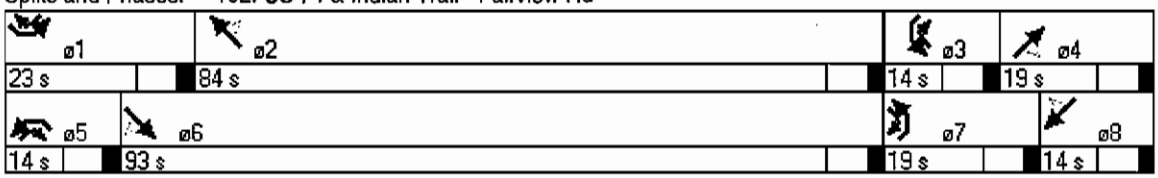
Maximum v/c Ratio: 1.42

Intersection Signal Delay: 176.1 Intersection LOS: F

Intersection Capacity Utilization 115.8% ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 102: US 74 & Indian Trail - Fairview Rd



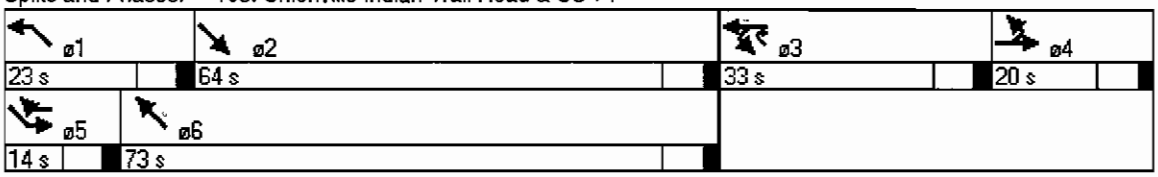
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	50	240	200	240	540	430	250	2050	70	320	2490	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Frt		0.939				0.850		0.995				0.850
Flt Protected		0.995		0.950	0.998		0.950			0.950		
Satd. Flow (prot)	0	3275	0	1665	1749	1568	3273	3357	0	1687	3374	1509
Flt Permitted		0.995		0.950	0.998		0.950			0.950		
Satd. Flow (perm)	0	3275	0	1665	1749	1568	3273	3357	0	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			45			55			55	
Link Distance (ft)		795			1304			1032			1062	
Travel Time (s)		15.5			19.8			12.8			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 (%)	3%	3%	3%	3%	3%	3%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	56	267	222	267	600	478	278	2278	78	356	2767	200
Shared Lane Traffic (%)				10%								
Lane Group Flow (vph)	0	545	0	240	627	478	278	2356	0	356	2767	200
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)		0			0			0			0	
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			Split		pm+ov	Prot			Prot		pm+ov
Protected Phases	4	4		3	3	5	5	2		1	6	3
Permitted Phases						3						6
Detector Phase	4	4		3	3	5	5	2		1	6	3
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	14.0		7.0	14.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	21.0		14.0	21.0	14.0
Total Split (s)	20.0	20.0	0.0	33.0	33.0	14.0	14.0	64.0	0.0	23.0	73.0	33.0
Total Split (%)	14.3%	14.3%	0.0%	23.6%	23.6%	10.0%	10.0%	45.7%	0.0%	16.4%	52.1%	23.6%
Maximum Green (s)	13.0	13.0		26.0	26.0	7.0	7.0	57.0		16.0	66.0	26.0
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	Lead	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	C-Max		None	C-Max	None
Act Effct Green (s)		15.0		28.0	28.0	37.0	9.0	59.0		18.0	68.0	101.0
Actuated g/C Ratio		0.11		0.20	0.20	0.26	0.06	0.42		0.13	0.49	0.72
v/c Ratio		1.55		0.72	1.79	1.15	1.32	1.67		1.64	1.69	0.18
Control Delay		302.1		65.8	399.7	125.6	223.1	331.4		345.1	339.5	6.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		302.1		65.8	399.7	125.6	223.1	331.4		345.1	339.5	6.7
LOS		F		E	F	F	F	F		F	F	A
Approach Delay		302.1			242.7			320.0			320.1	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.79
Intersection Signal Delay: 305.5 Intersection LOS: F
Intersection Capacity Utilization 136.2% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 103: Unionville Indian Trail Road & US 74



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	70	540	320	180	240	250	430	2490	50	200	2050	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Frt		0.948				0.850		0.997				0.850
Flt Protected		0.996		0.950	0.997		0.950			0.950		
Satd. Flow (prot)	0	3309	0	1665	1747	1568	3273	3364	0	1687	3374	1509
Flt Permitted		0.996		0.950	0.997		0.950			0.950		
Satd. Flow (perm)	0	3309	0	1665	1747	1568	3273	3364	0	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			45			55			55	
Link Distance (ft)		795			1304			1032			1062	
Travel Time (s)		15.5			19.8			12.8			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 (%)	3%	3%	3%	3%	3%	3%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	78	600	356	200	267	278	478	2767	56	222	2278	267
Shared Lane Traffic (%)				10%								
Lane Group Flow (vph)	0	1034	0	180	287	278	478	2823	0	222	2278	267
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)		0			0			0			0	
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			Split		pm+ov	Prot			Prot		pm+ov
Protected Phases	4	4		3	3	5	5	2		1	6	3
Permitted Phases						3						6
Detector Phase	4	4		3	3	5	5	2		1	6	3
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	14.0		7.0	14.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	21.0		14.0	21.0	14.0
Total Split (s)	30.0	30.0	0.0	20.0	20.0	18.0	18.0	72.0	0.0	18.0	72.0	20.0
Total Split (%)	21.4%	21.4%	0.0%	14.3%	14.3%	12.9%	12.9%	51.4%	0.0%	12.9%	51.4%	14.3%
Maximum Green (s)	23.0	23.0		13.0	13.0	11.0	11.0	65.0		11.0	65.0	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	Lead	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	C-Max		None	C-Max	None
Act Effct Green (s)		25.0		15.0	15.0	28.0	13.0	67.0		13.0	67.0	87.0
Actuated g/C Ratio		0.18		0.11	0.11	0.20	0.09	0.48		0.09	0.48	0.62
v/c Ratio		1.75		1.01	1.53	0.89	1.57	1.75		1.41	1.41	0.26
Control Delay		377.8		131.3	305.8	64.0	312.5	368.2		263.6	219.2	13.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		377.8		131.3	305.8	64.0	312.5	368.2		263.6	219.2	13.2
LOS		F		F	F	E	F	F		F	F	B
Approach Delay		377.8			173.4			360.1			202.9	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

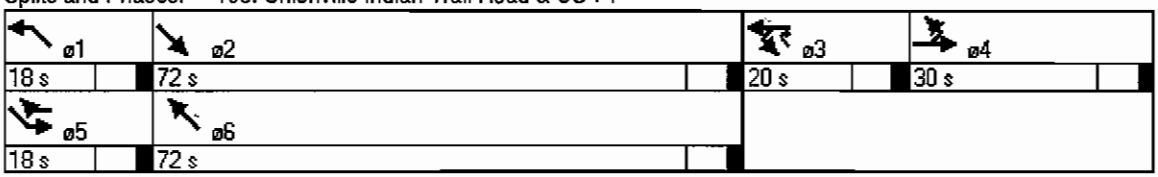
Maximum v/c Ratio: 1.75

Intersection Signal Delay: 289.3 Intersection LOS: F

Intersection Capacity Utilization 138.0% ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 103: Unionville Indian Trail Road & US 74



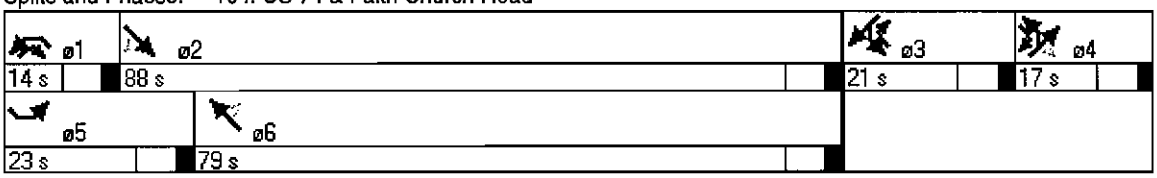
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	310	2110	90	50	2610	260	140	40	60	160	20	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.862	
Flt Protected	0.950			0.950				0.962		0.950		
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	0	1677	1482	1770	1606	0
Flt Permitted	0.950			0.950				0.962		0.950		
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	0	1677	1482	1770	1606	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			15			35	
Link Distance (ft)		1177			2588			625			368	
Travel Time (s)		14.6			32.1			28.4			7.2	
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 (%)	7%	7%	7%	7%	7%	7%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	344	2344	100	56	2900	289	156	44	67	178	22	256
Shared Lane Traffic (%)												
Lane Group Flow (vph)	344	2344	100	56	2900	289	0	200	67	178	278	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)		0			0			0			0	
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	Split		pm+ov	Split		
Protected Phases	5	2	4	1	6	3	4	4	1	3	3	
Permitted Phases			2			6			4			
Detector Phase	5	2	4	1	6	3	4	4	1	3	3	
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	23.0	88.0	17.0	14.0	79.0	21.0	17.0	17.0	14.0	21.0	21.0	0.0
Total Split (%)	16.4%	62.9%	12.1%	10.0%	56.4%	15.0%	12.1%	12.1%	10.0%	15.0%	15.0%	0.0%
Maximum Green (s)	16.0	81.0	10.0	7.0	72.0	14.0	10.0	10.0	7.0	14.0	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	
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	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	
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)	18.0	83.0	95.0	9.0	74.0	95.0		12.0	26.0	16.0	16.0	
Actuated g/C Ratio	0.13	0.59	0.68	0.06	0.53	0.68		0.09	0.19	0.11	0.11	
v/c Ratio	1.59	1.17	0.10	0.52	1.63	0.28		1.39	0.24	0.88	1.51	
Control Delay	322.4	111.4	4.2	80.8	311.2	9.8		256.9	51.4	99.3	296.4	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	322.4	111.4	4.2	80.8	311.2	9.8		256.9	51.4	99.3	296.4	
LOS	F	F	A	F	F	A		F	D	F	F	
Approach Delay		133.6			280.4			205.4			219.5	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.63
Intersection Signal Delay: 212.7 Intersection LOS: F
Intersection Capacity Utilization 131.1% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 104: US 74 & Faith Church Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	230	2610	140	60	2110	160	90	20	50	260	40	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.867	
Flt Protected	0.950			0.950				0.961		0.950		
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	0	1675	1482	1770	1615	0
Flt Permitted	0.950			0.950				0.961		0.950		
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	0	1675	1482	1770	1615	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			15			35	
Link Distance (ft)		1177			2588			625			368	
Travel Time (s)		14.6			32.1			28.4			7.2	
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 (%)	7%	7%	7%	7%	7%	7%	9%	9%	9%	2%	2%	2%
Adj. Flow (vph)	256	2900	156	67	2344	178	100	22	56	289	44	344
Shared Lane Traffic (%)												
Lane Group Flow (vph)	256	2900	156	67	2344	178	0	122	56	289	388	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)		0			0			0			0	
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	Split		pm+ov	Split		
Protected Phases	5	2	4	1	6	3	4	4	1	3	3	
Permitted Phases			2			6			4			
Detector Phase	5	2	4	1	6	3	4	4	1	3	3	
Switch Phase												
Minimum Initial (s)	7.0	14.0	7.0	7.0	14.0	7.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	14.0	21.0	14.0	14.0	21.0	14.0	14.0	14.0	14.0	14.0	14.0	
Total Split (s)	21.0	84.0	14.0	14.0	77.0	28.0	14.0	14.0	14.0	28.0	28.0	0.0
Total Split (%)	15.0%	60.0%	10.0%	10.0%	55.0%	20.0%	10.0%	10.0%	10.0%	20.0%	20.0%	0.0%
Maximum Green (s)	14.0	77.0	7.0	7.0	70.0	21.0	7.0	7.0	7.0	21.0	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	5.0	5.0	5.0	5.0	5.0	5.0	2.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	
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)	16.0	79.0	88.0	9.0	72.0	100.0		9.0	23.0	23.0	23.0	
Actuated g/C Ratio	0.11	0.56	0.63	0.06	0.51	0.71		0.06	0.16	0.16	0.16	
v/c Ratio	1.33	1.52	0.16	0.62	1.35	0.17		1.13	0.23	0.99	1.46	
Control Delay	224.3	264.8	6.2	88.1	192.0	6.9		182.3	53.7	108.9	268.7	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	224.3	264.8	6.2	88.1	192.0	6.9		182.3	53.7	108.9	268.7	
LOS	F	F	A	F	F	A		F	D	F	F	
Approach Delay		249.5			176.6			141.9			200.5	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

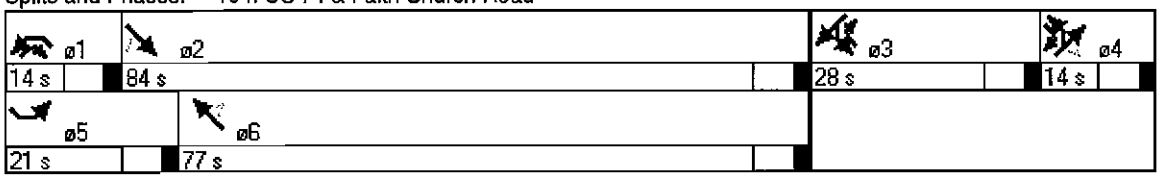
Maximum v/c Ratio: 1.52

Intersection Signal Delay: 213.8 Intersection LOS: F

Intersection Capacity Utilization 121.9% ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 104: US 74 & Faith Church Road



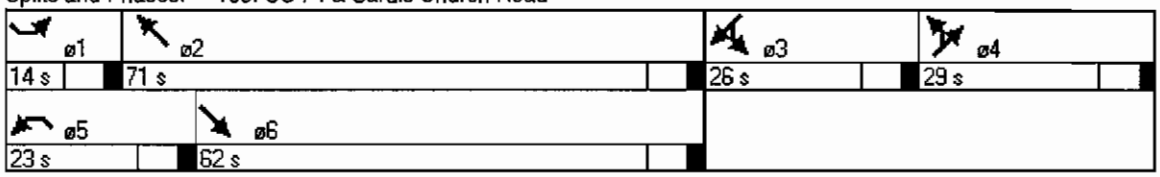
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	50	1900	400	350	2410	190	410	240	280	250	390	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.974			0.989			0.919			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3286	0	1687	3337	0	1770	1712	0	1770	1814	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3286	0	1687	3337	0	1770	1712	0	1770	1814	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		606			973			698			813	
Travel Time (s)		7.5			12.1			10.6			12.3	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	56	2111	444	389	2678	211	456	267	311	278	433	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	2555	0	389	2889	0	456	578	0	278	522	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)		0			0			0			0	
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			Split			Split		
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases												
Detector Phase	1	6		5	2		4	4		3	3	
Switch Phase												
Minimum Initial (s)	7.0	14.0		7.0	14.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	21.0		14.0	21.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	62.0	0.0	23.0	71.0	0.0	29.0	29.0	0.0	26.0	26.0	0.0
Total Split (%)	10.0%	44.3%	0.0%	16.4%	50.7%	0.0%	20.7%	20.7%	0.0%	18.6%	18.6%	0.0%
Maximum Green (s)	7.0	55.0		16.0	64.0		22.0	22.0		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	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	Lag		Lead	Lag		Lag	Lag		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	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	57.0		18.0	68.8		24.0	24.0		21.0	21.0	
Actuated g/C Ratio	0.06	0.41		0.13	0.49		0.17	0.17		0.15	0.15	
v/c Ratio	0.52	1.91		1.79	1.76		1.50	1.97		1.05	1.92	
Control Delay	80.8	438.5		408.3	371.4		282.7	479.7		123.9	458.1	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	80.8	438.5		408.3	371.4		282.7	479.7		123.9	458.1	
LOS	F	F		F	F		F	F		F	F	
Approach Delay		430.8			375.8			392.8			342.0	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.97
Intersection Signal Delay: 393.2 — Intersection LOS: F
Intersection Capacity Utilization 149.4% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 105: US 74 & Sardis Church Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	80	2410	410	280	1900	250	400	390	350	190	240	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.978			0.983			0.929			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3300	0	1687	3316	0	1770	1730	0	1770	1814	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3300	0	1687	3316	0	1770	1730	0	1770	1814	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		606			973			698			813	
Travel Time (s)		7.5			12.1			10.6			12.3	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	89	2678	456	311	2111	278	444	433	389	211	267	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	3134	0	311	2389	0	444	822	0	211	323	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)		0			0			0			0	
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			Split			Split		
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases												
Detector Phase	1	6		5	2		4	4		3	3	
Switch Phase												
Minimum Initial (s)	7.0	14.0		7.0	14.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	21.0		14.0	21.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	67.0	0.0	19.0	72.0	0.0	35.0	35.0	0.0	19.0	19.0	0.0
Total Split (%)	10.0%	47.9%	0.0%	13.6%	51.4%	0.0%	25.0%	25.0%	0.0%	13.6%	13.6%	0.0%
Maximum Green (s)	7.0	60.0		12.0	65.0		28.0	28.0		12.0	12.0	
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	Lag		Lead	Lag		Lag	Lag		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	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	62.0		14.0	67.0		30.0	30.0		14.0	14.0	
Actuated g/C Ratio	0.06	0.44		0.10	0.48		0.21	0.21		0.10	0.10	
v/c Ratio	0.82	2.15		1.84	1.51		1.17	2.22		1.19	1.78	
Control Delay	112.7	541.0		433.6	260.2		149.1	581.8		180.8	408.9	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	112.7	541.0		433.6	260.2		149.1	581.8		180.8	408.9	
LOS	F	F		F	F		F	F		F	F	
Approach Delay		529.2			280.2			430.1			318.8	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

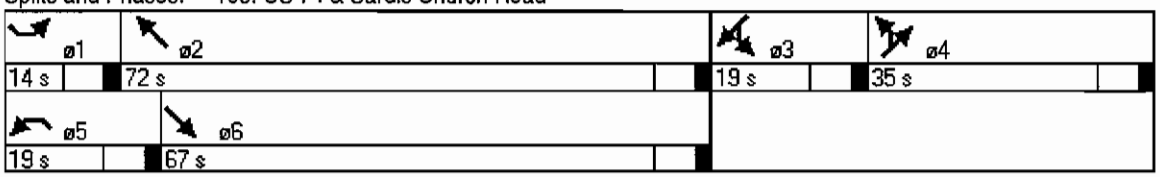
Maximum v/c Ratio: 2.22

Intersection Signal Delay: 411.3 Intersection LOS: F

Intersection Capacity Utilization 164.3% ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 105: US 74 & Sardis Church Road



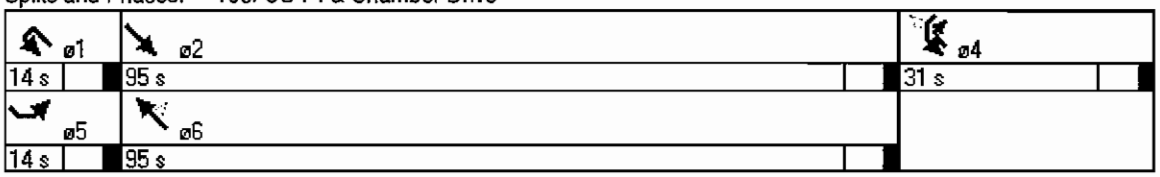
Lane Group	SEL	SET	NWU	NWT	NWR	SWL	SWR
Lane Configurations							
Volume (vph)	120	2250	10	2670	20	50	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Frt					0.850		0.850
Flt Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1687	3374	1687	3374	1509	1770	1583
Flt Permitted	0.950		0.950			0.950	
Satd. Flow (perm)	1687	3374	1687	3374	1509	1770	1583
Right Turn on Red					No		No
Satd. Flow (RTOR)							
Link Speed (mph)		55		55		35	
Link Distance (ft)		2407		1378		1258	
Travel Time (s)		29.8		17.1		24.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	7%	7%	2%	2%
Adj. Flow (vph)	133	2500	11	2967	22	56	400
Shared Lane Traffic (%)							
Lane Group Flow (vph)	133	2500	11	2967	22	56	400
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	Left	Right
Median Width(ft)		12		12		12	
Link Offset(ft)		0		0		0	
Crosswalk Width(ft)		0		0		0	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9		9	15	9
Turn Type	Prot		Prot		pm+ov		Perm
Protected Phases	5	2	1	6	4	4	
Permitted Phases					6		4
Detector Phase	5	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	7.0	14.0	7.0	14.0	7.0	7.0	7.0
Minimum Split (s)	14.0	21.0	14.0	21.0	14.0	14.0	14.0
Total Split (s)	14.0	95.0	14.0	95.0	31.0	31.0	31.0
Total Split (%)	10.0%	67.9%	10.0%	67.9%	22.1%	22.1%	22.1%
Maximum Green (s)	7.0	88.0	7.0	88.0	24.0	24.0	24.0
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	Lead	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	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	9.0	98.4	9.0	90.0	121.0	26.0	26.0
Actuated g/C Ratio	0.06	0.70	0.06	0.64	0.86	0.19	0.19
v/c Ratio	1.23	1.05	0.10	1.37	0.02	0.17	1.36
Control Delay	213.2	56.4	64.1	193.7	1.4	49.6	225.2

Lane Group	SEL	SET	NWU	NWT	NWR	SWL	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	213.2	56.4	64.1	193.7	1.4	49.6	225.2
LOS	F	E	E	F	A	D	F
Approach Delay		64.4		191.9		203.6	
Approach LOS		E		F		F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.37
Intersection Signal Delay: 137.6 — Intersection LOS: F
Intersection Capacity Utilization 104.4% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 106: US 74 & Chamber Drive



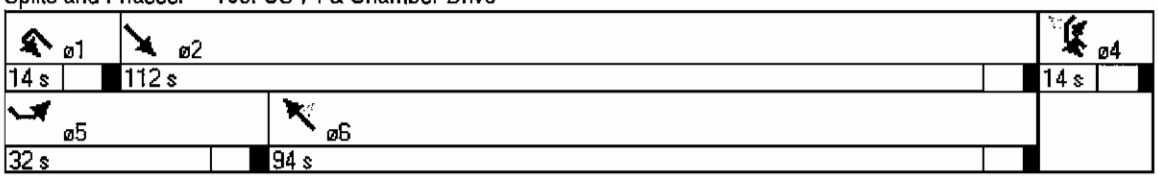
Lane Group	SEL	SET	NWU	NWT	NWR	SWL	SWR
Lane Configurations							
Volume (vph)	360	2670	10	2250	50	20	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Frt					0.850		0.850
Flt Protected	0.950		0.950			0.950	
Satd. Flow (prot)	1687	3374	1687	3374	1509	1770	1583
Flt Permitted	0.950		0.950			0.950	
Satd. Flow (perm)	1687	3374	1687	3374	1509	1770	1583
Right Turn on Red					No		No
Satd. Flow (RTOR)							
Link Speed (mph)		55		55		35	
Link Distance (ft)		2407		1378		1258	
Travel Time (s)		29.8		17.1		24.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	7%	7%	7%	7%	7%	2%	2%
Adj. Flow (vph)	400	2967	11	2500	56	22	133
Shared Lane Traffic (%)							
Lane Group Flow (vph)	400	2967	11	2500	56	22	133
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Left	R NA	Left	Right	Left	Right
Median Width (ft)		12		12		12	
Link Offset(ft)		0		0		0	
Crosswalk Width (ft)		0		0		0	
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9		9	15	9
Turn Type	Prot		Prot		pm+ov		Perm
Protected Phases	5	2	1	6	4	4	
Permitted Phases					6		4
Detector Phase	5	2	1	6	4	4	4
Switch Phase							
Minimum Initial (s)	7.0	14.0	7.0	14.0	7.0	7.0	7.0
Minimum Split (s)	14.0	21.0	14.0	21.0	14.0	14.0	14.0
Total Split (s)	32.0	112.0	14.0	94.0	14.0	14.0	14.0
Total Split (%)	22.9%	80.0%	10.0%	67.1%	10.0%	10.0%	10.0%
Maximum Green (s)	25.0	105.0	7.0	87.0	7.0	7.0	7.0
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	Lead	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	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	27.0	115.4	9.0	89.0	103.0	9.0	9.0
Actuated g/C Ratio	0.19	0.82	0.06	0.64	0.74	0.06	0.06
v/c Ratio	1.23	1.07	0.10	1.17	0.05	0.19	1.30
Control Delay	174.1	52.7	64.1	106.1	5.2	66.4	239.8

Lane Group	SEL	SET	NWU	NWT	NWR	SWL	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	174.1	52.7	64.1	106.1	5.2	66.4	239.8
LOS	F	D	E	F	A	E	F
Approach Delay		67.1		103.7		215.2	
Approach LOS		E		F		F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.30
Intersection Signal Delay: 86.3 Intersection LOS: F
Intersection Capacity Utilization 100.5% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 106: US 74 & Chamber Drive



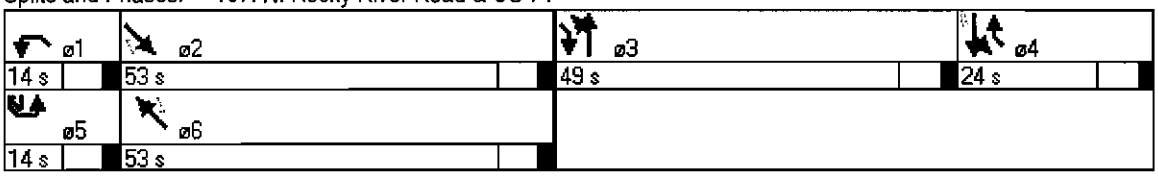
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	650	280	200	180	270	190	90	1730	300	110	2080	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.976				0.850			0.850			0.850
Flt Protected		0.972			0.980		0.950			0.950		
Satd. Flow (prot)	0	1767	0	0	1825	1583	1687	3374	1509	1687	3374	1509
Flt Permitted		0.972			0.980		0.950			0.950		
Satd. Flow (perm)	0	1767	0	0	1825	1583	1687	3374	1509	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		1176			418			3021			3350	
Travel Time (s)		17.8			6.3			37.5			41.5	
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%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	722	311	222	200	300	211	100	1922	333	122	2311	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1255	0	0	500	211	100	1922	333	122	2311	122
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)		0			0			0			0	
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			Split		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	3		4	4	5	5	2	3	1	6	4
Permitted Phases						4			2			6
Detector Phase	3	3		4	4	5	5	2	3	1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0
Total Split (s)	49.0	49.0	0.0	24.0	24.0	14.0	14.0	53.0	49.0	14.0	53.0	24.0
Total Split (%)	35.0%	35.0%	0.0%	17.1%	17.1%	10.0%	10.0%	37.9%	35.0%	10.0%	37.9%	17.1%
Maximum Green (s)	42.0	42.0		17.0	17.0	7.0	7.0	46.0	42.0	7.0	46.0	17.0
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	Lead	Lead	Lag	Lead	Lead	Lag	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	None		None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)		44.0			19.0	33.0	9.0	48.0	97.0	9.0	48.0	67.0
Actuated g/C Ratio		0.31			0.14	0.24	0.06	0.34	0.69	0.06	0.34	0.48
v/c Ratio		2.26			2.02	0.57	0.93	1.66	0.32	1.13	2.00	0.17
Control Delay		597.5			501.1	54.0	132.5	332.4	9.4	182.3	478.5	13.4

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay	0.0				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	597.5				501.1	54.0	132.5	332.4	9.4	182.3	478.5	13.4
LOS	F				F	D	F	F	A	F	F	B
Approach Delay	597.5				368.4			278.3			442.1	
Approach LOS	F				F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.26
Intersection Signal Delay: 406.7 Intersection LOS: F
Intersection Capacity Utilization 167.1% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 107: N. Rocky River Road & US 74



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	300	270	110	110	280	90	190	2080	650	200	1730	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.978				0.850			0.850			0.850
Flt Protected		0.978			0.986		0.950			0.950		
Satd. Flow (prot)	0	1782	0	0	1837	1583	1687	3374	1509	1687	3374	1509
Flt Permitted		0.978			0.986		0.950			0.950		
Satd. Flow (perm)	0	1782	0	0	1837	1583	1687	3374	1509	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		1176			418			3021			3350	
Travel Time (s)		17.8			6.3			37.5			41.5	
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%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	333	300	122	122	311	100	211	2311	722	222	1922	200
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	755	0	0	433	100	211	2311	722	222	1922	200
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)		0			0			0			0	
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			Split		pm+ov	Prot		pm+ov	Prot		pm+ov
Protected Phases	3	3		4	4	5	5	2	3	1	6	4
Permitted Phases						4			2			6
Detector Phase	3	3		4	4	5	5	2	3	1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	14.0	7.0	7.0	14.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	21.0	14.0	14.0	21.0	14.0
Total Split (s)	37.0	37.0	0.0	25.0	25.0	17.0	17.0	60.0	37.0	18.0	61.0	25.0
Total Split (%)	26.4%	26.4%	0.0%	17.9%	17.9%	12.1%	12.1%	42.9%	26.4%	12.9%	43.6%	17.9%
Maximum Green (s)	30.0	30.0		18.0	18.0	10.0	10.0	53.0	30.0	11.0	54.0	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	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	Lead	Lead	Lag	Lead	Lead	Lag	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	None		None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)		32.0			20.0	37.0	12.0	55.0	92.0	13.0	56.0	76.0
Actuated g/C Ratio		0.23			0.14	0.26	0.09	0.39	0.66	0.09	0.40	0.54
v/c Ratio		1.86			1.65	0.24	1.46	1.74	0.73	1.41	1.42	0.24
Control Delay		424.7			346.5	42.3	281.8	366.1	21.2	263.6	228.3	10.1

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		424.7			346.5	42.3	281.8	366.1	21.2	263.6	228.3	10.1
LOS		F			F	D	F	F	C	F	F	B
Approach Delay		424.7			289.4			283.9			213.0	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

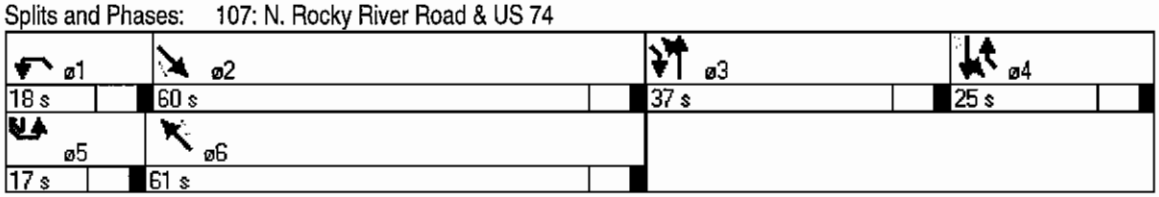
Maximum v/c Ratio: 1.86

Intersection Signal Delay: 275.6 Intersection LOS: F

Intersection Capacity Utilization 143.6% ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 107: N. Rocky River Road & US 74



