

**FINAL  
PURPOSE AND NEED STATEMENT**

**GASTON COUNTY EAST-WEST CORRIDOR  
STUDY**

**T.I.P. PROJECT NO. U-3321**

**Prepared For:**



**North Carolina Department of Transportation  
Project Development and Environmental Analysis Branch**

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**August 5, 2002**

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**TIP Project Number U-3321**

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# **PURPOSE AND NEED FOR ACTION**

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## **1 INTRODUCTION**

An environmental document is being prepared for this project in accordance with the requirements set forth in the National Environmental Policy Act (NEPA) of 1969, as amended. This is an informational document intended for use by both the decision makers and the public. As such, it represents a disclosure of relevant environmental information concerning the proposed action.

The content of this document conforms with the requirements of the Council on Environmental Quality (CEQ) guidelines, which provide direction regarding implementation of the procedural provisions of NEPA, and the Federal Highway Administration's *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* (Technical Advisory T66430.8.A, October 1987).

The project purpose and need drives the process for alternatives consideration and in-depth analysis. CEQ regulations require that an Environmental Impact Statement (EIS) address the "no-action" alternative and "rigorously explore and objectively evaluate all reasonable alternatives." Furthermore, a well-justified purpose and need is vital to meeting the requirements of NEPA, Section 4(f) (49 U.S.C. 303), the Executive Orders on Wetlands (E.O. 11990) and Floodplains (E.O. 11988), and the Section 404(b)(1) Guidelines.

## **2 PROPOSED ACTION**

The North Carolina Department of Transportation (NCDOT) proposes to improve east-west transportation mobility in the area around the City of Gastonia and other municipalities in southern Gaston County. **Figure 1** is a project location map. As part of this action, the NCDOT also proposes to improve mobility, access and connectivity between southern Gaston County and Mecklenburg County, including improving access to the Charlotte/Douglas International Airport, shopping and employment centers, and other destinations in both counties.

## **3 SUMMARY OF NEED FOR PROPOSED ACTION**

The need to improve east-west travel in the Gaston County area and to provide improved connectivity between southern Gaston County and Mecklenburg County are demonstrated by the following summary of existing and projected conditions:

### **POOR LEVELS OF SERVICE**

- Along I-85, the existing peak hour level of service (LOS) is LOS E between Exit 19 (Long Avenue [SR 2233]) in Gastonia and Exit 26 (Old NC 273 [Belmont-Mount Holly Road (SR

2093)) in Belmont (see Table 4, page 40), a distance of about 6.9 miles (11.1 kilometers). I-85 is the primary connection between Gaston and Mecklenburg Counties.

*The LOS is defined with letter designations from A to F. LOS A is the best operating conditions along a roadway or at an intersection, and LOS F is the worst. In urban areas, LOS D is generally considered acceptable, while in rural areas, LOS C is considered acceptable. LOS E and F conditions cause significant travel delay, increase the potential for accidents, and contribute substantially to the inefficient operation of motor vehicles.*

- The projected 2025 peak hour levels of service are LOS E or F along I-85 between Exit 19 (Long Avenue ([SR 2233]) in Gastonia and I-485 in Mecklenburg County (see Table 4, page 40), a distance of about 10.7 miles (17.2 kilometers).
- Existing and 2025 estimated average arterial speeds along US 29-74 and US 321 through the center of Gastonia are much lower than the posted speed limits.

US 29-74 through the center of Gastonia is a six or seven lane undivided roadway with no access control and a posted speed limit of 35-40 miles per hour (mph) (56-64 kilometers per hour (kph)). The estimated average arterial speed along this portion of existing US 29-74 in the eastbound direction (PM peak) is approximately 21 mph (34 kph). By 2025, the average arterial speed is projected to further decrease to 16 mph (26 kph). In the westbound direction (PM peak), the estimated average arterial speed is approximately 22 mph (35 kph) and by 2025, the average arterial speed is projected to decrease to 19 mph (31 kph) [see Table 9, page 46].

US 321 from Hudson Boulevard (SR 1255) to Davidson Avenue is a four to six-lane section with no access control and a posted speed limit of 35 mph (56 kph). US 321 is a one-way pair of streets, two or three-lanes each, through downtown Gastonia. The estimated average arterial speeds range from approximately 17 to 28 mph (27 to 45 kph). By 2025, the arterial speed is projected to further decrease to approximately 12 to 27 mph (19 to 43 kph) [see Table 11, page 49].

## **ABOVE-AVERAGE ACCIDENT RATES**

- The total accident rates along US 29-74 in the project study area are 1.6-4.8 times higher than the statewide average rates for similar US routes (see Table 14, page 53).
- The total accident rates along US 321 from the South Carolina state line to Hardin Road [SR 1607] are 1.6-12.4 times higher than the statewide average rates for similar US routes (see Table 17, page 56).

- The total accident rates along NC 273, NC 274, and NC 279 are all higher than the statewide average rates for similar NC routes (see Tables 20, 23, and 26).
- The fatal accident rates along the 4+ lanes divided sections of US 29-74 (approximately 6.25 miles [10.06 kilometers]) with no control of access are approximately 2.3 times higher than the statewide average for similar US route roadway types (see Table 14, page 53).
- The total fatal accident rates along US 321 from the South Carolina state line to Hardin Road [SR 1607] are approximately 2.7 times higher than the statewide average rates for similar US routes (see Table 17, page 56).

### **DIMINISHED REGIONAL TRANSPORTATION SYSTEM OPERATIONS AND POOR CONNECTIVITY**

- This section of US 29-74 is designated as part of the North Carolina Intrastate System. The Intrastate System was created to provide high-speed, safe regional travel service. The existing and projected traffic operational speed through Gastonia and the high accident rates along existing US 29-74 in Gaston County diminish this segment’s ability to function as an intrastate corridor.

*The purpose of the Intrastate Highway System is to “provide high-speed, safe travel service throughout the State. It connects major population centers both inside and outside the State and provides a safe, convenient, through-travel for motorists. It is designed to support statewide growth and development objectives and to connect to major highways of adjoining states. All segments of the routes in the Intrastate System shall have at least four travel lanes and, when warranted, shall have vertical separation or interchanges at crossings, more than four travel lanes, or bypasses” (GS 136-178).*

- Gaston and Mecklenburg Counties are separated by the Catawba River, which has two adjacent parallel crossings in southern Gaston County; I-85 and US 29-74. Visitors and passengers using the Charlotte-Douglas International Airport and commuters accessing major employment centers in Mecklenburg County that are traveling to/from southern Gaston County and western North Carolina must use I-85 and US 29-74, which are projected to experience poor levels of service and traffic operations, respectively.
- According to the draft Gaston County Comprehensive Plan (Section 8.3), southern Gaston County, especially the southeastern portion, is expected to experience high residential growth in the next twenty years. Similarly, as described in Section 8.5.1, the Dixie-Berryhill area is a planned development area in western Mecklenburg County expected to build out with high residential densities mixed with commercial uses and transit-oriented development.

Residential growth projected in southern Gaston County and residential and employment growth in western Mecklenburg County will continue to place demands on accessibility and

connectivity between the two counties.

The Charlotte-Douglas International Airport in western Mecklenburg County employs approximately 16,000 people and is planning on expanding through construction of a new runway. In the future, the airport also could have an intermodal facility combining rail, truck and air cargo transport that would generate employment opportunities and substantial numbers of regional truck trips.

The Westside Strategic Plan and the Dixie-Berryhill Vision Plan call for mixed use and transit-oriented development in the currently sparsely developed part of western Mecklenburg County directly across the Catawba River from southeastern Gaston County. This mixed-use area will create more employment opportunities in proximity to Gaston County in addition to existing office and industrial parks and the Charlotte-Douglas International Airport. .

- Traveling from Mecklenburg heading west to points in Cleveland County, South Carolina, and points farther south, I-85 (South) is the only full control of access interstate facility through Gaston County. Also traveling from Mecklenburg County via I-85 to points north of Gaston County such as Hickory or Boone, US 321 (north of I-85) is the only full control of access facility to those destinations from Gaston County, and these roadways are essential for regional truck and vehicular traffic. The poor levels of service along I-85 (east of US 321), and the poor traffic operations at the interchange of US 321 and I-85, inhibit regional travel.
- Visitors to the Daniel Stowe Botanical Garden (a large tourist attraction) must travel along circuitous two-lane non-access controlled routes in southern Gaston County to reach the Garden from the intrastate system. This creates confusion and delays for visitors, most of whom (94%) are non-members of the Daniel Stowe Botanical Garden. During a major event like the Fourth of July, traffic entering the Daniel Stowe Botanical Garden has been reported to back up on NC 279 (New Hope Road [SR 2302]) about 1.5 miles (2.4 kilometers) north of the Garden.

Detailed discussions of the existing and projected conditions and the purposes for the proposed action are presented in Sections 4 through 11.

## **4 PURPOSE OF PROPOSED ACTION**

The purpose of the proposed action is to improve east-west transportation mobility in the area around the City of Gastonia, between Gastonia and the Charlotte metropolitan area in general, and particularly to establish direct access between the rapidly growing area of southeast Gaston County and west Mecklenburg County. This project purpose is based on the following:

- Need to improve mobility, access and connectivity within southern Gaston County and between southern Gaston County and Mecklenburg County.

*Needs Addressed:* South of I-85 in southern Gaston County, a lack of continuous east-west roadways makes travel circuitous and limits mobility.

According to the draft Gaston County Comprehensive Plan (Section 8.3), southern Gaston County, especially the southeastern part, is expected to experience high residential growth in the next twenty years. Similarly, as described in Section 8.5.1, the Dixie-Berryhill area is a planned development area in western Mecklenburg County expected to build out with high residential densities mixed with commercial uses and transit-oriented development.

Access between southern Gaston County and major employment centers, Charlotte-Douglas International Airport (with future intermodal facility), the Dixie-Berryhill area (Section 8.5.1), and other destinations in Mecklenburg County is provided mainly by the I-85 and US 29-74 corridors. Many segments of I-85 in the study area currently operate at or above capacity, and congestion is projected to continue to worsen through the design year 2025. Also, there are high incident rates on I-85, contributing to unexpected delays. US 29-74 is not access controlled and has numerous signalized intersections, so speeds are limited. This road also has accident rates well above statewide averages.

Travel along circuitous two-lane non-access controlled routes in southern Gaston County is required to reach Daniel Stowe Botanical Garden (DSBG). Congestion and queues occur on NC 279 (New Hope Road [SR 2302]) due to traffic related to visitors of the DSBG in southern Gaston County mixing with local users. Delays are experienced due to event-related congestion by DSBG visitors. DSBG has plans for future expansion and as a result, they expect the number of visitors to increase to 250,000 visitors per year by 2011.

- Need to improve traffic flow on the sections of I-85, US 29-74 and US 321 in the project study area; improve high-speed, safe regional travel service along the US 29-74 intrastate corridor; and generally improve safety and reduce above average accident rates in the study area.

*Needs Addressed:* Existing and projected deficiencies in levels of service along existing I-85 cause significant travel delay for east-west traffic in Gaston County, increase the potential for accidents, and contribute substantially to the inefficient operation of motor vehicles.

Existing and projected deficiencies in the estimated average arterial speeds along existing US 29-74 and US 321 in Gastonia cause significant travel delay for traffic in and through

Gaston County. System deficiencies can increase the potential for accidents, and contribute substantially to the inefficient operation of motor vehicles.

The existing and projected traffic and land use conditions along existing US 29-74 through Gastonia diminish this segment's ability to function as an intrastate corridor for destinations in and out of Gaston County.

Accident rates along existing segments of US 29-74 and US 321 in the project study area are currently substantially above the average statewide accident rates for similar facilities.

Accident rates on all NC routes in the project study area are higher than statewide accident rates for similar facilities.

## 5 PROJECT DESCRIPTION

### 5.1 Project Setting

As shown in **Figure 1**, the proposed project study area is located in southern Gaston County and western Mecklenburg County, and mostly within the municipalities of Gastonia, McAdenville, Cramerton, and Belmont. The project study area consists of the following general boundaries: I-85 to the north, the South Carolina State line to the south, the Charlotte-Douglas International Airport to the east, and the I-85 and US 29-74 junction to the west.

Gaston County is located in the South-Central Piedmont section of North Carolina. It is bounded on the east by the Catawba River and Mecklenburg County, on the west by Cleveland County, on the north by Lincoln County and on the south by York County, South Carolina. The nearest major metropolitan area is Charlotte, in Mecklenburg County, which is 20 miles (32 km) to the east. Hickory is 37 miles (60 km) to the north and Asheville is 95 miles (153 km) to the northwest.

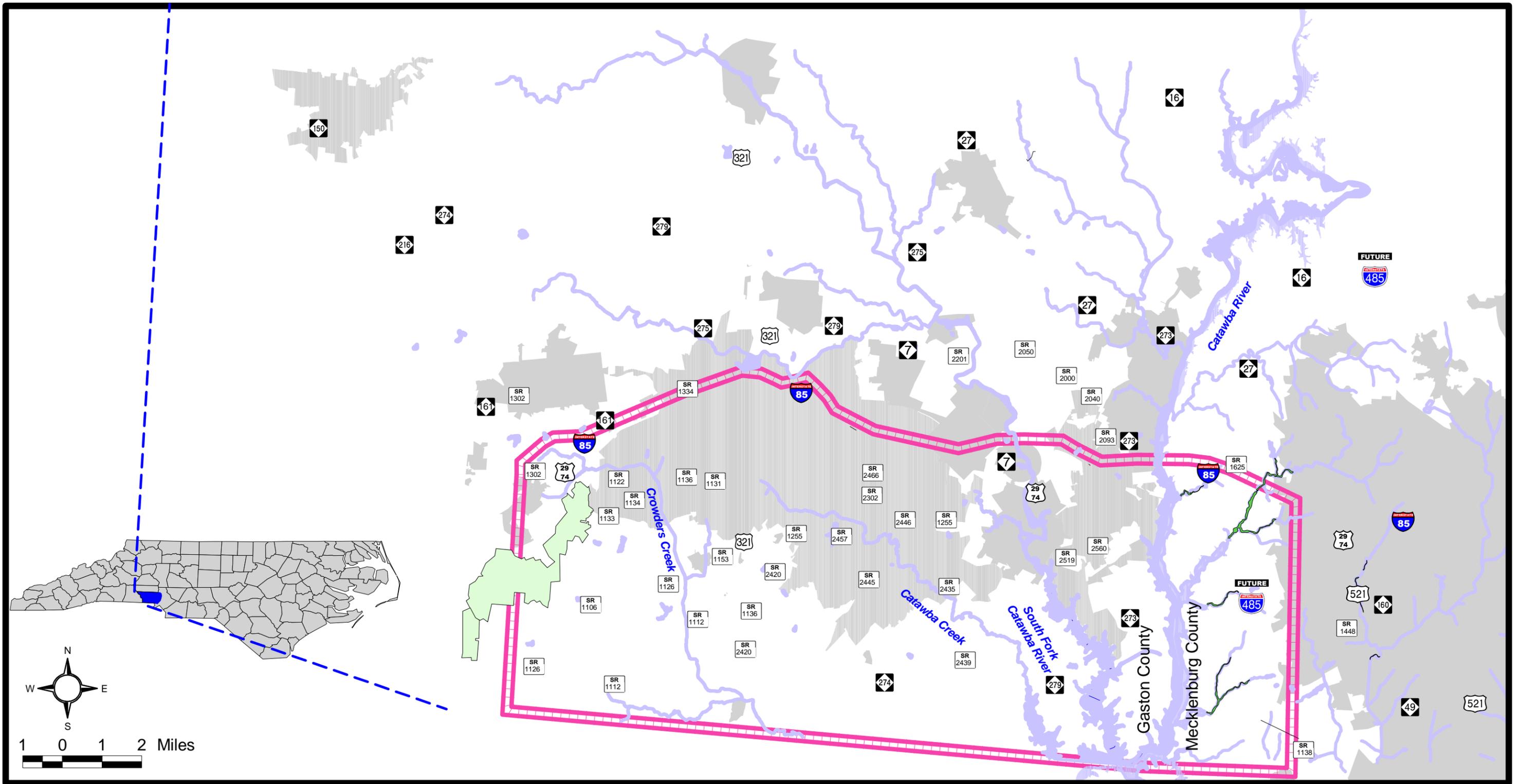
Gaston County has a total area of approximately 364.5 square miles (944.0 square kilometers) (NC Dept. of Commerce website: <http://cmedis.commerce.state.nc.us/countyprofiles/>). The topography of the county is gently rolling to hilly, with several pronounced ridges, including Kings Mountain Pinnacle, Spencer Mountain, Jackson's Knob, Paysour Mountain and Crowders Mountain.

Elevations above sea level in Gaston County range from 587 feet (179 meters) in the southeast corner to 1,705 feet (520 meters) at the Pinnacle of the Kings Mountain ridge in the southwest. The average elevation is estimated at 825 feet (252 meters). Another natural feature in the Gaston County area is the Catawba River, which forms the boundary with Mecklenburg County. The Catawba River and its lakes provide Gastonia's water supply, as well as boating, fishing and other recreational opportunities. Gastonia draws its drinking water from Mountain Island Lake.

Mecklenburg County has a total area of approximately 531 square miles (1,375 square kilometers). The topography of the county is rolling, with an average elevation of 795 feet above sea level. (NC Dept. of Commerce website: <http://cmedis.commerce.state.nc.us/countyprofiles/>). Mecklenburg County is the hub of the 13-county Charlotte region, which also includes Gaston County.

The Mecklenburg-Gaston County area has a temperate climate characterized by moderate temperature variations and moderate humidity. The average temperature is about 60 degrees Fahrenheit, ranging from an average winter temperature of 43 degrees to a summer average of 78 degrees. The average annual precipitation is 44 inches (112 centimeters), and the average relative humidity is 54 percent (NC Dept. of Commerce website: <http://cmedis.commerce.state.nc.us/countyprofiles/>).

Outside the municipal boundaries, the land uses in southern Gaston County are predominantly rural, with residential subdivisions scattered among large tracts of undeveloped land. Businesses and industries are concentrated within the City limits and outside the city along I-85, US 29-74, US 321, NC 274 (Union Road), and NC 273 (South Point Road [SR 2525]) where water and sewer services are provided.



**LEGEND**

-  Interstate
-  US Route
-  NC Route
-  Railroad
-  County Boundary
-  Hydrology

-  Municipal Boundary
-  Park
-  Study Area Boundary

**U-3321 GASTON and MECKLENBURG COUNTIES EAST-WEST CORRIDOR STUDY**

The most prominent land use in western Mecklenburg County is the Charlotte-Douglas International Airport. Business and commercial uses are concentrated in areas surrounding the airport and along I-85. Land between the airport and the Mecklenburg/Gaston County line is predominantly rural, with scattered residences, forest, and pasture.