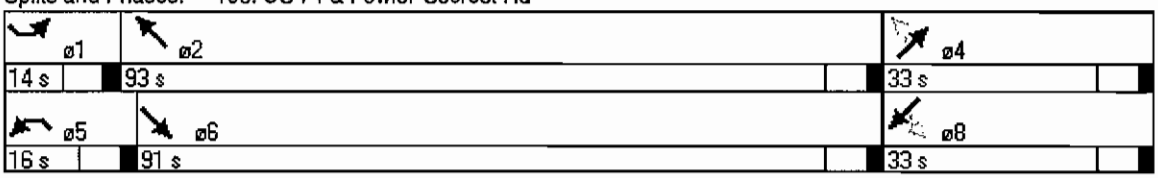
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	20	1940	20	120	2400	120	20	30	80	160	60	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.993			0.917			0.984	
Flt Protected	0.950			0.950				0.992			0.969	
Satd. Flow (prot)	1687	3367	0	1687	3350	0	0	1694	0	0	1776	0
Flt Permitted	0.950			0.950				0.929			0.605	
Satd. Flow (perm)	1687	3367	0	1687	3350	0	0	1587	0	0	1109	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			45	
Link Distance (ft)		2601			2354			277			1205	
Travel Time (s)		39.4			35.7			5.4			18.3	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	22	2156	22	133	2667	133	22	33	89	178	67	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2178	0	133	2800	0	0	144	0	0	278	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)		0			0			0			0	
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		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Detector Phase	1	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		21.0	21.0	
Total Split (s)	14.0	91.0	0.0	16.0	93.0	0.0	33.0	33.0	0.0	33.0	33.0	0.0
Total Split (%)	10.0%	65.0%	0.0%	11.4%	66.4%	0.0%	23.6%	23.6%	0.0%	23.6%	23.6%	0.0%
Maximum Green (s)	7.0	84.0		9.0	86.0		26.0	26.0		26.0	26.0	
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	Lag		Lead	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	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	86.0		11.0	93.6			28.0			28.0	
Actuated g/C Ratio	0.06	0.61		0.08	0.67			0.20			0.20	
v/c Ratio	0.20	1.05		1.00	1.25			0.45			1.25	
Control Delay	66.9	62.7		141.4	140.7			54.6			190.2	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	66.9	62.7		141.4	140.7			54.6			190.2	
LOS	E	E		F	F			D			F	
Approach Delay		62.8			140.7			54.6			190.2	
Approach LOS		E			F			D			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.25
Intersection Signal Delay: 110.1 Intersection LOS: F
Intersection Capacity Utilization 109.0% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 108: US 74 & Fowler-Secrest Rd



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	30	2400	20	80	1940	160	20	60	120	120	30	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.989			0.919			0.984	
Flt Protected	0.950			0.950				0.995			0.966	
Satd. Flow (prot)	1687	3370	0	1687	3337	0	0	1703	0	0	1771	0
Flt Permitted	0.950			0.950				0.958			0.418	
Satd. Flow (perm)	1687	3370	0	1687	3337	0	0	1640	0	0	766	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			45	
Link Distance (ft)		2601			2354			277			1205	
Travel Time (s)		39.4			35.7			5.4			18.3	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	33	2667	22	89	2156	178	22	67	133	133	33	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	2689	0	89	2334	0	0	222	0	0	188	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)		0			0			0			0	
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		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Detector Phase	1	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	94.0	0.0	14.0	94.0	0.0	32.0	32.0	0.0	32.0	32.0	0.0
Total Split (%)	10.0%	67.1%	0.0%	10.0%	67.1%	0.0%	22.9%	22.9%	0.0%	22.9%	22.9%	0.0%
Maximum Green (s)	7.0	87.0		7.0	87.0		25.0	25.0		25.0	25.0	
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	Lag		Lead	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	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	89.0		9.0	94.6			27.0			27.0	
Actuated g/C Ratio	0.06	0.64		0.06	0.68			0.19			0.19	
v/c Ratio	0.31	1.26		0.82	1.04			0.70			1.27	
Control Delay	70.4	144.8		112.7	52.3			65.9			208.9	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	70.4	144.8		112.7	52.3			65.9			208.9	
LOS	E	F		F	D			E			F	
Approach Delay		143.9			54.5			65.9			208.9	
Approach LOS		F			D			E			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

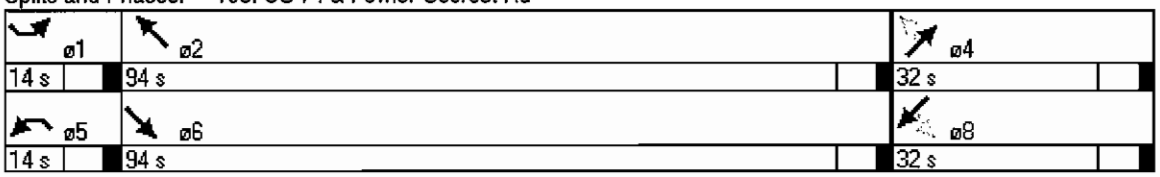
Maximum v/c Ratio: 1.27

Intersection Signal Delay: 104.0 Intersection LOS: F

Intersection Capacity Utilization 100.5% ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 108: US 74 & Fowler-Secrest Rd



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	20	2080	50	50	2550	20	80	10	60	30	10	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996				0.850		0.946			0.932	
Flt Protected	0.950			0.950				0.974			0.982	
Satd. Flow (prot)	1687	3360	0	1687	3374	1509	0	1716	0	0	1705	0
Flt Permitted	0.950			0.950				0.720			0.757	
Satd. Flow (perm)	1687	3360	0	1687	3374	1509	0	1269	0	0	1314	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		309			978			474			425	
Travel Time (s)		4.7			14.8			12.9			11.6	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	22	2311	56	56	2833	22	89	11	67	33	11	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	2367	0	56	2833	22	0	167	0	0	88	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)		0			0			0			0	
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			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases						2	4			8		
Detector Phase	1	6		5	2	2	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	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	
Total Split (s)	14.0	107.0	0.0	14.0	107.0	107.0	19.0	19.0	0.0	19.0	19.0	0.0
Total Split (%)	10.0%	76.4%	0.0%	10.0%	76.4%	76.4%	13.6%	13.6%	0.0%	13.6%	13.6%	0.0%
Maximum Green (s)	7.0	100.0		7.0	100.0	100.0	12.0	12.0		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	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lead	Lag		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	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	9.0	104.8		9.0	107.6	107.6		14.0			14.0	
Actuated g/C Ratio	0.06	0.75		0.06	0.77	0.77		0.10			0.10	
v/c Ratio	0.20	0.94		0.52	1.09	0.02		1.31			0.67	
Control Delay	66.9	25.2		80.8	67.0	5.0		233.7			85.5	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	66.9	25.2		80.8	67.0	5.0		233.7			85.5	
LOS	E	C		F	E	A		F			F	
Approach Delay		25.6			66.8			233.7			85.5	
Approach LOS		C			E			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.31
Intersection Signal Delay: 54.4 Intersection LOS: D
Intersection Capacity Utilization 91.9% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 110: US 74 & Rolling Hill Drive

ø1	ø2	ø4
14 s	107 s	19 s
ø5	ø6	ø8
14 s	107 s	19 s

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	40	2550	80	50	2080	30	60	10	50	20	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00											
Frt		0.995				0.850		0.944			0.946	
Flt Protected	0.950			0.950				0.976			0.980	
Satd. Flow (prot)	1687	3357	0	1687	3205	1509	0	1716	0	0	1727	0
Flt Permitted	0.950			0.950				0.822			0.727	
Satd. Flow (perm)	1686	3357	0	1687	3205	1509	0	1445	0	0	1281	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		309			978			474			425	
Travel Time (s)		4.7			14.8			12.9			11.6	
Confl. Peds. (#/hr)	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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Parking (#/hr)					0							
Adj. Flow (vph)	44	2833	89	56	2311	33	67	11	56	22	11	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	2922	0	56	2311	33	0	134	0	0	55	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)		0			0			0			0	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.07	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			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases						2	4			8		
Detector Phase	1	6		5	2	2	4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0	12.0	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	
Total Split (s)	14.0	111.0	0.0	14.0	111.0	111.0	15.0	15.0	0.0	15.0	15.0	0.0
Total Split (%)	10.0%	79.3%	0.0%	10.0%	79.3%	79.3%	10.7%	10.7%	0.0%	10.7%	10.7%	0.0%
Maximum Green (s)	7.0	104.0		7.0	104.0	104.0	8.0	8.0		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	
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	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lead	Lag		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	
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	9.0	108.8		9.0	108.8	108.8		10.0			10.0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Actuated g/C Ratio	0.06	0.78		0.06	0.78	0.78		0.07			0.07	
v/c Ratio	0.41	1.12		0.52	0.93	0.03		1.30			0.60	
Control Delay	74.7	78.2		80.8	21.8	4.3		238.1			89.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	74.7	78.2		80.8	21.8	4.3		238.1			89.2	
LOS	E	E		F	C	A		F			F	
Approach Delay		78.1			23.0			238.1			89.2	
Approach LOS		E			C			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.30
Intersection Signal Delay: 58.3 Intersection LOS: E
Intersection Capacity Utilization 91.2% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 110: US 74 & Rolling Hill Drive

ø1	ø2	ø4
14 s	111 s	15 s

ø5	ø6	ø8
14 s	111 s	15 s

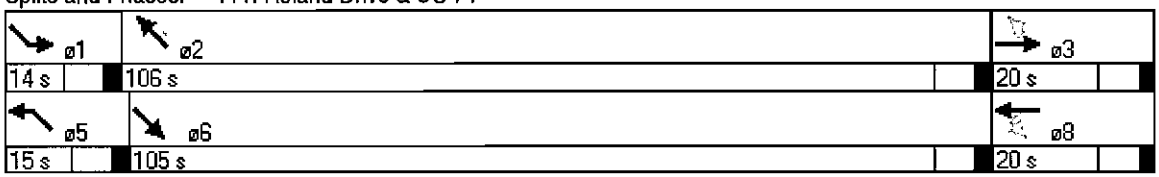
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	90	20	80	50	20	70	70	1990	100	110	2450	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.880			0.932			0.993				0.850
Flt Protected	0.950				0.982		0.950			0.950		
Satd. Flow (prot)	1770	1639	0	0	1705	0	1687	3350	0	1687	3374	1509
Flt Permitted	0.433				0.657		0.950			0.950		
Satd. Flow (perm)	807	1639	0	0	1141	0	1687	3350	0	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		510			371			748			991	
Travel Time (s)		13.9			10.1			11.3			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 (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	100	22	89	56	22	78	78	2211	111	122	2722	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	111	0	0	156	0	78	2322	0	122	2722	78
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)		0			0			0			0	
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		Perm
Protected Phases		3			8		1	6		5	2	
Permitted Phases	3			8								2
Detector Phase	3	3		8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	12.0
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0		14.0	19.0	19.0
Total Split (s)	20.0	20.0	0.0	20.0	20.0	0.0	14.0	105.0	0.0	15.0	106.0	106.0
Total Split (%)	14.3%	14.3%	0.0%	14.3%	14.3%	0.0%	10.0%	75.0%	0.0%	10.7%	75.7%	75.7%
Maximum Green (s)	13.0	13.0		13.0	13.0		7.0	98.0		8.0	99.0	99.0
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	2.0	5.0	5.0	5.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?								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	Max	Max		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0			15.0		9.0	100.0		10.0	101.0	101.0
Actuated g/C Ratio	0.11	0.11			0.11		0.06	0.71		0.07	0.72	0.72
v/c Ratio	1.16	0.63			1.28		0.72	0.97		1.01	1.12	0.07
Control Delay	200.3	76.5			222.3		98.3	31.7		147.3	80.7	5.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	200.3	76.5		222.3			98.3	31.7		147.3	80.7	5.9
LOS	F	E		F			F	C		F	F	A
Approach Delay		135.2		222.3				33.9			81.5	
Approach LOS		F		F				C			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.28
Intersection Signal Delay: 67.3 Intersection LOS: E
Intersection Capacity Utilization 100.8% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 111: Roland Drive & US 74



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	100	20	110	70	20	70	70	2450	100	80	1990	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.873			0.941			0.994				0.850
Flt Protected	0.950				0.979		0.950			0.950		
Satd. Flow (prot)	1770	1626	0	0	1716	0	1687	3354	0	1687	3374	1509
Flt Permitted	0.514				0.576		0.950			0.950		
Satd. Flow (perm)	957	1626	0	0	1010	0	1687	3354	0	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		510			371			748			991	
Travel Time (s)		13.9			10.1			11.3			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 (%)	2%	2%	2%	2%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	111	22	122	78	22	78	78	2722	111	89	2211	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	144	0	0	178	0	78	2833	0	89	2211	56
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)		0			0			0			0	
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		Perm
Protected Phases		3			8		1	6		5	2	
Permitted Phases	3			8								2
Detector Phase	3	3		8	8		1	6		5	2	2
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	12.0
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0		14.0	19.0	19.0
Total Split (s)	25.0	25.0	0.0	25.0	25.0	0.0	14.0	101.0	0.0	14.0	101.0	101.0
Total Split (%)	17.9%	17.9%	0.0%	17.9%	17.9%	0.0%	10.0%	72.1%	0.0%	10.0%	72.1%	72.1%
Maximum Green (s)	18.0	18.0		18.0	18.0		7.0	94.0		7.0	94.0	94.0
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	2.0	5.0	5.0	5.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?								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	Max	Max		None	None		None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	20.0	20.0			20.0		9.0	96.0		9.0	96.0	96.0
Actuated g/C Ratio	0.14	0.14			0.14		0.06	0.69		0.06	0.69	0.69
v/c Ratio	0.81	0.62			1.24		0.72	1.23		0.82	0.96	0.05
Control Delay	97.2	69.1			200.2		98.3	132.0		112.7	31.4	7.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	97.2	69.1			200.2		98.3	132.0		112.7	31.4	7.4
LOS	F	E			F		F	F		F	C	A
Approach Delay		81.3			200.2			131.1			33.9	
Approach LOS		F			F			F			C	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

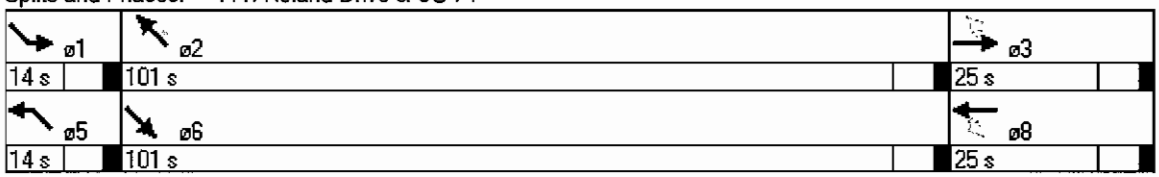
Maximum v/c Ratio: 1.24

Intersection Signal Delay: 90.8 Intersection LOS: F

Intersection Capacity Utilization 100.5% ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 111: Roland Drive & US 74



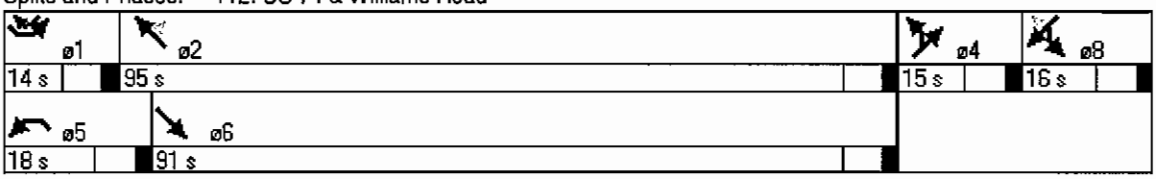
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	90	2030	20	180	2470	120	20	40	100	150	80	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.893				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3370	0	1687	3374	1509	1770	1663	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3370	0	1687	3374	1509	1770	1663	0	1770	1863	1583
Right Turn on Red			No			Yes			No			No
Satd. Flow (RTOR)						73						
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		822			734			281			279	
Travel Time (s)		12.5			11.1			5.5			7.6	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	100	2256	22	200	2744	133	22	44	111	167	89	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	100	2278	0	200	2744	133	22	155	0	167	89	144
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)		0			0			0			0	
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	Split			Split		pm+ov
Protected Phases	1	6		5	2		4	4		8	8	1
Permitted Phases						2						8
Detector Phase	1	6		5	2	2	4	4		8	8	1
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)	14.0	91.0	0.0	18.0	95.0	95.0	15.0	15.0	0.0	16.0	16.0	14.0
Total Split (%)	10.0%	65.0%	0.0%	12.9%	67.9%	67.9%	10.7%	10.7%	0.0%	11.4%	11.4%	10.0%
Maximum Green (s)	7.0	84.0		11.0	88.0	88.0	8.0	8.0		9.0	9.0	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	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 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	Max	C-Max		None	C-Max	C-Max	None	None		Max	Max	Max
Act Effct Green (s)	9.0	86.0		13.0	90.0	90.0	10.0	10.0		11.0	11.0	25.0
Actuated g/C Ratio	0.06	0.61		0.09	0.64	0.64	0.07	0.07		0.08	0.08	0.18
v/c Ratio	0.93	1.10		1.27	1.27	0.13	0.17	1.30		1.20	0.61	0.51
Control Delay	132.5	80.5		212.4	148.7	4.8	64.6	232.9		193.0	80.5	59.1

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	132.5	80.5		212.4	148.7	4.8	64.6	232.9		193.0	80.5	59.1
LOS	F	F		F	F	A	E	F		F	F	E
Approach Delay		82.7			146.6			212.0			119.8	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.30
Intersection Signal Delay: 121.6 Intersection LOS: F
Intersection Capacity Utilization 107.3% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 112: US 74 & Williams Road



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	130	2470	20	100	2030	150	20	80	180	120	40	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999				0.850		0.896				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3370	0	1687	3374	1509	1770	1669	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3370	0	1687	3374	1509	1770	1669	0	1770	1863	1583
Right Turn on Red			No			Yes			No			No
Satd. Flow (RTOR)						99						
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		822			734			281			279	
Travel Time (s)		12.5			11.1			5.5			7.6	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	144	2744	22	111	2256	167	22	89	200	133	44	100
Shared Lane Traffic (%)												
Lane Group Flow (vph)	144	2766	0	111	2256	167	22	289	0	133	44	100
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)		0			0			0			0	
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	Split			Split		pm+ov
Protected Phases	1	6		5	2		4	4		8	8	1
Permitted Phases						2						8
Detector Phase	1	6		5	2	2	4	4		8	8	1
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)	14.0	89.0	0.0	14.0	89.0	89.0	23.0	23.0	0.0	14.0	14.0	14.0
Total Split (%)	10.0%	63.6%	0.0%	10.0%	63.6%	63.6%	16.4%	16.4%	0.0%	10.0%	10.0%	10.0%
Maximum Green (s)	7.0	82.0		7.0	82.0	82.0	16.0	16.0		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	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 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	Max	C-Max		None	C-Max	C-Max	None	None		Max	Max	Max
Act Effct Green (s)	9.0	84.0		9.0	84.0	84.0	18.0	18.0		9.0	9.0	23.0
Actuated g/C Ratio	0.06	0.60		0.06	0.60	0.60	0.13	0.13		0.06	0.06	0.16
v/c Ratio	1.33	1.37		1.03	1.11	0.18	0.10	1.34		1.17	0.37	0.38
Control Delay	247.7	195.6		156.6	87.1	5.6	55.1	227.7		190.7	71.9	57.2

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	247.7	195.6		156.6	87.1	5.6	55.1	227.7		190.7	71.9	57.2
LOS	F	F		F	F	A	E	F		F	E	E
Approach Delay		198.2			84.8			215.4			123.6	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

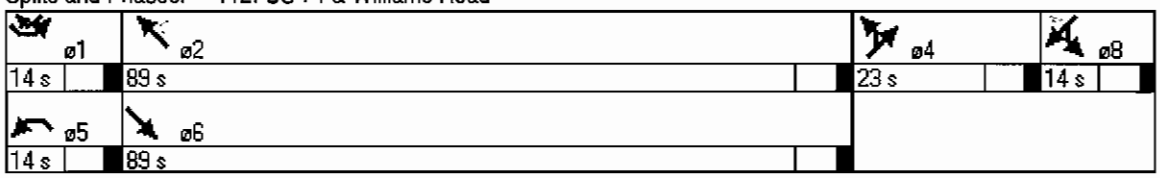
Maximum v/c Ratio: 1.37

Intersection Signal Delay: 148.0 Intersection LOS: F

Intersection Capacity Utilization 113.3% ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 112: US 74 & Williams Road



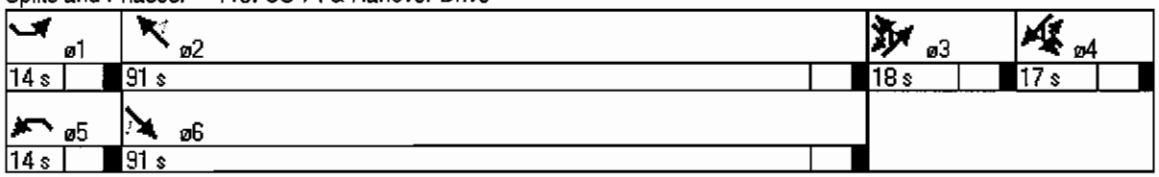
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	2080	150	110	2560	430	130	110	80	330	120	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850		0.937			0.956	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	1752	1728	0	3400	1763	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	1752	1728	0	3400	1763	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		338			529			376			313	
Travel Time (s)		5.1			8.0			7.3			8.5	
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 (%)	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	67	2311	167	122	2844	478	144	122	89	367	133	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	2311	167	122	2844	478	144	211	0	367	189	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)		0			0			0			0	
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	Split			Split		
Protected Phases	1	6	3	5	2	4	3	3		4	4	
Permitted Phases			6			2						
Detector Phase	1	6	3	5	2	4	3	3		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	7.0	
Minimum Split (s)	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	91.0	18.0	14.0	91.0	17.0	18.0	18.0	0.0	17.0	17.0	0.0
Total Split (%)	10.0%	65.0%	12.9%	10.0%	65.0%	12.1%	12.9%	12.9%	0.0%	12.1%	12.1%	0.0%
Maximum Green (s)	7.0	84.0	11.0	7.0	84.0	10.0	11.0	11.0		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	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	Lead	Lag	Lead	Lead	Lag	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	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effct Green (s)	9.0	86.0	104.0	9.0	88.8	101.8	13.0	13.0		12.0	12.0	
Actuated g/C Ratio	0.06	0.61	0.74	0.06	0.63	0.73	0.09	0.09		0.09	0.09	
v/c Ratio	0.62	1.11	0.15	1.13	1.33	0.44	0.88	1.32		1.26	1.25	
Control Delay	88.1	86.3	5.6	182.3	176.8	6.2	107.4	227.7		192.1	206.3	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	88.1	86.3	5.6	182.3	176.8	6.2	107.4	227.7		192.1	206.3	
LOS	F	F	A	F	F	A	F	F		F	F	
Approach Delay		81.0			153.3			178.9			196.9	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.33
Intersection Signal Delay: 131.5 — Intersection LOS: F
Intersection Capacity Utilization 113.4% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 113: US 74 & Hanover Drive



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	50	2560	130	80	2080	330	150	120	110	430	110	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850		0.928			0.947	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	1752	1712	0	3400	1747	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	1752	1712	0	3400	1747	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			25	
Link Distance (ft)		338			529			376			313	
Travel Time (s)		5.1			8.0			7.3			8.5	
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 (%)	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	56	2844	144	89	2311	367	167	133	122	478	122	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	2844	144	89	2311	367	167	255	0	478	189	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)		0			0			0			0	
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	Split			Split		
Protected Phases	1	6	3	5	2	4	3	3		4	4	
Permitted Phases			6			2						
Detector Phase	1	6	3	5	2	4	3	3		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	7.0	
Minimum Split (s)	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	87.0	20.0	14.0	87.0	19.0	20.0	20.0	0.0	19.0	19.0	0.0
Total Split (%)	10.0%	62.1%	14.3%	10.0%	62.1%	13.6%	14.3%	14.3%	0.0%	13.6%	13.6%	0.0%
Maximum Green (s)	7.0	80.0	13.0	7.0	80.0	12.0	13.0	13.0		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	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	Lead	Lag	Lead	Lead	Lag	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	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effct Green (s)	9.0	82.0	102.0	9.0	84.8	99.8	15.0	15.0		14.0	14.0	
Actuated g/C Ratio	0.06	0.59	0.73	0.06	0.61	0.71	0.11	0.11		0.10	0.10	
v/c Ratio	0.52	1.44	0.13	0.82	1.13	0.34	0.89	1.39		1.41	1.08	
Control Delay	80.8	227.3	6.0	112.7	93.4	5.4	103.0	251.0		243.6	148.4	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	80.8	227.3	6.0	112.7	93.4	5.4	103.0	251.0		243.6	148.4	
LOS	F	F	A	F	F	A	F	F		F	F	
Approach Delay		214.2			82.4			192.5			216.6	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

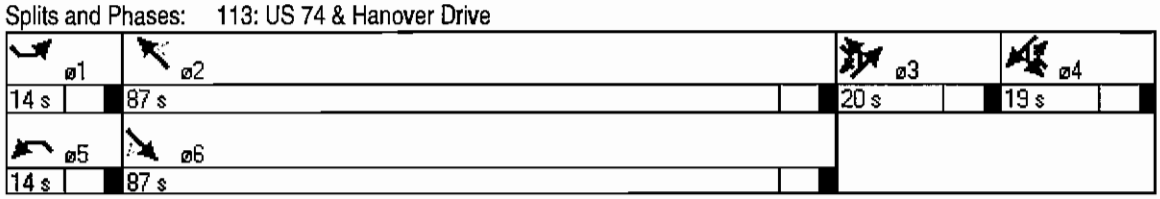
Maximum v/c Ratio: 1.44

Intersection Signal Delay: 160.2 Intersection LOS: F

Intersection Capacity Utilization 108.6% ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 113: US 74 & Hanover Drive



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑	↱
Volume (vph)	970	1390	170	420	1740	470	140	810	270	450	1200	1150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3273	4848	1509	3273	4848	1509	3335	3438	1538	3273	3374	1509
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3273	4848	1509	3273	4848	1509	3335	3438	1538	3273	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			45	
Link Distance (ft)		858			915			405			209	
Travel Time (s)		13.0			13.9			7.9			3.2	
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 (%)	7%	7%	7%	7%	7%	7%	5%	5%	5%	7%	7%	7%
Adj. Flow (vph)	1078	1544	189	467	1933	522	156	900	300	500	1333	1278
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1078	1544	189	467	1933	522	156	900	300	500	1333	1278
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)		0			0			0			0	
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	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Detector Phase	1	6	7	5	2	3	7	4	5	3	8	1
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0	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	14.0	14.0	14.0
Total Split (s)	41.0	58.0	14.0	28.0	45.0	21.0	14.0	33.0	28.0	21.0	40.0	41.0
Total Split (%)	29.3%	41.4%	10.0%	20.0%	32.1%	15.0%	10.0%	23.6%	20.0%	15.0%	28.6%	29.3%
Maximum Green (s)	34.0	51.0	7.0	21.0	38.0	14.0	7.0	26.0	21.0	14.0	33.0	34.0
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	Lag	Lead	Lead	Lag	Lead	Lead	Lag	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)	36.0	53.2	67.2	22.8	40.0	61.0	9.0	28.0	55.8	16.0	35.0	76.0
Actuated g/C Ratio	0.26	0.38	0.48	0.16	0.29	0.44	0.06	0.20	0.40	0.11	0.25	0.54
v/c Ratio	1.28	0.84	0.26	0.88	1.40	0.79	0.73	1.31	0.49	1.34	1.58	1.56
Control Delay	177.2	44.6	22.9	75.3	220.4	44.7	83.9	192.5	34.8	214.7	301.4	285.1

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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
Total Delay	177.2	44.6	22.9	75.3	220.4	44.7	83.9	192.5	34.8	214.7	301.4	285.1
LOS	F	D	C	E	F	D	F	F	C	F	F	F
Approach Delay		94.0			165.8			145.1			280.8	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.58
Intersection Signal Delay: 178.3 — Intersection LOS: F
Intersection Capacity Utilization 123.2% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 114: US 74 & Monroe Northern Loop

ø1	ø2	ø3	ø4
41 s	45 s	21 s	33 s

ø5	ø6	ø7	ø8
28 s	58 s	14 s	40 s

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	1150	1740	140	270	1390	450	170	1200	420	470	810	970
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3273	4848	1509	3273	4848	1509	3335	3438	1538	3273	3374	1509
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3273	4848	1509	3273	4848	1509	3335	3438	1538	3273	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			45	
Link Distance (ft)		858			915			405			209	
Travel Time (s)		13.0			13.9			7.9			3.2	
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 (%)	7%	7%	7%	7%	7%	7%	5%	5%	5%	7%	7%	7%
Adj. Flow (vph)	1278	1933	156	300	1544	500	189	1333	467	522	900	1078
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1278	1933	156	300	1544	500	189	1333	467	522	900	1078
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)		0			0			0			0	
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	1	6	4	5	2	7	4	8	5	7	3	1
Permitted Phases			6			2			8			8
Detector Phase	1	6	4	5	2	7	4	8	5	7	3	1
Switch Phase												
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0	7.0	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	14.0	14.0	14.0
Total Split (s)	40.0	62.0	15.0	17.0	39.0	21.0	15.0	40.0	17.0	21.0	46.0	40.0
Total Split (%)	28.6%	44.3%	10.7%	12.1%	27.9%	15.0%	10.7%	28.6%	12.1%	15.0%	32.9%	28.6%
Maximum Green (s)	33.0	55.0	8.0	10.0	32.0	14.0	8.0	33.0	10.0	14.0	39.0	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	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	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)	35.0	57.0	72.0	12.0	34.0	55.0	10.0	35.0	52.0	16.0	41.0	81.0
Actuated g/C Ratio	0.25	0.41	0.51	0.09	0.24	0.39	0.07	0.25	0.37	0.11	0.29	0.58
v/c Ratio	1.56	0.98	0.20	1.07	1.31	0.84	0.79	1.55	0.82	1.40	0.91	1.23
Control Delay	294.3	56.8	19.3	131.8	188.1	53.1	87.2	288.9	52.9	237.7	61.8	144.1

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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
Total Delay	294.3	56.8	19.3	131.8	188.1	53.1	87.2	288.9	52.9	237.7	61.8	144.1
LOS	F	E	B	F	F	D	F	F	D	F	E	F
Approach Delay		145.2			152.1			214.3			134.0	
Approach LOS		F			F			F			F	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

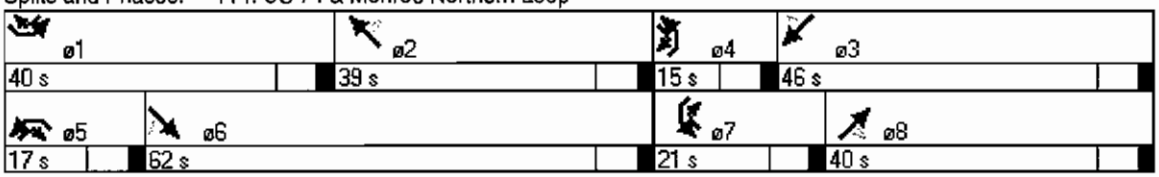
Maximum v/c Ratio: 1.56

Intersection Signal Delay: 157.5 Intersection LOS: F

Intersection Capacity Utilization 122.9% ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 114: US 74 & Monroe Northern Loop