## 5.2 History of Project

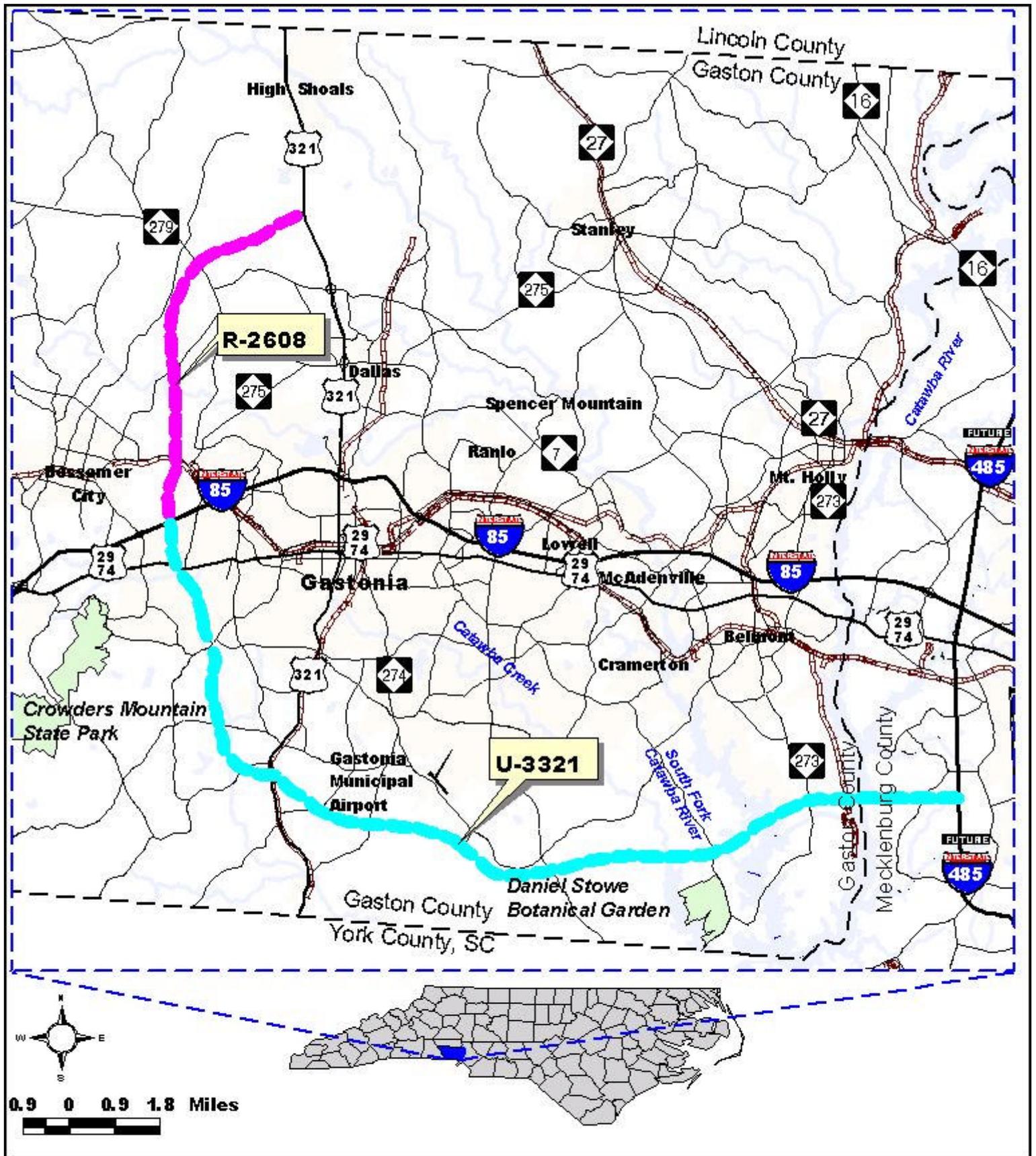
The Gaston Urban Area Metropolitan Planning Organization (MPO) has recommended improvements to east-west mobility in southern Gaston County through construction of a new location roadway. The need for improved east-west mobility and the bypass concept was first identified in 1989 during the citizen participation process associated with the update of the Gaston Urban Area Thoroughfare Plan. The Gaston Urban Area MPO held five citizen workshops, six public meetings, and 13 formal public hearings before adopting the locally named US 321/74 Bypass on their 1991 Plan.

The Gaston Urban Area MPO's Transportation Advisory Committee (TAC) oversees state and federal road projects within the Gaston Urbanized Area. In 1992, the TAC requested the Mecklenburg-Union MPO (MUMPO) TAC to place the US 321/74 Bypass on their thoroughfare plan. In 1994, the MUMPO TAC adopted a conceptual regional thoroughfare plan proposed by the Charlotte Committee of 100, which included the US 321/74 Bypass.

In 1996, a citizens' advisory council was formed to serve as an advisory board to the Gaston Urban Area TAC. This group, later called the US 321/74 Bypass Citizens' Committee, consisted of 40 Gaston County residents. From 1997 through 1999, the US 321/74 Bypass Citizens' Committee met on a monthly basis in an effort to select a corridor for the "Bypass". The Citizens' Committee recommended to the Gaston Urban Area TAC the existing proposed location of the bypass facility and shortly thereafter, it appeared on the 1999 Gaston Urban Area Thoroughfare Plan. **Figure 2** shows this Gaston County urban area "bypass" conceptual alignment.

During the Gaston Urban Area 1999 Thoroughfare Plan update process, it was predicted that I-85 will be over capacity in the near future. US 29-74 also is projected to be at or near capacity in the near future and there is a need to relieve traffic on US 321. For these reasons, the Gaston Urban Area MPO has identified the "US 321/74 Bypass" as the number one priority on the MPO's Unmet Needs List, which is a subset of the Gaston Urban Area Thoroughfare Plan. The Unmet Needs List is the Gaston Urban Area's prioritized list of projects they propose for inclusion in the NCDOT Transportation Improvement Program (TIP). In November 2001, the Gaston Urban Area TAC approved a motion to use the name *Garden Parkway* (as in Daniel Stowe Botanical Garden) in reference to the "US 321/74 Bypass".

The NCDOT and the Gaston Urban Area MPO are in the process of updating the Gaston Urban Area Long Range Transportation Plan for 2002. Section 8.2 includes more information on the Gaston Urban Area Thoroughfare Plan.





**LEGEND**

- R-2608 Conceptual Alignment
- U-3321 Conceptual Alignment
- Interstate
- US Route
- NC Route
- Railroad
- County Boundary
- Hydrology
- Municipal Boundary

**GASTON COUNTY URBAN AREA "BYPASS"  
THOROUGHFARE CONCEPTUAL ALIGNMENT**

U-3321 GASTON and MECKLENBURG  
COUNTIES EAST-WEST CORRIDOR STUDY

**FIGURE 2**

This project (US 321/74 Bypass) is currently listed in NCDOT's 2002-2008 *Transportation Improvement Program (TIP)* as two unfunded projects, U-3321 and R-2608. Section 8.1 includes descriptions of U-3321 and R-2608. Currently, these projects are candidate projects for inclusion in the upcoming 2004-2010 *TIP*.

If the project purpose and need are established for U-3321 (this document), the "bypass" conceptual alignment will be evaluated as an alternative in the project study area. However, this will not be the only alternative evaluated during the NEPA process. In accordance with CEQ and FHWA guidance, a range of alternatives, including Transportation System Management, mass transit, and improvements to existing highways would be evaluated in the next phase of this project as potential ways to fulfill the project purpose and need.

## 6 SYSTEM LINKAGE

### 6.1 Existing Road Network

#### 6.1.1 Major Roadways

The primary east-west routes through Gaston County are I-85 and US 29-74 (see **Figure 1**). In the project study area, the I-85/US 29-74 travel corridor also is used by most of the traffic traveling east-west within southern Gaston County. US 321 is the primary north-south route through the County. It intersects the I-85/US 29-74 corridor in the center of Gastonia.

The major arterials that connect to I-85/US 29-74 travel corridor in Gaston County are, from east to west, NC 273 (Park Street [North of NC 7]), NC 7 (Main Street North), NC 279 (New Hope Road [SR 2302]), and NC 274 (Bessemer City Road [North of US 29-74]). NC 273 (Park Street [North of NC 7]) and NC 279 (New Hope Road [SR 2302]) provide north-south connections to southeastern Gaston County parallel to the South Fork of the Catawba River. Minor arterials that intersect NC 273 (Park Street [North of NC 7]) and NC 279 (New Hope Road [SR 2302]) generally traverse in a northeast-southwest direction. Excluding I-85, US 29-74 and US 321, travel in southern Gaston County can be circuitous.

**I-85.** I-85 is a north-south interstate route that traverses Gaston County in an east-west direction. I-85 extends from Richmond, Virginia, through Atlanta, Georgia. I-85 connects Gaston County with Charlotte to the northeast and Greenville-Spartanburg to the southwest. It connects to I-77, I-485 (under construction) and Charlotte to the north and South Carolina to the south.

**I-485.** I-485 is under construction in Mecklenburg County and when completed, it will cross I-85 and US 29-74 in a north-south direction on the west side of the Charlotte-Douglas International Airport.

**US 29-74.** US 29 and US 74 are coinciding routes through most of Gaston County and part of Mecklenburg County. Travelers driving between Gaston or Cleveland Counties and Mecklenburg County or Charlotte use US 29-74 through Gaston and Mecklenburg counties as an alternative to using I-85,

especially in the event of congestion or incident delays. US 29-74, also known as Franklin Boulevard and Wilkinson Boulevard, complements I-85 travel as the only east-west US route in Gaston County.

**US 321.** US 321, also known as Chester Street and York Road, is the only north-south US route in Gaston County. It connects to I-40, Hickory, and Boone to the north and South Carolina to the south. US 321 from Dallas, North Carolina to Hickory is mostly a full control of access, four-lane divided facility. Consequently, US 321 serves as an alternative north-south route to I-77 that connects to I-40, the only east-west interstate route in the State.

**NC Routes.** Segments of five NC routes are in the southern Gaston County (see **Figure 1**). These NC routes are: NC 7, NC 161, NC 273, NC 274, and NC 279. Segments of one NC route, NC 160, are in the western Mecklenburg County portion of the study area (see **Figure 1**).

### 6.1.2 Types of Travel on Existing Roadways

The NCDOT, the South Carolina Department of Transportation, and the City of Charlotte conducted a regional travel survey in August 2001 designed to track the commuter traffic of more than 500,000 vehicles that currently use major highways in the Charlotte region each day. The survey stations were at major roadways (Interstate and US routes) along the planning area cordon line in Iredell, Davidson, Union, York (South Carolina) and Cleveland counties and at three locations along an internal screenline (I-85 S in Gaston, I-85 N in Cabarrus County, and I-77 N in Mecklenburg County). This project is in the process of matching license plate images and the final data is expected sometime in 2002. The entire regional model is not expected to be completed until 2005 at the earliest (NCDOT – Statewide Planning Branch, 2001).

Although the regional travel survey data is not yet complete, older data on commuting patterns in the Charlotte Metropolitan Statistical Area (MSA) are available based on 1990 employment and census data.

**Table 1** shows the 1990 commuting patterns in the Charlotte MSA.

**Table 1: 1990 Commuting Patterns in Charlotte MSA**

County of Residence	County of Work								
	Cabarrus	Gaston	Lincoln	Mecklenburg	Rowan	Union	York, SC	Elsewhere	Living in County
<b>Cabarrus</b>	29,121	165	33	16,603	2,930	374	63	1,720	51,039
<b>Gaston</b>	134	64,827	1,458	16,624	54	92	917	3,575	87,681
<b>Lincoln</b>	62	3,421	1,337	415	50	13	98	4,696	25,822
<b>Mecklenburg</b>	2,218	3,596	174	258,943	398	2,681	2,389	6,828	277,227
<b>Rowan</b>	8,040	68	27	3,278	37,477	69	22	4,911	53,892
<b>Union</b>	172	97	11	14,949	51	26,221	238	1,465	43,204
<b>York, SC</b>	98	2,745	25	16,849	19	195	42,675	3,385	65,911
<b>Elsewhere</b>	2,159	6,407	2,103	30,181	4,682	5,420	5,696	N/A	N/A
<b>Working in County</b>	42,004	81,326	17,208	361,532	45,691	35,065	52,098	N/A	

In 1990, approximately 22,000 people left Gaston County daily, to go to work, with the overwhelming

majority (73%) going to Charlotte or elsewhere in Mecklenburg County. Approximately 16,000 people came from other counties into Gaston County to work on a daily basis. Therefore, approximately 6,000 more people daily leave Gaston County to work than enter Gaston County to work.

Also in 1990, a total of approximately 20,000 people commuted between Gaston and Mecklenburg Counties, more than any two counties shown in Table 1. This commuting pattern demonstrates the demand for connectivity between Gaston and Mecklenburg Counties.

### *6.1.3 Roadway Connections between Gaston and Mecklenburg Counties*

Gaston County is separated from Mecklenburg County, the region's largest employment and destination generator, by the Catawba River. There are four roadway connections between Gaston and Mecklenburg Counties over the Catawba River. From the north, two of the crossings are NC 16 and NC 27. South of NC 27, the two adjacent parallel connections across the river are I-85 and US 29-74. The next crossing of the Catawba River is approximately 11 miles (18 kilometers) to the south on NC 49 between southwest Mecklenburg County and York County, South Carolina.

NC 16 is a four-lane divided roadway over the Catawba River with a posted speed limit of 45 mph. The NC 27 crossing is approximately four miles south of the NC 16 crossing along the Catawba River. The NC 27 bridge crossing is being replaced as part of TIP Project Number B-1193. Construction is underway, and when completed, the NC 27 bridge crossing will be upgraded to a four-lane crossing from the existing two-lanes across the Catawba River.

According to 1999 annual average daily traffic (ADT) from NCDOT (Statewide Planning Branch), there were approximately 16,000 vehicles per day (vpd) using the NC 16 crossing and 13,000 vpd using the NC 27 crossing. The 2000 ADT volumes for the I-85 and US 29-74 crossings (Section 9.3.1) are approximately 100,000 vpd and 21,000 vpd, respectively. For comparison purposes, it is assumed that traffic volumes along NC 16 and NC 27 increased four percent between 1999 and 2000. Therefore, based on these assumptions and the 2000 ADT volumes, the I-85/US 29-74 corridor accommodates approximately 80 percent (approximately 121,000 vpd) of the traffic volume between Gaston and Mecklenburg Counties.

## **6.2 Modal Interrelationships**

### *6.2.1 Railways*

In 1911, the Piedmont and Northern Railroad (P&N) interurban line began running from Gastonia to Charlotte and furnished Gastonia with its first and only streetcar (Gastonia's Comprehensive Plan, 1995). The streetcar ran directly along Franklin Avenue starting at Webb Street and continuing to Church Street (SR 2339). The line continued to Groves Mill before connecting with the P&N. Due to increased automobile traffic along this route, streetcar use stopped in 1948. After the streetcars stopped running,

passenger operations on the P&N ceased in 1954. The P&N line was popular because of its convenient schedule and low prices.

Presently, Amtrak provides passenger rail service in Gastonia and Charlotte through their Crescent train route along CSX and Norfolk-Southern rail lines. The Crescent train travels between New York, New York and New Orleans, Louisiana with one train in each direction daily (Amtrak, 2001).

There are three existing railroad bridge crossings across the Catawba River between Gaston and Mecklenburg Counties. Two of the three are adjacent and parallel to existing NC 27 on the south side. The third railroad bridge crossing is approximately 0.7 miles south of the existing US 29-74 crossing.

### 6.2.2 Airports

The Gastonia Municipal Airport is the airport nearest the project study area in Gaston County and the Charlotte-Douglas International Airport is the closest airport in Mecklenburg County. The Gaston Municipal Airport is a general aviation airport adjacent to the east side of NC 274 (Union Road). The airport has one runway that is approximately 3,500 feet (1,068 meters) long. Access to the airport is from NC 274 (Union Road) via Gaston Day School Road (SR 2444) and Airport Road (SR 1903). This airport accommodates corporate aircraft and other non-passenger services.

The Charlotte Douglas International Airport is located on approximately 5,000 acres (2020 hectares) of land in western Charlotte and employs approximately 16,000 people. As shown in **Figure 1**, the Airport is bounded to the north by I-85, US 29-74, and a Norfolk-Southern railroad line. To the east, the Airport is bordered by US 521 (Billy Graham Parkway), a limited access parkway connecting the Airport with South Charlotte, the region's largest residential concentration. To the south, NC 160 (West Boulevard [SR 1448]) serves as the current boundary.

Immediate public access to the Airport is possible from multiple directions. From Uptown Charlotte or Gaston County, access is along US 29-74 (Wilkinson Boulevard). From South Charlotte, it is accomplished via US 521 (Billy Graham Parkway). From the region, access occurs primarily along I-85 North and South.

The Airport is planning on improving the capacity of the facility by constructing a new runway. The new 9,000-foot (2,744-meter) independent runway, is planned parallel to and 3,700 feet (1,128 meters) west of existing Runway 18R/36L. The construction of the new runway is expected to take two years, however, plans are on hold at the present time (Interview with Charlotte-Douglas International Airport, 2001).

The construction of I-485 will serve as the primary means of airport related passenger and freight access and form a western boundary to the Airport. I-485 will have two separate access interchanges, one for passengers, as a dedicated exit paralleling US 29-74, and a second for freight at the interchange of NC 160 (West Boulevard [SR 1448]). Existing NC 160 (West Boulevard [SR 1448]) is planned on being relocated further south and connecting to I-485 (Federal Aviation Administration, 1999).

In the future, the Charlotte-Douglas International Airport could have an “intermodal zone” that would combine direct rail and truck access with incoming air cargo. The intermodal facility would be located between the new runway and the existing runway and is expected to have a 10-track rail yard and approximately 2,500 trailer parking spaces. Additional truck traffic generated from the site would use NC 160 (West Boulevard [SR 1448]) to access I-485 and vice versa (Charlotte-Douglas International Airport, 2002). I-485 provides increased mobility to destinations within Mecklenburg County. Gaston County is connected to I-485 through the I-85/US 29-74 travel corridor.

### 6.2.3 *Mass Transit*

Bus service is available in Gastonia through Gastonia Transit. All bus routes begin and end at Bradley Station at the corner of Oakland Street (SR 1001) and Main Avenue in Gastonia. Most buses run once every hour on the hour or once every hour on the half hour. There are a total of seven bus routes, of which, two serve US 29-74 and two serve US 321.

The Charlotte Area Transit System (CATS), in partnership with Gastonia, has established Express Bus service to uptown Charlotte. Route 85x, called the Gastonia Express, makes one stop between the Bradley Station and Uptown Charlotte. It stops at the Abbey Plaza Shopping Center at the corner of US 29-74 and NC 273 (Park Street [North of NC 7]) in Belmont and the total travel time is exactly one hour.

In November 1998, Mecklenburg County citizens approved a local sales and use tax (one-half percent) to support implementation of the *2025 Integrated Transit/Land-Use Plan*. As part of this plan, future development and redevelopment in the region would be focused along five major transportation corridors that were strong candidates for transit service and transit-oriented development. The West Corridor extends approximately 12 miles (19 kilometers) from Uptown Charlotte (the Center City) in Mecklenburg County to the Catawba River (south of I-85), which forms the boundary between Mecklenburg and Gaston Counties.