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	110	1930	70	130	2410	280	70	70	100	300	90	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.912			0.904	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	3273	4848	1509	1770	1699	0	1770	1684	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	4848	1509	3273	4848	1509	1770	1699	0	1770	1684	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		413			1354			238			233	
Travel Time (s)		6.3			20.5			6.5			4.5	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	122	2144	78	144	2678	311	78	78	111	333	100	178
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	2144	78	144	2678	311	78	189	0	333	278	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)		0			0			0			0	
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		
Protected Phases	1	6	7	5	2	3	7	4		3	8	
Permitted Phases			6			2						
Detector Phase	1	6	7	5	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	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	19.0	14.0	14.0	19.0	14.0	14.0	14.0		14.0	14.0	
Total Split (s)	15.0	77.0	14.0	14.0	76.0	29.0	14.0	20.0	0.0	29.0	35.0	0.0
Total Split (%)	10.7%	55.0%	10.0%	10.0%	54.3%	20.7%	10.0%	14.3%	0.0%	20.7%	25.0%	0.0%
Maximum Green (s)	8.0	70.0	7.0	7.0	69.0	22.0	7.0	13.0		22.0	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	
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	Lead	Lag	Lead	Lead	Lag	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	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effct Green (s)	10.0	72.0	86.0	9.0	71.0	95.0	9.0	15.0		24.0	30.0	
Actuated g/C Ratio	0.07	0.51	0.61	0.06	0.51	0.68	0.06	0.11		0.17	0.21	
v/c Ratio	1.01	0.86	0.08	0.69	1.09	0.30	0.68	1.04		1.10	0.77	
Control Delay	147.3	34.2	11.3	81.1	81.2	5.5	92.8	136.5		133.4	67.0	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	147.3	34.2	11.3	81.1	81.2	5.5	92.8	136.5		133.4	67.0	
LOS	F	C	B	F	F	A	F	F		F	E	
Approach Delay		39.3			73.6			123.7			103.2	
Approach LOS		D			E			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 65.9 Intersection LOS: E
Intersection Capacity Utilization 95.8% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 115: US 74 & Secrest Shortcut Road

ø1	ø2	ø4	ø3
15 s	76 s	20 s	29 s
ø5	ø6	ø7	ø8
14 s	77 s	14 s	35 s

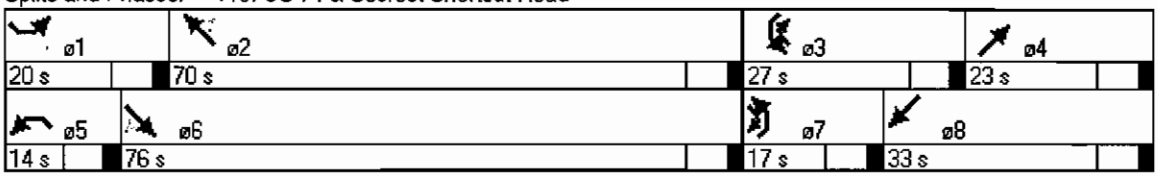
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	160	2410	70	100	1930	300	70	90	130	280	70	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.911			0.908	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	3273	4848	1509	1770	1697	0	1770	1691	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	4848	1509	3273	4848	1509	1770	1697	0	1770	1691	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		413			1354			238			233	
Travel Time (s)		6.3			20.5			6.5			4.5	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	178	2678	78	111	2144	333	78	100	144	311	78	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	2678	78	111	2144	333	78	244	0	311	200	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)		0			0			0			0	
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		
Protected Phases	1	6	7	5	2	3	7	4		3	8	
Permitted Phases			6			2						
Detector Phase	1	6	7	5	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	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	19.0	14.0	14.0	19.0	14.0	14.0	14.0		14.0	14.0	
Total Split (s)	20.0	76.0	17.0	14.0	70.0	27.0	17.0	23.0	0.0	27.0	33.0	0.0
Total Split (%)	14.3%	54.3%	12.1%	10.0%	50.0%	19.3%	12.1%	16.4%	0.0%	19.3%	23.6%	0.0%
Maximum Green (s)	13.0	69.0	10.0	7.0	63.0	20.0	10.0	16.0		20.0	26.0	
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	Lead	Lag	Lead	Lead	Lag	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	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effct Green (s)	15.0	71.0	87.3	9.0	65.0	92.0	11.3	18.0		22.0	28.7	
Actuated g/C Ratio	0.11	0.51	0.62	0.06	0.46	0.66	0.08	0.13		0.16	0.20	
v/c Ratio	0.98	1.09	0.08	0.53	0.95	0.34	0.54	1.12		1.12	0.58	
Control Delay	124.2	81.2	10.6	73.0	46.9	11.7	76.1	150.6		142.2	58.1	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	124.2	81.2	10.6	73.0	46.9	11.7	76.1	150.6		142.2	58.1	
LOS	F	F	B	E	D	B	E	F		F	E	
Approach Delay		81.9			43.5			132.5			109.3	
Approach LOS		F			D			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.12
Intersection Signal Delay: 71.0 Intersection LOS: E
Intersection Capacity Utilization 97.3% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 115: US 74 & Secrest Shortcut Road



TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*116*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*8/16/2007*	Analysis Year	*2030*
Analysis Time Period	*AM Peak*		
Project Description	*R-3329/R-2559*		
East/West Street:	*WB US 74 Ramp*	North/South Street:	*Concord Ave.*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*240*	*50*	*40*	*300*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*266*	*55*	*44*	*333*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*130*	*0*	*40*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*144*	*0*	*44*	*0*	*0*	*0*
Percent Heavy Vehicles	*7*	*0*	*7*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*44*		*188*				
C (m) (vph)		*1228*		*424*				
v/c		*0.04*		*0.44*				
95% queue length		*0.11*		*2.22*				
Control Delay		*8.0*		*20.1*				
LOS		*A*		*C*				
Approach Delay	--	--	*20.1*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*(116)*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*8/16/2007*	Analysis Year	*2030*
Analysis Time Period	*PM Peak*		
Project Description	*R-3329/R-2559*		
East/West Street:	*WB US 74 Ramp*	North/South Street:	*Concord Ave.*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*300*	*50*	*40*	*240*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*333*	*55*	*44*	*266*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*100*	*0*	*40*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*111*	*0*	*44*	*0*	*0*	*0*
Percent Heavy Vehicles	*7*	*0*	*7*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*44*		*155*				
C (m) (vph)		*1160*		*430*				
v/c		*0.04*		*0.36*				
95% queue length		*0.12*		*1.62*				
Control Delay		*8.2*		*18.0*				
LOS		*A*		*C*				
Approach Delay	--	--	*18.0*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*117*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*8/16/2007*	Analysis Year	*2030*
Analysis Time Period	*AM Peak*		

Project Description	*R-3329/R-2559*
East/West Street:	*EB US 74 Ramp*
Intersection Orientation:	*North-South*
North/South Street:	*Concord Ave.*
Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*100*	*250*			*390*	*40*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*111*	*277*	*0*	*0*	*433*	*44*
Percent Heavy Vehicles	*4*	--	--		--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*		*40*	*0*	*50*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*44*	*0*	*55*
Percent Heavy Vehicles		*0*		*7*	*0*	*7*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*111*						*99*	
C (m) (vph)	*1075*						*371*	
v/c	*0.10*						*0.27*	
95% queue length	*0.34*						*1.06*	
Control Delay	*8.7*						*18.2*	
LOS	*A*						*C*	
Approach Delay	--	--					*18.2*	
Approach LOS	--	--					*C*	

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*117*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*8/16/2007*	Analysis Year	*2030*
Analysis Time Period	*PM Peak*		

Project Description	*R-3329/R-2559*
East/West Street: *EB US 74 Ramp*	North/South Street: *Concord Ave.*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*130*	*310*			*310*	*40*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*144*	*344*	*0*	*0*	*344*	*44*
Percent Heavy Vehicles	*4*	--	--		--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*0*		*50*	*0*	*50*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*55*	*0*	*55*
Percent Heavy Vehicles		*0*		*7*	*0*	*7*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*144*						*110*	
C (m) (vph)	*1160*						*344*	
v/c	*0.12*						*0.32*	
95% queue length	*0.42*						*1.35*	
Control Delay	*8.5*						*20.3*	
LOS	*A*						*C*	
Approach Delay	--	--				*20.3*		
Approach LOS	--	--				*C*		

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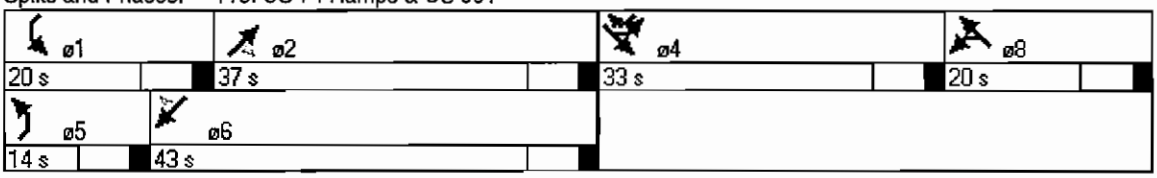
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	10	10	10	110	10	0	10	540	140	110	540	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.955							0.850			0.850
Flt Protected		0.984		0.950			0.950			0.950		
Satd. Flow (prot)	0	1669	0	1687	1776	0	1687	3374	1509	1687	3374	1509
Flt Permitted		0.984		0.950			0.950			0.950		
Satd. Flow (perm)	0	1669	0	1687	1776	0	1687	3374	1509	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		412			451			446			441	
Travel Time (s)		8.0			8.8			6.8			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	11	11	122	11	0	11	600	156	122	600	556
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	122	11	0	11	600	156	122	600	556
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	Split			Split			Prot		Perm	Prot		pm+ov
Protected Phases	4	4		8	8		5	2		1	6	4
Permitted Phases									2			6
Detector Phase	4	4		8	8		5	2	2	1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0	12.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0	19.0	14.0	19.0	14.0
Total Split (s)	33.0	33.0	0.0	20.0	20.0	0.0	14.0	37.0	37.0	20.0	43.0	33.0
Total Split (%)	30.0%	30.0%	0.0%	18.2%	18.2%	0.0%	12.7%	33.6%	33.6%	18.2%	39.1%	30.0%
Maximum Green (s)	26.0	26.0		13.0	13.0		7.0	30.0	30.0	13.0	36.0	26.0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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	Lag	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
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		14.8		14.3	14.3		9.0	46.8	46.8	14.1	63.1	82.9
Actuated g/C Ratio		0.13		0.13	0.13		0.08	0.43	0.43	0.13	0.57	0.75
v/c Ratio		0.15		0.56	0.05		0.08	0.42	0.24	0.56	0.31	0.49
Control Delay		40.0		54.5	41.0		48.2	25.6	25.1	55.1	15.5	8.3
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		40.0		54.5	41.0		48.2	25.6	25.1	55.1	15.5	8.3
LOS		D		D	D		D	C	C	E	B	A
Approach Delay		40.0			53.4			25.8			16.2	
Approach LOS		D			D			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 20 (18%), Referenced to phase 2:NET, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 22.1 — Intersection LOS: C
Intersection Capacity Utilization 55.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 118: US 74 Ramps & US 601



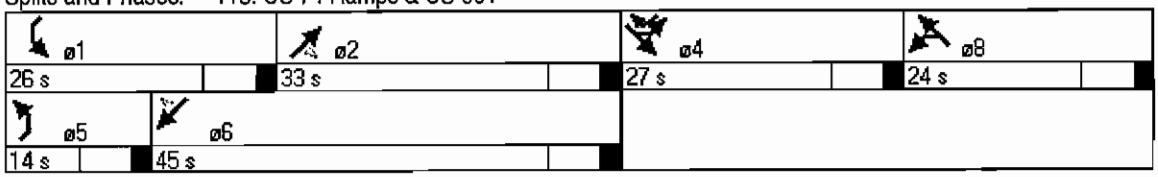
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	10	10	10	140	10	0	10	440	110	160	720	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	1		1	1		1
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.955							0.850			0.850
Flt Protected		0.984		0.950			0.950			0.950		
Satd. Flow (prot)	0	1669	0	1687	1776	0	1687	3374	1509	1687	3374	1509
Flt Permitted		0.984		0.950			0.950			0.950		
Satd. Flow (perm)	0	1669	0	1687	1776	0	1687	3374	1509	1687	3374	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		412			451			446			441	
Travel Time (s)		8.0			8.8			6.8			6.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	11	11	11	156	11	0	11	489	122	178	800	456
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	33	0	156	11	0	11	489	122	178	800	456
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	Split			Split			Prot		Perm	Prot		pm+ov
Protected Phases	4	4		8	8		5	2		1	6	4
Permitted Phases									2			6
Detector Phase	4	4		8	8		5	2	2	1	6	4
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0	12.0	7.0	12.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0		14.0	19.0	19.0	14.0	19.0	14.0
Total Split (s)	27.0	27.0	0.0	24.0	24.0	0.0	14.0	33.0	33.0	26.0	45.0	27.0
Total Split (%)	24.5%	24.5%	0.0%	21.8%	21.8%	0.0%	12.7%	30.0%	30.0%	23.6%	40.9%	24.5%
Maximum Green (s)	20.0	20.0		17.0	17.0		7.0	26.0	26.0	19.0	38.0	20.0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
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	Lag	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
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None		Max	Max		None	C-Max	C-Max	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		10.7		30.3	30.3		9.0	31.1	31.1	17.9	51.2	66.9
Actuated g/C Ratio		0.10		0.28	0.28		0.08	0.28	0.28	0.16	0.47	0.61
v/c Ratio		0.20		0.34	0.02		0.08	0.51	0.29	0.65	0.51	0.50
Control Delay		47.8		35.0	30.8		48.2	36.1	34.3	54.0	23.0	15.1
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		47.8		35.0	30.8		48.2	36.1	34.3	54.0	23.0	15.1
LOS		D		D	C		D	D	C	D	C	B
Approach Delay		47.8			34.7			36.0			24.3	
Approach LOS		D			C			D			C	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 26 (24%), Referenced to phase 2:NET, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 28.6 — Intersection LOS: C
Intersection Capacity Utilization 52.7% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 118: US 74 Ramps & US 601



TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*118A*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*6/27/2007*	Analysis Year	*2030*
Analysis Time Period	*AM Peak Hour*		
Project Description	*Monroe Connector*		
East/West Street:	*East Ave.*	North/South Street:	*US 74 Off Ramp*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*10*	*620*	*10*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*11*	*688*	*11*	*0*	*0*	*0*
Percent Heavy Vehicles	*7*	--	--		--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration	*LTR*					
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*110*	*140*	*10*	*250*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*122*	*155*	*11*	*277*	*0*
Percent Heavy Vehicles		*7*	*7*	*7*	*7*	
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*				*TR*	*LT*		
v (vph)	*11*				*277*	*288*		
C (m) (vph)	*1591*				*390*	*322*		
v/c	*0.01*				*0.71*	*0.89*		
95% queue length	*0.02*				*5.34*	*8.48*		
Control Delay	*7.3*				*33.9*	*63.6*		
LOS	*A*				*D*	*F*		
Approach Delay	--	--	*33.9*			*63.6*		
Approach LOS	--	--	*D*			*F*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*118A*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*6/27/2007*	Analysis Year	*2030*
Analysis Time Period	*PM Peak Hour*		
Project Description	*Monroe Connector*		
East/West Street:	*East Ave.*	North/South Street:	*US 74 Off Ramp*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*10*	*510*	*10*			
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*11*	*566*	*11*	*0*	*0*	*0*
Percent Heavy Vehicles	*7*	--	--		--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration	*LTR*					
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume		*140*	*140*	*10*	*270*	
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*155*	*155*	*11*	*300*	*0*
Percent Heavy Vehicles		*7*	*7*	*7*	*7*	
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*				*TR*	*LT*		
v (vph)	*11*				*310*	*311*		
C (m) (vph)	*1591*				*453*	*384*		
v/c	*0.01*				*0.68*	*0.81*		
95% queue length	*0.02*				*5.07*	*7.16*		
Control Delay	*7.3*				*28.5*	*44.0*		
LOS	*A*				*D*	*E*		
Approach Delay	--	--	*28.5*			*44.0*		
Approach LOS	--	--	*D*			*E*		

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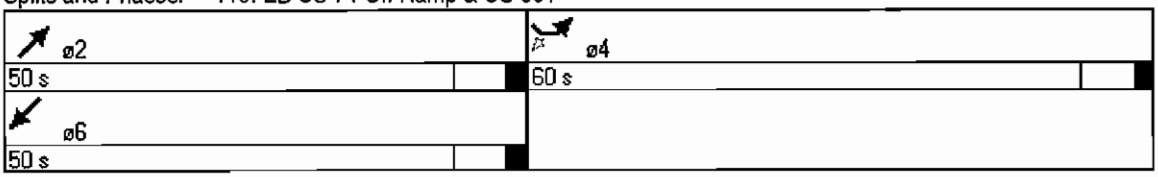
Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	410	420	0	780	780	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3273	1509	0	3374	3374	0
Flt Permitted	0.950					
Satd. Flow (perm)	3273	1509	0	3374	3374	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	529			486	575	
Travel Time (s)	10.3			7.4	8.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	456	467	0	867	867	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	456	467	0	867	867	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			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)	15	9	15			9
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0		12.0	12.0	
Minimum Split (s)	14.0	14.0		19.0	19.0	
Total Split (s)	60.0	60.0	0.0	50.0	50.0	0.0
Total Split (%)	54.5%	54.5%	0.0%	45.5%	45.5%	0.0%
Maximum Green (s)	53.0	53.0		43.0	43.0	

Lane Group	SEL	SER	NEL	NET	SWT	SWR
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	2.0	5.0	5.0	2.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		C-Max	C-Max	
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)	55.0	55.0		45.0	45.0	
Actuated g/C Ratio	0.50	0.50		0.41	0.41	
v/c Ratio	0.28	0.62		0.63	0.63	
Control Delay	16.6	24.4		28.4	28.4	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	16.6	24.4		28.4	28.4	
LOS	B	C		C	C	
Approach Delay	20.5			28.4	28.4	
Approach LOS	C			C	C	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 62 (56%), Referenced to phase 2:NET and 6:SWT, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 25.6
Intersection LOS: C
Intersection Capacity Utilization 55.9%
ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 119: EB US 74 Off Ramp & US 601



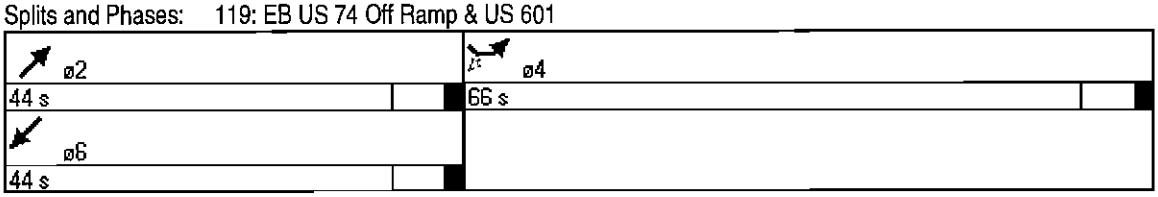
Lane Group	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (vph)	500	520	0	470	770	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	2	1	0			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor						
Frt		0.850				
Flt Protected	0.950					
Satd. Flow (prot)	3273	1509	0	3374	3374	0
Flt Permitted	0.950					
Satd. Flow (perm)	3273	1509	0	3374	3374	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	529			486	575	
Travel Time (s)	10.3			7.4	8.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	556	578	0	522	856	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	556	578	0	522	856	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			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)	15	9	15			9
Turn Type		Perm				
Protected Phases	4			2	6	
Permitted Phases		4				
Detector Phase	4	4		2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0		12.0	12.0	
Minimum Split (s)	14.0	14.0		19.0	19.0	
Total Split (s)	66.0	66.0	0.0	44.0	44.0	0.0
Total Split (%)	60.0%	60.0%	0.0%	40.0%	40.0%	0.0%
Maximum Green (s)	59.0	59.0		37.0	37.0	

Lane Group	SEL	SER	NEL	NET	SWT	SWR
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	2.0	5.0	5.0	2.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	
Recall Mode	Max	Max		None	None	
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)	61.1	61.1		34.0	34.0	
Actuated g/C Ratio	0.58	0.58		0.32	0.32	
v/c Ratio	0.29	0.66		0.48	0.78	
Control Delay	12.2	20.5		29.8	37.9	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	12.2	20.5		29.8	37.9	
LOS	B	C		C	D	
Approach Delay	16.4			29.8	37.9	
Approach LOS	B			C	D	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 105.2
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 26.5 — Intersection LOS: C
Intersection Capacity Utilization 61.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 119: EB US 74 Off Ramp & US 601



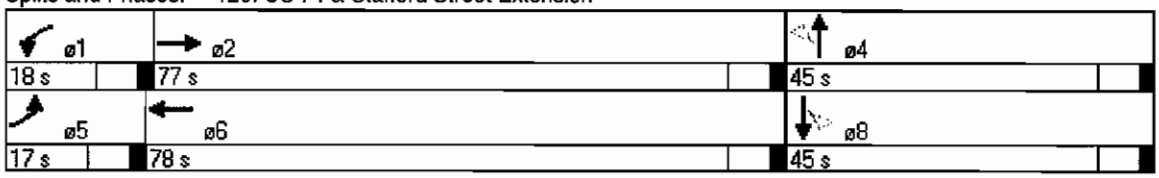
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	2290	90	170	2830	60	160	130	240	70	110	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.997			0.903			0.898	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4819	0	1687	4833	0	1770	1682	0	1770	1673	0
Flt Permitted	0.950			0.950			0.247			0.201		
Satd. Flow (perm)	1687	4819	0	1687	4833	0	460	1682	0	374	1673	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		443			590			549			636	
Travel Time (s)		6.7			8.9			15.0			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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	178	2544	100	189	3144	67	178	144	267	78	122	256
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	2644	0	189	3211	0	178	411	0	78	378	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	17.0	77.0	0.0	18.0	78.0	0.0	45.0	45.0	0.0	45.0	45.0	0.0
Total Split (%)	12.1%	55.0%	0.0%	12.9%	55.7%	0.0%	32.1%	32.1%	0.0%	32.1%	32.1%	0.0%
Maximum Green (s)	10.0	70.0		11.0	71.0		38.0	38.0		38.0	38.0	
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	Lag		Lead	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	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	12.0	72.0		13.0	73.0		40.0	40.0		40.0	40.0	
Actuated g/C Ratio	0.09	0.51		0.09	0.52		0.29	0.29		0.29	0.29	
v/c Ratio	1.23	1.07		1.20	1.27		1.36	0.85		0.73	0.79	
Control Delay	199.7	72.4		188.9	157.4		241.5	65.2		82.8	59.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	199.7	72.4		188.9	157.4		241.5	65.2		82.8	59.4	
LOS	F	E		F	F		F	E		F	E	
Approach Delay		80.4			159.1			118.5			63.4	
Approach LOS		F			F			F			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.36
Intersection Signal Delay: 119.3 — Intersection LOS: F
Intersection Capacity Utilization 110.3% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 120: US 74 & Stafford Street Extension



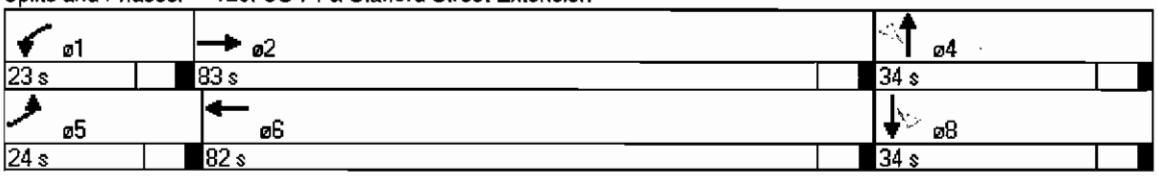
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	2830	160	240	2290	70	90	110	170	60	130	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00											
Frt		0.992			0.996			0.909			0.917	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4809	0	1687	4828	0	1770	1693	0	1770	1708	0
Flt Permitted	0.950			0.950			0.191			0.213		
Satd. Flow (perm)	1687	4809	0	1687	4828	0	356	1693	0	397	1708	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		443			590			549			636	
Travel Time (s)		6.7			8.9			15.0			12.4	
Confl. Peds. (#/hr)	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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	256	3144	178	267	2544	78	100	122	189	67	144	178
Shared Lane Traffic (%)												
Lane Group Flow (vph)	256	3322	0	267	2622	0	100	311	0	67	322	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	24.0	83.0	0.0	23.0	82.0	0.0	34.0	34.0	0.0	34.0	34.0	0.0
Total Split (%)	17.1%	59.3%	0.0%	16.4%	58.6%	0.0%	24.3%	24.3%	0.0%	24.3%	24.3%	0.0%
Maximum Green (s)	17.0	76.0		16.0	75.0		27.0	27.0		27.0	27.0	
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	Lag		Lead	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	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	19.0	78.0		18.0	77.0		29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.14	0.56		0.13	0.55		0.21	0.21		0.21	0.21	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.12	1.24		1.23	0.99		1.35	0.89		0.82	0.91	
Control Delay	148.4	140.9		186.3	45.8		266.0	80.5		112.0	83.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	148.4	140.9		186.3	45.8		266.0	80.5		112.0	83.9	
LOS	F	F		F	D		F	F		F	F	
Approach Delay		141.4			58.8			125.6			88.7	
Approach LOS		F			E			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.35
Intersection Signal Delay: 104.9 Intersection LOS: F
Intersection Capacity Utilization 110.7% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 120: US 74 & Stafford Street Extension



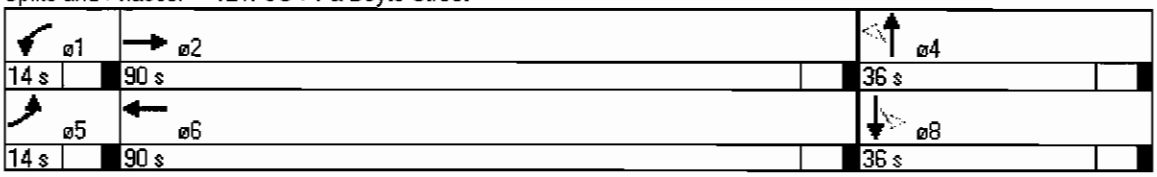
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	2310	120	90	2810	40	100	20	60	70	60	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993			0.998			0.887			0.882	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4814	0	1687	4838	0	1770	1652	0	1770	1643	0
Flt Permitted	0.950			0.950			0.244			0.684		
Satd. Flow (perm)	1687	4814	0	1687	4838	0	455	1652	0	1274	1643	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			20	
Link Distance (ft)		493			536			238			211	
Travel Time (s)		7.5			8.1			6.5			7.2	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	111	2567	133	100	3122	44	111	22	67	78	67	244
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	2700	0	100	3166	0	111	89	0	78	311	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	90.0	0.0	14.0	90.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0
Total Split (%)	10.0%	64.3%	0.0%	10.0%	64.3%	0.0%	25.7%	25.7%	0.0%	25.7%	25.7%	0.0%
Maximum Green (s)	7.0	83.0		7.0	83.0		29.0	29.0		29.0	29.0	
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	Lag		Lead	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	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	85.0		9.0	85.0		31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.06	0.61		0.06	0.61		0.22	0.22		0.22	0.22	
v/c Ratio	1.03	0.92		0.93	1.08		1.10	0.24		0.28	0.85	
Control Delay	156.6	31.3		132.5	69.8		168.6	47.0		48.4	74.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	156.6	31.3		132.5	69.8		168.6	47.0		48.4	74.5	
LOS	F	C		F	E		F	D		D	E	
Approach Delay		36.3			71.7			114.5			69.3	
Approach LOS		D			E			F			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 57.9 Intersection LOS: E
Intersection Capacity Utilization 100.2% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 121: US 74 & Boyte Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	2810	100	60	2310	70	120	60	90	40	20	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.996			0.910			0.875	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4823	0	1687	4828	0	1770	1695	0	1770	1630	0
Flt Permitted	0.950			0.950			0.518			0.415		
Satd. Flow (perm)	1687	4823	0	1687	4828	0	965	1695	0	773	1630	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			20	
Link Distance (ft)		493			536			238			211	
Travel Time (s)		7.5			8.1			6.5			7.2	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	244	3122	111	67	2567	78	133	67	100	44	22	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	244	3233	0	67	2645	0	133	167	0	44	133	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4			8		
Detector Phase	5	2		1	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	7.0	12.0		7.0	12.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	19.0		14.0	19.0		14.0	14.0		14.0	14.0	
Total Split (s)	26.0	101.0	0.0	14.0	89.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Split (%)	18.6%	72.1%	0.0%	10.0%	63.6%	0.0%	17.9%	17.9%	0.0%	17.9%	17.9%	0.0%
Maximum Green (s)	19.0	94.0		7.0	82.0		18.0	18.0		18.0	18.0	
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	Lag		Lead	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	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	21.0	98.8		9.0	84.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.15	0.71		0.06	0.60		0.14	0.14		0.14	0.14	
v/c Ratio	0.96	0.95		0.62	0.91		0.96	0.69		0.40	0.57	
Control Delay	106.8	27.1		88.1	30.9		126.6	72.7		66.6	66.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	106.8	27.1		88.1	30.9		126.6	72.7		66.6	66.6	
LOS	F	C		F	C		F	E		E	E	
Approach Delay		32.7			32.3			96.6			66.6	
Approach LOS		C			C			F			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

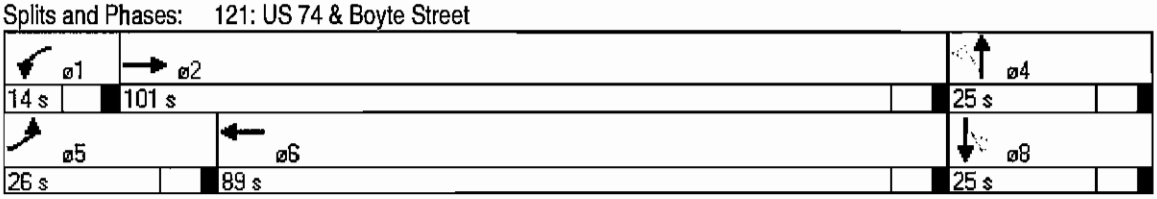
Maximum v/c Ratio: 0.96

Intersection Signal Delay: 36.3 Intersection LOS: D

Intersection Capacity Utilization 93.5% ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 121: US 74 & Boyte Street