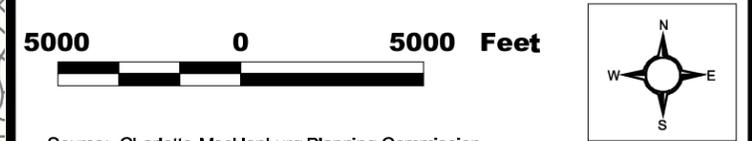
Several transit alternatives with general alignments and a range of technologies including Bus Rapid Transit (BRT) and Light Rail Transit (LRT) were developed and are being studied as part of a Major Investment Study (MIS). The current alternatives are being further refined, as ridership projections, initial cost estimates and station area land use plans are developed. The goals, objectives and evaluation criteria developed in cooperation with the community will continue to provide the framework for the evaluation process. **Figure 3** shows the alternative alignments currently under study by CATS. The alternative alignments terminate at the Catawba River along US 29-74 (Wilkinson Boulevard) and NC 160 (West Boulevard). There are no plans to extend this service into Gaston County at this time.



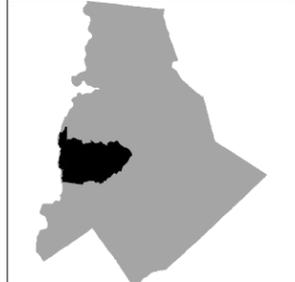
**LEGEND**

-  LRT/BRT
-  BRT
-  People Mover
-  Major Streets and Highways
-  Other Streets
-  Railroad
-  County Boundary
-  West Corridor Study Area

5000 0 5000 Feet

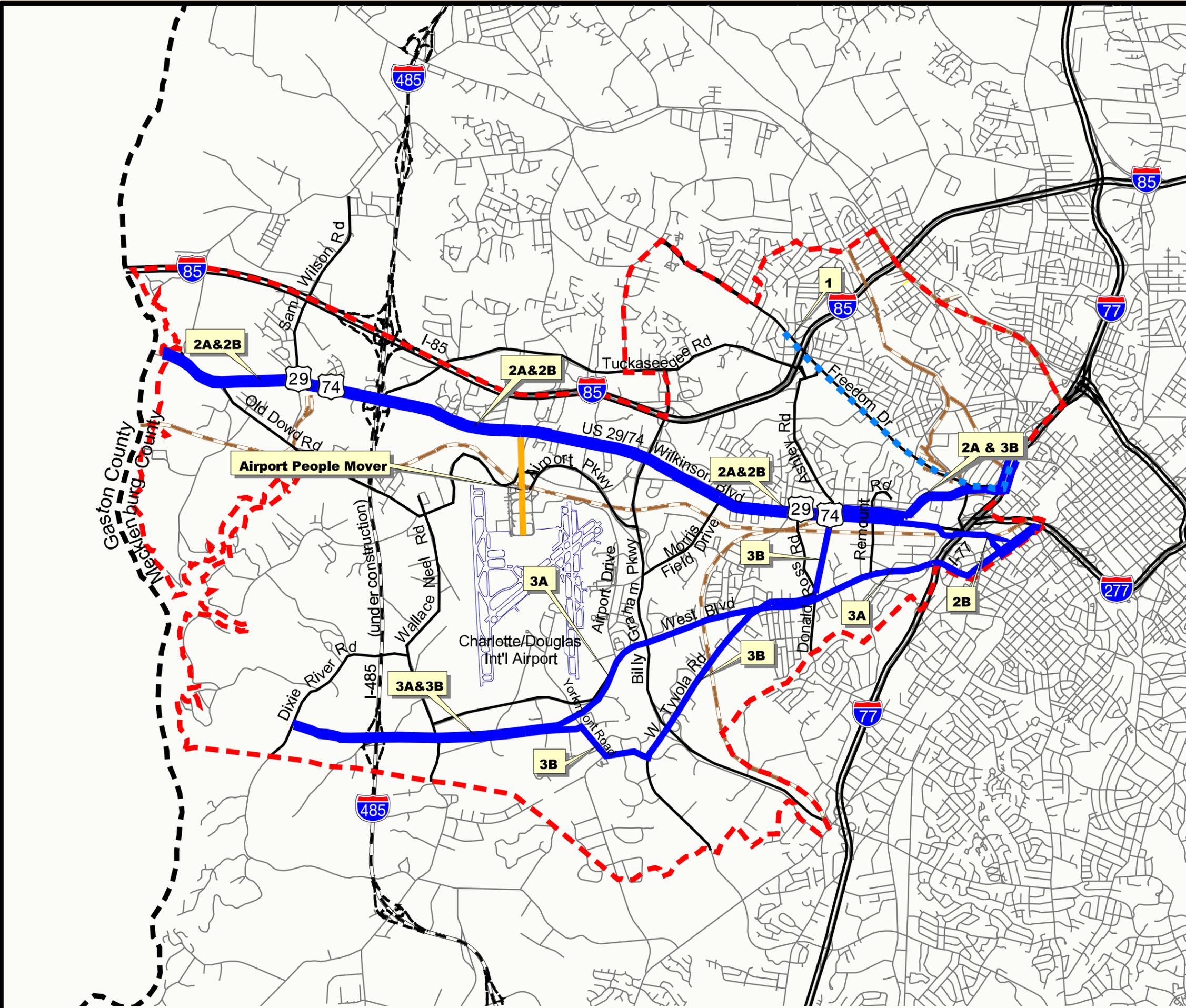


Source: Charlotte-Mecklenburg Planning Commission

**WEST CORRIDOR ALTERNATIVES  
UNDER STUDY BY CHARLOTTE  
AREA TRANSIT SYSTEM  
U-3321 GASTON and MECKLENBURG  
COUNTIES EAST-WEST CORRIDOR STUDY**

**FIGURE 3**



## 7 SOCIAL AND ECONOMIC CONDITIONS

### 7.1 Demographics

Gaston County has 15 municipalities entirely within the county, the most of any North Carolina county. Gastonia, centrally located in the county, is the county's largest city and its seat. Mecklenburg County has seven municipalities, with the largest being Charlotte, the county seat.

Gaston County has been growing at an average rate of approximately one percent per year since 1990. In 1990, the population of Gaston County was 175,093. In 2000, the County population rose to 190,365. That same year, Gastonia had a population of 66,277, which is about 35 percent of the total county population (US Census 2000). About 58 percent of the County's population lives within the 15 incorporated municipalities. Most of the population growth in Gaston County between 1980 and 2000 occurred in the county's eastern towns near the Mecklenburg County border, including Mount Holly, Belmont, and Cramerton (Gaston County Draft Comprehensive Plan, 2002).

From 1990 to 2000, Mecklenburg County's population increased 36.0 percent, from 511,433 to 695,454 (US Census Bureau website: [quickfacts.census.gov/qfd/state/37](http://quickfacts.census.gov/qfd/state/37), accessed 01/06/02). In 1990, the percentage of people living in incorporated areas of Mecklenburg County was about 88 percent (US Census Bureau, 1990 US Census-Summary Tape File 1). The percentages increased to about 90 percent in 2000 (NC Office of State Planning website: [demog.state.nc.us](http://demog.state.nc.us), accessed 01/06/02).

The populations of both Gaston and Mecklenburg Counties are expected to increase through 2020. The population of Gaston County is projected to grow 7.0 percent (to 203,623 people) from 2000 to 2010, and another 5.9 percent (to 215,587 people) from 2010 to 2020. The population of Mecklenburg County is projected to grow 27.7 percent (to 888,137 people) from 2000 to 2010, and another 22.6 percent (to 1,089,258 people) from 2010 to 2020 (NC Office of State Planning website: [demog.state.nc.us](http://demog.state.nc.us), accessed 01/06/02).

Future growth is expected within the City of Gastonia and the City of Belmont and their extraterritorial jurisdictions in the southeast and south directions, respectively (City of Gastonia and City of Belmont 2001). Gastonia has grown primarily to the east and southeast over the past twenty years, with population growth occurring primarily in the east sector and southeast sector. The central and western parts of Gastonia, on the other hand, have not kept pace with the growth of the rest of the City. As previously mentioned, the largest population growth in Gaston County occurred in southeast Gastonia between 1990 and 2000.

### 7.2 Economic Data

Gaston County's reputation as an industrial center began more than a century ago with the advent of the textile industries. Today, Gaston County is home to a diverse set of industries, including health services, transportation equipment manufacturing, retail eating and drinking establishments, business services, food

stores, industrial machinery and equipment manufacturing, and government (Gaston County Economic Development Commission 2002).

While textile mill manufacturing continues to dominate the industrial structure of Gaston County, its industrial base is becoming more diversified. Electrical goods, motor oil filters, chemicals, plastics, chain saws, brick and tile, zipper fasteners, business forms, resistors, corrugated boxes, lawnmowers, lithium compounds, and a host of other items are currently manufactured in Gaston County to balance out the industrial community.

Wholesale and retail trade is second to manufacturing in total employment. Government employs the third largest number of workers, with service employment being fourth, with finance, insurance and real estate being fifth, and with transportation, communications and public utilities being sixth. While approximately sixty-five percent of the total acreage of Gaston County is classified as farmland, agricultural employment is minimal. In 2001, there were approximately 430 people employed in agriculture within approximately 89 firms (Gaston County Economic Development Commission, 2002).

The unemployment rate in Gaston County was 5.8 percent in 2000, which was higher than the statewide unemployment rate of 3.6 percent. Gaston County ranked 74 out of 100 counties in 1998 per capita income with the per capita income averaging \$23,210 compared to a statewide average of \$25,181 (NC Department of Commerce). Retail sales increased an average of 6 percent per year between 1990 and 2000 (Gaston County Fact Book 2002).

In 1999, manufacturing comprised 36.4 percent of Gaston County's employment. The next two largest employment sectors were services (19.5 percent) and retail trade (18.0 percent) (NC Department of Commerce). Major employers in Gaston County include Gaston Healthcare (hospital system), Freightliner Corporation (manufacturing), Dana (manufacturing), American & Efird (manufacturing), and Pharr Yarns (manufacturing) (Gaston County Economic Development Commission 2002). Within the project study area, industries primarily are located off I-85 interchange areas and along US 29-74 and US 321 within Gastonia city limits.

In 2001, Mecklenburg County's workforce was primarily employed in service (28%), followed by retail (16%), finance/insurance/real estate (11%), and manufacturing (10%). The largest manufacturers in the county are IBM Corporation electronic computers (3,000 employees), Solectron Technology printed circuit boards (2,500 employees), Continental General Tire tires and inner tubes (1,700 employees) and Lance snack foods (1,600 employees). Unemployment in the County was 3.7 percent in 2001 (NC Department of Commerce website: <http://cmedis.commerce.state.nc.us/countyprofiles> accessed 02/22/02).

Mecklenburg County attracted substantial investments and employment in manufacturing in 1999. According to the North Carolina Department of Commerce, the county had investments of \$571 million in new plants and \$415 million in plant expansions in 1999, resulting in county scores of 100 for both new plants and expansions. The County's score for employment also was 100 for both new plants and expansions (NC Department of Commerce, 2000 County and Regional Scan).

The growth in Gaston and Mecklenburg Counties has resulted in construction of improvements to area infrastructure to support the needs of such a population. Gaston County is forecasted to have about 87,300 workers in 2010. Most of the employment growth in Gaston County will be in the services industry, which is forecasted to represent 26.7% of total employment in 2010 (Gaston County Draft Comprehensive Plan, 2002).

## **7.3 Major Attractions in Southern Gaston County**

### *7.3.1 Daniel Stowe Botanical Garden*

In 1991, retired Belmont textile executive, Daniel Jonathan Stowe, set aside 450 acres (182 hectares) of rolling meadows, woodlands and lakefront property as well as a \$14 million endowment for the development of a world class botanical garden. The Daniel Stowe Botanical Garden (DSBG), in the southeastern portion of Gaston County (**Figure 1**), is a major tourist attraction in Gaston County. In 2000, the 450-acre (182-hectare) botanical garden attracted approximately 70,000 visitors (Daniel Stowe Botanical Garden, 2001). With planned improvements to the Daniel Stowe Botanical Garden, described later in this section, visitor attendance is expected to reach 250,000 by 2011 (Daniel Stowe Botanical Garden, 2001).

The Garden is part of a 450-acre (182-hectare) Master Plan. Implementation of the Master Plan will take place in phases, and will require between \$150-200 million before full development is achieved. The Garden is comprised of 158,000 square feet (14,700 square meters) of planting beds divided into separate areas, each with a distinctive theme.

On October 9, 1999, DSBG hosted the Grand Opening of a new 110-acre (44-hectare) greenspace, including gardens, grounds, fountains and a 13,500 square foot (1,255 square meters) Visitor Pavilion. The Garden's next major undertaking will be the construction of an enclosed glass conservatory, housing exotic plants. A capital campaign to fund the conservatory will begin by 2003.

DSBG's 40-year Master Plan includes a walled English garden, conservatory complex, Asian garden, rose pergola, natural wetland, waterfall, Piedmont garden, library and reading garden, home demonstration complex, auditorium and full-service restaurant.

The Daniel Stowe Botanical Garden is a private non-profit public charity. The total budget for fiscal year 2001/2002 was approximately \$1.8 million. The botanical gardens currently have about 35 permanent employees and three part-time employees (Interview with DSBG, 2001).

The only visitor entrance to the Daniel Stowe Botanical Garden is off NC 279 (New Hope Road [SR 2302]). Vehicles entering and leaving the Garden often experience delays on NC 279 (New Hope Road [SR 2302]), particularly during events like the Fourth of July and Balloon Glow (August). Traffic entering the Daniel Stowe Botanical Garden for Fourth of July has queued on NC 279 (New Hope Road [SR 2302]) for about 1.5 miles (2.4 kilometers) north of the visitor entrance (Interview with DSBG, 2001).

### 7.3.2 Crowders Mountain State Park

Crowders Mountain State Park is located near the North Carolina-South Carolina state line in southwest Gaston County (**Figure 1**). Regional access to Crowders Mountain is provided primarily by I-85, which is approximately three miles north. US 29-74, US 321, and NC 161 (York Road) surround the park to the north, east and west, respectively.

Crowders Mountain State Park contains 2,591 acres (1,047 hectares), including the peaks of Crowders Mountain and Kings Pinnacle. These peaks rise approximately 800 feet (1287 meters) above the surrounding countryside. The significant scenic resources of the park include the contrast between rolling Piedmont hills and the sheer rock outcrops of the Kings Mountain Range. Numerous opportunities exist to view the panoramic Piedmont plateau from the park's cliffs.

Crowders Mountain State Park offers a variety of hiking trails, ranging from the more rugged trails leading to the summits of Crowders Mountain and Kings Pinnacle, to the flat, easy trail circling the nine-acre (four-hectare) park lake. Canoes for use on the lake can be rented at the park office from June through Labor Day, and both canoe and bank fishing are allowed. The lake is the only public lake in Gaston County.

In 2000, the 2,591-acre (1,047-hectare) park attracted 297,635 visitors and in 1991, Park visitors numbered 163,432 (Division of Parks and Recreation, 2001). The attendance figures increased on average approximately six percent per year over the past nine years. The Park receives its heaviest use in early spring through mid-summer. During the five months from March through July, Crowders Mountain normally receives a little over half its annual visitation.

Crowders Mountain State Park is administered under the auspices of the NC Department of Environment and Natural Resources, Division of Parks and Recreation. The total budget for fiscal year 1990/1991 was \$119,874 and for fiscal year 2000/2001 was \$322,552. Most of the Park's budget comes from State appropriations (Division of Parks and Recreation, 2001). The Park currently has about 11 permanent employees, four seasonal employees and two part-time employees.

## 8 TRANSPORTATION PLANS AND LAND USE PLANS

### 8.1 NCDOT Transportation Improvement Program

The proposed action is included as Projects U-3321 and R-2608 in the NCDOT's 2002-2008 TIP. Project U-3321 is an unfunded project programmed for a planning and environmental study only and R-2608 is an unfunded project. Twelve other funded projects in the TIP are in the general vicinity of the proposed action: R-2248, U-2408, U-2712, U-2713, U-3405, U-3411, U-3425, U-3806, U-4023, B-3455, B-3456, and B-4517. **Figure 4** shows the general locations of these projects in relation to U-3321 and R-2608 (Gaston County East-West Corridor Study).

**Project U-3321** is a proposed new route from I-85 west of Gastonia in Gaston County to NC 160 (West Boulevard [SR 1448]) in Mecklenburg County. The new route is a proposed four-lane divided freeway on new location. The total project length is 21.5 miles (34.6 km), and the scheduling depends on the funding of the project.

**Project R-2608** is a proposed new route from I-85 west of Gastonia to US 321 north of Gastonia in Gaston County. The new route is proposed four-lane divided freeway on new location. The total project length is 7.5 miles (12.1 km), and the scheduling depends on the funding of the project.

**Project R-2248** is a proposed new location freeway (Charlotte Western Outer Loop) from west of I-77 to I-85 north in Mecklenburg County. The new freeway is a proposed four to six-lane divided freeway on new location. The total project length is 28.0 miles (45.1 km). Right-of-way acquisition is currently in progress, and construction is scheduled to begin in Federal Fiscal Year (FFY) 2002.

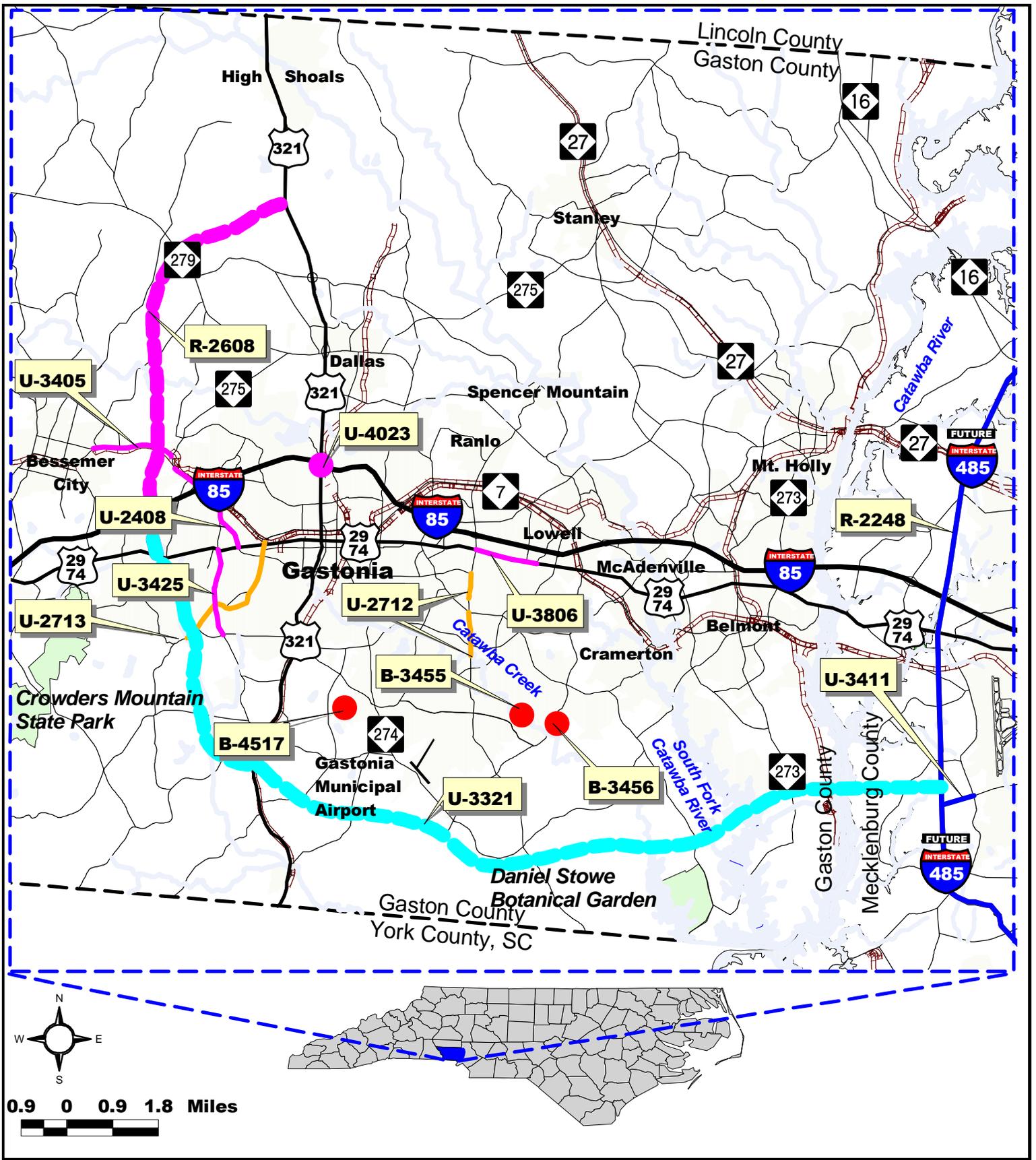
**Project U-2408** is on NC 274 (Bessemer City Road [North of US 29-74]) from NC 275 to US 29-74 in Gaston County. Project U-2408 is proposed to widen existing NC 274 (Bessemer City Road [North of US 29-74]) to a multi-lane facility. The total project length is 2.8 miles (4.5 km). Right-of-way acquisition is scheduled to begin in FFY 2002, and construction is scheduled to begin in FFY 2004.

**Project U-2712** is an extension of SR 2200 (Cox Road) from Duke Street to NC 279 (New Hope Road [SR 2302]) and Hoffman Road to Armstrong Park Road in Gaston County. Project U-2712 is proposed to widen existing Cox Road (SR 2200) to a multi-lane facility, with some multi-lane connectors. The total project length is 2.0 miles (3.2 km). Construction is complete and the roadway is open to traffic.

**Project U-2713** is on SR 1131 (Linwood Road) from Crowders Creek to US 29-74-NC 274 (Franklin Boulevard) in Gaston County. Project U-2713 is proposed to widen existing Linwood Road (SR 1133) to a multi-lane facility, with some roadway relocation. The total project length is 2.2 miles (3.5 km). Planning is scheduled to begin in FFY 2002, and right-of-way acquisition is scheduled to begin in FFY 2007.

**Project U-3405** is on NC 274 (Gastonia Highway) from SR 1484 (Maine Avenue) to NC 275 in Gaston County. Project U-3405 is proposed to widen existing NC 274 (Gastonia Highway) to a five-lane curb and gutter facility. The total project length is 1.4 miles (2.3 km). Right-of-way acquisition is scheduled to begin in FFY 2003, and construction is scheduled to begin in FFY 2005.

**Project U-3411** is a connector between NC 160 (West Boulevard [SR 1448]) and I-485 (Charlotte Outer Loop) in Mecklenburg County. Project U-3411 is proposed to construct a multi-lane facility on new location. The total project length is 0.5 miles (0.8 km). Right-of-way acquisition is scheduled to begin in SFY 2002, and construction is scheduled to begin in State Fiscal Year (SFY) 2003.



	<b>LEGEND</b>	
	Interstate	Widen (Multi Lanes)
	US Route	Some Relocation
	NC Route	Widen (Multi Lanes)
	Railroad	Bridge Replacement
	County Boundary	R-2608 Conceptual Alignment
	Hydrology	U-3321 Conceptual Alignment
Municipal Boundary	New Location (Multi Lanes)	
Widen (Multi Lanes)		

**TIP PROJECTS IN THE AREA**  
**U-3321 GASTON and MECKLENBURG**  
**COUNTIES EAST-WEST CORRIDOR STUDY**

**FIGURE 4**

**Project U-3425** is on SR 1136 (Myrtle School Road) from US 29-74 to Hudson Boulevard (SR 1255) in Gaston County. Project U-3425 is proposed to widen existing SR 1136 (Myrtle School Road), a length of 1.8 miles (2.9 kilometers) to a multi-lane facility, and the scheduling depends on the funding of the project.

**Project U-3806** is on US 29-74 (Franklin Boulevard) from SR 2200 (Cox Road) to SR 2339 (Church Street) in Gaston County. Project U-3806 is proposed to add an additional lane in the eastbound direction of US 29-74. The total project length is 0.5 miles (0.8 km). Planning is scheduled to begin in FFY 2007, and right-of-way acquisition is scheduled to begin in FFY 2008.

**Project U-4023** is at the interchange of US 321 and I-85 in Gaston County. Project U-4023 is proposed to add a right turn lane for US 321 southbound onto the I-85 southbound ramp. Construction is currently in progress.

**Project B-3455** is a bridge replacement project on Gaston Day School Road (SR 2444). Project B-3455 will replace Bridge Number 24 in Gaston County over Forest Brook Branch. Right-of-way acquisition is currently in progress, and construction is scheduled to begin in FFY 2002.

**Project B-3456** is a bridge replacement project on SR 2445. Project B-3456 will replace Bridge Number 23 in Gaston County over a branch of the Catawba Creek. Right-of-way acquisition is currently in progress, and construction is scheduled to begin in FFY 2002.

**Project B-4517** is a bridge replacement project on Crowders Creek Road (SR 1103). Project B-4517 will replace Bridge Number 49 in Gaston County over Crowders Creek. Right-of-way acquisition is scheduled to begin in FFY 2006, and construction is scheduled to begin in FFY 2007.

## **8.2 Gaston Urban Area Thoroughfare Plan**

**Figure 5A** shows the currently approved Gaston Urban Area Thoroughfare Plan (last revised in 1999). As discussed in Section 2.3, the 1999 revisions included a new bypass conceptual alignment as voted on by the TAC. The local mutual adoption process of the Thoroughfare Plan is complete. The bypass in southern Gaston County was included by local officials as the top project on the priority list of the major thoroughfare projects recommended in the plan.

The Gaston Urban Area Long Range Transportation Plan is being updated by the NCDOT's Statewide Planning Branch, in cooperation with the City of Gastonia and the other municipalities included in the Gaston Urban Area shown on **Figure 5A**. The update process is expected to be completed by July 2002 with TAC approval.



### 8.3 Gaston Comprehensive Plan

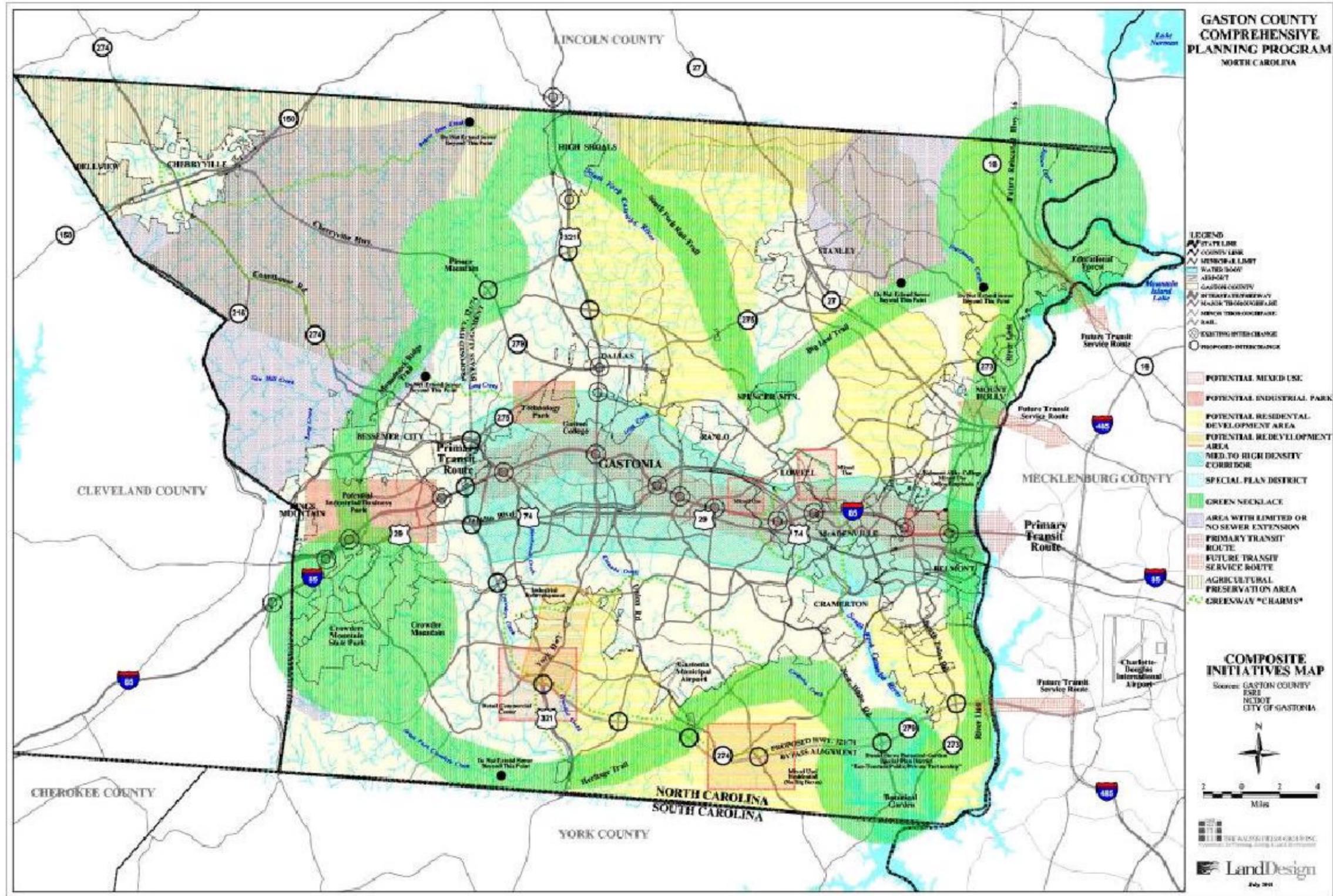
Gaston County is developing a Comprehensive Plan, with the draft document recently completed in June 2002. **Figure 5B** shows the draft land use plan. The document provides a “big picture” perspective and acts as a common framework, allowing the 15 municipalities to develop or update their own comprehensive plan. The document is a general land use guide, without prescribing land use on a parcel by parcel basis, or locating future public facilities.

A key component of the planning process is community input and comment. The Comprehensive Plan Steering Committee has approved a draft set of Proposed Initiatives, developed on a County wide basis.

These Proposed Initiatives are a starting point for community thought, consideration and discussion, and may or may not reflect the Initiatives ultimately considered by the County Commission in the final document. The Comprehensive Plan outline calls for breaking the county into five sections, or Small Area Plans. The Proposed Initiatives will be related to each area in the planning process to bolster the final goals and objectives for the county. The Proposed Initiatives include three main focus areas: economic development, infrastructure, and open space and natural resources.

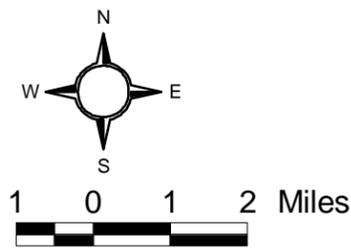
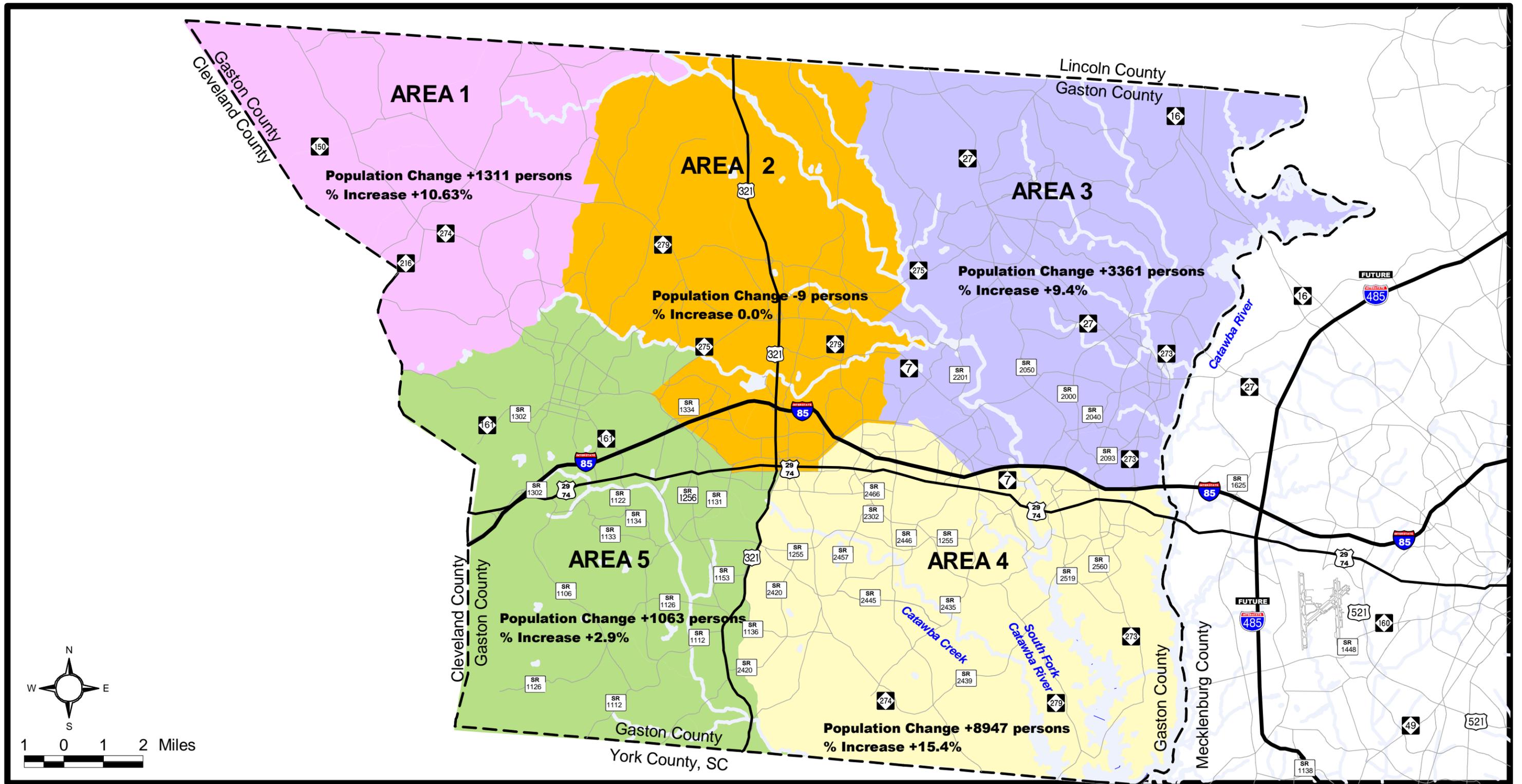
As a part of the Gaston County Comprehensive Plan development, a second series of small area planning forums was held in February 2002. Information gathered from these meetings will be used in development of the Small Area Plans, upon which the final County wide plan will be based.

Among the five Small Areas within Gaston County, the population grew fastest between 1990 and 2000 in the Southeast, from 57,958 to 66,905 persons. This equated to a growth rate of approximately 15.4%. The Northwest area, which has the smallest population in Gaston County, increased by 11.6%, mainly due to the amount of mobile home units that were built between 1990 and 2000. Gaston County as a whole increased by 8.7% between 1990 and 2000. The Southeast area accounted for approximately 58% (8,947 persons) of the population growth in Gaston County from 1990 to 2000. **Figure 5C** displays the population growth between 1990 and 2000 for the five Small Areas. Based on the Gaston Comprehensive Land Use Plan (**Figure 5B**), the Southeast is expected to continue growing. Expected growth would be from potential residential development areas and the expansion of the DSBG as a major tourist attraction.



**GASTON COMPREHENSIVE LAND USE PLAN**  
**U-3221 GASTON and MECKLENBURG COUNTIES EAST-WEST CORRIDOR STUDY**

**FIGURE 5B**



**LEGEND**

- Interstate
- US Route
- NC Route
- Railroad
- County Boundary
- Hydrology

- Municipal Boundary
- Park

**Population Changes**

- Area 1
- Area 2
- Area 3
- Area 4
- Area 5

**POPULATION GROWTH  
BETWEEN 1990 & 2000  
FOR SMALL AREAS  
U-3221 GASTON and MECKLENBURG  
COUNTIES EAST-WEST CORRIDOR STUDY**

**FIGURE 5C**

## 8.4 Mecklenburg-Union Thoroughfare Plan

**Figure 5A** shows the western section of the currently approved Mecklenburg-Union Thoroughfare Plan adopted November 1994 (last revised in July 2000). The adopted 1994 Plan included a new freeway from the Western Outer Loop (I-485) across the Catawba River to coincide with the Gaston Urban Area Bypass Conceptual Alignment shown on the Gaston Urban Area Thoroughfare Plan. A new freeway also is included in the Mecklenburg-Union Metropolitan Planning Organization (MUMPO) 2020 Transportation Plan as NC 160 (West Boulevard) Extension from I-485 to the Gaston County Line.

The Mecklenburg-Union Thoroughfare Plan currently is being updated by the NCDOT's Statewide Planning Branch, in cooperation with the City of Charlotte and the other municipalities in the Mecklenburg-Union Metropolitan Planning Organization (MUMPO).

## 8.5 Land Use Plans in Mecklenburg County

### 8.5.1 Dixie-Berryhill Area

The Dixie-Berryhill Area is an approximately 5,000-acre planning area in western Mecklenburg County, across the river from southern Gaston County. The area is bounded by I-485 to the east, the Catawba River to the west, I-85 to the north, and Dixie River Road to the south. In the I-485 / Dixie-Berryhill Strategic Plan, shown in **Figure 5D** (Charlotte Mecklenburg Planning Commission, October 2000), this area is designated for mixed-use development and transit-oriented development in planned communities.

Transit oriented development is planned around US 29-74 (Wilkinson Boulevard) since the roadway (west of I-485) is one of the two alignments currently being studied by the Charlotte Area Transit System (CATS) for expanded mass transit in western Mecklenburg County. Two north-south arterial routes parallel to I-485 also are planned in the Dixie-Berryhill area.

The I-485 / Dixie-Berryhill Strategic Plan was recommended as part of the Westside Strategic Plan. The Westside Strategic Plan, described below, includes a larger area in western Mecklenburg County.