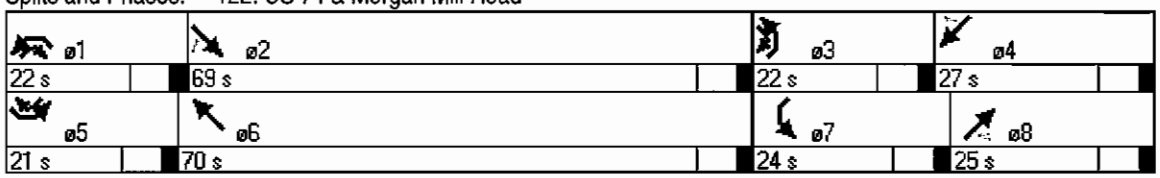
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	210	1970	220	190	2440	160	220	210	150	200	320	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.991				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	1687	4804	0	1687	1776	1509	1687	1776	1509
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	4848	1509	1687	4804	0	1687	1776	1509	1687	1776	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		515			499			502			475	
Travel Time (s)		7.8			7.6			9.8			9.3	
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
Adj. Flow (vph)	233	2189	244	211	2711	178	244	233	167	222	356	367
Shared Lane Traffic (%)												
Lane Group Flow (vph)	233	2189	244	211	2889	0	244	233	167	222	356	367
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)		0			0			0			0	
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	7.0	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	14.0	14.0
Total Split (s)	21.0	69.0	22.0	22.0	70.0	0.0	22.0	25.0	22.0	24.0	27.0	21.0
Total Split (%)	15.0%	49.3%	15.7%	15.7%	50.0%	0.0%	15.7%	17.9%	15.7%	17.1%	19.3%	15.0%
Maximum Green (s)	14.0	62.0	15.0	15.0	63.0		15.0	18.0	15.0	17.0	20.0	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
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	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead	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	3.0
Recall Mode	None	C-Max	None	None	C-Max		None	None	None	None	None	None
Act Effct Green (s)	16.0	64.0	86.0	17.0	65.0		17.0	20.0	42.0	19.0	22.0	43.0
Actuated g/C Ratio	0.11	0.46	0.61	0.12	0.46		0.12	0.14	0.30	0.14	0.16	0.31
v/c Ratio	1.21	0.99	0.26	1.03	1.30		1.19	0.92	0.37	0.97	1.28	0.79
Control Delay	182.5	54.0	13.3	129.7	169.3		174.8	97.5	41.5	111.7	195.3	58.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	182.5	54.0	13.3	129.7	169.3		174.8	97.5	41.5	111.7	195.3	58.3
LOS	F	D	B	F	F		F	F	D	F	F	E
Approach Delay		61.5			166.6			112.3			122.4	
Approach LOS		E			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.30
Intersection Signal Delay: 118.1 Intersection LOS: F
Intersection Capacity Utilization 108.0% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 122: US 74 & Morgan Mill Road



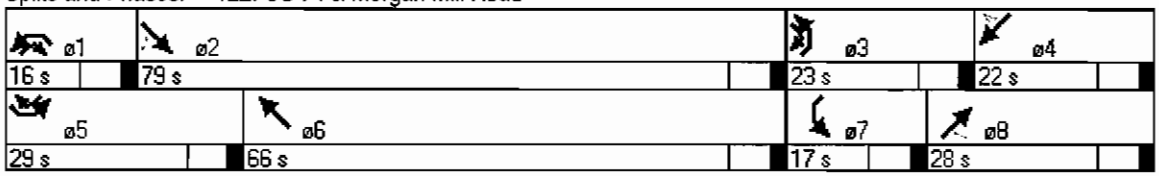
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	330	2440	220	150	1970	200	220	320	190	160	210	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.986				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	1687	4780	0	1687	1776	1509	1687	1776	1509
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	4848	1509	1687	4780	0	1687	1776	1509	1687	1776	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		515			499			502			475	
Travel Time (s)		7.8			7.6			9.8			9.3	
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
Adj. Flow (vph)	367	2711	244	167	2189	222	244	356	211	178	233	233
Shared Lane Traffic (%)												
Lane Group Flow (vph)	367	2711	244	167	2411	0	244	356	211	178	233	233
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)		0			0			0			0	
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	7.0	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	14.0	14.0
Total Split (s)	29.0	79.0	23.0	16.0	66.0	0.0	23.0	28.0	16.0	17.0	22.0	29.0
Total Split (%)	20.7%	56.4%	16.4%	11.4%	47.1%	0.0%	16.4%	20.0%	11.4%	12.1%	15.7%	20.7%
Maximum Green (s)	22.0	72.0	16.0	9.0	59.0		16.0	21.0	9.0	10.0	15.0	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
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	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead	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	3.0
Recall Mode	None	C-Max	None	None	C-Max		None	None	None	None	None	None
Act Effct Green (s)	24.0	74.0	97.0	11.0	61.0		18.0	23.0	39.0	12.0	17.0	46.0
Actuated g/C Ratio	0.17	0.53	0.69	0.08	0.44		0.13	0.16	0.28	0.09	0.12	0.33
v/c Ratio	1.27	1.06	0.23	1.26	1.16		1.12	1.22	0.50	1.23	1.08	0.47
Control Delay	191.7	68.0	8.5	212.5	113.3		152.3	173.6	47.3	199.7	140.1	41.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay	191.7	68.0	8.5	212.5	113.3		152.3	173.6	47.3	199.7	140.1	41.2
LOS	F	E	A	F	F		F	F	D	F	F	D
Approach Delay		77.3			119.7			134.3			120.8	
Approach LOS		E			F			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:SET and 6:NWT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.27
Intersection Signal Delay: 102.2 Intersection LOS: F
Intersection Capacity Utilization 103.2% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 122: US 74 & Morgan Mill Road



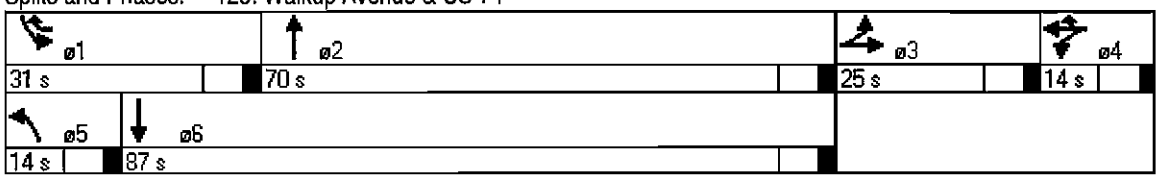
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	150	40	10	110	310	50	2370	20	340	1900	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.982				0.850		0.999			0.994	
Flt Protected		0.983		0.950			0.950			0.950		
Satd. Flow (prot)	0	1798	0	1770	1863	1583	1687	4843	0	1687	4819	0
Flt Permitted		0.983		0.950			0.950			0.950		
Satd. Flow (perm)	0	1798	0	1770	1863	1583	1687	4843	0	1687	4819	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		443			502			602			356	
Travel Time (s)		12.1			9.8			9.1			5.4	
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%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	111	167	44	11	122	344	56	2633	22	378	2111	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	322	0	11	122	344	56	2655	0	378	2200	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)		0			0			0			0	
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			Split		pt+ov	Prot			Prot		
Protected Phases	3	3		4	4	4 1	5	2		1	6	
Permitted Phases												
Detector Phase	3	3		4	4	4 1	5	2		1	6	
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)	25.0	25.0	0.0	14.0	14.0	45.0	14.0	70.0	0.0	31.0	87.0	0.0
Total Split (%)	17.9%	17.9%	0.0%	10.0%	10.0%	32.1%	10.0%	50.0%	0.0%	22.1%	62.1%	0.0%
Maximum Green (s)	18.0	18.0		7.0	7.0		7.0	63.0		24.0	80.0	
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	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	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	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		20.0		9.0	9.0	40.0	9.0	65.0		26.0	84.8	
Actuated g/C Ratio		0.14		0.06	0.06	0.29	0.06	0.46		0.19	0.61	
v/c Ratio		1.25		0.10	1.02	0.76	0.52	1.18		1.21	0.75	
Control Delay		189.4		63.8	149.8	57.9	80.8	120.9		167.0	22.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0		
Total Delay	189.4		63.8	149.8	57.9	80.8	120.9		167.0	22.8		
LOS	F		E	F	E	F	F		F	C		
Approach Delay	189.4			81.6			120.0			44.0		
Approach LOS	F			F			F			D		

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.25
Intersection Signal Delay: 88.5 Intersection LOS: F
Intersection Capacity Utilization 100.1% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 123: Walkup Avenue & US 74



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	110	50	20	150	350	40	1900	10	310	2370	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.91	0.91
Frt		0.972				0.850		0.999			0.994	
Flt Protected		0.984		0.950			0.950			0.950		
Satd. Flow (prot)	0	1782	0	1770	1863	1583	1687	4843	0	1687	4819	0
Flt Permitted		0.984		0.950			0.950			0.950		
Satd. Flow (perm)	0	1782	0	1770	1863	1583	1687	4843	0	1687	4819	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			35			45			45	
Link Distance (ft)		443			502			602			356	
Travel Time (s)		12.1			9.8			9.1			5.4	
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%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	89	122	56	22	167	389	44	2111	11	344	2633	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	267	0	22	167	389	44	2122	0	344	2744	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)		0			0			0			0	
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			Split		pt+ov	Prot			Prot		
Protected Phases	3	3		4	4	4 1	5	2		1	6	
Permitted Phases												
Detector Phase	3	3		4	4	4 1	5	2		1	6	
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)	25.0	25.0	0.0	18.0	18.0	50.0	14.0	65.0	0.0	32.0	83.0	0.0
Total Split (%)	17.9%	17.9%	0.0%	12.9%	12.9%	35.7%	10.0%	46.4%	0.0%	22.9%	59.3%	0.0%
Maximum Green (s)	18.0	18.0		11.0	11.0		7.0	58.0		25.0	76.0	
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	5.0	5.0	5.0	2.0	5.0	5.0	2.0
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	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	
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	
Act Effct Green (s)		20.0		13.0	13.0	45.0	9.0	60.0		27.0	80.8	
Actuated g/C Ratio		0.14		0.09	0.09	0.32	0.06	0.43		0.19	0.58	
v/c Ratio		1.05		0.13	0.97	0.76	0.41	1.02		1.06	0.99	
Control Delay		125.9		60.5	122.3	54.1	74.7	65.0		119.3	43.8	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay		125.9		60.5	122.3	54.1	74.7	65.0		119.3	43.8	
LOS		F		E	F	D	E	E		F	D	
Approach Delay		125.9			74.0			65.2			52.2	
Approach LOS		F			E			E			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 160

Control Type: Actuated-Coordinated

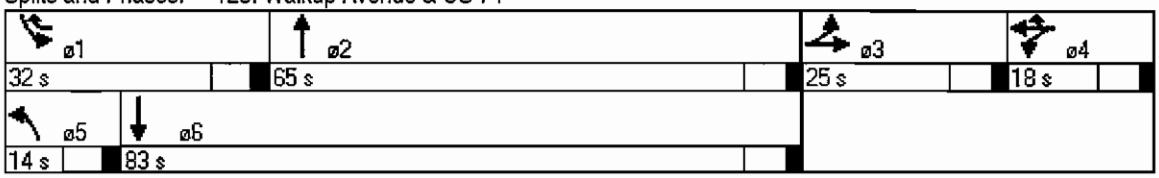
Maximum v/c Ratio: 1.06

Intersection Signal Delay: 62.1 Intersection LOS: E

Intersection Capacity Utilization 91.9% ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 123: Walkup Avenue & US 74



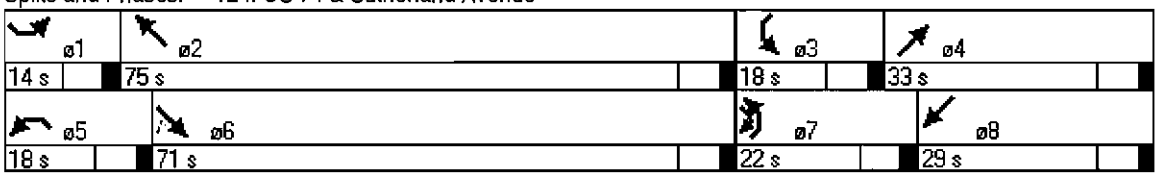
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	80	1680	250	70	2100	170	200	230	40	110	230	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.989			0.978			0.969	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	1687	4794	0	1752	1804	0	1752	1787	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	4848	1509	1687	4794	0	1752	1804	0	1752	1787	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		425			487			426			331	
Travel Time (s)		6.4			7.4			11.6			6.4	
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 (%)	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	89	1867	278	78	2333	189	222	256	44	122	256	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	1867	278	78	2522	0	222	300	0	122	323	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)		0			0			0			0	
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	1	6	7	5	2		7	4		3	8	
Permitted Phases			6									
Detector Phase	1	6	7	5	2		7	4		3	8	
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	71.0	22.0	18.0	75.0	0.0	22.0	33.0	0.0	18.0	29.0	0.0
Total Split (%)	10.0%	50.7%	15.7%	12.9%	53.6%	0.0%	15.7%	23.6%	0.0%	12.9%	20.7%	0.0%
Maximum Green (s)	7.0	64.0	15.0	11.0	68.0		15.0	26.0		11.0	22.0	
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	Lead	Lag	Lead	Lead	Lag		Lead	Lag		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	
Recall Mode	None	C-Max	None	None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	67.0	89.0	12.0	70.0		17.0	28.2		12.8	24.0	
Actuated g/C Ratio	0.06	0.48	0.64	0.09	0.50		0.12	0.20		0.09	0.17	
v/c Ratio	0.82	0.80	0.29	0.54	1.05		1.04	0.82		0.76	1.06	
Control Delay	112.7	34.5	12.6	75.1	68.3		131.4	72.9		90.5	121.3	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	112.7	34.5	12.6	75.1	68.3		131.4	72.9		90.5	121.3	
LOS	F	C	B	E	E		F	E		F	F	
Approach Delay		34.9			68.5			97.8			112.9	
Approach LOS		C			E			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 61.6 Intersection LOS: E
Intersection Capacity Utilization 93.7% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 124: US 74 & Sutherland Avenue



Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	60	2100	200	40	1680	110	250	230	70	170	280	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.991			0.965			0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	4848	1509	1687	4804	0	1752	1780	0	1752	1773	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1687	4848	1509	1687	4804	0	1752	1780	0	1752	1773	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			25			35	
Link Distance (ft)		425			487			426			331	
Travel Time (s)		6.4			7.4			11.6			6.4	
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 (%)	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	67	2333	222	44	1867	122	278	256	78	189	256	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	2333	222	44	1989	0	278	334	0	189	345	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)		0			0			0			0	
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	1	6	7	5	2		7	4		3	8	
Permitted Phases			6									
Detector Phase	1	6	7	5	2		7	4		3	8	
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	70.0	26.0	14.0	70.0	0.0	26.0	35.0	0.0	21.0	30.0	0.0
Total Split (%)	10.0%	50.0%	18.6%	10.0%	50.0%	0.0%	18.6%	25.0%	0.0%	15.0%	21.4%	0.0%
Maximum Green (s)	7.0	63.0	19.0	7.0	63.0		19.0	28.0		14.0	23.0	
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	Lead	Lag	Lead	Lead	Lag		Lead	Lag		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	
Recall Mode	None	C-Max	None	None	C-Max		None	None		None	None	
Act Effct Green (s)	9.0	67.8	93.8	9.0	67.8		21.0	30.0		16.0	25.0	
Actuated g/C Ratio	0.06	0.48	0.67	0.06	0.48		0.15	0.21		0.11	0.18	
v/c Ratio	0.62	0.99	0.22	0.41	0.86		1.06	0.88		0.94	1.09	
Control Delay	88.1	53.3	10.2	74.7	37.1		127.1	77.0		111.7	128.9	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	88.1	53.3	10.2	74.7	37.1		127.1	77.0		111.7	128.9	
LOS	F	D	B	E	D		F	E		F	F	
Approach Delay		50.5			37.9			99.8			122.8	
Approach LOS		D			D			F			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NWT and 6:SET, Start of Green
Natural Cycle: 160
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 58.0 Intersection LOS: E
Intersection Capacity Utilization 93.2% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 124: US 74 & Sutherland Avenue

ø1	ø2	ø3	ø4
14 s	70 s	21 s	35 s

ø5	ø6	ø7	ø8
14 s	70 s	26 s	30 s

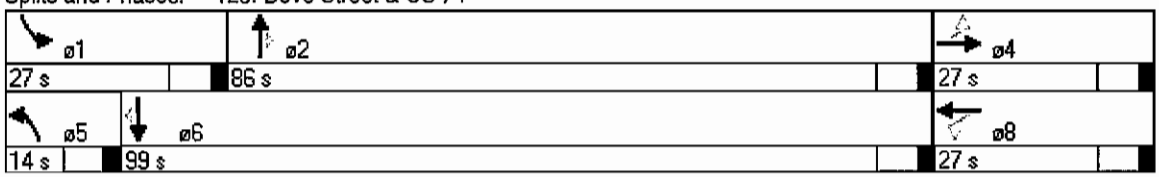
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	10	10	20	10	120	10	2070	20	140	1650	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt		0.925			0.861				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1723	0	1770	1604	0	1687	4848	1509	1687	4848	1509
Flt Permitted	0.469			0.743			0.950			0.950		
Satd. Flow (perm)	874	1723	0	1384	1604	0	1687	4848	1509	1687	4848	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			45			45	
Link Distance (ft)		163			218			356			257	
Travel Time (s)		5.6			4.2			5.4			3.9	
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%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	67	11	11	22	11	133	11	2300	22	156	1833	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	22	0	22	144	0	11	2300	22	156	1833	122
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)		0			0			0			0	
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	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	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	19.0	19.0	14.0	19.0	19.0
Total Split (s)	27.0	27.0	0.0	27.0	27.0	0.0	14.0	86.0	86.0	27.0	99.0	99.0
Total Split (%)	19.3%	19.3%	0.0%	19.3%	19.3%	0.0%	10.0%	61.4%	61.4%	19.3%	70.7%	70.7%
Maximum Green (s)	20.0	20.0		20.0	20.0		7.0	79.0	79.0	20.0	92.0	92.0
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	Lag	Lag	Lead	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	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	18.8	18.8		18.8	18.8		9.0	87.2	87.2	19.0	105.6	105.6
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.06	0.62	0.62	0.14	0.75	0.75
v/c Ratio	0.57	0.10		0.12	0.67		0.10	0.76	0.02	0.68	0.50	0.11
Control Delay	75.2	52.4		53.1	72.6		64.1	22.2	12.2	72.4	8.5	6.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.2	52.4		53.1	72.6		64.1	22.2	12.2	72.4	8.5	6.3
LOS	E	D		D	E		E	C	B	E	A	A
Approach Delay		69.5			70.0			22.3			13.1	
Approach LOS		E			E			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 20.7 — Intersection LOS: C
Intersection Capacity Utilization 78.2% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 125: Dove Street & US 74



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	10	10	20	10	140	10	1650	20	120	2070	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt		0.925			0.860				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1723	0	1770	1602	0	1687	4848	1509	1687	4848	1509
Flt Permitted	0.466			0.743			0.950			0.950		
Satd. Flow (perm)	868	1723	0	1384	1602	0	1687	4848	1509	1687	4848	1509
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			35			45			45	
Link Distance (ft)		163			218			356			257	
Travel Time (s)		5.6			4.2			5.4			3.9	
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%	2%	2%	7%	7%	7%	7%	7%	7%
Adj. Flow (vph)	122	11	11	22	11	156	11	1833	22	133	2300	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	122	22	0	22	167	0	11	1833	22	133	2300	67
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)		0			0			0			0	
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	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	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	19.0	19.0	14.0	19.0	19.0
Total Split (s)	37.0	37.0	0.0	37.0	37.0	0.0	14.0	79.0	79.0	24.0	89.0	89.0
Total Split (%)	26.4%	26.4%	0.0%	26.4%	26.4%	0.0%	10.0%	56.4%	56.4%	17.1%	63.6%	63.6%
Maximum Green (s)	30.0	30.0		30.0	30.0		7.0	72.0	72.0	17.0	82.0	82.0
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	Lag	Lag	Lead	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	None		None	None		None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	24.1	24.1		24.1	24.1		9.0	83.7	83.7	17.2	100.3	100.3
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.06	0.60	0.60	0.12	0.72	0.72
v/c Ratio	0.82	0.07		0.09	0.61		0.10	0.63	0.02	0.64	0.66	0.06
Control Delay	92.2	45.8		46.3	62.0		64.0	20.8	14.6	72.6	14.1	8.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.2	45.8		46.3	62.0		64.0	20.8	14.6	72.6	14.1	8.7
LOS	F	D		D	E		E	C	B	E	B	A
Approach Delay		85.1			60.1			21.0			17.1	
Approach LOS		F			E			C			B	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

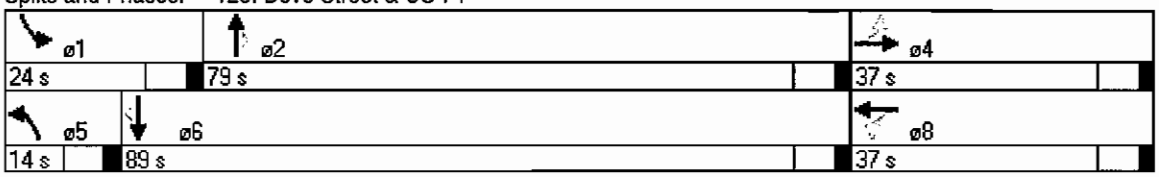
Maximum v/c Ratio: 0.82

Intersection Signal Delay: 22.4 Intersection LOS: C

Intersection Capacity Utilization 77.8% ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 125: Dove Street & US 74



Lane Group	NBU	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Volume (vph)	20	510	1860	110	80	1460	110	160	100	580	120	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.86	0.97	0.86	0.86	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00
Frt			0.992				0.850			0.850		
Flt Protected		0.950			0.950			0.950			0.950	
Satd. Flow (prot)	0	3273	6060	0	1687	4848	1509	1752	1845	2760	1752	1845
Flt Permitted		0.950			0.950			0.950			0.950	
Satd. Flow (perm)	0	3273	6060	0	1687	4848	1509	1752	1845	2760	1752	1845
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			45			35			20
Link Distance (ft)			341			436			391			335
Travel Time (s)			5.2			6.6			7.6			11.4
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 (%)	7%	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%
Adj. Flow (vph)	22	567	2067	122	89	1622	122	178	111	644	133	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	589	2189	0	89	1622	122	178	111	644	133	111
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	Left	Left	Right	Left	Left
Median Width(ft)			24			24			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			0			0			0			0
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		pm+ov	Split		Prot	Split	
Protected Phases	5	5	2		1	6	4	4	4	4	3	3
Permitted Phases							6					
Detector Phase	5	5	2		1	6	4	4	4	4	3	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0		7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	14.0	19.0		14.0	19.0	14.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	31.0	31.0	71.0	0.0	15.0	55.0	38.0	38.0	38.0	38.0	16.0	16.0
Total Split (%)	22.1%	22.1%	50.7%	0.0%	10.7%	39.3%	27.1%	27.1%	27.1%	27.1%	11.4%	11.4%
Maximum Green (s)	24.0	24.0	64.0		8.0	48.0	31.0	31.0	31.0	31.0	9.0	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	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		Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
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	None	C-Max		None	C-Max	None	None	None	None	None	None
Act Effct Green (s)		26.0	66.0		10.0	50.0	83.0	33.0	33.0	33.0	11.0	11.0
Actuated g/C Ratio		0.19	0.47		0.07	0.36	0.59	0.24	0.24	0.24	0.08	0.08
v/c Ratio		0.97	0.77		0.74	0.94	0.14	0.43	0.26	0.99	0.96	0.77
Control Delay		85.8	32.9		96.3	54.7	7.2	49.4	45.4	85.7	130.8	94.5

Lane Group	SWR
Lane Configurations	↱
Volume (vph)	110
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
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%
Adj. Flow (vph)	122
Shared Lane Traffic (%)	
Lane Group Flow (vph)	122
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	pt+ov
Protected Phases	3 1
Permitted Phases	
Detector Phase	3 1
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	31.0
Total Split (%)	22.1%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	21.0
Actuated g/C Ratio	0.15
v/c Ratio	0.52
Control Delay	37.9

Lane Group	NBU	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Volume (vph)	10	580	1460	120	110	1860	160	110	100	510	110	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.86	0.97	0.86	0.86	1.00	0.91	1.00	1.00	1.00	0.88	1.00	1.00
Frt			0.989				0.850			0.850		
Flt Protected		0.950			0.950			0.950			0.950	
Satd. Flow (prot)	0	3273	6041	0	1687	4848	1509	1752	1845	2760	1752	1845
Flt Permitted		0.950			0.950			0.950			0.950	
Satd. Flow (perm)	0	3273	6041	0	1687	4848	1509	1752	1845	2760	1752	1845
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			45			35			20
Link Distance (ft)			341			436			391			335
Travel Time (s)			5.2			6.6			7.6			11.4
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 (%)	7%	7%	7%	7%	7%	7%	7%	3%	3%	3%	3%	3%
Adj. Flow (vph)	11	644	1622	133	122	2067	178	122	111	567	122	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	655	1755	0	122	2067	178	122	111	567	122	111
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	Left	Left	Right	Left	Left
Median Width(ft)			24			24			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			0			0			0			0
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		pm+ov	Split		Prot	Split	
Protected Phases	5	5	2		1	6	4	4	4	4	3	3
Permitted Phases							6					
Detector Phase	5	5	2		1	6	4	4	4	4	3	3
Switch Phase												
Minimum Initial (s)	7.0	7.0	12.0		7.0	12.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	14.0	14.0	19.0		14.0	19.0	14.0	14.0	14.0	14.0	14.0	14.0
Total Split (s)	31.0	31.0	71.0	0.0	23.0	63.0	32.0	32.0	32.0	32.0	14.0	14.0
Total Split (%)	22.1%	22.1%	50.7%	0.0%	16.4%	45.0%	22.9%	22.9%	22.9%	22.9%	10.0%	10.0%
Maximum Green (s)	24.0	24.0	64.0		16.0	56.0	25.0	25.0	25.0	25.0	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	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		Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
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	None	C-Max		None	C-Max	None	None	None	None	None	None
Act Effct Green (s)		26.0	68.0		16.0	58.0	85.0	27.0	27.0	27.0	9.0	9.0
Actuated g/C Ratio		0.19	0.49		0.11	0.41	0.61	0.19	0.19	0.19	0.06	0.06
v/c Ratio		1.08	0.60		0.63	1.03	0.19	0.36	0.31	1.07	1.08	0.93
Control Delay		111.9	27.4		73.9	68.2	7.3	52.6	51.4	110.6	167.0	130.2

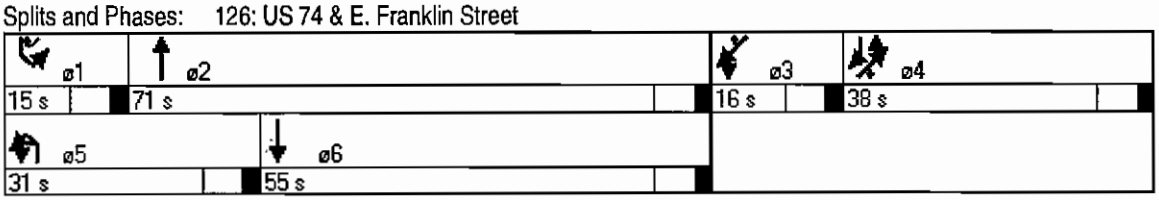
Lane Group	SWR
Lane Configurations	
Volume (vph)	80
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1568
Flt Permitted	
Satd. Flow (perm)	1568
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Adj. Flow (vph)	89
Shared Lane Traffic (%)	
Lane Group Flow (vph)	89
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	pt+ov
Protected Phases	3 1
Permitted Phases	
Detector Phase	3 1
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	37.0
Total Split (%)	26.4%
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	-2.0
Total Lost Time (s)	5.0
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Act Effct Green (s)	25.0
Actuated g/C Ratio	0.18
v/c Ratio	0.32
Control Delay	31.0

Lane Group	NBU	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		85.8	32.9		96.3	54.7	7.2	49.4	45.4	85.7	130.8	94.5
LOS		F	C		F	D	A	D	D	F	F	F
Approach Delay			44.1			53.6			74.0			88.9
Approach LOS			D			D			E			F

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 54.5 Intersection LOS: D
Intersection Capacity Utilization 86.9% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 126: US 74 & E. Franklin Street



Lane Group	SWR
Queue Delay	0.0
Total Delay	37.9
LOS	D
Approach Delay	
Approach LOS	

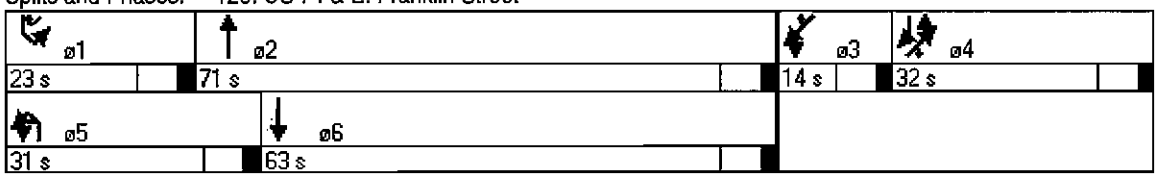
Intersection Summary

Lane Group	NBU	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		111.9	27.4		73.9	68.2	7.3	52.6	51.4	110.6	167.0	130.2
LOS		F	C		E	E	A	D	D	F	F	F
Approach Delay			50.4			63.9			93.5			116.7
Approach LOS			D			E			F			F

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.08
Intersection Signal Delay: 65.3 Intersection LOS: E
Intersection Capacity Utilization 93.4% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 126: US 74 & E. Franklin Street



Lane Group	SWR
Queue Delay	0.0
Total Delay	31.0
LOS	C
Approach Delay	
Approach LOS	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	0	1220	760	170	1420	20	1280	0	250	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.998			0.950			
Flt Protected	0.950				0.950			0.950	0.968			
Satd. Flow (prot)	1687	0	4848	1509	1687	4838	0	1504	1456	0	0	0
Flt Permitted	0.950				0.950			0.950	0.968			
Satd. Flow (perm)	1687	0	4848	1509	1687	4838	0	1504	1456	0	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			55			45			25
Link Distance (ft)			239			375			459			142
Travel Time (s)			3.6			4.6			7.0			3.9
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 (%)	7%	7%	7%	7%	7%	7%	7%	14%	14%	14%	3%	3%
Adj. Flow (vph)	11	0	1356	844	189	1578	22	1422	0	278	0	0
Shared Lane Traffic (%)								39%				
Lane Group Flow (vph)	11	0	1356	844	189	1600	0	867	833	0	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	Left	Left	Right	Left	Left
Median Width(ft)			12			12			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			0			0			0			0
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			pm+ov	Prot			Split				
Protected Phases	5		2	8	1	6		8	8			
Permitted Phases				2								
Detector Phase	5		2	8	1	6		8	8			
Switch Phase												
Minimum Initial (s)	7.0		12.0	12.0	7.0	14.0		12.0	12.0			
Minimum Split (s)	14.0		19.0	19.0	14.0	21.0		19.0	19.0			
Total Split (s)	14.0	0.0	42.0	78.0	20.0	48.0	0.0	78.0	78.0	0.0	0.0	0.0
Total Split (%)	10.0%	0.0%	30.0%	55.7%	14.3%	34.3%	0.0%	55.7%	55.7%	0.0%	0.0%	0.0%
Maximum Green (s)	7.0		35.0	71.0	13.0	41.0		71.0	71.0			
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	5.0	2.0	2.0	2.0
Lead/Lag	Lead		Lag		Lead	Lag						
Lead-Lag Optimize?			Yes			Yes						
Vehicle Extension (s)	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			
Act Effct Green (s)	9.0		37.0	115.0	15.0	51.4		73.0	73.0			
Actuated g/C Ratio	0.06		0.26	0.82	0.11	0.37		0.52	0.52			
v/c Ratio	0.10		1.06	0.68	1.04	0.90		1.11	1.10			
Control Delay	64.1		91.1	8.5	138.0	50.0		97.7	95.2			