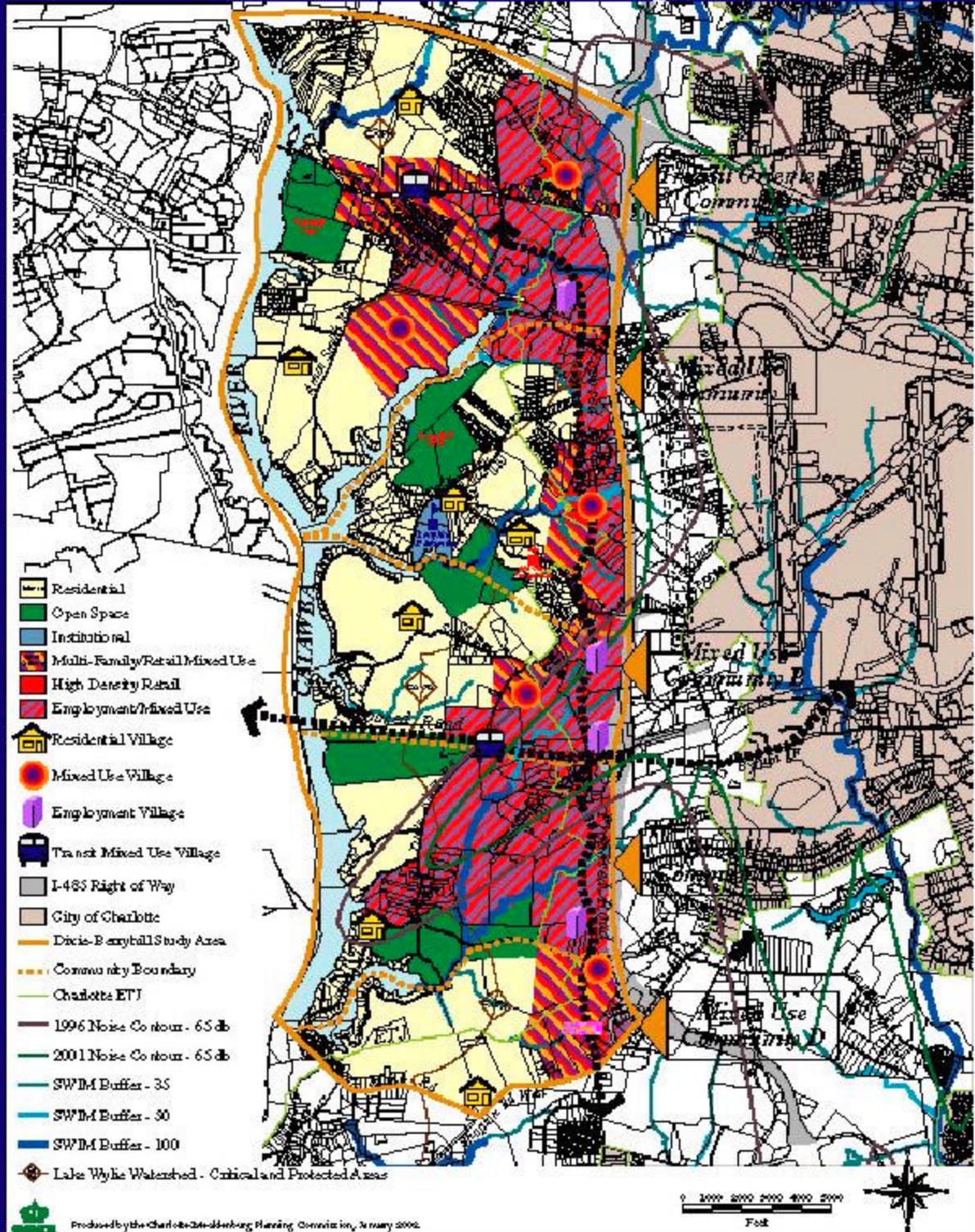
### 8.5.2 Westside Strategic Plan

The Westside Strategic Plan is organized in three parts: 1) a Concept Plan which identifies the issues and proposes objectives, 2) an Implementation Plan that contains suggested strategies for achieving the objectives, and 3) a Summary document which lists priority objectives and key strategies from the Concept and Implementation Plans.

The study area for the Westside Strategic Plan – Volume I: Concept Plan 2000 (adopted August 2000 by the Board of County Commissioners) is the area generally bounded by the Catawba River and Gaston County to the west; York County to the south; Mountain Island Lake to the north; and Statesville Road, I-77/I-277, and South Boulevard to the east. The Westside area is approximately 145 square miles, or a little over one-quarter of Mecklenburg County's total land use.

# I-485 / Dixie-Berryhill Strategic Plan

## Future Land Use - Map # 18



**DIXIE BERRYHILL PLAN**  
**U-3321 GASTON and MECKLENBURG**  
**COUNTIES EAST-WEST CORRIDOR STUDY**

**FIGURE 5D**

Within the Westside, there are three distinct sub-areas: the southwest, central, and northwest areas. The Dixie-Berryhill area would be considered part of the central sub-area. The existing land use in this area is sparsely developed and almost all of the land currently is zoned for low-density residential use. Nearly 50% of the Westside's total land area is vacant, with the largest amount of vacant land in the southwest. Twenty-eight percent (28%) of the total land area is developed with single-family homes, and industrial development consumes nearly 12%.

In 1990, the Census Bureau counted 119,425 people living in the Westside, or 23% of Mecklenburg County's total population. By 1996, the Charlotte-Mecklenburg Planning Commission estimated this figure had increased to 132,739, representing a 10% gain in six years.

New residential development has accelerated in the suburban areas of the Westside since 1990. Subdivision plans have been approved for 11,000 new single-family homes, or approximately 30% of Mecklenburg County's total approved units between 1990 and 1997. In that same period, over 6,000 new multi-family units were approved for the Westside, the majority in the southwest.

North of I-85, land use patterns have been established for development proposals approved for most of the I-485 interchanges on the Westside and at other key intersections. However, several interchange and intersection areas have not been tied to specific development plans, creating the opportunity to plan and design them as unified mixed-use centers.

**Figure 5E** illustrates the adopted proposed land use for the Westside areas. The northwest and southeast areas were just digitized and have not yet been checked by staff at the Charlotte-Mecklenburg Planning Commission (L. Quinn, Charlotte-Mecklenburg Planning Commission, 2002).

As shown in **Figure 5E**, the highest density uses are focused on the central and southwest areas. The northwest area is proposed for less dense development because of the proximity to Mountain Island Lake, Charlotte's principle source of drinking water.

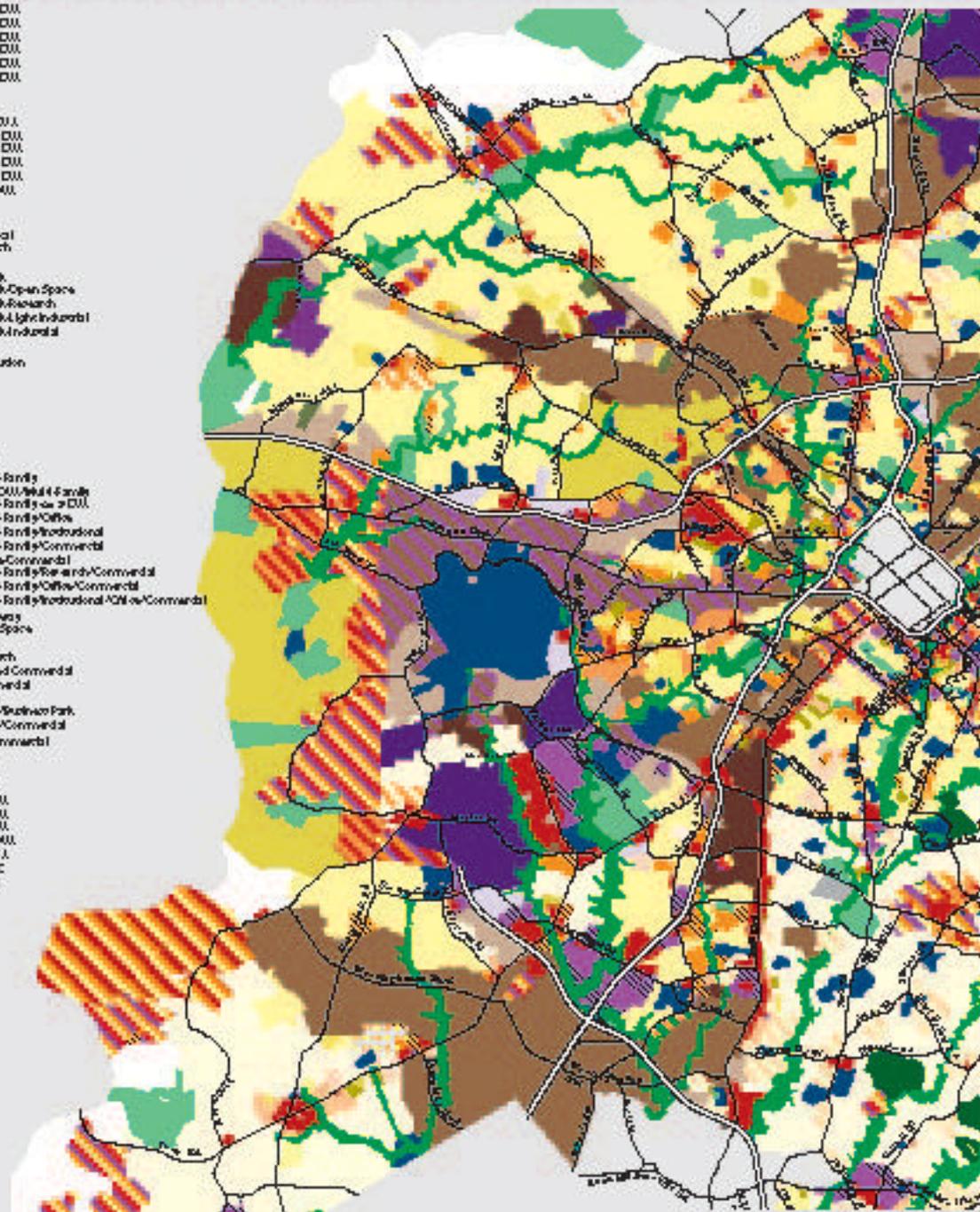
## **9 ROADWAY CAPACITY**

### **9.1 Existing Facility Characteristics**

There is one interstate route and two US routes in southern Gaston County; I-85, US 29-74 and US 321. There are two interstate routes and one US routes in western Mecklenburg County; I-85, I-485 (under construction) and US 29-74. **Figure 6** displays the characteristics of these major roadways, which are described below.

# District Plan Adopted Proposed Land Use

- Single Family <= 1 DU
- Single Family <= 2 DU
- Single Family <= 3 DU
- Single Family <= 4 DU
- Single Family <= 5 DU
- Single Family <= 6 DU
- Mobile Home
- Multi-Family
- Multi-Family <= 2 DU
- Multi-Family <= 3 DU
- Multi-Family <= 4 DU
- Multi-Family <= 5 DU
- Multi-Family <= 6 DU
- Multi-Family > 6 DU
- Research
- Industrial
- Industrial - Medical
- Industrial - Church
- Office
- Office/Reserve Park
- Office/Reserve Park/Open Space
- Office/Reserve Park/Research
- Office/Reserve Park/Light Industrial
- Office/Reserve Park/Industrial
- Commercial
- Warehouse/Distribution
- Industrial
- Industrial - Light
- Industrial - Heavy
- Utility
- Park/Open Space
- Greenway
- Parks/Recreation
- Single Family/Single Family
- Single Family <= 4 DU/Single Family
- Single Family/Single Family <= 2 DU
- Single Family/Single Family/Office
- Single Family/Single Family/Industrial
- Single Family/Single Family/Commercial
- Single Family/Office/Commercial
- Single Family/Single Family/Research/Commercial
- Single Family/Single Family/Office/Commercial
- Single Family/Single Family/Industrial/Office/Commercial
- Multi-Family/Greenway
- Multi-Family/Open Space
- Multi-Family/Office
- Multi-Family/Research
- Multi-Family/Reserve Commercial
- Multi-Family/Commercial
- Multi-Family/Office
- Multi-Family/Office/Reserve Park
- Multi-Family/Office/Commercial
- Research/Office/Commercial
- Industrial Park
- Office/Commercial
- Office/Industrial
- Residential <= 2 DU
- Residential <= 3 DU
- Residential <= 4 DU
- Residential <= 5 DU
- Residential <= 6 DU
- Non-Residential/OC
- Non-Residential/OC



Produced by the Charlotte-Mecklenburg Planning Commission, June 2002.

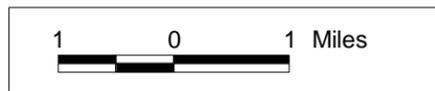
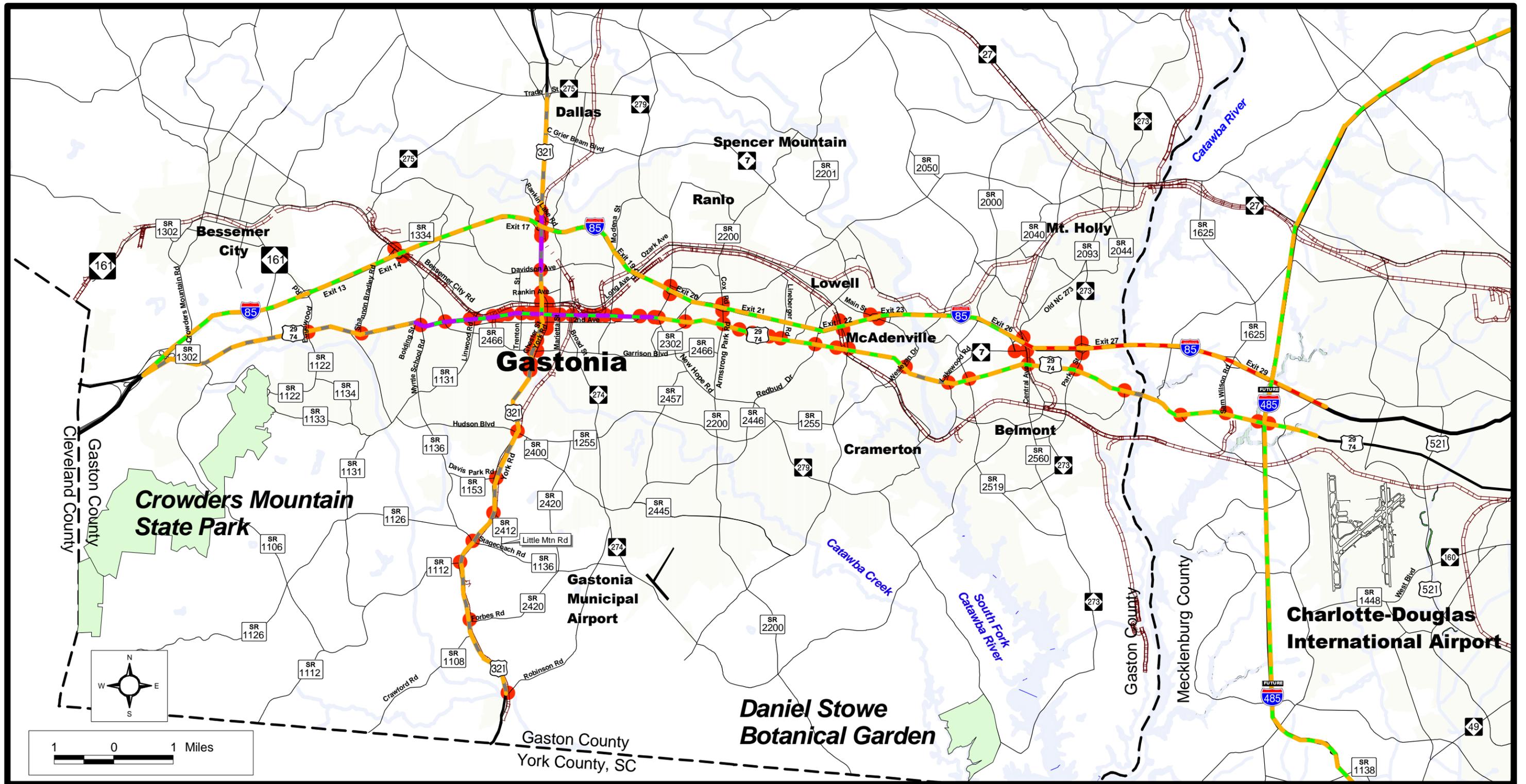


Note: Striped areas designate a mix of the prescribed uses. Dotted areas indicate either a choice or mix of the prescribed uses.



## Westside Strategic Plan U-3321 GASTON and MECKLENBURG COUNTIES EAST-WEST CORRIDOR STUDY

FIGURE 5E



**LEGEND**

- 4 Lanes Divided
- 5 Lanes Divided
- 6 Lanes Divided
- 8 Lanes Divided
- 4 Lanes Undivided
- 5 Lanes Undivided
- 6 Lanes Undivided
- 8 Lanes Undivided
- Interstate
- US Route
- NC Route
- Railroad
- County Boundary
- Hydrology
- Municipal Boundary
- Park
- Signalized Intersection

**EXISTING FACILITY CHARACTERISTICS  
U-3321 GASTON and MECKLENBURG  
COUNTIES EAST-WEST CORRIDOR STUDY**

**FIGURE 6**

**I-85.** Between Exit 14 (NC 274 [Bessemer City Road [North of US 29-74]]) and I-485 (under construction) in Mecklenburg County, the interstate varies between six and eight lanes, with posted speed limits from 55 to 65 mph (88 to 105 kph). I-85 is a full control of access facility with nine interchanges in Gaston County between Exit 14 (NC 274 [Bessemer City Road [North of US 29-74]]) and Exit 27 (NC 273 [Park Street [North of NC 7]]). At these interchange areas, there are 17 signalized and two unsignalized intersections formed by the I-85 on and off-ramps. Most of the interchange areas have two signalized intersections with the on and off-ramps. Exit 26 (Old NC 273 [Belmont-Mount Holly Road] (SR 2093)) includes three signalized intersections because the on and off-ramps intersect two different roadways which are connected by a third signal. Exit 19 (Long Avenue [SR 2233]) has the only two unsignalized intersections.

**I-485.** I-485 is under construction in Mecklenburg County and when completed, will cross I-85 and US 29-74 in a north-south direction on the west side of the Charlotte-Douglas International Airport. Based on existing sections of I-485, it is assumed that the posted speed limit on this new section will be 65 mph (105 kph).

**US 29-74.** US 29-74 is a secondary route between Mecklenburg and Gaston Counties and it parallels I-85 to the south and accommodates a large portion of the east-west travel demand in the corridor study area. US 29-74 varies from four-lanes (at the South Fork of the Catawba River crossing and west of Myrtle School Road [SR 1136]) to seven-lanes, with posted speed limits between 35 and 50 mph (56 to 80 kph).

Access control along US 29-74 varies from partial control of access to no control of access. Access to US 29-74 is provided at numerous locations, through signalized and unsignalized intersections and residential and commercial driveways.

US 29-74 intersects I-85 west of Gastonia and crosses US 321 in Gastonia. In addition, US 29-74 is crossed by several major and minor arterials between I-85 and I-485 (under construction), including the following:

- NC 274 (Bessemer City Road and Broad Street)
- NC 279 (New Hope Road [SR 2302])
- NC 7 (Main Street)
- NC 273 (Park Street)

**US 321.** In the corridor study area, US 321 varies from four lanes to six lanes, with posted speed limits between 35 and 55 mph (56 to 88 kph). Access control varies from full control of access, north and south of Gastonia, to no control of access in Gastonia. Through Gastonia, US 321 is a one-way pair of streets. Chester Street is southbound US 321 and York Road is northbound US 321. Other major and minor arterials that cross US 321 in Gaston County include the following (from south to north):

- NC 7 (Long Avenue)

- NC 275

## 9.2 Transportation Modeling

Travel demand is a function of socioeconomic conditions such as residential densities, locations of jobs and services, and trip lengths and distributions for the various types of trip purposes. Travel demand models are used for simulating current travel conditions and for forecasting future travel patterns and conditions.