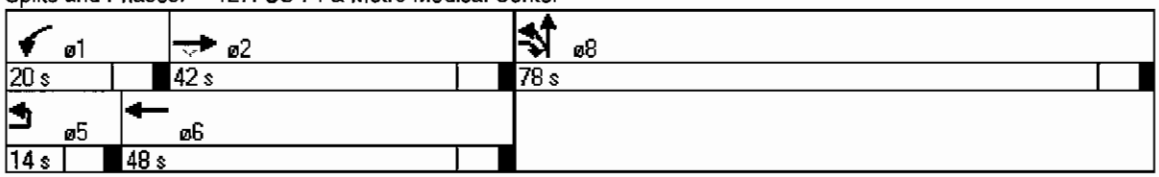
Lane Group	SBR
Lane Configurations	
Volume (vph)	30
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1596
Flt Permitted	
Satd. Flow (perm)	1596
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Adj. Flow (vph)	33
Shared Lane Traffic (%)	
Lane Group Flow (vph)	33
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	Free
Protected Phases	
Permitted Phases	Free
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)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.02
Control Delay	0.0

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0	0.0			
Total Delay	64.1		91.1	8.5	138.0	50.0		97.7	95.2			
LOS	E		F	A	F	D		F	F			
Approach Delay			59.4			59.3			96.5			
Approach LOS			E			E			F			

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 170
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 70.0 Intersection LOS: E
Intersection Capacity Utilization 89.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 127: US 74 & Metro Medical Center



Lane Group	SBR
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	

Intersection Summary

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	10	0	1440	1290	250	1210	30	750	0	180	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91	0.91	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.996			0.941			
Flt Protected	0.950				0.950			0.950	0.971			
Satd. Flow (prot)	1687	0	4848	1509	1687	4828	0	1504	1447	0	0	0
Flt Permitted	0.950				0.950			0.950	0.971			
Satd. Flow (perm)	1687	0	4848	1509	1687	4828	0	1504	1447	0	0	0
Right Turn on Red				No			No			No		
Satd. Flow (RTOR)												
Link Speed (mph)			45			55			45			25
Link Distance (ft)			239			375			459			145
Travel Time (s)			3.6			4.6			7.0			4.0
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 (%)	7%	7%	7%	7%	7%	7%	7%	14%	14%	14%	3%	3%
Adj. Flow (vph)	11	0	1600	1433	278	1344	33	833	0	200	0	0
Shared Lane Traffic (%)								37%				
Lane Group Flow (vph)	11	0	1600	1433	278	1377	0	525	508	0	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	Left	Left	Right	Left	Left
Median Width(ft)			12			12			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width (ft)			0			0			0			0
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			pm+ov	Prot			Split				
Protected Phases	5		2	8	1	6		8	8			
Permitted Phases				2								
Detector Phase	5		2	8	1	6		8	8			
Switch Phase												
Minimum Initial (s)	7.0		12.0	12.0	7.0	14.0		12.0	12.0			
Minimum Split (s)	14.0		19.0	19.0	14.0	21.0		19.0	19.0			
Total Split (s)	14.0	0.0	47.0	69.0	24.0	57.0	0.0	69.0	69.0	0.0	0.0	0.0
Total Split (%)	10.0%	0.0%	33.6%	49.3%	17.1%	40.7%	0.0%	49.3%	49.3%	0.0%	0.0%	0.0%
Maximum Green (s)	7.0		40.0	62.0	17.0	50.0		62.0	62.0			
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	5.0	2.0	2.0	2.0
Lead/Lag	Lead		Lag		Lead	Lag						
Lead-Lag Optimize?			Yes			Yes						
Vehicle Extension (s)	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			
Act Effct Green (s)	9.0		42.0	111.0	19.0	60.4		64.0	64.0			
Actuated g/C Ratio	0.06		0.30	0.79	0.14	0.43		0.46	0.46			
v/c Ratio	0.10		1.10	1.20	1.21	0.66		0.76	0.77			
Control Delay	64.1		101.4	115.9	179.0	34.6		40.5	41.2			

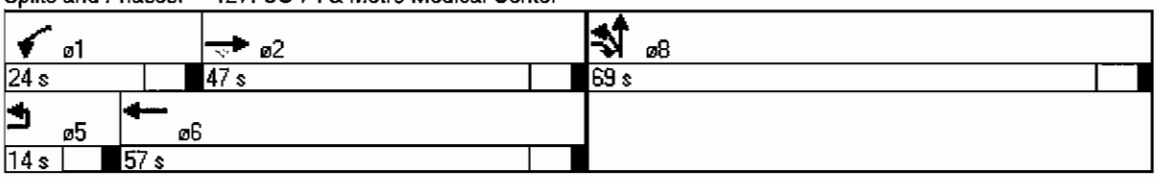
Lane Group	SBR
Lane Configurations	
Volume (vph)	20
Ideal Flow (vphpl)	1900
Lane Util. Factor	1.00
Frt	0.865
Flt Protected	
Satd. Flow (prot)	1596
Flt Permitted	
Satd. Flow (perm)	1596
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.90
Heavy Vehicles (%)	3%
Adj. Flow (vph)	22
Shared Lane Traffic (%)	
Lane Group Flow (vph)	22
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	Free
Protected Phases	
Permitted Phases	Free
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)	140.0
Actuated g/C Ratio	1.00
v/c Ratio	0.01
Control Delay	0.0

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Queue Delay	0.0		0.0	0.0	0.0	0.0		0.0	0.0			
Total Delay	64.1		101.4	115.9	179.0	34.6		40.5	41.2			
LOS	E		F	F	F	C		D	D			
Approach Delay			108.1			58.8			40.9			
Approach LOS			F			E			D			

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.21
Intersection Signal Delay: 81.4 Intersection LOS: F
Intersection Capacity Utilization 102.1% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 127: US 74 & Metro Medical Center



Lane Group	SBR
Queue Delay	0.0
Total Delay	0.0
LOS	A
Approach Delay	
Approach LOS	

Intersection Summary

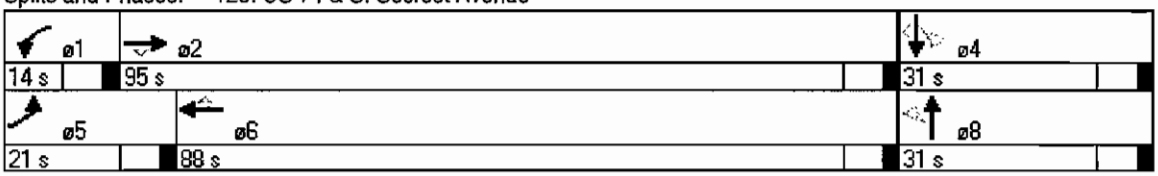
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1250	20	10	1530	240	20	120	10	100	50	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.991				0.850
Flt Protected	0.950			0.950				0.993			0.968	
Satd. Flow (prot)	1518	3036	1358	1518	3036	1358	0	1650	0	0	1623	1425
Flt Permitted	0.950			0.950				0.921			0.535	
Satd. Flow (perm)	1518	3036	1358	1518	3036	1358	0	1530	0	0	897	1425
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)			22			207						
Link Speed (mph)		55			55			35			35	
Link Distance (ft)		411			374			242			283	
Travel Time (s)		5.1			4.6			4.7			5.5	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	167	1389	22	11	1700	267	22	133	11	111	56	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	167	1389	22	11	1700	267	0	166	0	0	167	89
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)		0			0			0			0	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	2	1	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	14.0	14.0	7.0	14.0	14.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	21.0	21.0	14.0	21.0	21.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	21.0	95.0	95.0	14.0	88.0	88.0	31.0	31.0	0.0	31.0	31.0	31.0
Total Split (%)	15.0%	67.9%	67.9%	10.0%	62.9%	62.9%	22.1%	22.1%	0.0%	22.1%	22.1%	22.1%
Maximum Green (s)	14.0	88.0	88.0	7.0	81.0	81.0	24.0	24.0		24.0	24.0	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
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	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	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	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Time Before Reduce (s)	0.0	25.0	25.0	0.0	25.0	25.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	None
Act Effct Green (s)	16.0	98.2	98.2	9.0	82.8	82.8		26.2			26.2	26.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.11	0.70	0.70	0.06	0.59	0.59		0.19			0.19	0.19
v/c Ratio	0.97	0.65	0.02	0.11	0.95	0.30		0.58			0.99	0.33
Control Delay	120.9	14.3	3.3	64.6	38.8	4.2		61.2			124.3	53.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	120.9	14.3	3.3	64.6	38.8	4.2		61.2			124.3	53.6
LOS	F	B	A	E	D	A		E			F	D
Approach Delay		25.5			34.3			61.2			99.7	
Approach LOS		C			C			E			F	

Intersection Summary

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
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: 0.99
Intersection Signal Delay: 36.1 Intersection LOS: D
Intersection Capacity Utilization 90.9% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 128: US 74 & S. Secrest Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	1530	20	10	1250	100	20	50	10	240	120	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.983				0.850
Flt Protected	0.950			0.950				0.988			0.968	
Satd. Flow (prot)	1687	3374	1509	1687	3374	1509	0	1809	0	0	1803	1583
Flt Permitted	0.950			0.950				0.684			0.741	
Satd. Flow (perm)	1687	3374	1509	1687	3374	1509	0	1252	0	0	1380	1583
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)			15			90						
Link Speed (mph)		55			55			35			35	
Link Distance (ft)		411			374			242			283	
Travel Time (s)		5.1			4.6			4.7			5.5	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	89	1700	22	11	1389	111	22	56	11	267	133	167
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	1700	22	11	1389	111	0	89	0	0	400	167
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)		0			0			0			0	
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		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		4
Detector Phase	5	2	2	1	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	14.0	14.0	7.0	14.0	14.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	21.0	21.0	14.0	21.0	21.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	15.0	79.0	79.0	14.0	78.0	78.0	47.0	47.0	0.0	47.0	47.0	47.0
Total Split (%)	10.7%	56.4%	56.4%	10.0%	55.7%	55.7%	33.6%	33.6%	0.0%	33.6%	33.6%	33.6%
Maximum Green (s)	8.0	72.0	72.0	7.0	71.0	71.0	40.0	40.0		40.0	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
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	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	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	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Time Before Reduce (s)	0.0	25.0	25.0	0.0	25.0	25.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None		None	None	None
Act Effct Green (s)	10.1	81.9	81.9	9.0	72.5	72.5		42.5			42.5	42.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Actuated g/C Ratio	0.07	0.58	0.58	0.06	0.52	0.52		0.30			0.30	0.30
v/c Ratio	0.73	0.86	0.02	0.10	0.80	0.13		0.23			0.95	0.35
Control Delay	95.7	31.0	8.2	64.1	31.9	5.2		38.8			82.0	40.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	95.7	31.0	8.2	64.1	31.9	5.2		38.8			82.0	40.6
LOS	F	C	A	E	C	A		D			F	D
Approach Delay		33.9			30.2			38.8			69.8	
Approach LOS		C			C			D			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

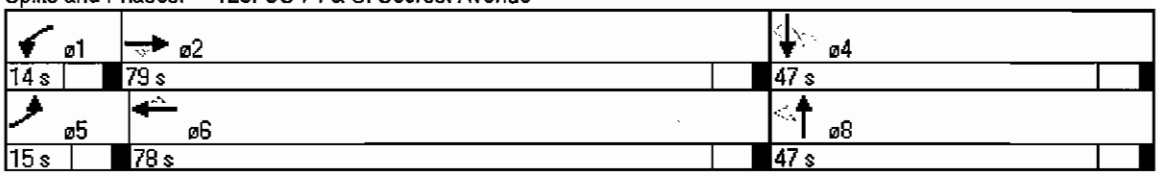
Maximum v/c Ratio: 0.95

Intersection Signal Delay: 37.7 Intersection LOS: D

Intersection Capacity Utilization 86.9% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 128: US 74 & S. Secrest Avenue



TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*BSL*
Agency/Co.	*PBS&J*
Date Performed	*11/26/2007*
Analysis Time Period	*AM Peak*

Site Information

Intersection	*US 74 and Bivens Road*
Jurisdiction	
Analysis Year	*2030*

Project Description *Monroe Bypass / Connector*

East/West Street: *US 74* | North/South Street: *Bivens Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*170*	*1250*	*10*	*10*	*1550*	*120*
Peak-hour factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate (veh/h)	*188*	*1388*	*11*	*11*	*1722*	*133*
Proportion of heavy vehicles, P_{HV}	*7*	--	--	*7*	--	--
Median type	*Undivided*					
RT Channelized?			*0*			*1*
Lanes	*1*	*2*	*1*	*1*	*2*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*10*	*10*	*10*	*90*	*10*	*150*
Peak-hour factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate (veh/h)	*11*	*11*	*11*	*100*	*11*	*166*
Proportion of heavy vehicles, P_{HV}	*2*	*2*	*2*	*2*	*2*	*2*
Percent grade (%)		*0*			*0*	
Flared approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized?			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
Volume, v (vph)	*188*	*11*		*33*			*277*	
Capacity, c_m (vph)	*342*	*459*		*0*			*0*	
v/c ratio	*0.55*	*0.02*						
Queue length (95%)	*3.15*	*0.07*						
Control Delay (s/veh)	*27.7*	*13.0*						

LOS	D	B		F			F	
Approach delay (s/veh)	--	--						
Approach LOS	--	--						

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*BSL*	Intersection	*US 74 and Bivens Road*
Agency/Co.	*PBS&J*	Jurisdiction	
Date Performed	*11/26/2007*	Analysis Year	*2030*
Analysis Time Period	*PM Peak*		

Project Description *Monroe Bypass / Connector*

East/West Street: *US 74*	North/South Street: *Bivens Road*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*150*	*1550*	*10*	*10*	*1250*	*90*
Peak-hour factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate (veh/h)	*166*	*1722*	*11*	*11*	*1388*	*100*
Proportion of heavy vehicles, P_{HV}	*7*	--	--	*7*	--	--
Median type	*Undivided*					
RT Channelized?			*0*			*1*
Lanes	*1*	*2*	*1*	*1*	*2*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*10*	*10*	*10*	*120*	*10*	*170*
Peak-hour factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate (veh/h)	*11*	*11*	*11*	*133*	*11*	*188*
Proportion of heavy vehicles, P_{HV}	*2*	*2*	*2*	*2*	*2*	*2*
Percent grade (%)	*0*			*0*		
Flared approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized?			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Control Delay, Queue Length, Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
Volume, v (vph)	*166*	*11*		*33*			*332*	
Capacity, c_m (vph)	*464*	*339*		*0*			*0*	
v/c ratio	*0.36*	*0.03*						
Queue length (95%)	*1.60*	*0.10*						
Control Delay (s/veh)	*17.0*	*16.0*						

LOS	C	C	F	F
Approach delay (s/veh)	--	--		
Approach LOS	--	--		

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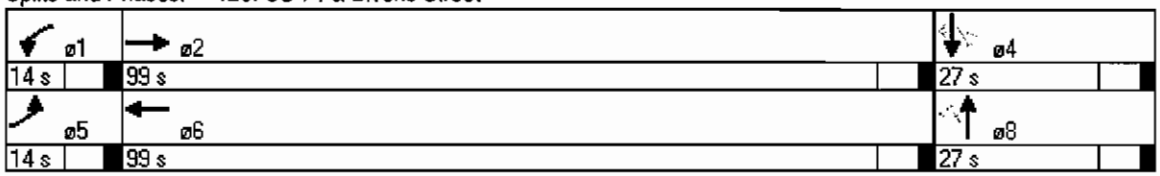
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	1320	20	20	1590	180	10	40	10	100	50	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.985			0.978				0.850
Flt Protected	0.950			0.950				0.992			0.968	
Satd. Flow (prot)	1687	3367	0	1687	3323	0	0	1807	0	0	1803	1583
Flt Permitted	0.950			0.950				0.893			0.749	
Satd. Flow (perm)	1687	3367	0	1687	3323	0	0	1627	0	0	1395	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			20			25	
Link Distance (ft)		251			259			175			292	
Travel Time (s)		4.9			5.0			6.0			8.0	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	33	1467	22	22	1767	200	11	44	11	111	56	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	1489	0	22	1967	0	0	66	0	0	167	22
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)		0			0			0			0	
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		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4
Detector Phase	5	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	14.0
Total Split (s)	14.0	99.0	0.0	14.0	99.0	0.0	27.0	27.0	0.0	27.0	27.0	27.0
Total Split (%)	10.0%	70.7%	0.0%	10.0%	70.7%	0.0%	19.3%	19.3%	0.0%	19.3%	19.3%	19.3%
Maximum Green (s)	7.0	92.0		7.0	92.0		20.0	20.0		20.0	20.0	20.0
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	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	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	3.0
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None
Act Effct Green (s)	9.0	100.9		9.0	100.9			20.7			20.7	20.7
Actuated g/C Ratio	0.06	0.72		0.06	0.72			0.15			0.15	0.15
v/c Ratio	0.31	0.61		0.20	0.82			0.27			0.81	0.09
Control Delay	70.4	12.3		66.9	19.0			55.6			85.7	51.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	70.4	12.3		66.9	19.0			55.6			85.7	51.8
LOS	E	B		E	B			E			F	D
Approach Delay		13.6			19.5			55.6			81.7	
Approach LOS		B			B			E			F	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
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: 0.82
Intersection Signal Delay: 20.9 Intersection LOS: C
Intersection Capacity Utilization 73.9% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 129: US 74 & Bivens Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1590	10	10	1320	100	20	50	20	180	40	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.989			0.970				0.850
Flt Protected	0.950			0.950				0.989			0.961	
Satd. Flow (prot)	1687	3370	0	1687	3337	0	0	1787	0	0	1790	1583
Flt Permitted	0.950			0.950				0.809			0.661	
Satd. Flow (perm)	1687	3370	0	1687	3337	0	0	1462	0	0	1231	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			20			25	
Link Distance (ft)		251			259			175			292	
Travel Time (s)		4.9			5.0			6.0			8.0	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	22	1767	11	11	1467	111	22	56	22	200	44	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	1778	0	11	1578	0	0	100	0	0	244	44
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)		0			0			0			0	
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		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4
Detector Phase	5	2		1	6		8	8		4	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	14.0
Total Split (s)	14.0	88.0	0.0	14.0	88.0	0.0	38.0	38.0	0.0	38.0	38.0	38.0
Total Split (%)	10.0%	62.9%	0.0%	10.0%	62.9%	0.0%	27.1%	27.1%	0.0%	27.1%	27.1%	27.1%
Maximum Green (s)	7.0	81.0		7.0	81.0		31.0	31.0		31.0	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
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	2.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	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	3.0
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None
Act Effct Green (s)	9.0	92.4		9.0	89.6			32.0			32.0	32.0
Actuated g/C Ratio	0.06	0.66		0.06	0.64			0.23			0.23	0.23
v/c Ratio	0.20	0.80		0.10	0.74			0.30			0.87	0.12
Control Delay	66.8	22.5		64.1	21.7			46.8			80.3	42.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	0.0
Total Delay	66.8	22.5		64.1	21.7			46.8			80.3	42.8
LOS	E	C		E	C			D			F	D
Approach Delay		23.0			22.0			46.8			74.6	
Approach LOS		C			C			D			E	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

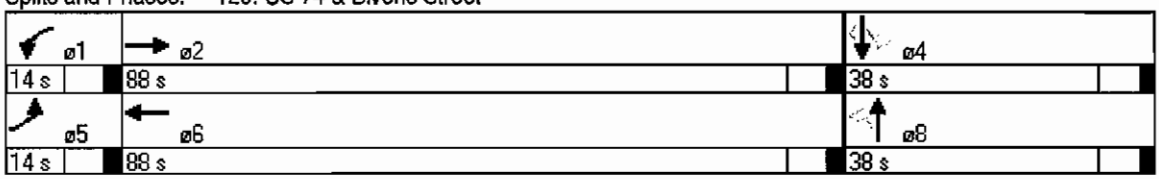
Maximum v/c Ratio: 0.87

Intersection Signal Delay: 27.2 Intersection LOS: C

Intersection Capacity Utilization 71.3% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 129: US 74 & Bivens Street



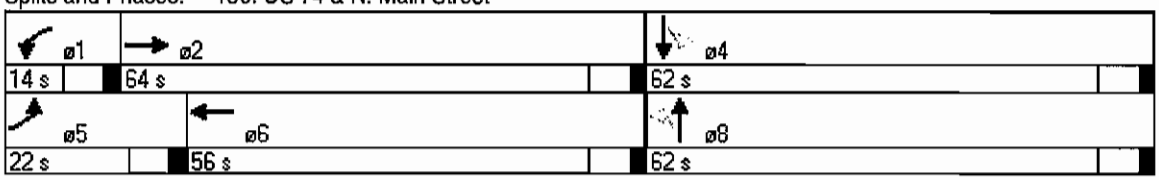
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	1070	150	60	1340	70	190	180	60	50	130	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.993			0.981			0.904	
Flt Protected	0.950			0.950				0.978		0.950		
Satd. Flow (prot)	1687	3313	0	1687	3350	0	0	1787	0	1770	1684	0
Flt Permitted	0.950			0.950				0.455		0.472		
Satd. Flow (perm)	1687	3313	0	1687	3350	0	0	831	0	879	1684	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		282			333			173			197	
Travel Time (s)		5.5			6.5			3.4			3.8	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	267	1189	167	67	1489	78	211	200	67	56	144	256
Shared Lane Traffic (%)												
Lane Group Flow (vph)	267	1356	0	67	1567	0	0	478	0	56	400	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	22.0	64.0	0.0	14.0	56.0	0.0	62.0	62.0	0.0	62.0	62.0	0.0
Total Split (%)	15.7%	45.7%	0.0%	10.0%	40.0%	0.0%	44.3%	44.3%	0.0%	44.3%	44.3%	0.0%
Maximum Green (s)	15.0	57.0		7.0	49.0		55.0	55.0		55.0	55.0	
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	Lag		Lead	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	C-Max		None	None		None	None		None	None	
Act Effct Green (s)	17.0	61.8		9.0	51.0			57.0		57.0	57.0	
Actuated g/C Ratio	0.12	0.44		0.06	0.36			0.41		0.41	0.41	
v/c Ratio	1.30	0.93		0.62	1.28			1.41		0.16	0.58	
Control Delay	213.7	49.5		88.1	171.6			236.2		27.9	36.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	213.7	49.5		88.1	171.6			236.2		27.9	36.5	
LOS	F	D		F	F			F		C	D	
Approach Delay		76.5			168.2			236.2			35.5	
Approach LOS		E			F			F			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 180
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.41
Intersection Signal Delay: 126.0 Intersection LOS: F
Intersection Capacity Utilization 113.8% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 130: US 74 & N. Main Street



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	1340	190	60	1070	50	150	130	60	70	180	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981			0.993			0.976			0.914	
Flt Protected	0.950			0.950				0.978		0.950		
Satd. Flow (prot)	1687	3310	0	1687	3350	0	0	1778	0	1770	1703	0
Flt Permitted	0.950			0.950				0.383		0.511		
Satd. Flow (perm)	1687	3310	0	1687	3350	0	0	696	0	952	1703	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		282			333			173			197	
Travel Time (s)		5.5			6.5			3.4			3.8	
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 (%)	7%	7%	7%	7%	7%	7%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	256	1489	211	67	1189	56	167	144	67	78	200	267
Shared Lane Traffic (%)												
Lane Group Flow (vph)	256	1700	0	67	1245	0	0	378	0	78	467	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)		0			0			0			0	
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		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	17.0		14.0	17.0		14.0	14.0		14.0	14.0	
Total Split (s)	24.0	63.0	0.0	14.0	53.0	0.0	63.0	63.0	0.0	63.0	63.0	0.0
Total Split (%)	17.1%	45.0%	0.0%	10.0%	37.9%	0.0%	45.0%	45.0%	0.0%	45.0%	45.0%	0.0%
Maximum Green (s)	17.0	56.0		7.0	46.0		56.0	56.0		56.0	56.0	
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	Lag		Lead	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	C-Max		None	None		None	None		None	None	
Act Effct Green (s)	19.0	60.8		9.0	48.0			58.0		58.0	58.0	
Actuated g/C Ratio	0.14	0.43		0.06	0.34			0.41		0.41	0.41	
v/c Ratio	1.12	1.18		0.62	1.08			1.31		0.20	0.66	
Control Delay	148.4	125.7		88.1	95.6			197.8		27.9	38.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0			0.0		0.0	0.0	
Total Delay	148.4	125.7		88.1	95.6			197.8		27.9	38.6	
LOS	F	F		F	F			F		C	D	
Approach Delay		128.6			95.2			197.8			37.1	
Approach LOS		F			F			F			D	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green

Natural Cycle: 180

Control Type: Actuated-Coordinated

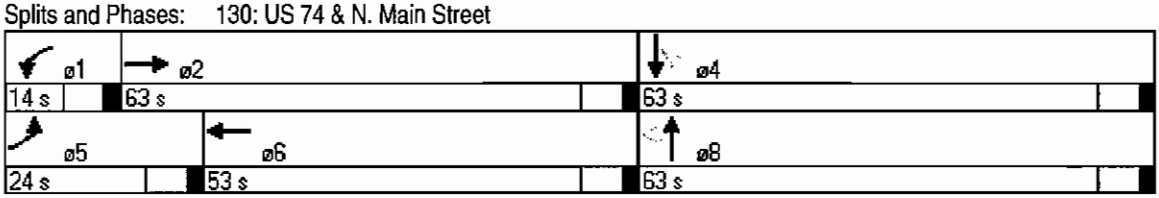
Maximum v/c Ratio: 1.31

Intersection Signal Delay: 112.5 Intersection LOS: F

Intersection Capacity Utilization 108.6% ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 130: US 74 & N. Main Street



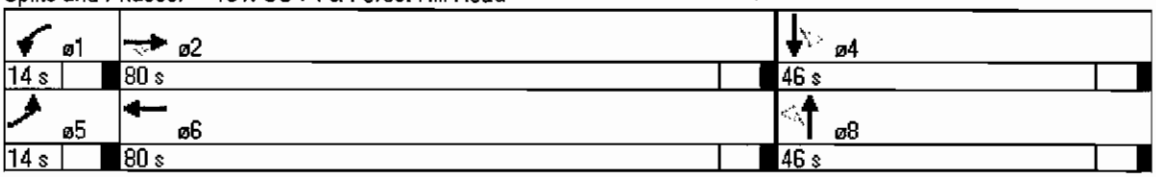
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	990	180	40	1250	20	100	30	20	30	120	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.998			0.982			0.953	
Flt Protected	0.950			0.950				0.968			0.994	
Satd. Flow (prot)	1687	3374	1509	1687	3367	0	0	1688	0	0	1731	0
Flt Permitted	0.950			0.950				0.450			0.942	
Satd. Flow (perm)	1687	3374	1509	1687	3367	0	0	785	0	0	1640	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			55			35	
Link Distance (ft)		576			646			376			353	
Travel Time (s)		7.1			8.0			4.7			6.9	
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 (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	4%	4%	4%
Adj. Flow (vph)	33	1100	200	44	1389	22	111	33	22	33	133	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	1100	200	44	1411	0	0	166	0	0	255	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)		0			0			0			0	
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			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	14.0	14.0	7.0	14.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	21.0	21.0	14.0	21.0		14.0	14.0		14.0	14.0	
Total Split (s)	14.0	80.0	80.0	14.0	80.0	0.0	46.0	46.0	0.0	46.0	46.0	0.0
Total Split (%)	10.0%	57.1%	57.1%	10.0%	57.1%	0.0%	32.9%	32.9%	0.0%	32.9%	32.9%	0.0%
Maximum Green (s)	7.0	73.0	73.0	7.0	73.0		39.0	39.0		39.0	39.0	
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	Lead	Lag	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	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Act Effct Green (s)	9.7	85.5	85.5	10.2	88.8			32.1			32.1	
Actuated g/C Ratio	0.07	0.61	0.61	0.07	0.63			0.23			0.23	
v/c Ratio	0.28	0.53	0.22	0.36	0.66			0.92			0.68	
Control Delay	68.4	19.0	15.4	70.2	20.9			101.0			57.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	68.4	19.0	15.4	70.2	20.9			101.0			57.6	
LOS	E	B	B	E	C			F			E	
Approach Delay		19.7			22.4			101.0			57.6	
Approach LOS		B			C			F			E	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 28.1 Intersection LOS: C
Intersection Capacity Utilization 68.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 131: US 74 & Forest Hill Road



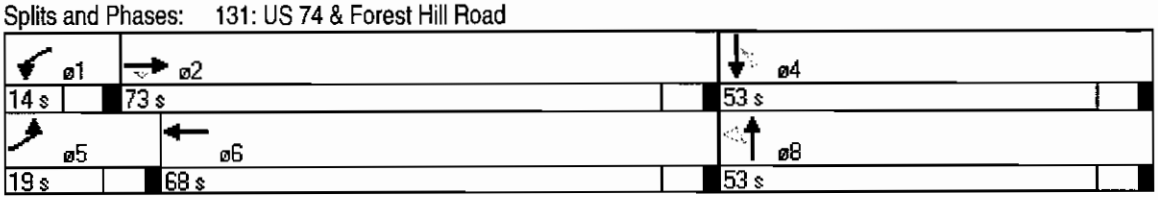
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	1250	100	20	990	30	180	120	40	20	80	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.996			0.984			0.949	
Flt Protected	0.950			0.950				0.974			0.988	
Satd. Flow (prot)	1687	3374	1509	1687	3360	0	0	1702	0	0	1713	0
Flt Permitted	0.950			0.950				0.785			0.868	
Satd. Flow (perm)	1687	3374	1509	1687	3360	0	0	1372	0	0	1505	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			55			35	
Link Distance (ft)		576			646			376			353	
Travel Time (s)		7.1			8.0			4.7			6.9	
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 (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	4%	4%	4%
Adj. Flow (vph)	89	1389	111	22	1100	33	200	133	44	22	33	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	1389	111	22	1133	0	0	377	0	0	88	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)		0			0			0			0	
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			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8			4		
Detector Phase	5	2	2	1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	14.0	14.0	7.0	14.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.0	21.0	21.0	14.0	21.0		14.0	14.0		14.0	14.0	
Total Split (s)	19.0	73.0	73.0	14.0	68.0	0.0	53.0	53.0	0.0	53.0	53.0	0.0
Total Split (%)	13.6%	52.1%	52.1%	10.0%	48.6%	0.0%	37.9%	37.9%	0.0%	37.9%	37.9%	0.0%
Maximum Green (s)	12.0	66.0	66.0	7.0	61.0		46.0	46.0		46.0	46.0	
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	Lead	Lag	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	
Recall Mode	None	C-Min	C-Min	None	C-Min		None	None		None	None	
Act Effct Green (s)	13.0	78.1	78.1	9.0	68.6			43.4			43.4	
Actuated g/C Ratio	0.09	0.56	0.56	0.06	0.49			0.31			0.31	
v/c Ratio	0.57	0.74	0.13	0.20	0.69			0.89			0.19	
Control Delay	74.9	28.7	18.0	66.8	31.4			68.4			35.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	74.9	28.7	18.0	66.8	31.4			68.4			35.1	
LOS	E	C	B	E	C			E			D	
Approach Delay		30.5			32.1			68.4			35.1	
Approach LOS		C			C			E			D	

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
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: 0.89
Intersection Signal Delay: 35.7 Intersection LOS: D
Intersection Capacity Utilization 78.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 131: US 74 & Forest Hill Road

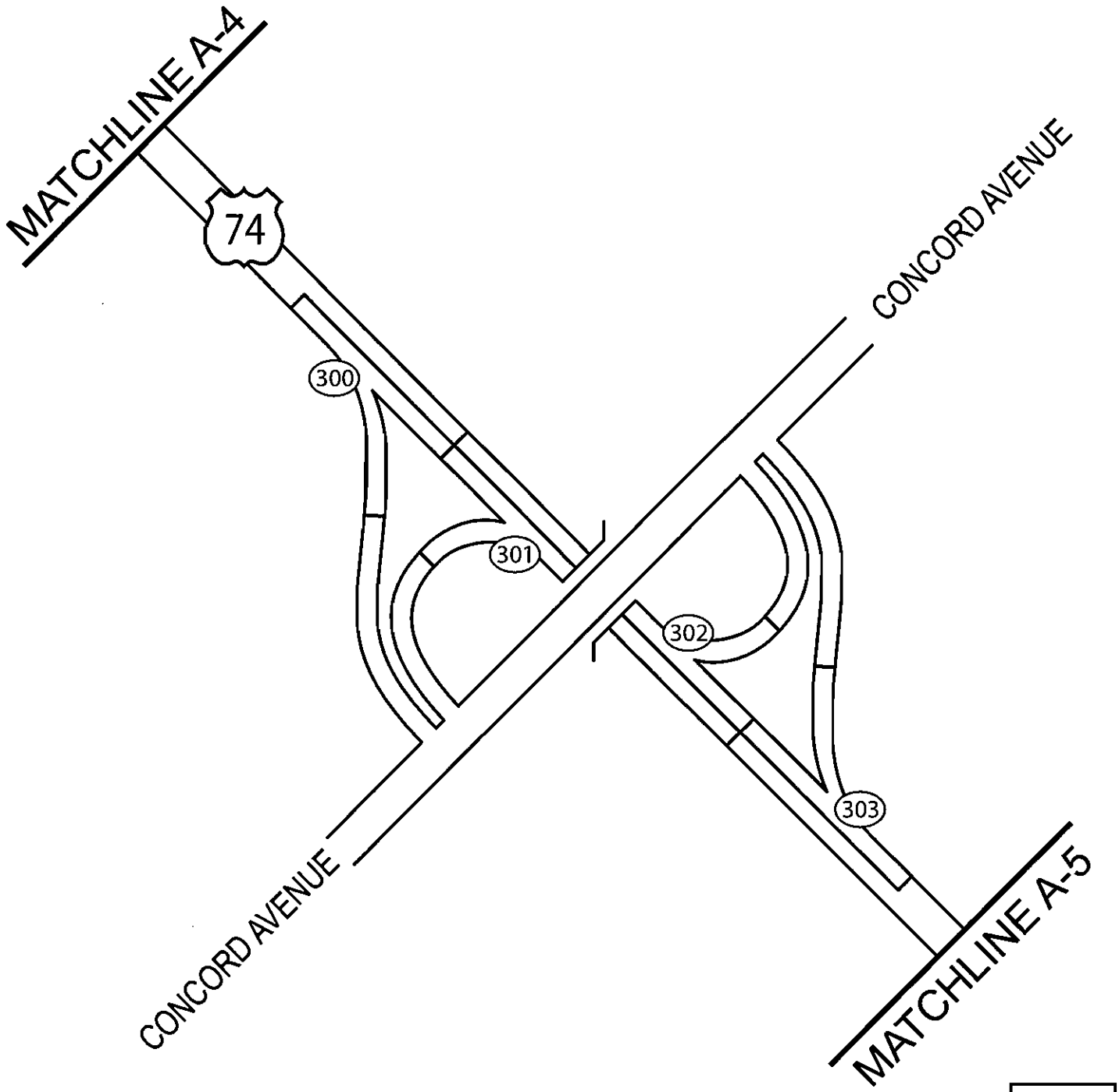


Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 and Concord Avenue Ramp Analysis



NORTH CAROLINA
Turnpike Authority

US 74 and Concord Avenue Key Sheet

MONROE CONNECTOR / BYPASS
TIP Project Numbers R-3329 & R-2559
Mecklenburg and Union Counties

Appendix C

3_1-10 ExistingConditions.ai 7-23-07

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 and Concord Avenue
Ramp Analysis
Existing Condition

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB off to Concord Ave.
Junction:	300
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2230	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	90	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	90	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2230	90	90	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	619	25	25	v
Trucks and buses	7	7	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.943	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2738	111	106	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.686 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1914 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2738	6750	No
v_{12}	1914	4400	No
$v_{FO} = v_F - v_R$	2627	6750	No
v_R	111	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 20.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.373	
Space mean speed in ramp influence area,	S_R = 50.2	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 52.8	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB off to Concord Ave.
Junction:	300
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2710	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	90	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	110	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2710	90	110	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	753	25	31	v
Trucks and buses	7	7	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.943	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3327	111	130	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.672 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2271 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3327	6750	No
v_{12}	2271	4400	No
$v_{FO} = v_F - v_R$	3216	6750	No
v_R	111	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 23.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.373	
Space mean speed in ramp influence area,	S_R = 50.2	mph
Space mean speed in outer lanes,	S_0 = 60.1	mph
Space mean speed for all vehicles,	S = 52.9	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB on from Concord Ave.
Junction:	301
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2140	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	90	vph
Length of first accel/decel lane	100	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	90	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2140	90	90	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	594	25	25	v
Trucks and buses	7	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2627	106	111	pcph

Estimation of V12 Merge Areas

L_{EQ} = -465.74 (Equation 25-2 or 25-3)

P_{FM} = 0.580 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1524 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2733	6750	No
v_{R12}	1630	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.336	
Space mean speed in ramp influence area,	S_R = 50.6	mph
Space mean speed in outer lanes,	S_O = 52.8	mph
Space mean speed for all vehicles,	S = 51.5	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB on from Concord Ave.
Junction:	301
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2620	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	110	vph
Length of first accel/decel lane	100	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	90	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2620	110	90	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	728	31	25	v
Trucks and buses	7	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3217	130	111	pcph

Estimation of V12 Merge Areas

L_{EQ} = -334.34 (Equation 25-2 or 25-3)

P_{FM} = 0.580 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1867 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3347	6750	No
v_{R12}	1997	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 20.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M_S = 0.345

Space mean speed in ramp influence area, S_R = 50.5 mph

Space mean speed in outer lanes, S_O = 51.9 mph

Space mean speed for all vehicles, S = 51.1 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB on from Concord Ave.
Junction:	302
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2620	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	90	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	110	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2620	90	110	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	728	25	31	v
Trucks and buses	7	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3217	106	135	pcph

Estimation of V12 Merge Areas

L_{EQ} = -250.68 (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1885 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3323	6750	No
v_{R12}	1991	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 19.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.335

Space mean speed in ramp influence area, S_R = 50.7 mph

Space mean speed in outer lanes, S_O = 52.0 mph

Space mean speed for all vehicles, S = 51.2 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB on from Concord Ave.
Junction:	302
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2140	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	90	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	90	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2140	90	90	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	594	25	25	v
Trucks and buses	7	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2627	106	111	pcph

Estimation of V12 Merge Areas

L_{EQ} = -376.94 (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1539 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2733	6750	No
v_{R12}	1645	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 16.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.326

Space mean speed in ramp influence area, S_R = 50.8 mph

Space mean speed in outer lanes, S_O = 52.9 mph

Space mean speed for all vehicles, S = 51.6 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB off to Concord Ave.
Junction:	303
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2730	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	110	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	350	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2730	110	350	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	758	31	97	v
Trucks and buses	7	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3352	135	436	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 3163.18 (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 6

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3352 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3352	6750	No
v_{12}	3352	4400	No
$v_{FO} = v_F - v_R$	3217	6750	No
v_R	135	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 33.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.375	
Space mean speed in ramp influence area,	S_R = 50.1	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 50.1	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB off to Concord Ave.
Junction:	303
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2230	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	90	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	290	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2230	90	290	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	619	25	81	v
Trucks and buses	7	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2738	111	361	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 2875.62 (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 6

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2738 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2738	6750	No
v_{12}	2738	4400	No
$v_{FO} = v_F - v_R$	2627	6750	No
v_R	111	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 27.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.373	
Space mean speed in ramp influence area,	S_R = 50.2	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 50.2	mph

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 and Concord Avenue
Ramp Analysis
2030 No-Build

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB off to Concord Ave.
Junction:	300
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2330	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	90	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	140	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2330	90	140	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	647	25	39	v
Trucks and buses	7	7	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.943	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2861	111	165	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.683 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1990 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2861	6750	No
v_{12}	1990	4400	No
$v_{FO} = v_F - v_R$	2750	6750	No
v_R	111	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 21.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.373

Space mean speed in ramp influence area, S_R = 50.2 mph

Space mean speed in outer lanes, S_O = 60.3 mph

Space mean speed for all vehicles, S = 52.9 mph

HCS2000: Ramps and Ramp Junctions Release 4.1f

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB off to Concord Ave.
Junction:	300
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2840	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	100	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	170	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2840	100	170	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	789	28	47	v
Trucks and buses	7	7	4	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.943	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3487	123	200	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.667 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2367 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3487	6750	No
v_{12}	2367	4400	No
$v_{FO} = v_F - v_R$	3364	6750	No
v_R	123	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 24.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.374	
Space mean speed in ramp influence area,	S_R = 50.1	mph
Space mean speed in outer lanes,	S_O = 59.9	mph
Space mean speed for all vehicles,	S = 52.9	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB on from Concord Ave.
Junction:	301
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2240	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	140	vph
Length of first accel/decel lane	100	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	90	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2240	140	90	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	622	39	25	v
Trucks and buses	7	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2750	165	111	pcph

Estimation of V12 Merge Areas

L_{EQ} = -426.79 (Equation 25-2 or 25-3)

P_{FM} = 0.580 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1596 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2915	6750	No
v_{R12}	1761	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.339	
Space mean speed in ramp influence area,	S_R = 50.6	mph
Space mean speed in outer lanes,	S_O = 52.6	mph
Space mean speed for all vehicles,	S = 51.4	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB on from Concord Ave.
Junction:	301
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2740	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	170	vph
Length of first accel/decel lane	100	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	100	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2740	170	100	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	761	47	28	v
Trucks and buses	7	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3364	200	123	pcph

Estimation of V12 Merge Areas

L_{EQ} = -287.90 (Equation 25-2 or 25-3)

P_{FM} = 0.580 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1952 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3564	6750	No
v_{R12}	2152	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 21.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M_S = 0.350

Space mean speed in ramp influence area, S_R = 50.5 mph

Space mean speed in outer lanes, S_O = 51.7 mph

Space mean speed for all vehicles, S = 50.9 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB on from Concord Ave.
Junction:	302
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2740	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	90	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	170	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2740	90	170	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	761	25	47	v
Trucks and buses	7	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3364	106	209	pcph

Estimation of V12 Merge Areas

L_{EQ} = -219.22 (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1971 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3470	6750	No
v_{R12}	2077	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.337

Space mean speed in ramp influence area, S_R = 50.6 mph

Space mean speed in outer lanes, S_O = 51.8 mph

Space mean speed for all vehicles, S = 51.1 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB on from Concord Ave.
Junction:	302
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2240	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	90	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	140	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2240	90	140	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	622	25	39	v
Trucks and buses	7	4	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.943	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2750	106	172	pcph

Estimation of V12 Merge Areas

L_{EQ} = -350.62 (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1611 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2856	6750	No
v_{R12}	1717	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 16.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.328

Space mean speed in ramp influence area, S_R = 50.7 mph

Space mean speed in outer lanes, S_O = 52.7 mph

Space mean speed for all vehicles, S = 51.5 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB off to Concord Ave.
Junction:	303
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2910	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	170	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	500	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2910	170	500	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	808	47	139	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3573	209	614	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 4472.12 (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 6

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3573 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3573	6750	No
v_{12}	3573	4400	No
$v_{FO} = v_F - v_R$	3364	6750	No
v_R	209	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 35.0- pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.382	
Space mean speed in ramp influence area,	S_R = 50.0	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 50.0	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB off to Concord Ave.
Junction:	303
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2380	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	140	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	410	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2380	140	410	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	661	39	114	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2922	172	503	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 4019.69 (Equation 25-8 or 25-9)

P_{FD} = 1.000 Using Equation 6

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2922 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2922	6750	No
v_{12}	2922	4400	No
$v_{FO} = v_F - v_R$	2750	6750	No
v_R	172	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 29.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D_S = 0.378

Space mean speed in ramp influence area, S_R = 50.1 mph

Space mean speed in outer lanes, S_O = 60.3 mph

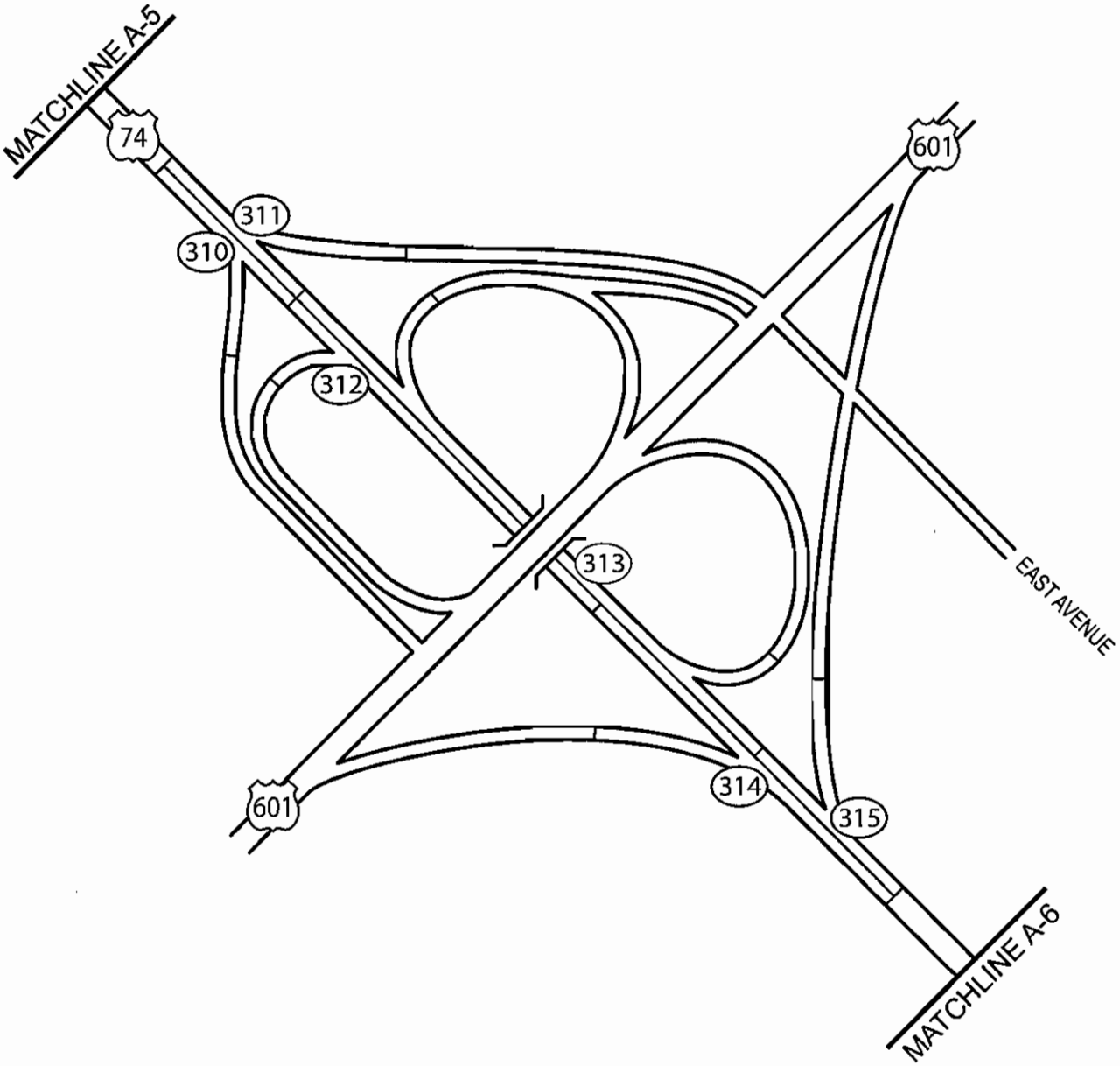
Space mean speed for all vehicles, S = 50.1 mph

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 and US 601
Ramp Analysis



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NORTH CAROLINA
Turnpike Authority

US 74 and US 601 Key Sheet

MONROE CONNECTOR / BYPASS
TIP Project Numbers R-3329 & R-2559
Mecklenburg and Union Counties

Appendix C

3_1-10 ExistingConditions.ai 7-23-07

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 and US 601 Ramp Analysis
Existing Condition

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB off to US 601
Junction:	310
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2230	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	590	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	230	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	700	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2230		590		230		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	619		164		64		v
Trucks and buses	7		7		8		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		

Heavy vehicle adjustment, fHV	0.905	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2738	724	286	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.658 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2050 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2738	6750	No
v_{12}	2050	4400	No
$v_{FO} = v_F - v_R$	2014	6750	No
v_R	724	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 20.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.428	
Space mean speed in ramp influence area,	S_R = 49.4	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 51.8	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB off to US 601
Junction:	310
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2720	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	720	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	280	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	700	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2720	720	280	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	756	200	78	v
Trucks and buses	7	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3340	884	348	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.636 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2446 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3340	6750	No
v_{12}	2446	4400	No
$v_{FO} = v_F - v_R$	2456	6750	No
v_R	884	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 23.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.443	
Space mean speed in ramp influence area,	S_R = 49.2	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 51.8	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB on from US 601
Junction:	311
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2370	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	350	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	110	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2370	350	110	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	658	97	31	v
Trucks and buses	7	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2910	436	135	pcph

Estimation of V12 Merge Areas

L_{EQ} = 990.10 (Equation 25-2 or 25-3)

P_{FM} = 0.620 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1803 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3346	6750	No
v_{R12}	2239	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 21.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M_S = 0.338

Space mean speed in ramp influence area, S_R = 50.6 mph

Space mean speed in outer lanes, S_0 = 52.8 mph

Space mean speed for all vehicles, S = 51.3 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB on from US 601
Junction:	311
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1940	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	290	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	90	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1940	290	90	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	539	81	25	v
Trucks and buses	7	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2382	361	111	pcph

Estimation of V12 Merge Areas

L_{EQ} = 814.08 (Equation 25-2 or 25-3)

P_{FM} = 0.607 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1446 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2743	6750	No
v_{R12}	1807	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 17.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.325

Space mean speed in ramp influence area, S_R = 50.8 mph

Space mean speed in outer lanes, S_O = 53.4 mph

Space mean speed for all vehicles, S = 51.7 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB on from US 601 SB
Junction:	312
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1640	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	590	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	700	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1640	230	590	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	456	64	164	v
Trucks and buses	7	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2014	286	724	pcph

Estimation of V12 Merge Areas

L_{EQ} = -469.60 (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1180 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2300	6750	No
v_{R12}	1466	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 14.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.323	
Space mean speed in ramp influence area,	S_R = 50.8	mph
Space mean speed in outer lanes,	S_O = 53.8	mph
Space mean speed for all vehicles,	S = 51.8	mph

HCS2000: Ramps and Ramp Junctions Release 4.1f

Phone: Fax:
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Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB on from US 601 SB
Junction:	312
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2000	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	280	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	720	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	700	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2000	280	720	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	556	78	200	v
Trucks and buses	7	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2456	348	884	pcph

Estimation of V12 Merge Areas

L_{EQ} = -361.74 (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1439 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2804	6750	No
v_{R12}	1787	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 17.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.329	
Space mean speed in ramp influence area,	S_R = 50.7	mph
Space mean speed in outer lanes,	S_O = 53.1	mph
Space mean speed for all vehicles,	S = 51.6	mph

FREEWAY WEAVING WORKSHEET

General Information

Analyst	BSL
Agency/Company	PBSJ
Date Performed	11/21/2007
Analysis Time Period	AM Peak

Site Information

Freeway/Dir of Travel	US 74 WB
Weaving Seg Location	313
Jurisdiction	
Analysis Year	2007

Inputs

Freeway free-flow speed, SFF (mi/h)	55	Weaving type	A
Weaving number of lanes, N	4	Volume ratio, VR	0.25
Weaving seg length, L (ft)	550	Weaving ratio, R	0.43
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
Vo1	2000	0.90	7	0	2.5	2.0	0.905	1.00	2455
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	280	0.90	7	0	2.5	2.0	0.905	1.00	343
Vw2	370	0.90	8	0	2.5	2.0	0.893	1.00	460
Vw				803	Vnw				2455
V									3258

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)	0.15	0.00		
b (Exhibit 24-6)	2.20	4.00		
c (Exhibit 24-6)	0.97	1.30		
d (Exhibit 24-6)	0.80	0.75		
Weaving intensity factor, Wi	1.04	0.45		
Weaving and non-weaving speeds, Si (mi/h)	37.04	45.98		

Number of lanes required for unconstrained operation, Nw 1.20
Maximum number of lanes, Nw (max) 1.40

☑ If Nw < Nw(max) unconstrained operation ☐ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	43.40
Weaving segment density, D (pc/mi/ln)	18.77
Level of service, LOS	B
Capacity of base condition, c_b (pc/h)	6048
Capacity as a 15-minute flow rate, c (veh/h)	5473
Capacity as a full-hour volume, c_h (veh/h)	4926

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	BSL
Agency/Company	PBSJ
Date Performed	11/21/2007
Analysis Time Period	PM Peak

Site Information

Freeway/Dir of Travel	US 74 WB
Weaving Seg Location	313
Jurisdiction	
Analysis Year	2007

Inputs

Freeway free-flow speed, SFF (mi/h)	55	Weaving type	A
Weaving number of lanes, N	4	Volume ratio, VR	0.25
Weaving seg length, L (ft)	550	Weaving ratio, R	0.43
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	fHV	fp	v
Vo1	1640	0.90	7	0	2.5	2.0	0.905	1.00	2013
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	230	0.90	7	0	2.5	2.0	0.905	1.00	282
Vw2	300	0.90	8	0	2.5	2.0	0.893	1.00	373
Vw				655	Vnw				2013
V									2668

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)	0.15	0.00		
b (Exhibit 24-6)	2.20	4.00		
c (Exhibit 24-6)	0.97	1.30		
d (Exhibit 24-6)	0.80	0.75		
Weaving intensity factor, Wi	0.86	0.35		
Weaving and non-weaving speeds, Si (mi/h)	39.23	48.38		

Number of lanes required for unconstrained operation, Nw 1.16
Maximum number of lanes, Nw (max) 1.40

☑ If Nw < Nw(max) unconstrained operation ☐ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	45.76
Weaving segment density, D (pc/mi/ln)	14.58
Level of service, LOS	B
Capacity of base condition, c_b (pc/h)	6053
Capacity as a 15-minute flow rate, c (veh/h)	5478
Capacity as a full-hour volume, c_h (veh/h)	4930

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB on from US 601 NB
Junction:	314
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1870	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1870	230	230	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	519	64	64	v
Trucks and buses	7	8	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.893	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2296	286	286	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1345 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2582	6750	No
v_{R12}	1631	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 16.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.317

Space mean speed in ramp influence area, S_R = 50.9 mph

Space mean speed in outer lanes, S_O = 53.4 mph

Space mean speed for all vehicles, S = 51.8 mph

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Phone: Fax:
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Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB on from US 601 NB
Junction:	314
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2280	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	280	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	280	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2280	280	280	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	633	78	78	v
Trucks and buses	7	8	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.893	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2799	348	348	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1640 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3147	6750	No
v_{R12}	1988	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 18.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.325	
Space mean speed in ramp influence area,	S_R = 50.8	mph
Space mean speed in outer lanes,	S_O = 52.6	mph
Space mean speed for all vehicles,	S = 51.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB off to US 601
Junction:	315
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2560	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	280	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	370	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2560	280	370	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	711	78	103	v
Trucks and buses	7	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3143	344	460	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.666 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2207 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3143	6750	No
v_{12}	2207	4400	No
$v_{FO} = v_F - v_R$	2799	6750	No
v_R	344	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 20.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.394	
Space mean speed in ramp influence area,	S_R = 49.9	mph
Space mean speed in outer lanes,	S_0 = 60.3	mph
Space mean speed for all vehicles,	S = 52.6	mph

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Phone: Fax:
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Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB off to US 601
Junction:	315
Jurisdiction:	
Analysis Year:	2007
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2100	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	300	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2100	230	300	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	583	64	83	v
Trucks and buses	7	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2578	282	373	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.683 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1849 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2578	6750	No
v_{12}	1849	4400	No
$v_{FO} = v_F - v_R$	2296	6750	No
v_R	282	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 17.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.388	
Space mean speed in ramp influence area,	S_R = 50.0	mph
Space mean speed in outer lanes,	S_0 = 60.3	mph
Space mean speed for all vehicles,	S = 52.5	mph

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA
Turnpike Authority

PBSJ

US 74 and US 601 Ramp Analysis
2030 No-Build

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB off to US 601
Junction:	310
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2380	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	830	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	510	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	700	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2380		830		510	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	661		231		142	v
Trucks and buses	7		7		7	%
Recreational vehicles	0		0		0	%
Terrain type:	Rolling		Rolling		Rolling	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	2.5		2.5		2.5	
Recreational vehicle PCE, ER	2.0		2.0		2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2922	1019	626	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.640 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2237 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2922	6750	No
v_{12}	2237	4400	No
$v_{FO} = v_F - v_R$	1903	6750	No
v_R	1019	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 21.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.455	
Space mean speed in ramp influence area,	S_R = 49.1	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 51.3	mph

HCS2000: Ramps and Ramp Junctions Release 4.1f

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB off to US 601
Junction:	310
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2920	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1020	vph
Length of first accel/decel lane	200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	620	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	700	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2920	1020	620	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	811	283	172	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3585	1252	761	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.613 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2682 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3585	6750	No
v_{12}	2682	4400	No
$v_{FO} = v_F - v_R$	2333	6750	No
v_R	1252	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 25.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.476	
Space mean speed in ramp influence area,	S_R = 48.8	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 51.3	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB on from US 601
Junction:	311
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2410	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	500	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	170	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2410	500	170	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	669	139	47	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2959	614	209	pcph

Estimation of V12 Merge Areas

L_{EQ} = 1532.82 (Equation 25-2 or 25-3)

P_{FM} = 0.659 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1949 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3573	6750	No
v_{R12}	2563	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M_S = 0.352

Space mean speed in ramp influence area, S_R = 50.4 mph

Space mean speed in outer lanes, S_O = 53.2 mph

Space mean speed for all vehicles, S = 51.2 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB on from US 601
Junction:	311
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1970	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	410	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	140	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1970	410	140	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	547	114	39	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2419	503	172	pcph

Estimation of V12 Merge Areas

L_{EQ} = 1261.46 (Equation 25-2 or 25-3)

P_{FM} = 0.639 Using Equation 3

$v_{12} = v_F (P_{FM})$ = 1546 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2922	6750	No
v_{R12}	2049	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.331	
Space mean speed in ramp influence area,	S_R = 50.7	mph
Space mean speed in outer lanes,	S_O = 53.7	mph
Space mean speed for all vehicles,	S = 51.5	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB on from US 601 SB
Junction:	312
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1550	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	510	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	830	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	700	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1550	510	830	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	431	142	231	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1903	626	1019	pcph

Estimation of V12 Merge Areas

L_{EQ} = -420.59 (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1115 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2529	6750	No
v_{R12}	1741	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 16.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.328

Space mean speed in ramp influence area, S_R = 50.7 mph

Space mean speed in outer lanes, S_O = 54.0 mph

Space mean speed for all vehicles, S = 51.7 mph

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Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB on from US 601 SB
Junction:	312
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1900	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	620	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1020	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	700	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1900	620	1020	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	528	172	283	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2333	761	1252	pcph

Estimation of V12 Merge Areas

L_{EQ} = -299.68 (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1367 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3094	6750	No
v_{R12}	2128	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 19.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.339

Space mean speed in ramp influence area, S_R = 50.6 mph

Space mean speed in outer lanes, S_O = 53.3 mph

Space mean speed for all vehicles, S = 51.4 mph

FREEWAY WEAVING WORKSHEET

General Information

Analyst	BSL
Agency/Company	PBSJ
Date Performed	11/21/2007
Analysis Time Period	AM Peak

Site Information

Freeway/Dir of Travel	US 74 WB
Weaving Seg Location	313
Jurisdiction	
Analysis Year	2030 No Build

Inputs

Freeway free-flow speed, SFF (mi/h)	55	Weaving type	A
Weaving number of lanes, N	4	Volume ratio, VR	0.38
Weaving seg length, L (ft)	550	Weaving ratio, R	0.45
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	f_{HV}	f_p	v
Vo1	1890	0.90	7	0	2.5	2.0	0.905	1.00	2320
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	640	0.90	7	0	2.5	2.0	0.905	1.00	785
Vw2	520	0.90	7	0	2.5	2.0	0.905	1.00	638
Vw				1423	Vnw				2320
V									3743

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.15	0.00
b (Exhibit 24-6)			4.00	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			3.48	0.47
Weaving and non-weaving speeds, Si (mi/h)			25.04	45.70

Number of lanes required for unconstrained operation, Nw: 1.61
Maximum number of lanes, Nw (max): 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	34.79
Weaving segment density, D (pc/mi/ln)	26.90
Level of service, LOS	C
Capacity of base condition, c_b (pc/h)	5505
Capacity as a 15-minute flow rate, c (veh/h)	4982
Capacity as a full-hour volume, c_h (veh/h)	4484

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	BSL
Agency/Company	PBSJ
Date Performed	11/21/2007
Analysis Time Period	PM Peak

Site Information

Freeway/Dir of Travel	US 74 WB
Weaving Seg Location	313
Jurisdiction	
Analysis Year	2030 No Build

Inputs

Freeway free-flow speed, SFF (mi/h)	55	Weaving type	A
Weaving number of lanes, N	4	Volume ratio, VR	0.38
Weaving seg length, L (ft)	550	Weaving ratio, R	0.44
Terrain	Rolling		

Conversions to pc/h Under Base Conditions

(pc/h)	V	PHF	Truck %	RV %	E_T	E_R	fHV	fp	v
Vo1	1550	0.90	7	0	2.5	2.0	0.905	1.00	1903
Vo2	0	0.90	0	0	2.5	2.0	1.000	1.00	0
Vw1	530	0.90	7	0	2.5	2.0	0.905	1.00	650
Vw2	420	0.90	7	0	2.5	2.0	0.905	1.00	515
Vw				1165	Vnw				1903
V									3068

Weaving and Non-Weaving Speeds

	Unconstrained		Constrained	
	Weaving (i = w)	Non-Weaving (i = nw)	Weaving (i = w)	Non-Weaving (= nw)
a (Exhibit 24-6)			0.15	0.00
b (Exhibit 24-6)			4.00	4.00
c (Exhibit 24-6)			0.97	1.30
d (Exhibit 24-6)			0.80	0.75
Weaving intensity factor, Wi			2.87	0.36
Weaving and non-weaving speeds, Si (mi/h)			26.63	48.11

Number of lanes required for unconstrained operation, Nw: 1.57
Maximum number of lanes, Nw (max): 1.40

☐ If Nw < Nw(max) unconstrained operation ☑ if Nw > Nw (max) constrained operation

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment speed, S (mi/h)	36.83
Weaving segment density, D (pc/mi/ln)	20.82
Level of service, LOS	B
Capacity of base condition, c_b (pc/h)	5505
Capacity as a 15-minute flow rate, c (veh/h)	4982
Capacity as a full-hour volume, c_h (veh/h)	4484

Notes

a. Weaving segments longer than 2500 ft. are treated as isolated merge and diverge areas using the procedures of Chapter 25, "Ramps and Ramp Junctions".
b. Capacity constrained by basic freeway capacity.
c. Capacity occurs under constrained operating conditions.
d. Three-lane Type A segments do not operate well at volume ratios greater than 0.45. Poor operations and some local queuing are expected in such cases.
e. Four-lane Type A segments do not operate well at volume ratios greater than 0.35. Poor operations and some local queuing are expected in such cases.
f. Capacity constrained by maximum allowable weaving flow rate: 2,800 pc/h (Type A), 4,000 (Type B), 3,500 (Type C).
g. Five-lane Type A segments do not operate well at volume ratios greater than 0.20. Poor operations and some local queuing are expected in such cases.
h. Type B weaving segments do not operate well at volume ratios greater than 0.80. Poor operations and some local queuing are expected in such cases.
i. Type C weaving segments do not operate well at volume ratios greater than 0.50. Poor operations and some local queuing are expected in such cases.