In the mid-1990's, a network-based travel demand model was developed for the Gaston Urban Area as part of the effort to update the 1991 Thoroughfare Plan. The Gaston Urban Area travel demand model was created for the base year (1995) and 2025 design year. For this study, Martin Alexiou Bryson, PLLC (M/A/B) updated the model using the methods and assumptions described in their technical memorandum, entitled *Gastonia East-West Connector Traffic Forecasting Methodology*, as included in the *Traffic Technical Memorandum* (PBS&J, 2002). The updated model provided a travel demand model for the base and design years 2000 and 2025. The 2025 model was based on an existing plus committed network, obtained by adding programmed improvement projects (2025 Long Range Transportation Plan) to the 2000 network.

The updated model generated 2025 traffic forecasts in the form of average daily traffic (ADT) and peak hour traffic volumes. These forecasted volumes also included turning ADT and turning peak hour traffic volumes at the signalized and unsignalized intersections of the I-85 on and off-ramps (Exit 14 to Exit 27). These forecasted volumes did not include turning movement volumes at the signalized intersections along US 29-74.

## 9.3 Traffic Volumes

### 9.3.1 Existing Traffic Volumes

Base year 2000 ADT volumes along I-85, US 29-74, and US 321 are shown in **Figure 7**.

In the study area (base year 2000), traffic volumes are approximately 66,000 to 106,000 vehicles per day (vpd) on I-85, 12,400 to 39,000 vpd on US 29-74, and 8,600 to 42,000 vpd on US 321.

In addition to ADT volumes, the updated travel demand model provided turning peak hour traffic volumes for the I-85 on and off-ramps in the corridor study area. **Table 2** lists the 2000 turning peak hour traffic volumes in vehicles per hour (vph) for the I-85 on and off-ramps at the nine interchanges.

The percent of the ADT in the peak hour (design hour volume) for all the major roadways is estimated to be nine percent; and the PM peak hour volumes are estimated as 55 percent in the peak direction and 45 percent in the off-peak direction. On US 29-74 in Mecklenburg County, the design hour volume is 10 percent. On US 321 from Little Mountain Road to Tenth Avenue, the design hour volume is 10 percent

and the PM peak hour directional split is 60/40.

For analysis purposes, a peak hour factor of 0.9 was assumed for all roadways and intersections for converting peak hour volumes (vph) to peak flow rates (vph). In Gaston County, the percentages of trucks for I-85, US 29-74, and US 321 were estimated at 20, 5, and 5 percent, respectively.

Traffic forecasts associated with the I-485 project were used to estimate base year 2000 traffic volumes and truck percentages in Mecklenburg County. For Mecklenburg County, the percentages of trucks along I-85, US 29-74, and I-485 were estimated at 23, 6, and 15 percent, respectively.

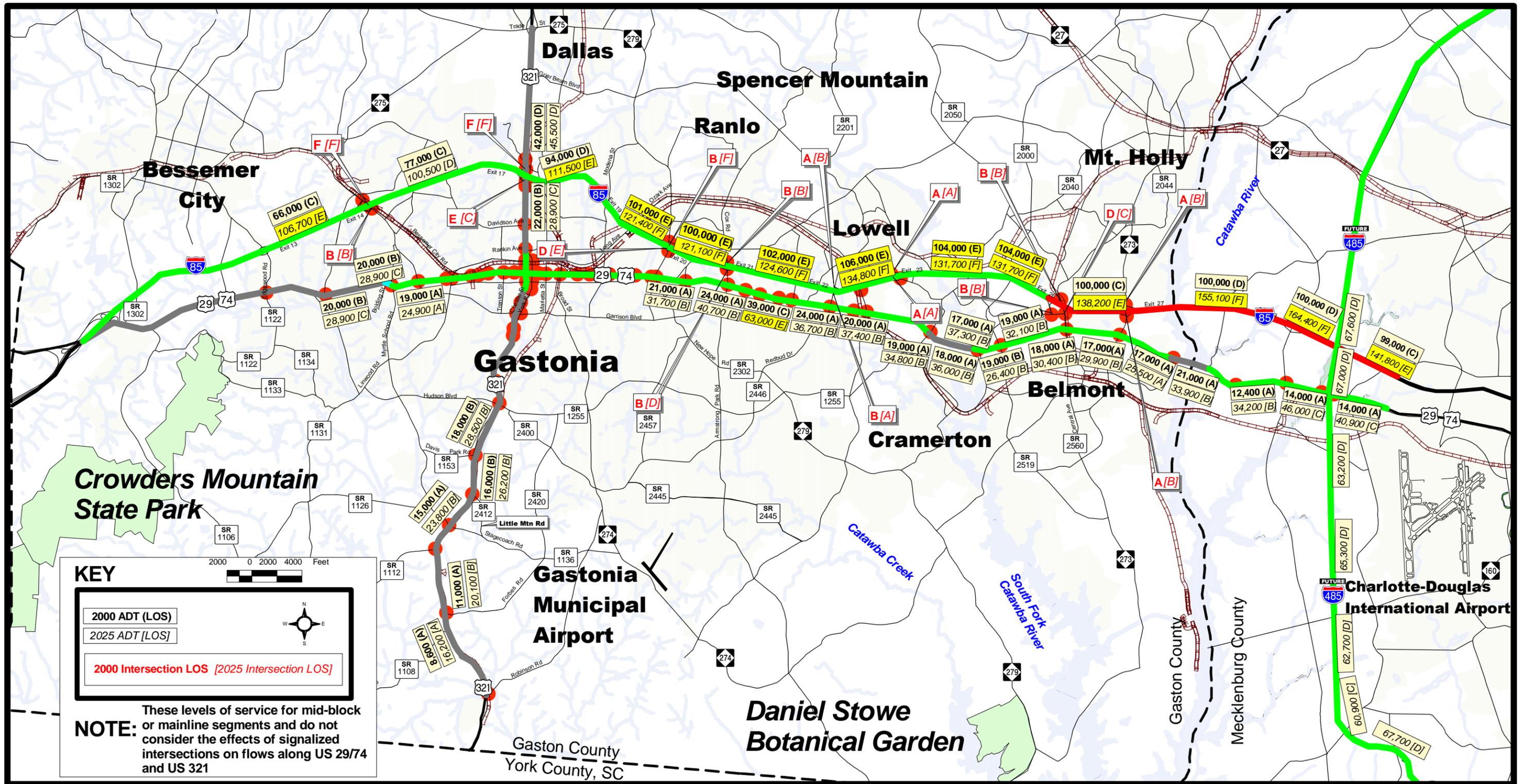
### 9.3.2 *Design Year Traffic Volumes*

Design year 2025 ADT volumes along I-85, I-485, US 29-74, and US 321, in the corridor study area shown in **Figure 7**.

Between 2000 and 2025, ADT volumes are anticipated to increase 19 to 64 percent on I-85, 31 to 329 percent on US 29-74, and 8 to 88 percent on US 321.

In the study area (design year 2025) traffic volumes are approximately 100,500 to 164,400 vehicles per day (vpd) on I-85, 24,900 to 63,000 vpd on US 29-74, and 16,200 to 45,500 vpd on US 321. Finally, approximately 60,900 to 67,700 vpd are forecasted to use I-485 in 2025.

**Table 2** lists the 2025 turning peak hour traffic volumes in vehicles per hour (vph) for the I-85 on and off-ramps at the nine interchanges.



- LEGEND**
- US Route
  - Interstate
  - Thoroughfare
  - County Line
  - Railroad
  - Streams
  - 4 Lanes
  - 5 Lanes
  - 6 Lanes
  - 8 Lanes
  - Lakes
  - Municipal Area
  - Park
  - Signalized Intersection

**TRAFFIC VOLUMES AND LOS's**  
**U-321 GASTON and MECKLENBURG**  
**COUNTIES EAST-WEST CORRIDOR STUDY**

**FIGURE 7**

**Table 2: I-85 Interchange Peak Hour Traffic Volumes**

I-85 Interchanges	2000 PM Peak						2025 PM Peak					
	THRU (SUM) :		TO:		FROM:		THRU (SUM) :		TO:		FROM:	
	NB Pk Hr	SB Pk Hr	NB Pk Hr	SB Pk Hr	NB Pk Hr	SB Pk Hr	NB Pk Hr	SB Pk Hr	NB Pk Hr	SB Pk Hr	NB Pk Hr	SB Pk Hr
<b>(14) NC 274</b>												
North	390	1200	610			710	870	1960	940			1180
EB off			20	30					20	40		
EB on					230	680					380	1140
WB off			590	280					920	440		
WB on					60	30					80	40
South	680	490		310	290		1330	780		480	460	
<b>(17) US 321</b>												
North	950	2460	1540			1720	1040	2550	1300			1500
EB off			100	110					110	120		
EB on					350	1500					300	1270
WB off			1440	850					1190	700		
WB on					200	220					210	230
South	1500	740		960	550		1550	1050		820	510	
<b>(19) NC 7</b>												
North	260	410	110			110	360	650	130			130
EB off			90	10					110	20		
EB on					600	20					750	30
WB off			20	530					20	650		
WB on					10	90					10	100
South	870	300		540	610		1120	520		670	760	
<b>(20) NC 279</b>												
North	690	1380	690			610	930	2290	760			710
EB off			510	660					550	720		
EB on					410	300					500	380
WB off			180	240					210	290		
WB on					400	310					430	330
South	1500	770		900	810		1860	1580		1010	930	
<b>(21) Cox Road (SR 2200)</b>												
North	590	1020	470			560	870	1050	580			620
EB off			100	500					110	580		
EB on					280	520					310	570
WB off			370	200					470	260		
WB on					340	40					400	50
South	1210	460		700	620		1580	430		840	710	
<b>(22) Main Street (SR 2329)</b>												
North	50	140	330			70	130	180	130			80
EB off			330	370					130	140		
EB on					560	0					830	0
WB off			0	250					0	550		
WB on					70	70					80	80
South	680	70		620	630		1040	100		690	910	
<b>(23) NC 7</b>												
North	40	230	310			170	60	350	430			250
EB off			0	160					0	290		
EB on					30	170					40	250
WB off			310	50					430	70		
WB on					260	0					420	0
South	330	60		210	290		520	100		360	460	
<b>(26) Belmont-Mount Holly Road (SR 2093)</b>												
North			580			220			490			640
EB off			500	450					370	330		
EB on					130	90					210	150
WB off			80	100					120	160		
WB on					530	580					450	490
South				550	1110					490	660	
<b>(27) NC 273</b>												
North	690	730	260			200	1060	1620	380			320
EB off			80	230					80	240		
EB on					200	150					360	270
WB off			180	140					300	240		
WB on					150	50					140	50
South	1040	530		370	350		1560	1300		480	500	

With one exception, the percent of the ADT in the peak hour (design hour volume) for all the major roadways is estimated to be the same as existing conditions. On I-485, the design hour volume is 10 percent and the PM peak hour directional split is 60/40. It should be noted that no base year 2000 traffic volumes are available for I-485 along this section because it is under construction.

The future peak hour factor and truck percentages are assumed to be the same as they are for existing conditions.

#### **9.4 Existing and Design Year Levels of Service**

The level of service (LOS) is a “qualitative measure describing operational conditions within a traffic stream (Transportation Research Board 2000:2-2). The LOS is defined with letter designations from A to F that can be applied to both roadway segments and intersections. LOS A represents the best operating conditions and LOS F the worst.

**Table 3** describes the traffic conditions along roadway segments and intersections generally associated with each LOS designation. In urban areas, LOS D is generally considered acceptable, while in rural areas LOS C is considered acceptable.

LOS was analyzed for the freeway sections of I-85, I-485, and the multi-lane highway sections of US 29-74 and US 321 using *Highway Capacity Software 2000 (HCS 2000)*, which is based on the methodologies of the *Highway Capacity Manual (2000)*. In addition, urban arterial LOS analyses were conducted using Synchro Version 5 (Build 317) for the sections of US 29-74 and US 321 in Gastonia.

**Table 3: Levels of Service Definitions**

<b>LEVEL OF SERVICE</b>	<b>SIGNALIZED INTERSECTION</b>	<b>ROADWAY SEGMENT</b>
<b>A</b>	Very low delay (<10.0 sec. per vehicle). Most vehicles do not have to stop at all.	Free flow. Individuals are unaffected by others in traffic stream. Freedom to select speed and maneuver is extremely high.
<b>B</b>	10.1-20.0 sec. delay. Good progression and short cycle length.	Free flow, but the presence of other vehicles begins to be noticeable. Slight decline in freedom to maneuver.
<b>C</b>	20.1-35.0 sec. delay. Fair progression and/or longer cycles. The number of vehicles stopping is significant.	Stable flow, but the beginning of the range in which the influence of traffic density on operations becomes marked. Maneuvering requires substantial vigilance. Average travel speeds may begin to show some reduction.
<b>D</b>	35.1-55.0 sec. delay. Many vehicles stop. Individual cycle failures noticeable.	High density flow in which ability to maneuver is severely restricted by increasing volumes. Only minor traffic disruptions can be absorbed without effect.
<b>E</b>	55.1-80.0 sec. delay. The limit of acceptable delay.	Flow at or near capacity. Unstable. Most traffic disruptions will cause queues to form and service to deteriorate.
<b>F</b>	>80.0 sec. delay. Considered unacceptable to most drivers.	Breakdown flow. Traffic exceeds capacity. Queues form behind such locations, which are characterized by extremely unstable stop-and-go waves.

Source: Transportation Research Board 2000.

Traffic operations analysis for the I-85 on and off-ramp intersections were conducted using Synchro Version 5 (Build 317). Results were reported using the Highway Capacity Manual report feature of the software, which is based on the *Highway Capacity Manual (2000)*.

Unsignalized intersections with the I-85 on and off-ramps were analyzed using the HCM Unsignalized Report from Synchro, which is based on the HCM 2000 Chapter 17.

LOS C was assumed as the minimum standard for all operational segments outside the municipal areas. LOS D was deemed acceptable for the segments of major roadways within municipal areas, since these areas maintain urban characteristics.

#### 9.4.1 I-85 Freeway Sections

LOS for basic freeway sections is defined in terms of density, which is defined as passenger cars per mile per lane (pc/mi/ln). The freeway section of I-85 was analyzed from west of NC 274 (Bessemer City Road [North of US 29-74]) (Exit 14) to east of future I-485 in Mecklenburg County.

**Table 4** summarizes the I-85 basic freeway peak hour LOS for 2000 and 2025 in the corridor study area.

**Table 4: I-85 Basic Freeway LOS Summary**

I-85 Segment	2000 LOS	2025 LOS
<b>Gaston County</b>		
West of NC 274 [Bessemer City Road [North of US 29-74]] (Exit 14)	C	E
Between NC 274 [Bessemer City Road [North of US 29-74]] and US 321 (Exit 17)	C	D
Between US 321 and NC 7 [Ozark Avenue] (Exit 19)	D	E
Between NC 7 [Ozark Avenue] and NC 279 (New Hope Road [SR 2302]) (Exit 20)	E	F
Between NC 279 (New Hope Road [SR 2302]) (Exit 20) and Cox Road [SR 2200] (Exit 21)	E	F
Between Cox Road [SR 2200] (Exit 21) and Main Street [SR 2329] (Exit 22)	E	F
Between Main Street [SR 2329] (Exit 22) and NC 7 (Exit 23)	E	F
Between NC 7 (Exit 23) and Belmont-Mount Holly Loop (Future Exit)	E	F
Between Belmont-Mount Holly Loop (Future Exit) and Old NC 273 [Belmont-Mount Holly Road (SR 2093)] (Exit 26)	E	F
Between Old NC 273 [Belmont-Mount Holly Road (SR 2093)] (Exit 26) and the Mecklenburg County Line	C	E
<b>Mecklenburg County</b>		
Between the Gaston County Line and Sam Wilson Road [SR 1625] (Exit 29)	D	F
Between Sam Wilson Road [SR 1625] (Exit 29) and Future I-485	D	F
East of Future I-485	C	E

Seven of the 13 basic freeway segments analyzed operate at an acceptable LOS (C or D) in the base year 2000. The remaining six are approaching capacity at LOS E from Exit 19 to Exit 26, approximately 6.9 miles (11.1 kilometers).

Twelve of the 13 basic freeway segments are approaching or over capacity in design year 2025 and operate at level of service (LOS) E or F. The other segment between NC 274 [Bessemer City Road [North of US 29-74]] and US 321 (Exit 17) is operating at LOS D.

#### 9.4.2 I-85 On and Off-ramp Signalized Intersections

Level of service for signalized intersections is evaluated on the basis of control delay per vehicle (seconds per vehicle). Control delay is the portion of the total delay attributed to traffic signal operation for signalized intersections. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Each I-85 on and off-ramp signalized intersection between Exit 14 and Exit 27 in Gaston County was analyzed for LOS and intersection delay; a total of 17 signalized intersections. **Table 5** summarizes the signalized intersections peak hour LOS and intersection delay for 2000 and 2025.

**Table 5: I-85 On and Off-Ramp Signalized Intersection Summary**

I-85 On and Off-Ramp Intersections	2000		2025	
	LOS	Intersection Delay (sec/veh)	LOS	Intersection Delay (sec/veh)
Eastbound Off & NC 274 [Bessemer City Road [North of US 29-74]] (Exit 14)	B	18.1	B	19.9
Westbound Off & NC 274 [Bessemer City Road [North of US 29-74]] (Exit 14)	F	83.4	F	195.9
Eastbound On & US 321 (Exit 17)	E	55.9	C	32.2
Westbound On & US 321 (Exit 17)	F	118.2	F	105.9
Eastbound On & NC 279 (New Hope Road [SR 2302]) (Exit 20)	D	49.4	E	62.3
Westbound On & NC 279 (New Hope Road [SR 2302]) (Exit 20)	B	12.1	F	80.1
Eastbound Off & Cox Road [SR 2200] (Exit 21)	B	19.3	D	52.4
Westbound On & Cox Road [SR 2200] (Exit 21)	B	10.5	B	16.2
Eastbound Off & Main Street [SR 2329] (Exit 22)	B	18.5	A	8.0
Westbound Off & Main Street [SR 2329] (Exit 22)	A	8.5	B	11.2
Eastbound Off & NC 7 (Exit 23)	A	1.6	A	3.8
Westbound Off & NC 7 (Exit 23)	A	8.6	A	8.6
Eastbound On & NC 7 (Exit 26)	B	15.7	B	12.1

**Table 5: I-85 On and Off-Ramp Signalized Intersection Summary**

I-85 On and Off-Ramp Intersections	2000		2025	
	LOS	Intersection Delay (sec/veh)	LOS	Intersection Delay (sec/veh)
NC 7 & Old NC 273 [Belmont-Mount Holly Road (SR 2093)] (Exit 26)	D	40.1	C	26.7
Westbound On & Old NC 273 [Belmont-Mount Holly Road (SR 2093)] (Exit 26)	B	14.6	B	13.4
Eastbound Off & NC 273 (Exit 27)	A	7.7	B	10.7
Westbound On & NC 273 (Exit 27)	A	6.7	B	12.9

**Table 5** indicates that three intersections (westbound off/NC 274, eastbound on/US 321, and westbound on/US 321) operate at an unacceptable LOS E and F in the base year 2000. A total of four intersections operate at LOS E or F in the design year 2025. However, six of the 17 intersections exhibited a reduction in intersection delay in 2025.