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Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 EB on from US 601 NB
Junction:	314
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2060	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	530	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	510	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2060	530	510	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	572	147	142	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2529	651	626	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1482 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3180	6750	No
v_{R12}	2133	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.330

Space mean speed in ramp influence area, S_R = 50.7 mph

Space mean speed in outer lanes, S_O = 53.0 mph

Space mean speed for all vehicles, S = 51.5 mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 EB on from US 601 NB
Junction:	314
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2520	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	40.0	mph
Volume on ramp	640	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	620	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	800	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2520	640	620	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	700	178	172	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3094	786	761	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.586 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1813 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3880	6750	No
v_{R12}	2599	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M_S = 0.349

Space mean speed in ramp influence area, S_R = 50.5 mph

Space mean speed in outer lanes, S_O = 52.2 mph

Space mean speed for all vehicles, S = 51.0 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	AM Peak
Freeway/Dir of Travel:	US 74 WB off to US 601
Junction:	315
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	3160	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	620	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	520	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3160	620	520	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	878	172	144	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3880	761	638	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.628 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2720 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3880	6750	No
v_{12}	2720	4400	No
$v_{FO} = v_F - v_R$	3119	6750	No
v_R	761	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 24.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.431

Space mean speed in ramp influence area, S_R = 49.4 mph

Space mean speed in outer lanes, S_O = 59.7 mph

Space mean speed for all vehicles, S = 52.1 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	BSL
Agency/Co.:	PBSJ
Date performed:	11/21/2007
Analysis time period:	PM Peak
Freeway/Dir of Travel:	US 74 WB off to US 601
Junction:	315
Jurisdiction:	
Analysis Year:	2030 No Build
Description:	Monroe Bypass / Connector

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	55.0	mph
Volume on freeway	2590	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	510	vph
Length of first accel/decel lane	300	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	420	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2590	510	420	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	719	142	117	v
Trucks and buses	7	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.905	0.905	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3180	626	516	pcph

Estimation of V12 Diverge Areas

L_{EQ} = (Equation 25-8 or 25-9)

P_{FD} = 0.652 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2290 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3180	6750	No
v_{12}	2290	4400	No
$v_{FO} = v_F - v_R$	2554	6750	No
v_R	626	2100	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 21.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.419	
Space mean speed in ramp influence area,	S_R = 49.5	mph
Space mean speed in outer lanes,	S_O = 60.3	mph
Space mean speed for all vehicles,	S = 52.2	mph

Monroe Connector / Bypass
TIP Number R-3329/R-2559
Union and Mecklenburg Counties

NORTH CAROLINA Turnpike Authority

PBS&J

Appendix D
SimTraffic Analysis Worksheets

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	5.6	20.1	0.2	36
	133	2.2	10.6	0.1	43
	138	9.9	129.9	1.8	50
N. Main Street	130	16.6	23.5	0.1	11
Bivens Street	129	5.5	24.4	0.2	27
	97	1.2	9.7	0.1	30
	142	15.5	193.9	2.2	41
S. Secrest Avenue	128	27.5	37.6	0.1	14
	148	6.6	15.2	0.1	30
	153	10.2	76.0	1.0	47
Metro Medical Center	127	22.2	34.6	0.2	20
	79	3.6	8.5	0.1	24
	61	2.0	5.3	0.0	28
Shopping Center	126	16.5	19.9	0.0	8
Venus Street	125	7.1	21.7	0.2	30
	40	1.0	7.3	0.1	38
	19	1.3	9.9	0.1	39
Sutherland Avenue	124	11.2	18.0	0.1	17
	13	2.3	11.7	0.1	36
	99	5.3	30.5	0.3	37
Walkup Avenue	123	44.7	52.0	0.1	7
	98	7.5	20.1	0.2	28
Morgan Mill Road	122	16.0	22.9	0.1	14
	93	3.7	12.7	0.1	31
	89	4.9	35.2	0.4	38
Boyte Street	121	9.9	16.3	0.1	18
Stafford Street Exte	120	14.4	33.5	0.2	26
	83	4.0	13.1	0.1	31
	16	7.4	53.8	0.6	38
Secrest Shortcut Roa	115	30.8	61.1	0.4	22
Dickerson Boulevard	114	99.3	120.5	0.3	8
	64	32.8	47.6	0.2	14
Hanover Drive	113	51.3	61.8	0.1	10
Williams Road	112	38.6	56.4	0.2	14
Round Table Road	111	27.6	57.2	0.4	23
Rolling Hill Drive	110	14.9	44.8	0.4	30
Fowler-Secrest Rd	108	15.6	71.3	0.7	36
N. Rocky River Road	107	293.1	370.8	1.2	11
Chamber Drive	106	19.3	105.7	1.4	47
Sardis Church Road	105	146.2	220.3	1.2	19
Faith Church Road	104	29.1	69.5	0.6	32
	17	4.8	11.2	0.1	30
Unionville Indian Tr	103	46.4	91.2	0.7	27
Indian Trail - Fairv	102	270.0	314.4	0.7	8
Stallings Road	101	44.1	127.7	1.3	36
Entry Point	139	22.1	100.6	1.2	43
Total		1471.7	2900.1	19.9	25

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Entry Point	139	39.9	43.9	0.0	13
Stallings Road	101	453.1	533.0	1.2	8
Indian Trail Road	102	58.1	141.4	1.3	32
Unionville Indian Tr	103	34.4	78.0	0.7	31
	17	12.5	58.7	0.7	42
Faith Church Road	104	8.8	14.9	0.1	23
Wesley Chapel Stouts	105	183.9	223.9	0.6	10
Chamber Drive	106	18.9	91.1	1.2	46
N. Rocky River Road	107	35.1	122.6	1.4	40
John Moore Rd	108	16.6	91.8	1.2	46
Carroll Street	110	9.2	64.9	0.7	40
Roland Drive	111	13.7	43.3	0.4	31
Williams Road	112	24.6	54.2	0.4	25
Hanover Drive	113	16.7	34.5	0.2	23
	64	4.1	15.1	0.1	32
Dickerson Boulevard	114	32.9	47.2	0.2	14
Shopping Center	115	14.6	35.9	0.3	27
	16	5.1	35.8	0.4	38
	83	4.8	51.1	0.6	40
Stafford Street	120	12.8	21.7	0.1	19
Boyte Street	121	9.2	28.3	0.2	31
	89	1.6	8.2	0.1	35
	93	18.1	48.7	0.4	28
Morgan Mill Road	122	15.9	24.5	0.1	16
	98	2.6	9.9	0.1	32
Walkup Avenue	123	7.9	20.0	0.2	28
	99	2.0	9.8	0.1	34
	13	2.4	27.6	0.3	41
Sutherland Avenue	124	4.5	13.8	0.1	30
	19	1.4	8.4	0.1	37
	40	1.0	9.6	0.1	40
Dove Street	125	2.1	8.1	0.1	34
E. Franklin Street	126	37.3	51.7	0.2	13
	61	3.1	7.1	0.0	23
	79	1.9	5.6	0.0	27
Pageland Hwy	127	24.2	28.1	0.1	7
	153	8.0	21.9	0.2	32
	148	7.3	72.7	1.0	49
Old Pageland-Monroe	128	5.3	13.7	0.1	34
	142	2.7	12.8	0.1	42
	97	12.7	190.3	2.2	42
Bivens Street	129	4.1	12.4	0.1	24
S. Main Street	130	12.0	31.2	0.2	21
	138	1.4	8.8	0.1	29
	133	8.4	129.8	1.8	50
Forest Hill Road	131	6.8	14.8	0.1	30
Total		1204.1	2620.7	19.7	27

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	6.6	21.1	0.2	34
	133	2.4	10.7	0.1	42
	138	10.5	130.7	1.8	50
N. Main Street	130	18.7	25.5	0.1	11
Bivens Street	129	5.4	24.4	0.2	27
	97	1.2	9.8	0.1	30
	142	16.4	195.4	2.2	41
S. Secrest Avenue	128	26.9	37.0	0.1	15
	148	6.6	15.3	0.1	30
	153	10.0	75.9	1.0	47
Metro Medical Center	127	28.9	41.4	0.2	17
	79	4.0	8.8	0.1	23
	61	1.9	5.2	0.0	29
Shopping Center	126	17.6	21.0	0.0	8
Venus Street	125	7.5	22.1	0.2	30
	40	1.1	7.4	0.1	37
	19	1.4	10.1	0.1	38
Sutherland Avenue	124	10.6	17.4	0.1	18
	13	2.2	11.7	0.1	36
	99	4.7	30.0	0.3	38
Walkup Avenue	123	42.3	49.6	0.1	7
	98	7.6	20.3	0.2	27
Morgan Mill Road	122	15.7	22.6	0.1	14
	93	3.4	12.5	0.1	32
	89	5.1	35.3	0.4	38
Boyte Street	121	9.8	16.2	0.1	18
Stafford Street Exte	120	16.5	35.8	0.2	24
	83	4.4	13.6	0.1	30
	16	7.6	54.1	0.6	38
Secrest Shortcut Roa	115	62.7	93.0	0.4	15
Dickerson Boulevard	114	121.2	142.7	0.3	7
	64	45.6	60.5	0.2	11
Hanover Drive	113	42.3	52.8	0.1	10
Williams Road	112	26.2	44.1	0.2	18
Round Table Road	111	26.5	56.0	0.4	24
Rolling Hill Drive	110	15.8	45.8	0.4	29
Fowler-Secrest Rd	108	14.3	70.2	0.7	37
N. Rocky River Road	107	324.4	401.1	1.2	10
Chamber Drive	106	19.6	107.3	1.4	46
Sardis Church Road	105	233.9	307.4	1.2	14
Faith Church Road	104	29.7	70.2	0.6	32
	17	4.6	11.0	0.1	30
Unionville Indian Tr	103	36.1	80.6	0.7	31
Indian Trail - Fairv	102	267.1	311.7	0.7	8
Stallings Road	101	55.4	139.3	1.3	33
Entry Point	139	23.6	102.2	1.2	42
Total		1646.0	3076.7	19.9	23

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Entry Point	139	13.4	17.5	0.0	18
Stallings Road	101	437.4	518.3	1.2	8
Indian Trail Road	102	65.7	150.0	1.3	31
Unionville Indian Tr	103	33.1	77.0	0.7	32
	17	11.3	57.7	0.7	43
Faith Church Road	104	8.6	14.7	0.1	23
Wesley Chapel Stouts	105	94.1	134.7	0.6	16
Chamber Drive	106	17.9	90.2	1.2	46
N. Rocky River Road	107	37.7	125.7	1.4	39
John Moore Rd	108	18.9	94.5	1.2	44
Carroll Street	110	9.5	65.2	0.7	40
Roland Drive	111	13.7	43.4	0.4	31
Williams Road	112	23.3	53.0	0.4	25
Hanover Drive	113	14.1	32.0	0.2	25
	64	3.5	14.5	0.1	33
Dickerson Boulevard	114	32.9	47.3	0.2	14
Shopping Center	115	15.8	37.0	0.3	26
	16	5.2	35.9	0.4	38
	83	4.8	51.1	0.6	40
Stafford Street	120	12.5	21.4	0.1	19
Boyte Street	121	9.7	28.6	0.2	30
	89	1.7	8.3	0.1	35
	93	3.1	33.5	0.4	40
Morgan Mill Road	122	13.7	22.2	0.1	18
	98	2.6	9.9	0.1	32
Walkup Avenue	123	7.2	19.3	0.2	29
	99	1.8	9.6	0.1	35
	13	2.2	27.5	0.3	41
Sutherland Avenue	124	3.8	13.1	0.1	32
	19	1.1	8.1	0.1	38
	40	0.8	9.4	0.1	41
Dove Street	125	2.6	8.6	0.1	32
E. Franklin Street	126	36.9	51.4	0.2	13
	61	3.2	7.2	0.0	23
	79	1.9	5.6	0.0	27
Pageland Hwy	127	23.0	27.0	0.1	7
	153	7.3	21.3	0.2	33
	148	7.3	73.0	1.0	49
Old Pageland-Monroe	128	5.8	14.1	0.1	33
	142	2.7	12.7	0.1	43
	97	11.2	189.5	2.2	42
Bivens Street	129	3.2	11.5	0.1	26
S. Main Street	130	10.2	29.2	0.2	23
	138	1.4	8.8	0.1	29
	133	6.8	127.7	1.8	51
Forest Hill Road	131	6.4	14.4	0.1	31
Total		1051.0	2472.6	19.7	29

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	6.1	20.5	0.2	35
	133	2.1	10.5	0.1	43
	138	9.3	129.0	1.8	50
N. Main Street	130	17.3	24.2	0.1	11
Bivens Street	129	5.8	24.9	0.2	27
	97	1.2	9.8	0.1	30
	142	14.2	192.1	2.2	41
S. Secrest Avenue	128	28.0	38.1	0.1	14
	148	6.3	15.0	0.1	31
	153	9.5	75.5	1.0	47
Metro Medical Center	127	23.6	36.0	0.2	20
	79	3.8	8.7	0.1	23
	61	2.3	5.5	0.0	27
Shopping Center	126	17.9	21.3	0.0	8
Venus Street	125	8.0	22.7	0.2	29
	40	1.1	7.4	0.1	37
	19	1.3	9.9	0.1	39
Sutherland Avenue	124	10.0	16.9	0.1	18
	13	2.2	11.7	0.1	36
	99	7.6	32.9	0.3	34
Walkup Avenue	123	70.5	77.9	0.1	5
	98	7.8	20.4	0.2	27
Morgan Mill Road	122	17.5	24.4	0.1	13
	93	3.8	12.9	0.1	30
	89	5.0	35.3	0.4	38
Boyte Street	121	8.7	15.1	0.1	19
Stafford Street Exte	120	15.6	34.7	0.2	25
	83	4.1	13.3	0.1	31
	16	7.3	53.8	0.6	38
Secrest Shortcut Roa	115	37.3	67.6	0.4	20
Dickerson Boulevard	114	73.8	95.2	0.3	10
	64	13.2	28.0	0.2	23
Hanover Drive	113	22.1	32.5	0.1	16
Williams Road	112	36.6	54.5	0.2	15
Round Table Road	111	30.3	59.8	0.4	22
Rolling Hill Drive	110	18.4	48.5	0.4	27
Fowler-Secrest Rd	108	17.6	73.5	0.7	35
N. Rocky River Road	107	251.5	329.4	1.2	13
Chamber Drive	106	19.9	108.2	1.4	46
Sardis Church Road	105	271.2	345.5	1.2	12
Faith Church Road	104	29.9	70.5	0.6	31
	17	5.2	11.6	0.1	29
Unionville Indian Tr	103	45.9	90.9	0.7	27
Indian Trail - Fairv	102	243.6	288.0	0.7	9
Stallings Road	101	89.8	174.4	1.3	26
Entry Point	139	22.6	101.4	1.2	42
Total		1546.8	2980.0	19.9	24

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Entry Point	139	53.6	57.7	0.0	14
Stallings Road	101	473.3	553.7	1.2	8
Indian Trail Road	102	48.2	131.6	1.3	35
Unionville Indian Tr	103	30.5	74.3	0.7	33
	17	11.3	57.6	0.7	43
Faith Church Road	104	7.6	13.7	0.1	24
Wesley Chapel Stouts	105	58.9	99.1	0.6	22
Chamber Drive	106	17.9	90.9	1.2	46
N. Rocky River Road	107	41.8	128.9	1.4	38
John Moore Rd	108	18.2	93.5	1.2	45
Carroll Street	110	9.1	65.0	0.7	40
Roland Drive	111	13.1	42.9	0.4	31
Williams Road	112	23.3	53.2	0.4	25
Hanover Drive	113	13.1	31.0	0.2	26
	64	3.3	14.3	0.1	34
Dickerson Boulevard	114	32.4	46.7	0.2	14
Shopping Center	115	12.7	34.2	0.3	28
	16	4.1	34.9	0.4	39
	83	4.3	50.6	0.6	41
Stafford Street	120	11.5	20.3	0.1	20
Boyte Street	121	9.3	28.5	0.2	30
	89	1.5	8.1	0.1	36
	93	4.2	34.6	0.4	39
Morgan Mill Road	122	14.7	23.3	0.1	17
	98	2.7	10.0	0.1	32
Walkup Avenue	123	7.2	19.4	0.2	29
	99	1.7	9.5	0.1	36
	13	2.1	27.4	0.3	41
Sutherland Avenue	124	3.4	12.7	0.1	33
	19	1.1	8.1	0.1	38
	40	0.8	9.4	0.1	41
Dove Street	125	1.9	8.0	0.1	35
E. Franklin Street	126	39.2	53.7	0.2	12
	61	3.2	7.3	0.0	23
	79	1.8	5.6	0.0	27
Pageland Hwy	127	24.2	28.2	0.1	7
	153	7.7	21.6	0.2	33
	148	6.7	72.5	1.0	49
Old Pageland-Monroe	128	5.9	14.3	0.1	32
	142	2.3	12.3	0.1	44
	97	11.8	191.1	2.2	42
Bivens Street	129	3.9	12.2	0.1	24
S. Main Street	130	10.4	29.6	0.2	23
	138	1.2	8.6	0.1	29
	133	6.8	127.5	1.8	51
Forest Hill Road	131	7.3	15.3	0.1	30
Total		1071.3	2492.7	19.7	29

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	9.0	23.5	0.2	31
	133	2.3	10.7	0.1	42
	138	9.3	128.6	1.8	51
N. Main Street	130	13.3	20.3	0.1	13
Bivens Street	129	4.8	23.8	0.2	28
	97	1.0	9.6	0.1	31
	142	12.8	191.0	2.2	42
S. Secrest Avenue	128	22.1	32.2	0.1	17
	148	4.8	13.4	0.1	35
	153	7.6	72.7	1.0	49
Metro Medical Center	127	18.8	31.1	0.2	23
	79	2.7	7.8	0.1	27
	61	2.0	5.0	0.0	28
Shopping Center	126	21.0	24.4	0.0	7
Venus Street	125	6.8	21.3	0.2	31
	40	0.9	7.2	0.1	39
	19	0.9	9.5	0.1	40
Sutherland Avenue	124	9.1	15.8	0.1	19
	13	1.8	11.3	0.1	37
	99	3.2	28.4	0.3	40
Walkup Avenue	123	24.4	31.7	0.1	11
	98	7.1	19.8	0.2	28
Morgan Mill Road	122	14.8	21.8	0.1	15
	93	4.1	13.2	0.1	30
	89	4.3	34.5	0.4	39
Boyte Street	121	8.1	14.5	0.1	20
Stafford Street Exte	120	7.1	26.4	0.2	33
	83	1.8	11.0	0.1	37
	16	4.5	50.9	0.6	41
Secrest Shortcut Roa	115	59.4	89.0	0.4	15
Dickerson Boulevard	114	113.4	134.5	0.3	7
	64	91.7	106.5	0.2	6
Hanover Drive	113	59.5	70.0	0.1	8
Williams Road	112	9.9	27.8	0.2	29
Round Table Road	111	15.4	44.8	0.4	30
Rolling Hill Drive	110	9.4	39.2	0.4	34
Fowler-Secrest Rd	108	8.1	64.0	0.7	41
N. Rocky River Road	107	36.9	110.8	1.2	38
Chamber Drive	106	20.8	105.9	1.4	47
Sardis Church Road	105	39.2	111.3	1.2	38
Faith Church Road	104	20.2	59.7	0.6	37
	17	4.4	10.7	0.1	31
Unionville Indian Tr	103	21.8	66.4	0.7	37
Indian Trail - Fairv	102	243.8	288.2	0.7	9
Stallings Road	101	37.1	120.1	1.3	38
Entry Point	139	15.1	89.4	1.2	48
Total		1036.9	2449.9	19.9	30

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Entry Point	139	1.3	5.4	0.0	27
Stallings Road	101	620.2	701.5	1.2	11
Indian Trail Road	102	123.9	207.4	1.3	22
Unionville Indian Tr	103	27.9	71.6	0.7	34
	17	11.8	57.7	0.7	43
Faith Church Road	104	7.9	14.0	0.1	24
Wesley Chapel Stouts	105	60.9	101.4	0.6	22
Chamber Drive	106	23.9	97.0	1.2	43
N. Rocky River Road	107	52.7	138.6	1.4	36
John Moore Rd	108	19.5	92.9	1.2	45
Carroll Street	110	11.1	66.6	0.7	39
Roland Drive	111	12.4	41.7	0.4	32
Williams Road	112	15.8	45.5	0.4	29
Hanover Drive	113	14.2	31.9	0.2	25
	64	4.9	15.8	0.1	30
Dickerson Boulevard	114	33.7	47.9	0.2	14
Shopping Center	115	11.0	32.1	0.3	30
	16	5.9	36.7	0.4	37
	83	7.5	53.9	0.6	38
Stafford Street	120	29.6	38.5	0.1	11
Boyte Street	121	8.7	27.8	0.2	31
	89	1.5	8.1	0.1	36
	93	3.7	34.1	0.4	40
Morgan Mill Road	122	9.9	18.5	0.1	21
	98	2.5	9.8	0.1	33
Walkup Avenue	123	7.3	19.4	0.2	29
	99	2.4	10.1	0.1	33
	13	3.1	28.3	0.3	40
Sutherland Avenue	124	3.6	12.8	0.1	33
	19	1.9	8.9	0.1	35
	40	1.5	10.1	0.1	38
Dove Street	125	1.9	7.9	0.1	35
E. Franklin Street	126	21.8	36.3	0.2	18
	61	2.8	6.7	0.0	24
	79	2.8	6.2	0.0	23
Pageland Hwy	127	22.4	26.8	0.1	8
	153	8.4	22.4	0.2	32
	148	8.3	73.3	1.0	49
Old Pageland-Monroe	128	12.9	21.2	0.1	22
	142	4.6	14.6	0.1	37
	97	14.5	192.7	2.2	41
Bivens Street	129	4.1	12.3	0.1	24
S. Main Street	130	8.5	27.4	0.2	24
	138	1.3	8.7	0.1	29
	133	8.0	129.0	1.8	50
Forest Hill Road	131	5.0	12.9	0.1	35
Total		1269.7	2684.3	19.7	30

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	8.7	23.1	0.2	31
	133	2.3	10.5	0.1	43
	138	8.3	126.6	1.8	51
N. Main Street	130	13.2	20.1	0.1	13
Bivens Street	129	5.4	24.3	0.2	27
	97	1.1	9.5	0.1	31
	142	11.8	191.0	2.2	42
S. Secrest Avenue	128	23.4	33.4	0.1	16
	148	4.9	13.4	0.1	34
	153	6.6	71.8	1.0	50
Metro Medical Center	127	20.5	32.8	0.2	22
	79	2.9	8.0	0.1	26
	61	2.6	5.6	0.0	25
Shopping Center	126	21.7	25.2	0.0	7
Venus Street	125	6.5	21.0	0.2	31
	40	1.0	7.3	0.1	38
	19	0.9	9.5	0.1	40
Sutherland Avenue	124	8.7	15.5	0.1	20
	13	1.7	11.1	0.1	38
	99	3.0	28.1	0.3	40
Walkup Avenue	123	27.3	34.6	0.1	10
	98	7.5	20.1	0.2	28
Morgan Mill Road	122	17.4	24.2	0.1	13
	93	4.6	13.7	0.1	29
	89	4.7	34.9	0.4	39
Boyte Street	121	8.2	14.6	0.1	20
Stafford Street Exte	120	6.9	26.2	0.2	33
	83	1.9	11.0	0.1	37
	16	4.5	51.0	0.6	40
Secrest Shortcut Roa	115	30.9	60.3	0.4	23
Dickerson Boulevard	114	29.2	50.4	0.3	19
	64	7.3	22.1	0.2	30
Hanover Drive	113	14.3	24.8	0.1	20
Williams Road	112	9.6	27.6	0.2	29
Round Table Road	111	15.4	45.0	0.4	29
Rolling Hill Drive	110	11.9	41.8	0.4	32
Fowler-Secrest Rd	108	10.5	66.7	0.7	39
N. Rocky River Road	107	46.3	121.4	1.2	35
Chamber Drive	106	27.4	113.2	1.4	44
Sardis Church Road	105	51.4	124.5	1.2	34
Faith Church Road	104	22.0	61.8	0.6	36
	17	4.7	11.1	0.1	30
Unionville Indian Tr	103	21.3	66.1	0.7	38
Indian Trail - Fairv	102	193.9	238.2	0.7	11
Stallings Road	101	37.5	120.3	1.3	38
Entry Point	139	15.6	90.3	1.2	48
Total		787.2	2203.7	19.9	33

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Entry Point	139	48.0	52.0	0.0	13
Stallings Road	101	757.4	837.5	1.2	9
Indian Trail Road	102	305.0	388.5	1.3	12
Unionville Indian Tr	103	26.5	70.4	0.7	35
	17	12.4	58.3	0.7	43
Faith Church Road	104	8.7	14.8	0.1	23
Wesley Chapel Stouts	105	56.2	96.5	0.6	23
Chamber Drive	106	22.7	96.2	1.2	44
N. Rocky River Road	107	48.7	135.8	1.4	36
John Moore Rd	108	20.5	93.7	1.2	45
Carroll Street	110	10.8	66.0	0.7	39
Roland Drive	111	13.6	43.0	0.4	31
Williams Road	112	15.8	45.4	0.4	29
Hanover Drive	113	14.6	32.4	0.2	25
	64	5.2	16.1	0.1	30
Dickerson Boulevard	114	36.5	50.6	0.2	13
Shopping Center	115	12.5	33.8	0.3	28
	16	6.1	36.9	0.4	37
	83	8.0	54.4	0.6	38
Stafford Street	120	31.0	40.0	0.1	10
Boyte Street	121	8.5	27.6	0.2	31
	89	1.5	8.0	0.1	36
	93	4.3	34.6	0.4	39
Morgan Mill Road	122	11.9	20.6	0.1	19
	98	2.9	10.1	0.1	32
Walkup Avenue	123	9.5	21.6	0.2	26
	99	2.9	10.6	0.1	32
	13	3.9	29.1	0.3	39
Sutherland Avenue	124	4.8	14.0	0.1	30
	19	2.5	9.4	0.1	33
	40	1.8	10.4	0.1	37
Dove Street	125	1.8	7.8	0.1	35
E. Franklin Street	126	23.4	37.9	0.2	17
	61	2.9	6.9	0.0	24
	79	3.5	6.9	0.0	20
Pageland Hwy	127	22.7	27.1	0.1	8
	153	8.5	22.4	0.2	32
	148	8.3	73.2	1.0	49
Old Pageland-Monroe	128	10.4	18.7	0.1	25
	142	3.9	13.9	0.1	39
	97	15.1	191.8	2.2	41
Bivens Street	129	4.9	13.1	0.1	23
S. Main Street	130	10.7	29.3	0.2	23
	138	1.4	8.9	0.1	29
	133	8.9	130.1	1.8	50
Forest Hill Road	131	4.3	12.1	0.1	37
Total		1645.2	3058.6	19.7	27

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	9.6	24.1	0.2	30
	133	2.4	10.7	0.1	42
	138	8.4	128.4	1.8	51
N. Main Street	130	15.4	22.4	0.1	11
Bivens Street	129	5.7	24.8	0.2	27
	97	1.1	9.6	0.1	31
	142	12.8	191.1	2.2	42
S. Secrest Avenue	128	24.9	34.9	0.1	15
	148	5.6	14.1	0.1	33
	153	7.2	72.6	1.0	49
Metro Medical Center	127	17.1	29.4	0.2	24
	79	2.6	7.7	0.1	27
	61	2.2	5.3	0.0	27
Shopping Center	126	20.7	24.1	0.0	7
Venus Street	125	7.6	22.2	0.2	30
	40	1.0	7.3	0.1	38
	19	0.9	9.5	0.1	40
Sutherland Avenue	124	9.2	15.9	0.1	19
	13	1.8	11.2	0.1	37
	99	2.7	27.9	0.3	40
Walkup Avenue	123	22.0	29.2	0.1	12
	98	6.2	18.8	0.2	29
Morgan Mill Road	122	12.6	19.4	0.1	16
	93	3.7	12.8	0.1	31
	89	4.1	34.3	0.4	39
Boyte Street	121	7.7	14.1	0.1	21
Stafford Street Exte	120	9.9	29.2	0.2	30
	83	2.4	11.6	0.1	35
	16	4.9	51.4	0.6	40
Secrest Shortcut Roa	115	26.0	55.3	0.4	25
Dickerson Boulevard	114	52.8	73.9	0.3	13
	64	76.3	91.1	0.2	7
Hanover Drive	113	59.5	70.0	0.1	7
Williams Road	112	13.4	31.3	0.2	25
Round Table Road	111	16.8	46.3	0.4	29
Rolling Hill Drive	110	12.2	42.0	0.4	32
Fowler-Secrest Rd	108	10.3	66.3	0.7	39
N. Rocky River Road	107	43.7	120.2	1.2	35
Chamber Drive	106	22.7	108.5	1.4	45
Sardis Church Road	105	47.5	119.7	1.2	35
Faith Church Road	104	20.9	60.7	0.6	37
	17	4.5	11.0	0.1	30
Unionville Indian Tr	103	22.5	67.6	0.7	37
Indian Trail - Fairv	102	225.2	270.0	0.7	10
Stallings Road	101	37.6	120.8	1.3	38
Entry Point	139	17.7	92.7	1.2	46
Total		941.8	2361.3	19.9	31