Four of these six intersections with reduced traffic are located at Exits 22 and 26. This area between the two interchanges is expected to experience a reduction in traffic due to the proposed Belmont-Mount Holly Loop that is planned to cross I-85 in this area. Two of the six intersections were at the US 321 interchange, where volumes decreased because NC 279 is planned on being widened to a five-lane section north of NC 7 by 2025.

**9.4.3 I-85 On and Off-ramp Unsignalized Intersections**

For unsignalized intersections, traffic operations are measured in terms of average vehicle delay (seconds/vehicle). The average total delay for any particular movement is a function of the service rate or capacity of the approach and the degree of saturation.

**Table 6** summarizes the peak hour LOS for the two unsignalized intersections and intersection capacity utilization.

**Table 6: I-85 On and Off-Ramp Unsignalized Intersection Summary**

I-85 On/Off Ramp Intersections	2000		2025	
	LOS	Intersection Capacity Utilization	LOS	Intersection Capacity Utilization
Eastbound Off & NC 7 (Exit 19)	A	51.3%	B	61.6%
Westbound Off & NC 7 (Exit 19)	A	55.4%	C	71.4%

The two unsignalized intersections have acceptable levels of service for the design year, which indicates no further intersection improvements are necessary from a capacity standpoint.

#### 9.4.4 I-485 Freeway Sections

I-485 is currently under construction. The freeway section of I-485 was analyzed from north of I-85 to south of NC 49 in Mecklenburg County for 2025.

**Table 7** summarizes the I-485 basic freeway peak hour LOS for 2025 in the corridor study area.

**Table 7: I-485 Basic Freeway LOS Summary**

I-485 Freeway Section	2025 LOS
Just North of I-85	D
I-85 to US 29-74	D
South of US 29-74 to Paul Brown Road (future road)	D
South of Paul Brown Road (future road) to NC 160 (West Blvd [SR 1448])	D
South of NC 160 (West Boulevard [SR 1448]) to Arrowood Road Extension (SR 1138)	D
South of Arrowood Road Extension (SR 1138) to NC 49	C
South of NC 49	D

Since the urban area of Charlotte includes I-485, all of the basic freeway segments operate at an acceptable LOS (C or D) in the design year 2025.

#### 9.4.5 US 29-74 Capacity Analysis

In order to evaluate the multi-lane route, US 29-74, through the suburban and urban areas of the corridor study area, two methods were available for analysis. The first method is the multi-lane highway analysis using HCS 2000 and the second is arterial LOS analysis using Synchro Version 5.

In general, multi-lane highway analysis is used for suburban areas where the free-flow speed is 45 mph (72 kph) or greater and the traffic flow is not significantly interrupted by other signals; signal spacing is farther apart. Arterial analysis is used for urban areas where the signals are closely spaced (about one mile (1.6 kilometers) or less) and the free-flow speeds are less than 45 mph (72 kph).

Along US 29-74, traffic flow is significantly influenced by traffic signals since most of the signalized intersections in the corridor study area are within two miles (3.2 kilometers) of each other. In Gastonia, signalized intersections control the capacity and govern the level of service provided to the motoring public on existing US 29-74. The turning movement data required to calculate intersection levels of service along US 29-74 were not available for this study.

**US 29-74 Multi-Lane Highway Analysis.** Multi-lane highway analyses were conducted between signalized intersections along the sections where the posted speed limit is 45 mph (72 kph) or greater and the signals are spaced farther apart (about one mile (1.6 kilometers) or more). These sections are from Shannon Bradley Road (SR 1135) to Garrison Boulevard (SR 2466) and from NC 279-New Hope Road (SR 2302) to east of future I-485 (See **Figure 6**).

Ten or twenty access points per mile were used for the analysis of multi-lane highway segments, and are based on windshield surveys. Traffic operations are measured in terms of density, which is passenger cars per mile per lane (pc/mi/ln) [per kilometer per lane (pc/km/ln)].

**Table 8** shows the levels of service for peak and off-peak directions for 2000 and the design year 2025 broken out between intersections. The sections are listed from west to east along US 29-74.

**Table 8: US 29-74 Multilane Highway Level of Service Summary**

US 29-74 Multilane Highway Section (From / To)	2000		2025	
	Peak Direction	Off-Peak Direction	Peak Direction	Off-Peak Direction
Shannon Bradley Road (SR 1135) / Bolding Street (SR 1205)	B	A	C	B
Bolding Street (SR 1205) / Myrtle School Road (SR 1136)	B	A	C	A
Myrtle School Road (SR 1136) / Garrison Boulevard (SR 2466)*	A	A	A	A
NC 279 (New Hope Road [SR 2302])/ Aberdeen Boulevard (SR 2381)	A	A	B	A
Aberdeen Boulevard (SR 2381) / Cox Road (SR 2200)	A	A	B	B
Cox Road (SR 2200) / Franklin Sq Shopping Center Entrance #2 **	B	B	D	C
Franklin Sq Shopping Center Entrance #2 / Franklin Sq Shopping Center Entrance #4	C	B	E	C
Franklin Sq Shopping Center Entrance #4 / Church Street (SR 2339) **	B	B	D	C
Church Street (SR 2339) / Redbud Drive (SR 2329)	A	A	B	A

**Table 8: US 29-74 Multilane Highway Level of Service Summary**

US 29-74 Multilane Highway Section (From / To)	2000		2025	
	Peak Direction	Off-Peak Direction	Peak Direction	Off-Peak Direction
Redbud Drive (SR 2329)/ Westover Road	A	A	B	B
Westover Road / Groves Street (SR 2213)	A	A	B	B
Groves Street (SR 2213) / Mockingbird Lane (SR 2349)	A	A	B	B
Mockingbird Lane (SR 2349) / Wesleyan Drive (SR 2209)	A	A	B	B
Wesleyan Drive (SR 2209) / Lakewood Road (SR 2014)	B	A	B	B
Lakewood Road (SR 2014) / Belmont-Mount Holly Loop (future road)	A	A	B	A
Belmont-Mount Holly Loop (future road) / NC 7 (Main Street North)	A	A	B	A
NC 7 (Main Street North) / NC 273 (Park Street [North of NC 7])	A	A	B	A
NC 273 (Park Street [North of NC 7])/ 6 <sup>th</sup> Street (SR 2222)	A	A	A	A
6 <sup>th</sup> Street (SR 2222) / Mecklenburg County Line	A	A	B	B
Mecklenburg County Line / Sam Wilson Road [SR 1625]	A	A	B	B
Sam Wilson Road [SR 1625]/ Future I-485	A	A	C	B
East of Future I-485	A	A	C	B

\* From Garrison Boulevard (SR 2466) to NC 279-New Hope Road (SR 2302), arterial analysis was performed.

\*\* Closely spaced segments, not shown on Figure 7.

In 2025, there is one location where the LOS is an E, between Franklin Square Shopping Center Entrance #2 and #4. The multi-lane highway analysis indicates that, for these sections of US 29-74, there are enough lanes provided to carry the projected traffic volumes. However, due to the numerous driveways along the multi-lane highway sections and the presence of signal operations (which are not included in the multi-lane freeway analysis), the motorists' perceived LOS likely is worse than the calculated LOS listed in **Table 8**.

**US 29-74 Arterial Analysis.** Along the section of US 29-74 where the speed limits were less than 45 mph (72 kph), between Garrison Boulevard (SR 2466) and NC 279-New Hope Road (SR 2302), arterial analysis was conducted using Synchro. The existing signals along this section operate in a coordinated network during the PM peak hour. Existing signal timing data provided by Gastonia and estimated turning movement percentages from the travel demand model were used to simulate the existing and future traffic operations at the signalized intersections. (It should be noted that the turning movement percentages available from the travel demand model were adequate for the arterial analysis, but were not considered sufficiently accurate to perform intersection capacity analyses.)

The Arterial Travel Time report from Synchro contains information about the speed and travel time for an arterial. This report mirrors the reports used in the Arterials section of the HCM, Chapter 11. The Arterial report also can be compared with field travel time studies. The Arterial LOS is based on the speed (mph) [kph] and the Arterial Class of each segment of the arterial. Since the segment speeds were between 36 mph (58 kph) and 45 mph (72 kph), each segment was classified as Arterial Class II.

**Table 9** shows the arterial peak hour LOS for eastbound and westbound directions for 2000 and the design year 2025 averaged along the section.

**Table 9: US 29-74 Arterial Level of Service Summary**

US 29-74 Arterial Section (From / To [Direction])	2000		2025	
	Arterial Speed (mph) [kph]	LOS	Arterial Speed (mph) [kph]	LOS
Garrison Boulevard (SR 2466) / NC 279 (New Hope Road [SR 2302]) (EB)	21 [33.7]	D	16 [26.1]	E
Garrison Boulevard (SR 2466) / NC 279 (New Hope Road [SR 2302]) (WB)	22 [35.5]	C	19 [31.4]	D

In 2000, Arterial LOS D and C were estimated for the eastbound and westbound directions, respectively.

In 2025, LOS E and D were estimated for the eastbound and westbound directions, respectively. In terms of arterial speeds, the eastbound direction dropped from 21 miles per hour (mph) (33.7 kph) in 2000 to 16 mph (26.1 kph) in 2025. The westbound direction dropped from a peak hour average of 22 mph (35.5 kph) in 2000 to 19 mph (31.4 kph) in 2025. **Figure 8** displays the arterial speeds and LOS along US 29-74.



#### 9.4.6 US 321 Capacity Analysis

**US 321 Multi-Lane Highway Analysis.** As described above for US 29-74, multi-lane highway analysis was conducted between signalized intersections along the segments of US 321 where the posted speed limit is 45 mph (72 kph) or greater. These sections are from the South Carolina state line to Forbes Road (SR 2420), Forbes Road (SR 2420) to Stagecoach Road (SR 1136), Stagecoach Road (SR 1136) to Little Mountain Road (SR 2412), Little Mountain Road (SR 1136) to Hudson Boulevard (SR 1255) in the area south of Gastonia. North of Gastonia, the section of US 321 analyzed was from Davidson Avenue to Rankin Lake Road (See **Figure 6**). .

Ten or twenty access points per mile (kilometer) also were used for the analysis of multi-lane highway segments, based on windshield surveys of the route.

**Table 10** shows the LOS for peak and off-peak directions for 2000 and the design year 2025 broken out between intersections. The sections are listed from south to north along US 321.

**Table 10: US 321 Multilane Highway Level of Service Summary**

US 321 Multilane Highway Section (From / To)	2000		2025	
	Peak Direction	Off-Peak Direction	Peak Direction	Off-Peak Direction
South Carolina state line / Forbes Rd (SR 2420)	A	A	A	A
Forbes Road (SR 2420)/ Crowders Creek Road (SR 1103)	A	A	B	A
Crowders Creek Road (SR 1103) /Little Mountain Road (SR 2412)	A	A	B	A
Little Mountain Road (SR 2412) / Davis Park Road (SR 1153)	B	A	B	B
Davis Park Road (SR 1153) / Hudson Boulevard (SR 1255)*	B	A	B	B
Davidson Avenue / I-85	B	B	C	B
I-85 / Rankin Lake Road	D	C	D	C

\* From Hudson Boulevard (SR 1255) to Davidson Avenue, arterial analysis was performed.

**Table 10** lists the LOS in 2000 and 2025 based on the methodology of the multi-lane highway analysis. All segments are projected to operate at LOS C or better, except for the segment near I-85, which is projected to operate at LOS D in the peak direction in 2000 and 2025. Again, the results indicate US 321 has a sufficient number of lanes to carry projected traffic. However, it does not fully describe the traveler's experience, especially at the I-85 interchange area. As shown in **Table 5**, the signalized intersection of the WB on-ramp and US 321 has a LOS F in 2000 and 2025.

**US 321 Arterial Analysis.** An arterial analysis was conducted along the segment of US 321 where the posted speed limit is less than 45 mph (72 kph), which is between Hudson Boulevard (SR 1255) and Davidson Avenue in Gastonia (See **Figure 6**). Since the segment speeds were less than 35 mph (56 kph), each segment was classified as Arterial Class IV.

**Table 11** shows the arterial peak hour LOS for northbound and southbound directions for 2000 and the design year 2025 averaged along the sections of US 321 from south to north.

**Table 11: US 321 Arterial Level of Service Summary**

US 321 Arterial Section (From / To [Direction])	2000		2025	
	Arterial Speed (mph) [kph]	LOS	Arterial Speed (mph) [kph]	LOS
Hudson Boulevard (SR 1255) / Chester Street [NB York Road]	17.1 [27.5]	C	14.7 [23.6]	C
Hudson Boulevard (SR 1255) / Chester Street [SB York Road]	18.6 [29.9]	B	12.7 [20.4]	C
Garrison Boulevard (SR 2466) / York Road [SB Chester Street]	19.6 [31.5]	B	12.4 [20.0]	D
York Road / Davidson Avenue [NB Chester Street]	28.2 [45.4]	A	27.0 [43.4]	A

In 2000, arterial LOS C was estimated along York Road from Hudson Boulevard (SR 1255) to the signalized intersection of Chester Street (north of US 29-74). In 2025, arterial LOS D was estimated along Chester Street from the signalized intersection of York Road to Garrison Boulevard (SR 2466). Arterial speeds along southbound Chester Street from the signalized intersection of York Road to Garrison Boulevard (SR 2466) dropped from 19.6 mph in 2000 to 12.4 mph in 2025. **Figure 8** displays the arterial speeds and LOS along US 321.

## 10 ACCIDENT ANALYSIS

An accident study of the following six primary routes in Gaston and Mecklenburg counties was conducted to evaluate the relative safety of the existing roadways.

- I-85 from Edgewood Road [SR 1307](Exit 13) in Gaston County to Sam Wilson Road (SR 1625) in Mecklenburg County
- US 29-74 from Edgewood Road (SR 1307) to Sam Wilson Road (SR 1625)
- US 321 from the South Carolina state line to Hardin Road (SR 1607)

- NC 273 from NC 279 to I-85
- NC 274 from the South Carolina line northward to SR 1601 (Costner School Road))
- NC 279 from the South Carolina state line to I-85

Accident data was collected for a three-year period from August 1, 1998 to July 31, 2001 and included the accident rates, the accident types, and the intersections with the highest frequency of accidents.

Accident rates are determined by the length of roadway, average daily traffic, and number of reported accidents along a route for a specific time frame. The most recent available statewide average accident rates are categorized according to the type of facility based on 1996-1998 Statewide Crash Rates.

### 10.1 I-85 Accident Rates and Types

The accident study along I-85 includes the segment from Edgewood Road [SR 1307] (Exit 13), eastward past the Mecklenburg County line to Sam Wilson Road (SR 1625). A total of 1,539 reported accidents occurred along this 16.9-mile (27.2-kilometer) section of interstate. Reported accidents occurring on the crossroads of I-85 are not included in this accident total. Of the total, four accidents (0.26%) were fatal, 526 (34.18%) were non-fatal injury accidents, and 1,009 accidents (65.56%) resulted in property damage only. The 1,539 reported accidents resulted in approximately \$7,878,147 in property damage.

**Table 12** is a comparison summary of the accident rates per 100 million vehicle miles (100 MVM) [per 100 million vehicle kilometers (100 MVK)] along the Gaston and Mecklenburg County sections of I-85 compared to the North Carolina statewide average accident rates for similar routes. Accident rates were calculated based on the average daily traffic flow for the Gaston and Mecklenburg County sections of I-85, 93,200 and 100,000 vpd, respectively.

**Table 12: I-85 Accident Rates**

Location	Segment	Length (Miles) [Km]	Total Accidents (Per 100 MVM) [Per 100 MVK]	Fatal Accidents (Per 100 MVM) [Per 100 MVK]	Non-Fatal Accidents (Per 100 MVM) [Per 100 MVK]
Gaston County	Edgewood Road [SR 1307] (Exit 13) to County Line	14.89 [24.0]	93.82 [58.30]	0.20 [0.12]	32.02 [19.90]
Mecklenburg County	County Line to Sam Wilson Road [SR 1625]	2.01 [3.23]	50.84 [31.59]	0.45 [0.28]	17.70 [11.00]

**Table 12: I-85 Accident Rates**

Location	Segment	Length (Miles) [Km]	Total Accidents (Per 100 MVM) [Per 100 MVK]	Fatal Accidents (Per 100 MVM) [Per 100 MVK]	Non-Fatal Accidents (Per 100 MVM) [Per 100 MVK]
Statewide Average	Interstate Route, 4 or more lanes divided w/ full control of access	--	97.37 [60.50]	0.79 [0.49]	35.24 [21.90]

**Table 12** indicates that along both sections of I-85, accident rates are below the statewide average in total, fatal, and non-fatal accidents per 100 MVM (100 MVK). However, these reported accidents, and other incidents which occur along I-85, create delays for motorists. Along I-85 in Gaston County, from the Mecklenburg County to the US 29-74 junction, data on reported incidents was collected from NCDOT Incident Management. For a one-year period between 2000 and 2001, 2,399 reported incidents occurred along this section during the weekdays (Monday through Friday). Broken down by time of day, there is an AM and PM peak. Approximately 23 percent of the total number of incidents occurred between 7 and 9 AM, and approximately 19 percent occurred between 3 and 5 PM. **Table 13** illustrates the accident types and percentage of the total reported accidents for the two sections of I-85.

**Table 13: I-85 Accident Type Summary**

Roadway Section	Turning Movements		Rear-End		Run-off Road		Angle		Side Swipe		Other	
	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total
I-85, Edgewood Road [SR 1307] to Mecklenburg County Line	76	5.32	441	30.90	209	14.65	196	13.74	198	13.88	307	21.51
I-85, Gaston County Line to Sam Wilson Road [SR 1625]	1	0.89	40	35.71	11	9.82	2	1.79	30	26.79	28	25.00

**Table 13** shows the most frequent type of accident that occurred was rear-end collisions. A large percentage of rear-end collisions indicates a congested roadway. Congestion is confirmed by the traffic capacity analysis, where the LOS in 2000 varied between a C and E.

## 10.2 US 29-74 Accident Rates, Types, and Locations

The accident study along US 29-74 includes the segment from Edgewood Road [SR 1307], eastward past the Mecklenburg County line to Sam Wilson Road [SR 1625]. A total of 2,612 reported accidents occurred along the 15.94-mile (25.65-kilometer) section of roadway. Reported accidents that occurred on the crossroads of US 29-74 are included in this accident total. Of the total, six accidents (0.23%) were fatal, 1,085 (41.5%) were non-fatal injury accidents, and 1,521 accidents (58.2%) resulted in property damage only. The 2,612 reported accidents resulted in approximately \$10,478,445 in property damage.

**Table 14** is a comparison summary of the accident rates per 100 MVM (100 MVK) along the Gaston and Mecklenburg County sections of US 29-74 compared to the North Carolina statewide average accident rates for similar routes. Since US 29-74 changes roadway type along the 15.94-mile [25.65-kilometer], it is compared to US routes with 4+ lanes undivided, 4+ lanes divided with no control access, and 4+ lanes with partial control access. Accident rates were calculated based on the average daily traffic flow for the Gaston and Mecklenburg County sections of US 29-74, 20,500 and 17,500 vpd, respectively.

**Table 14** indicates that both sections of highway studied are well above the statewide averages in total accidents per 100 MVM (100 MVK). The 4+ lanes undivided section is approximately five times the statewide average, and the 4+ lanes divided with no control access section is approximately three times the statewide average.