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Entry Point	139	1.6	5.7	0.0	27
Stallings Road	101	613.1	695.1	1.2	12
Indian Trail Road	102	220.1	304.4	1.3	15
Unionville Indian Tr	103	26.5	70.4	0.7	35
	17	11.4	57.4	0.7	43
Faith Church Road	104	7.4	13.5	0.1	25
Wesley Chapel Stouts	105	50.2	90.7	0.6	24
Chamber Drive	106	22.2	95.4	1.2	44
N. Rocky River Road	107	53.6	139.9	1.4	35
John Moore Rd	108	19.6	93.4	1.2	45
Carroll Street	110	10.2	65.4	0.7	40
Roland Drive	111	13.0	42.5	0.4	31
Williams Road	112	14.6	44.4	0.4	30
Hanover Drive	113	12.7	30.4	0.2	26
	64	5.0	15.9	0.1	30
Dickerson Boulevard	114	34.5	48.6	0.2	13
Shopping Center	115	10.3	31.5	0.3	30
	16	5.6	36.4	0.4	38
	83	7.0	53.4	0.6	39
Stafford Street	120	30.3	39.4	0.1	10
Boyte Street	121	8.4	27.5	0.2	32
	89	1.4	7.9	0.1	37
	93	3.5	33.8	0.4	40
Morgan Mill Road	122	8.9	17.5	0.1	23
	98	2.3	9.5	0.1	34
Walkup Avenue	123	7.7	19.9	0.2	28
	99	2.4	10.1	0.1	33
	13	2.8	28.0	0.3	40
Sutherland Avenue	124	3.4	12.6	0.1	33
	19	1.9	8.9	0.1	35
	40	1.6	10.2	0.1	38
Dove Street	125	1.9	7.8	0.1	35
E. Franklin Street	126	20.0	34.5	0.2	19
	61	2.7	6.7	0.0	25
	79	2.7	6.1	0.0	23
Pageland Hwy	127	20.8	25.2	0.1	9
	153	8.2	22.2	0.2	32
	148	8.8	73.5	1.0	48
Old Pageland-Monroe	128	12.9	21.2	0.1	22
	142	4.7	14.7	0.1	37
	97	18.5	197.2	2.2	40
Bivens Street	129	5.1	13.3	0.1	22
S. Main Street	130	9.3	27.9	0.2	24
	138	1.4	8.8	0.1	29
	133	10.6	131.5	1.8	50
Forest Hill Road	131	6.3	14.2	0.1	32
Total		1346.9	2764.5	19.7	29

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	17.3	32.3	0.2	22
	133	4.1	12.4	0.1	36
	138	528.0	651.0	1.8	10
N. Main Street	130	115.6	122.8	0.1	3
Bivens Street	129	26.6	45.6	0.2	15
	97	2.6	11.1	0.1	27
	142	19.3	197.9	2.2	40
S. Secrest Avenue	128	19.6	29.4	0.1	19
	148	5.5	14.1	0.1	33
	153	12.4	77.0	1.0	46
Metro Medical Center	127	68.6	81.0	0.2	9
	79	4.6	9.7	0.1	22
	61	2.0	5.1	0.0	28
Shopping Center	126	16.3	19.6	0.0	8
Venus Street	125	4.0	18.4	0.2	36
	40	1.2	7.4	0.1	37
	19	2.2	10.8	0.1	36
Sutherland Avenue	124	15.4	22.1	0.1	14
	13	3.3	12.7	0.1	33
	99	6.4	31.5	0.3	36
Walkup Avenue	123	25.7	33.0	0.1	10
	98	54.7	67.2	0.2	8
Morgan Mill Road	122	55.8	62.7	0.1	5
	93	6.1	15.2	0.1	26
	89	6.5	36.8	0.4	37
Boyte Street	121	20.7	27.0	0.1	11
Stafford Street Exte	120	57.1	76.4	0.2	11
	83	9.7	18.9	0.1	22
	16	104.6	150.8	0.6	14
Secrest Shortcut Roa	115	170.9	199.6	0.4	7
Monroe Northern Loop	114	282.5	303.6	0.3	3
	64	11.6	26.8	0.2	24
Hanover Drive	113	21.5	32.0	0.1	15
Williams Road	112	16.9	34.7	0.2	23
Round Table Road	111	6.4	36.0	0.4	37
Rolling Hill Drive	110	12.6	42.7	0.4	31
Fowler-Secrest Rd	108	66.5	124.6	0.7	21
N. Rocky River Road	107	693.6	766.4	1.2	5
Chamber Drive	106	19.8	105.9	1.4	47
Sardis Church Road	105	68.3	144.1	1.2	29
Faith Church Road	104	28.7	68.8	0.6	32
	17	4.6	10.9	0.1	31
Unionville Indian Tr	103	36.8	81.4	0.7	30
Indian Trail - Fairv	102	36.2	80.7	0.7	30
Stallings Road	101	45.7	127.5	1.3	36
Entry Point	139	22.4	98.1	1.2	44
Total		2760.9	4183.6	19.9	17

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Stallings Road	101	766.2	845.9	1.2	9
Indian Trail Road	102	307.3	390.1	1.3	12
Unionville Indian Tr	103	428.0	471.7	0.7	5
	17	69.2	116.1	0.7	21
Faith Church Road	104	62.6	68.7	0.1	6
Wesley Chapel Stouts	105	477.2	517.0	0.6	4
Chamber Drive	106	16.0	91.6	1.2	46
N. Rocky River Road	107	59.0	146.0	1.4	34
John Moore Rd	108	16.7	92.0	1.2	46
Carroll Street	110	6.1	63.3	0.7	41
Roland Drive	111	9.3	38.8	0.4	34
Williams Road	112	27.8	57.5	0.4	23
Hanover Drive	113	15.9	33.8	0.2	24
	64	2.7	13.7	0.1	35
Dickerson Boulevard	114	41.5	55.7	0.2	12
Shopping Center	115	8.1	29.6	0.3	32
	16	3.5	34.3	0.4	40
	83	3.5	50.1	0.6	41
Stafford Street	120	31.4	40.2	0.1	10
Boyte Street	121	8.9	28.0	0.2	31
	89	1.8	8.4	0.1	35
	93	5.3	35.7	0.4	38
Morgan Mill Road	122	43.5	52.1	0.1	8
	98	5.8	13.1	0.1	24
Walkup Avenue	123	16.5	28.8	0.2	19
	99	5.1	12.9	0.1	26
	13	5.2	30.5	0.3	37
Sutherland Avenue	124	32.3	41.4	0.1	10
	19	5.6	12.7	0.1	24
	40	2.7	11.3	0.1	34
Dove Street	125	12.7	18.7	0.1	15
E. Franklin Street	126	105.0	119.5	0.2	6
	61	18.5	22.6	0.0	7
	79	25.7	29.1	0.0	5
Pageland Hwy	127	78.0	82.3	0.1	3
	153	14.3	28.2	0.2	25
	148	9.6	75.5	1.0	47
Old Pageland-Monroe	128	17.5	25.7	0.1	18
	142	5.9	16.0	0.1	34
	97	15.2	194.9	2.2	41
Bivens Street	129	5.5	14.0	0.1	21
S. Main Street	130	40.9	59.7	0.2	11
	138	2.1	9.6	0.1	26
	133	11.0	131.6	1.8	49
Forest Hill Road	131	15.4	23.7	0.1	19
Total		2861.6	4282.3	19.7	18

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	17.9	32.9	0.2	22
	133	4.7	13.0	0.1	35
	138	233.4	357.3	1.8	18
N. Main Street	130	86.4	93.5	0.1	4
Bivens Street	129	23.5	42.8	0.2	16
	97	2.3	10.9	0.1	27
	142	19.9	201.4	2.2	40
S. Secrest Avenue	128	22.5	32.3	0.1	17
	148	5.5	14.1	0.1	33
	153	12.7	77.9	1.0	46
Metro Medical Center	127	79.3	91.7	0.2	8
	79	4.6	9.7	0.1	22
	61	2.1	5.1	0.0	27
Shopping Center	126	17.9	21.2	0.0	8
Venus Street	125	4.6	19.3	0.2	34
	40	1.3	7.5	0.1	37
	19	2.4	11.0	0.1	35
Sutherland Avenue	124	16.2	22.9	0.1	14
	13	3.7	13.1	0.1	32
	99	7.4	32.6	0.3	35
Walkup Avenue	123	28.7	36.0	0.1	10
	98	58.2	70.8	0.2	8
Morgan Mill Road	122	54.0	60.9	0.1	5
	93	6.2	15.3	0.1	26
	89	6.4	36.7	0.4	37
Boyte Street	121	20.2	26.6	0.1	11
Stafford Street Exte	120	56.7	75.8	0.2	11
	83	7.2	16.4	0.1	25
	16	83.3	129.6	0.6	16
Secrest Shortcut Roa	115	154.9	183.6	0.4	7
Monroe Northern Loop	114	272.6	293.6	0.3	3
	64	11.6	26.7	0.2	24
Hanover Drive	113	19.3	29.8	0.1	16
Williams Road	112	18.7	36.6	0.2	22
Round Table Road	111	6.3	35.9	0.4	37
Rolling Hill Drive	110	15.1	45.3	0.4	29
Fowler-Secrest Rd	108	124.7	182.7	0.7	14
N. Rocky River Road	107	723.7	797.3	1.2	5
Chamber Drive	106	19.9	106.1	1.4	46
Sardis Church Road	105	62.9	138.6	1.2	30
Faith Church Road	104	28.6	68.8	0.6	32
	17	4.2	10.6	0.1	31
Unionville Indian Tr	103	33.8	78.5	0.7	32
Indian Trail - Fairv	102	44.4	89.0	0.7	28
Stallings Road	101	63.8	146.7	1.3	31
Entry Point	139	23.4	99.1	1.2	43
Total		2516.9	3947.2	19.9	18

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Stallings Road	101	785.6	865.4	1.2	9
Indian Trail Road	102	141.9	224.9	1.3	20
Unionville Indian Tr	103	420.7	464.5	0.7	5
	17	25.0	71.5	0.7	35
Faith Church Road	104	35.8	41.9	0.1	8
Wesley Chapel Stouts	105	447.9	487.5	0.6	5
Chamber Drive	106	14.7	89.5	1.2	47
N. Rocky River Road	107	59.9	146.1	1.4	34
John Moore Rd	108	16.4	91.5	1.2	46
Carroll Street	110	6.5	63.6	0.7	41
Roland Drive	111	9.5	39.0	0.4	34
Williams Road	112	26.8	56.6	0.4	23
Hanover Drive	113	15.7	33.5	0.2	24
	64	2.7	13.7	0.1	35
Dickerson Boulevard	114	42.4	56.9	0.2	12
Shopping Center	115	8.0	29.6	0.3	32
	16	3.4	34.2	0.4	40
	83	3.6	50.1	0.6	41
Stafford Street	120	35.3	44.0	0.1	10
Boyte Street	121	9.6	28.7	0.2	30
	89	1.9	8.5	0.1	34
	93	30.8	61.3	0.4	22
Morgan Mill Road	122	34.4	43.0	0.1	9
	98	5.4	12.7	0.1	25
Walkup Avenue	123	17.2	29.4	0.2	19
	99	5.2	13.0	0.1	26
	13	5.2	30.5	0.3	37
Sutherland Avenue	124	33.0	42.2	0.1	10
	19	5.8	12.8	0.1	24
	40	2.7	11.2	0.1	34
Dove Street	125	11.3	17.3	0.1	16
E. Franklin Street	126	47.0	61.5	0.2	11
	61	7.6	11.6	0.0	14
	79	11.4	14.8	0.0	9
Pageland Hwy	127	69.6	73.9	0.1	3
	153	14.6	28.5	0.2	25
	148	9.1	74.2	1.0	48
Old Pageland-Monroe	128	15.5	23.6	0.1	20
	142	5.4	15.4	0.1	35
	97	15.8	193.4	2.2	41
Bivens Street	129	7.3	15.6	0.1	19
S. Main Street	130	44.2	62.7	0.2	11
	138	2.3	9.7	0.1	26
	133	10.4	130.3	1.8	50
Forest Hill Road	131	18.6	26.8	0.1	17
Total		2543.0	3956.7	19.7	20

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	18.0	33.1	0.2	22
	133	4.6	12.9	0.1	35
	138	585.5	708.2	1.8	9
N. Main Street	130	117.3	124.4	0.1	3
Bivens Street	129	30.2	49.1	0.2	14
	97	2.4	10.9	0.1	27
	142	19.3	198.4	2.2	40
S. Secrest Avenue	128	26.7	36.4	0.1	16
	148	6.1	14.7	0.1	32
	153	58.6	123.9	1.0	29
Metro Medical Center	127	133.7	146.1	0.2	5
	79	5.2	10.2	0.1	20
	61	2.4	5.5	0.0	26
Shopping Center	126	16.8	20.1	0.0	8
Venus Street	125	4.3	19.0	0.2	35
	40	1.2	7.5	0.1	37
	19	2.2	10.8	0.1	35
Sutherland Avenue	124	15.3	22.0	0.1	14
	13	3.7	13.2	0.1	32
	99	6.7	32.1	0.3	35
Walkup Avenue	123	26.0	33.4	0.1	10
	98	42.3	54.9	0.2	10
Morgan Mill Road	122	54.1	61.0	0.1	5
	93	6.3	15.4	0.1	26
	89	7.9	38.5	0.4	35
Boyte Street	121	25.4	31.7	0.1	9
Stafford Street Exte	120	72.7	91.9	0.2	9
	83	14.4	23.6	0.1	17
	16	168.4	214.6	0.6	10
Secrest Shortcut Roa	115	223.3	252.4	0.4	5
Monroe Northern Loop	114	309.7	330.7	0.3	3
	64	11.4	26.5	0.2	25
Hanover Drive	113	20.9	31.4	0.1	16
Williams Road	112	16.9	34.8	0.2	23
Round Table Road	111	5.3	34.9	0.4	38
Rolling Hill Drive	110	11.6	41.8	0.4	32
Fowler-Secrest Rd	108	59.4	118.3	0.7	22
N. Rocky River Road	107	643.1	716.7	1.2	6
Chamber Drive	106	20.1	107.3	1.4	46
Sardis Church Road	105	64.7	140.3	1.2	30
Faith Church Road	104	31.2	71.7	0.6	31
	17	4.7	11.1	0.1	30
Unionville Indian Tr	103	50.6	95.5	0.7	26
Indian Trail - Fairv	102	38.6	83.2	0.7	29
Stallings Road	101	42.9	125.6	1.3	37
Entry Point	139	21.7	96.8	1.2	44
Total		3053.4	4482.7	19.9	16

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Stallings Road	101	717.8	797.2	1.2	9
Indian Trail Road	102	180.4	264.2	1.3	17
Unionville Indian Tr	103	411.1	455.1	0.7	5
	17	21.5	67.9	0.7	37
Faith Church Road	104	31.0	37.1	0.1	9
Wesley Chapel Stouts	105	439.8	479.5	0.6	5
Chamber Drive	106	16.8	91.5	1.2	46
N. Rocky River Road	107	56.0	142.3	1.4	35
John Moore Rd	108	18.9	94.2	1.2	45
Carroll Street	110	8.1	65.3	0.7	40
Roland Drive	111	9.7	39.4	0.4	34
Williams Road	112	28.6	58.6	0.4	23
Hanover Drive	113	15.1	33.0	0.2	24
	64	2.7	13.6	0.1	35
Dickerson Boulevard	114	41.9	56.2	0.2	12
Shopping Center	115	8.6	30.0	0.3	32
	16	3.6	34.1	0.4	40
	83	4.1	50.3	0.6	41
Stafford Street	120	33.6	42.3	0.1	10
Boyte Street	121	10.1	29.1	0.2	30
	89	1.9	8.4	0.1	35
	93	5.1	35.2	0.4	38
Morgan Mill Road	122	44.7	53.3	0.1	7
	98	5.8	13.1	0.1	24
Walkup Avenue	123	15.6	27.8	0.2	20
	99	4.7	12.4	0.1	27
	13	5.1	30.2	0.3	37
Sutherland Avenue	124	32.6	41.7	0.1	10
	19	5.7	12.7	0.1	24
	40	2.4	11.0	0.1	35
Dove Street	125	10.8	16.8	0.1	17
E. Franklin Street	126	68.8	83.3	0.2	8
	61	10.0	14.0	0.0	12
	79	14.8	18.2	0.0	8
Pageland Hwy	127	67.7	71.9	0.1	3
	153	14.1	28.0	0.2	25
	148	9.0	74.8	1.0	48
Old Pageland-Monroe	128	18.1	26.4	0.1	18
	142	5.2	15.3	0.1	35
	97	13.1	191.3	2.2	42
Bivens Street	129	9.2	17.6	0.1	17
S. Main Street	130	59.9	78.6	0.2	9
	138	2.4	9.9	0.1	26
	133	12.2	132.6	1.8	49
Forest Hill Road	131	18.2	26.6	0.1	17
Total		2516.5	3931.9	19.7	20

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	0.5	15.4	0.2	47
	133	0.1	8.4	0.1	54
	138	9.1	102.4	1.8	64
N. Main Street	130	6.4	14.0	0.1	18
Bivens Street	129	24.5	47.1	0.2	14
	97	1.1	8.9	0.1	33
	142	14.8	218.9	2.2	36
S. Secrest Avenue	128	22.7	31.4	0.1	17
	148	5.9	14.1	0.1	33
	153	5.5	57.9	1.0	61
Metro Medical Center	127	42.1	60.9	0.2	12
	79	1.0	6.1	0.1	32
	61	1.3	4.8	0.0	29
Shopping Center	126	10.1	13.8	0.1	14
Venus Street	125	6.9	22.3	0.2	30
	40	1.3	7.9	0.1	35
	19	2.3	11.3	0.1	34
Sutherland Avenue	124	11.1	17.4	0.1	18
	13	5.0	14.3	0.1	29
	99	6.4	31.1	0.3	36
Walkup Avenue	123	19.1	28.6	0.1	12
	98	10.7	23.8	0.2	23
Morgan Mill Road	122	16.4	23.8	0.1	14
	93	5.5	14.7	0.1	27
	89	4.3	36.0	0.4	38
Boyte Street	121	6.9	13.1	0.1	22
Stafford Street Exte	120	45.3	63.5	0.2	14
	83	4.0	13.2	0.1	31
	16	12.2	64.2	0.6	32
Secrest Shortcut Roa	115	15.8	41.8	0.4	33
Monroe Northern Loop	114	139.9	156.7	0.3	6
	64	10.9	26.4	0.2	25
Hanover Drive	113	7.5	17.6	0.1	27
Williams Road	112	17.9	38.1	0.2	21
Round Table Road	111	3.2	27.7	0.4	48
Rolling Hill Drive	110	5.1	37.2	0.4	36
Fowler-Secrest Rd	108	18.9	81.6	0.7	32
N. Rocky River Road	107	62.2	138.7	1.2	30
Chamber Drive	106	42.4	142.3	1.4	35
Sardis Church Road	105	43.3	110.8	1.2	38
Faith Church Road	104	21.5	58.4	0.6	38
	17	4.2	11.3	0.1	30
Unionville Indian Tr	103	29.8	61.8	0.7	40
Indian Trail - Fairv	102	31.2	85.7	0.7	29
Stallings Road	101	69.6	256.7	1.3	18
Entry Point	139	20.2	73.4	1.2	59
Total		846.2	2355.6	19.9	30

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Stallings Road	101	699.9	780.6	1.2	9
Indian Trail Road	102	51.7	134.1	1.3	34
Unionville Indian Tr	103	160.3	199.3	0.7	12
	17	23.1	71.9	0.7	35
Faith Church Road	104	34.3	39.7	0.1	8
Wesley Chapel Stouts	105	286.0	313.6	0.6	7
Chamber Drive	106	24.7	71.8	1.2	59
N. Rocky River Road	107	26.1	94.6	1.4	52
John Moore Rd	108	37.6	161.2	1.2	26
Carroll Street	110	7.6	55.7	0.7	47
Roland Drive	111	10.1	45.2	0.4	29
Williams Road	112	58.0	97.6	0.4	14
Hanover Drive	113	77.7	96.1	0.2	8
	64	3.7	14.1	0.1	34
Dickerson Boulevard	114	20.2	31.4	0.2	21
Shopping Center	115	14.1	40.3	0.3	24
	16	7.1	41.4	0.4	33
	83	3.0	38.9	0.6	53
Stafford Street	120	126.6	138.1	0.1	5
Boyte Street	121	29.9	42.4	0.2	20
	89	4.7	11.3	0.1	26
	93	4.4	37.0	0.4	36
Morgan Mill Road	122	6.8	15.9	0.1	25
	98	5.1	12.4	0.1	26
Walkup Avenue	123	38.5	54.2	0.2	10
	99	4.4	12.6	0.1	27
	13	6.1	32.8	0.3	34
Sutherland Avenue	124	2.3	12.6	0.1	33
	19	1.5	8.6	0.1	36
	40	1.4	10.3	0.1	37
Dove Street	125	1.1	6.9	0.1	40
E. Franklin Street	126	13.8	26.3	0.2	26
	61	4.0	8.3	0.1	22
	79	5.7	8.9	0.0	16
Pageland Hwy	127	63.2	67.7	0.1	5
	153	11.4	26.6	0.2	27
	148	10.0	70.8	1.0	50
Old Pageland-Monroe	128	6.4	14.9	0.1	31
	142	6.2	17.1	0.1	32
	97	16.9	202.8	2.2	39
Bivens Street	129	6.6	16.3	0.1	18
S. Main Street	130	17.8	35.1	0.2	19
	138	1.6	9.5	0.1	27
	133	5.3	78.7	1.8	83
Forest Hill Road	131	1.5	10.5	0.1	43
Total		1948.6	3316.0	19.7	24

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	25.3	40.7	0.2	18
	133	4.9	13.2	0.1	34
	138	165.5	287.0	1.8	23
N. Main Street	130	67.2	74.3	0.1	3
Bivens Street	129	20.8	39.7	0.2	17
	97	2.3	10.8	0.1	27
	142	19.1	197.3	2.2	40
S. Secrest Avenue	128	33.2	43.2	0.1	12
	148	7.2	15.8	0.1	29
	153	12.0	76.7	1.0	46
Metro Medical Center	127	78.9	91.2	0.2	11
	79	4.5	9.2	0.1	21
	61	2.9	6.0	0.0	23
Shopping Center	126	18.8	22.5	0.1	10
Venus Street	125	10.0	24.7	0.2	27
	40	1.6	7.8	0.1	35
	19	2.4	11.0	0.1	35
Sutherland Avenue	124	32.6	39.3	0.1	8
	13	4.1	13.6	0.1	31
	99	31.7	57.2	0.3	20
Walkup Avenue	123	66.3	73.6	0.1	5
	98	52.4	65.0	0.2	9
Morgan Mill Road	122	52.1	58.9	0.1	6
	93	5.6	14.7	0.1	27
	89	5.1	35.5	0.4	38
Boyte Street	121	5.4	11.8	0.1	25
Stafford Street Exte	120	29.3	48.4	0.2	18
	83	4.3	13.5	0.1	30
	16	44.2	91.2	0.6	23
Secrest Shortcut Roa	115	169.0	198.1	0.4	7
Monroe Northern Loop	114	331.7	352.4	0.3	3
	64	10.4	25.4	0.2	26
Hanover Drive	113	7.3	17.8	0.1	27
Williams Road	112	5.6	23.3	0.2	34
Round Table Road	111	4.2	33.6	0.4	40
Rolling Hill Drive	110	4.6	34.3	0.4	39
Fowler-Secrest Rd	108	12.7	70.7	0.7	37
N. Rocky River Road	107	93.9	169.1	1.2	25
Chamber Drive	106	26.9	112.6	1.4	44
Sardis Church Road	105	177.2	253.7	1.2	17
Faith Church Road	104	21.2	61.4	0.6	36
	17	3.4	9.7	0.1	34
Unionville Indian Tr	103	31.3	75.0	0.7	33
Indian Trail - Fairv	102	44.4	88.9	0.7	28
Stallings Road	101	29.1	112.4	1.3	41
Entry Point	139	18.5	93.0	1.2	46
Total		1800.5	3225.4	19.9	22

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Stallings Road	101	937.0	1016.7	1.2	9
Indian Trail Road	102	61.0	144.4	1.3	32
Unionville Indian Tr	103	380.8	425.2	0.7	8
	17	139.5	185.6	0.7	13
Faith Church Road	104	75.2	81.3	0.1	5
Wesley Chapel Stouts	105	451.9	491.6	0.6	5
Chamber Drive	106	24.8	99.3	1.2	42
N. Rocky River Road	107	54.6	138.0	1.4	36
John Moore Rd	108	20.6	94.0	1.2	45
Carroll Street	110	9.4	66.5	0.7	39
Roland Drive	111	21.8	51.6	0.4	26
Williams Road	112	46.0	75.8	0.4	18
Hanover Drive	113	52.8	70.5	0.2	11
	64	25.4	36.3	0.1	13
Dickerson Boulevard	114	32.2	46.0	0.2	14
Shopping Center	115	9.3	30.9	0.3	31
	16	4.6	35.5	0.4	38
	83	4.5	50.8	0.6	41
Stafford Street	120	38.7	47.1	0.1	11
Boyte Street	121	22.3	41.4	0.2	21
	89	2.9	9.4	0.1	31
	93	5.0	35.3	0.4	38
Morgan Mill Road	122	20.1	28.7	0.1	14
	98	4.7	12.0	0.1	27
Walkup Avenue	123	37.8	50.1	0.2	11
	99	4.8	12.6	0.1	27
	13	4.6	29.9	0.3	38
Sutherland Avenue	124	18.1	27.3	0.1	15
	19	4.1	11.1	0.1	28
	40	2.6	11.2	0.1	34
Dove Street	125	6.8	12.8	0.1	22
E. Franklin Street	126	24.9	39.5	0.2	17
	61	4.3	8.7	0.1	21
	79	14.4	17.7	0.0	8
Pageland Hwy	127	217.1	221.3	0.1	3
	153	13.6	27.4	0.2	26
	148	9.2	75.0	1.0	47
Old Pageland-Monroe	128	27.7	35.9	0.1	13
	142	5.8	15.8	0.1	34
	97	19.5	197.5	2.2	40
Bivens Street	129	8.9	17.0	0.1	17
S. Main Street	130	55.1	73.9	0.2	9
	138	2.5	9.9	0.1	26
	133	14.3	134.7	1.8	48
Forest Hill Road	131	27.8	36.0	0.1	13
Total		2969.0	4379.4	19.7	20

Arterial Level of Service: NW US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Forest Hill Road	131	28.1	43.6	0.2	17
	133	5.4	13.7	0.1	33
	138	80.9	202.1	1.8	32
N. Main Street	130	63.4	70.5	0.1	4
Bivens Street	129	23.0	42.0	0.2	16
	97	2.3	10.8	0.1	27
	142	18.9	198.8	2.2	40
S. Secrest Avenue	128	33.9	44.0	0.1	12
	148	16.0	24.6	0.1	19
	153	378.5	444.1	1.0	8
Metro Medical Center	127	329.6	341.9	0.2	2
	79	40.5	45.3	0.1	4
	61	5.7	8.8	0.0	16
Shopping Center	126	20.9	24.7	0.1	9
Venus Street	125	10.6	25.4	0.2	26
	40	1.4	7.8	0.1	36
	19	1.6	10.2	0.1	37
Sutherland Avenue	124	26.0	32.8	0.1	9
	13	3.6	13.1	0.1	32
	99	6.5	31.7	0.3	36
Walkup Avenue	123	45.1	52.4	0.1	6
	98	37.2	49.9	0.2	11
Morgan Mill Road	122	41.5	48.4	0.1	7
	93	5.3	14.4	0.1	27
	89	4.8	35.1	0.4	38
Boyte Street	121	5.8	12.2	0.1	24
Stafford Street Exte	120	21.6	40.9	0.2	21
	83	4.0	13.2	0.1	31
	16	10.3	56.8	0.6	36
Secrest Shortcut Roa	115	158.2	187.4	0.4	7
Monroe Northern Loop	114	384.3	405.0	0.3	2
	64	10.3	25.3	0.2	26
Hanover Drive	113	6.8	17.4	0.1	28
Williams Road	112	5.4	23.2	0.2	34
Round Table Road	111	4.0	33.4	0.4	40
Rolling Hill Drive	110	4.3	34.1	0.4	39
Fowler-Secrest Rd	108	13.9	71.5	0.7	36
N. Rocky River Road	107	78.2	151.3	1.2	28
Chamber Drive	106	26.1	111.2	1.4	44
Sardis Church Road	105	215.3	291.1	1.2	15
Faith Church Road	104	24.0	64.2	0.6	35
	17	3.5	9.9	0.1	34
Unionville Indian Tr	103	32.3	76.1	0.7	33
Indian Trail - Fairv	102	45.4	89.7	0.7	27
Stallings Road	101	31.4	114.9	1.3	40
Entry Point	139	16.9	91.8	1.2	47
Total		2332.5	3756.4	19.9	19

Arterial Level of Service: SE US 74

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Stallings Road	101	1028.0	1107.9	1.2	8
Indian Trail Road	102	55.4	138.9	1.3	33
Unionville Indian Tr	103	338.4	382.8	0.7	8
	17	154.6	200.7	0.7	12
Faith Church Road	104	70.3	76.4	0.1	5
Wesley Chapel Stouts	105	473.5	514.1	0.6	4
Chamber Drive	106	26.2	100.7	1.2	42
N. Rocky River Road	107	55.9	140.2	1.4	35
John Moore Rd	108	20.5	93.4	1.2	45
Carroll Street	110	9.9	67.3	0.7	39
Roland Drive	111	22.3	52.1	0.4	25
Williams Road	112	35.0	64.5	0.4	21
Hanover Drive	113	32.0	49.5	0.2	16
	64	11.3	22.2	0.1	22
Dickerson Boulevard	114	34.2	48.0	0.2	14
Shopping Center	115	9.8	31.4	0.3	31
	16	4.7	35.6	0.4	38
	83	5.0	51.2	0.6	40
Stafford Street	120	51.2	59.7	0.1	10
Boyte Street	121	23.3	42.4	0.2	21
	89	3.0	9.6	0.1	30
	93	12.7	43.0	0.4	31
Morgan Mill Road	122	20.4	29.1	0.1	14
	98	4.6	11.9	0.1	27
Walkup Avenue	123	35.5	47.7	0.2	12
	99	5.0	12.8	0.1	26
	13	4.7	30.0	0.3	37
Sutherland Avenue	124	17.7	27.0	0.1	16
	19	4.3	11.3	0.1	27
	40	3.9	12.5	0.1	31
Dove Street	125	10.5	16.5	0.1	17
E. Franklin Street	126	31.0	45.5	0.2	15
	61	14.5	18.8	0.1	10
	79	20.3	23.5	0.0	6
Pageland Hwy	127	263.6	267.8	0.1	3
	153	12.8	26.7	0.2	27
	148	9.7	75.6	1.0	47
Old Pageland-Monroe	128	24.8	33.1	0.1	14
	142	5.5	15.6	0.1	35
	97	22.3	202.7	2.2	39
Bivens Street	129	16.5	24.6	0.1	12
S. Main Street	130	76.8	95.9	0.2	7
	138	2.5	10.0	0.1	25
	133	15.1	135.5	1.8	48
Forest Hill Road	131	28.2	36.4	0.1	12
Total		3127.7	4542.1	19.7	20