**Table 14: US 29-74 Accident Rates**

Location	Segment	Road Type	Length (Miles) [Km]	Total Accidents (Per 100 MVM) [Per 100 MVK]	Fatal Accidents (Per 100 MVM) [Per 100 MVK]	Non-Fatal Accidents (Per 100 MVM) [Per 100 MVK]
Gaston County	Edgewood Road [SR 1307] (Exit 13) to the Mecklenburg County Line	All	14.39 [23.16]	777.26 [482.99]	1.55 [0.96]	322.91 [200.66]
	Myrtle School Road (SR 1136) to NC 279 (New Hope Road [SR 2302])	4+ lanes undivided	4.02 [6.47]	1,312.07 [815.32]	1.11 [0.69]	677.22 [420.82]
	Edgewood Road (SR 1307) to Myrtle School Road (SR 1136) and NC 279 (New Hope Road [SR 2302]) to Wesleyan Drive (SR 2209)	4+ lanes divided with no control access	6.25 [10.06]	606.57 [376.92]	2.85 [1.77]	251.99 [156.59]
	Wesleyan Drive (SR 2209) to the Mecklenburg County Line	4+ lanes divided with partial control access	4.12 [6.63]	206.52 [128.33]	0 [0]	85.80 [53.32]
Mecklenburg County	Gaston County Line to Sam Wilson Road (SR 1625)	4+ lanes divided with partial control access	1.55 [2.49]	331.01 [208.80]	3.36 [2.09]	137.91 [85.70]
Statewide Average		All	--	199.51 [123.98]	1.56 [0.97]	86.80 [53.94]
		US Route, 4+ lanes undivided	--	271.79 [168.92]	0.98 [0.61]	118.17 [73.44]
		US Route, 4+ lanes divided with no control access	--	196.86 [122.35]	1.25 [0.78]	85.50 [53.14]
		US Route, 4+ lanes divided with partial control access	--	128.31 [79.74]	1.10 [0.69]	56.00 [34.81]

**Table 15** illustrates the accident types and percentage of the total reported accidents for the sections of US 29-74 in Gaston and Mecklenburg Counties.

**Table 15: US 29-74 Accident Type Summary**

Roadway Section	Turning Movements		Rear-End		Run-off Road		Angle		Side Swipe		Other	
	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total
US 29-74, Edgewood Road [SR 1307] to Mecklenburg County Line	415	16.51	1041	41.42	95	3.78	675	26.86	155	6.17	132	5.25
US 29-74, Gaston County Line to Sam Wilson Road [SR 1625]	18	18.18	35	35.35	9	9.09	6	6.06	17	17.17	14	14.14

**Table 15** indicates that the most frequent type of accident that occurred was rear-end collisions. Angle and turning movement accidents also are a high percentage of the total. Considering these three accident types and the roadway characteristics, it is apparent that accidents are due to traffic entering and exiting the roadway and traffic signal congestion.

Of the 2,612 reported accidents along this section of US 29-74, over 60% occurred within 50 feet (15 meters) of an intersection. **Table 16** shows the intersections with the highest number of accidents, listed from west to east along US 29-74.

The greatest number of accidents (105) at a single intersection (non-couplet) occurred at the NC 279 (New Hope Road [SR 2302]) intersection. This is most likely due to shopping areas located at three of the four corners of the intersection, which requires traffic to turn into and out of the area (turning movements) from US 29-74 and NC 279. NC 279 is a major arterial, connecting southeastern Gaston County to Gastonia and the shopping areas along US 29-74.

**Table 16: US 29-74 High Accident Locations**

US 29-74 Intersections	# of Accidents
NC 274 (Bessemer City Road [North of US 29-74]) / Garrison Boulevard (SR 2466)	70
SR 1131/SR 1339/Airline/Gaston/Linwood	43
US 321/US 321 Couplet (York Road/Chester Street)	53
Oakland Street (SR 1001)	46
NC 274 Couplet (Broad Street)	118
Chestnut Street	65
Beverly Drive	60
NC 279 (New Hope Road [SR 2302])	105
Armstrong Park Road (SR 2466)/Cox Road (SR 2200)	70
Church Street (SR 2339)	49

### 10.3 US 321 Accident Rates, Types, and Locations

The accident study along US 321 in Gaston County includes the segment from the South Carolina state line northward to Hardin Road (SR 1607). A total of 1,661 reported accidents occurred along the 16.16-mile (26.00-kilometer) section of roadway. Reported accidents that occurred within 100 feet (30 meters) of US 321 along the crossroads are included in this accident total. Of the total, ten accidents (0.60%) were fatal, 719 (43.29%) were non-fatal injury accidents, and 932 accidents (56.11%) resulted in property damage only. The 1,661 reported accidents resulted in approximately \$7,023,798 in property damage.

**Table 17** is a comparison summary of the accident rates per 100 MVM (100 MVK) along the Gaston County section of US 321 compared to the North Carolina statewide accident rates for US routes by roadway type. Since the US 321 roadway type varies along the 16.16-mile [26.00-kilometer] section, it is compared to US Routes with 4+ lanes undivided, 4+ lanes divided with no control access, 4+ lanes with partial control access, and 4+ lanes with full control access. Accident rates were calculated based on the average daily traffic flow for the section of US 321, 13,600 vpd.

**Table 17: US 321 Accident Rates**

<b>Location</b>	<b>Segment</b>	<b>Road Type</b>	<b>Length (Miles) [Km]</b>	<b>Total Accidents (Per 100 MVM) [Per 100 MVK]</b>	<b>Fatal Accidents (Per 100 MVM) [Per 100 MVK]</b>	<b>Non-Fatal Accidents (Per 100 MVM) [Per 100 MVK]</b>
Gaston County	SC State Line to Hardin Road	All	16.16 [26.00]	689.57 [428.50]	4.15 [2.58]	298.50 [185.49]
	Davidson Avenue to C Grier Beam Boulevard (SR 1336)	4+ lanes undivided	1.03 [1.66]	1636.38 [1016.80]	13.04 [8.10]	108.65 [67.51]
	Hudson Boulevard (SR 1255) to Davidson Avenue	4+ lanes divided with no control access	2.60 [4.18]	2440.65 [1516.55]	7.75 [4.82]	409.06 [254.18]
	SC State Line to Hudson Boulevard (SR 1255)	4+ lanes divided with partial control access	6.96 [11.20]	316.45 [196.63]	1.93 [1.20]	145.01 [90.11]
	C Grier Beam Boulevard (SR 1336) to the Lincoln County Line	4+ lanes divided with full control access	5.57 [8.96]	154.31 [95.88]	2.41 [1.50]	55.41 [34.43]
Statewide Average		All	--	199.51 [123.98]	1.56 [0.97]	86.80 [53.94]
		US Route, 4+ lanes undivided	--	271.79 [168.92]	0.98 [0.61]	118.17 [73.44]
		US Route, 4+ lanes divided with no control access	--	196.86 [122.35]	1.25 [0.78]	85.50 [53.14]
		US Route, 4+ lanes divided with partial control access	--	128.31 [79.74]	1.10 [0.69]	56.00 [34.81]
		US Route, 4+ lanes divided with full control access	--	98.14 [60.98]	0.91 [0.57]	37.73 [23.44]

**Table 17** indicates that with one exception, the section of highway studied is well above the statewide averages in total, fatal, and non-fatal accidents per 100 MVM (100 MVK). The one exception is non-fatal accident rate for the 4+ lanes undivided section. The 4+ lanes divided with no control access section of highway studied is approximately twelve times the statewide average, and the 4+ lanes undivided section is approximately six times the statewide average. The fatality rate for the 4+ lanes undivided section is approximately thirteen times the statewide average. There were a total of eleven fatalities, six were involved in angle accidents, two were pedestrians, two were fixed object collisions, and one was a left-turn accident.

**Table 18** illustrates accident types and percentage of the total reported accidents for the section of US 321.

**Table 18: US 321 Accident Type Summary**

Roadway Section	Turning Movements		Rear-End		Run-off Road		Angle		Side Swipe		Other	
	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total
US 321, South Carolina state line to Hardin Road (SR 1607)	273	16.44	575	34.62	94	5.66	478	28.77	111	6.68	130	7.83

**Table 1-18** indicates the most frequent type of accident that occurred was rear-end collisions. Angle accidents also are a high percentage. Considering these two accident types and the roadway characteristics, it is apparent that accidents are due to traffic entering and exiting the roadway and traffic signal congestion.

Of the 1,616 reported accidents along this section of US 321, over 70% occurred within 50 feet (15 meters) of an intersection. **Table 19** shows the intersections with the highest number of accidents listed from south to north along US 321.

The greatest number of accidents (173) occurred at the US 29-74 (Franklin Boulevard) intersection. This is most likely due to the high traffic volumes. In addition, US 321 is divided into two one-way streets (Chester Street and York Road) at US 29-74 (Franklin Boulevard) and therefore, there are two signalized intersections of US 321 and US 29-74. These two intersections are located in the center of downtown Gastonia where there are closely spaced intersections and driveways, and visible pedestrian traffic.

**Table 19: US 321 High Accident Locations**

US 321 Intersections	# of Accidents
Hudson Boulevard (SR 1255)	51
Sixth Avenue (SR 1143)	56
Second Avenue	67
US 29-74/Franklin Boulevard	173
NC 7 (Airline Avenue)	100
Rankin Lake Road	87
I-85	73

#### 10.4 NC 273 Accident Rates, Types, and Locations

The accident study along NC 273 in Gaston County includes the segment from NC 279 northward to I-85. A total of 334 reported accidents occurred along the 8.29-mile (13.34-kilometer) section of roadway. Reported accidents that occurred within 100 feet of NC 273 along the crossroads are included in this accident total. Of the total, no accidents (0 %) were fatal, 101 (30.24%) were non-fatal injury accidents, and 233 accidents (69.76%) resulted in property damage only. The 334 reported accidents resulted in approximately \$1,461,435 in property damage.

**Table 20** is a comparison summary of the accident rates per 100 MVM (100 MVK) along the Gaston County section of NC 273 compared the North Carolina statewide accident rates for similar roadways. Accident rates were calculated based on the average daily traffic flow for the section of NC 273, 8,800 vpd.

**Table 20: NC 273 Accident Rates**

Location	Segment	Length (Miles) [Km]	Total Accidents (Per 100 MVM) [Per 100 MVK]	Fatal Accidents (Per 100 MVM) [Per 100 MVK]	Non-Fatal Accidents (Per 100 MVM) [Per 100 MVK]
Gaston County	NC 279 to I-85	8.29 [13.34]	417.73 [259.58]	0.0 [0.0]	126.32 [78.50]
Statewide Average	NC Route, 2 lanes undivided	--	216.47 [134.54]	2.23 [1.38]	95.70 [59.48]

**Table 20** indicates along the section of NC 273, the total accident rate and the non-fatal accident rate are

slightly above the statewide averages and the fatal accident rate is zero because no fatal accidents occurred.

**Table 21** illustrates the accident types and percentage of the total reported accidents for the section of NC 273.

**Table 21: NC 273 Accident Type Summary**

Roadway Section	Turning Movements		Rear-End		Run-off Road		Angle		Side Swipe		Other	
	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total
NC 273, NC 279 to I-85	58	17.37	104	31.14	31	9.28	71	21.26	16	4.78	54	16.17

**Table 21** indicates the most frequent type of accident that occurred was rear-end collisions. Angle accidents also are a high percentage. A large percentage of rear-end collisions and angle accidents indicates a congested roadway.

**Table 22** shows the intersections with the highest number of accidents listed from south to north along NC 273.

**Table 22: NC 273 High Accident Locations**

NC 273 Intersections	# of Accidents
NC 7 / Catawba Street (SR 2637)	19
US 29-74 / Wilkinson Boulevard	44
Abbey Plaza / Browntown Road (SR 2070)	27
I-85 interchange area	73

The most accidents (73) occurred at the I-85 interchange area. This is most likely due to the high volume of turning traffic onto/from I-85.

## 10.5 NC 274 Accident Rates, Types, and Locations

The accident study along NC 274 in Gaston County includes the segment from the South Carolina state line northward to Costner School Road (SR 1601). A total of 822 reported accidents occurred along the 16.20-mile (26.07-kilometer) section of roadway. Reported accidents that occurred within 100 feet of NC

274 along the crossroads are included in this accident total. Of the total, four accidents (0.49%) were fatal, 321 (39.05%) were non-fatal injury accidents, and 497 accidents (60.46%) resulted in property damage only. The 822 reported accidents resulted in approximately \$3,208,705 in property damage.

**Table 23** is a comparison summary of the accident rates per 100 MVM (100 MVK) along the Gaston County section of NC 274 compared the North Carolina statewide accident rates for similar roadways. Accident rates were calculated based on the average daily traffic flow for the section of NC 274, 16,000 vpd.

**Table 23: NC 274 Accident Rates**

Location	Segment	Length (Miles) [Km]	Total Accidents (Per 100 MVM) [Per 100 MVK]	Fatal Accidents (Per 100 MVM) [Per 100 MVK]	Non-Fatal Accidents (Per 100 MVM) [Per 100 MVK]
Gaston County	South Carolina state line to Costner School Road (SR 1601)	16.20 [26.07]	289.35 [179.79]	1.41 [0.88]	113.00 [70.21]
Statewide Average	NC Route, 2 lanes undivided	--	216.47 [134.54]	2.23 [1.38]	95.70 [59.48]

**Table 23** indicates along the section of NC 274, the total accident rate and the non-fatal accident rate are slightly above the statewide averages and the fatal accident rate is below the statewide average.

**Table 24** illustrates the accident types and percentage of the total reported accidents for the section of NC 274.

**Table 24: NC 274 Accident Type Summary**

Roadway Section	Turning Movements		Rear-End		Run-off Road		Angle		Side Swipe		Other	
	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total
NC 274, South Carolina state line to Costner School Road (SR 1601)	145	17.64	326	39.66	56	6.81	190	23.11	28	3.41	77	9.37

**Table 24** indicates the most frequent type of accident that occurred was rear-end collisions. Angle accidents also are a high percentage. A large percentage of rear-end collisions and angle accidents indicates a congested roadway.

**Table 25** shows the intersections with the highest number of accidents listed from south to north along NC 274.

**Table 25: NC 274 High Accident Locations**

NC 274 Intersections	# of Accidents
Neal Hawkins Road (SR 2400) / Robinwood Road (SR 2446)	48
East Seventh Street / Garrison Boulevard (SR 2466)	53
US 29-74 / Broad Street	39
US 29-74 / Garrison Boulevard (SR 2466)	35

## 10.6 NC 279 Accident Rates, Types, and Locations

The accident study along NC 279 includes the segment from the South Carolina state line northward to I-85. A total of 793 reported accidents occurred along the 11.51-mile (18.52-kilometer) section of roadway. Reported accidents that occurred within 100 feet of NC 279 along the crossroads are included in this accident total. Of the total, two accidents (0.25%) were fatal, 338 (42.62%) were non-fatal injury accidents, and 453 accidents (57.12%) resulted in property damage only. The 793 reported accidents resulted in approximately \$3,121,117 in property damage.

**Table 26** is a comparison summary of the accident rates per 100 MVM (100 MVK) along the 11.51-mile (18.52-kilometer) section of NC 279 compared to the North Carolina statewide accident rates for similar routes. Accident rates were calculated based on the average daily traffic flow for the section of NC 279, 14,100 vpd.

**Table 26: NC 279 Accident Rates**

Location	Segment	Length (Miles) [Km]	Total Accidents (Per 100 MVM) [Per 100 MVK]	Fatal Accidents (Per 100 MVM) [Per 100 MVK]	Non-Fatal Accidents (Per 100 MVM) [Per 100 MVK]
Gaston County	South Carolina state line north to I-85	11.51 [18.52]	445.83 [277.03]	1.12 [0.70]	190.03 [118.08]
Statewide Average	NC Route, 2 lanes undivided	--	216.47 [134.54]	2.23 [1.38]	95.70 [59.48]

**Table 26** indicates that along the section of NC 279, the total accident rate and the non-fatal accident rate is approximately twice the statewide average, and the fatal accident rate is approximately one-half the statewide average.

**Table 27** illustrates the accidents types and percentage of the total reported accidents for the section of NC 279.

**Table 27: NC 279 Accident Type Summary**

Roadway Section	Turning Movements		Rear-End		Run-off Road		Angle		Side Swipe		Other	
	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total	# of Acc.	% of Total
NC 279, South Carolina state line to I-85	127	16.02	349	44.01	48	6.05	184	23.20	23	2.90	62	7.82

**Table 27** indicates the most frequent type of accident that occurred was rear-end collisions. Angle accidents also are a high percentage. A large percentage of rear-end collisions and angle accidents indicates a congested roadway.

Of the 793 reported accidents along this section of NC 279, over 70% occurred within 50 feet (15 meters) of an intersection. This is yet another indication of congestion. **Table 28** shows the intersections with the highest number of accidents listed from north to south along NC 279.

**Table 28: NC 279 High Accident Locations**

NC 279 Intersections	# of Accidents
Redbud Drive (SR 2329)	54
Armstrong Park Drive / Garrison Boulevard (SR 2466)	60
US 29-74 (Franklin Boulevard)	126
I-85	51

The most accidents (126) occurred at the US 29-74 (Franklin Boulevard) intersection. This is most likely due to the high volume of traffic on US 29-74.

## 11 Overview of Mobility and Connectivity Issues

South of I-85 in southern Gaston County, a lack of connecting east-west roadways makes travel circuitous and limits mobility. Likewise, mobility is inhibited between southern Gaston County and Mecklenburg County because the Catawba River acts as natural barrier, and current connections are experiencing, or projected to experience, operational problems. This section provides an overview of the mobility and connectivity issues detailed in Sections 4-10.

**Within Southern Gaston County.** Currently, there are no continuous east-west routes in southern Gaston County. The NC Routes in southern Gaston County generally run more north/south. These routes, NC 273, NC 274, and NC 279, all have accident rates above the statewide averages for similar roadways.

The need for improved connectivity and east-west mobility within southern Gaston County will continue to grow as the population in this area increases. Between 1990 and 2000, southeastern Gaston County had the largest population increase in the County. According to the draft Gaston County Comprehensive Plan (Section 8.3), southern Gaston County, especially the southeastern part, is expected to continue to experience high residential growth in the next twenty years.

**Between Southern Gaston County and Mecklenburg County.** Mecklenburg County is the hub of the 13-county Charlotte region and is the primary center for employment, shopping, and other economic activities. The linkage between Gaston County and Mecklenburg County is demonstrated by commuting patterns. In 1990, approximately 22,000 people left Gaston County daily to go to work, with the overwhelming majority (73%) going to Mecklenburg County. Approximately 16,000 people came from other counties into Gaston County to work on a daily basis, with 22% of these workers originating from Mecklenburg County.

There is demand for regional accessibility through Gaston County to points west, southwest, and northwest as well. The Charlotte region is a major trucking center, and destinations to the southwest (i.e., Greenville-Spartanburg, SC and Atlanta, GA), west (i.e., Asheville, NC), and northwest (i.e., Hickory, NC) are reached by traveling on I-85 and US 321 through Gaston County. Tourists from the Charlotte metropolitan area traveling to the mountains of western North Carolina and Tennessee also use I-85 and US 321 through Gaston County.

Accessibility and regional travel between southern Gaston County and Mecklenburg County is inhibited because existing connections across the Catawba River have, or are projected to have, operational problems. The parallel corridors of I-85 and US 29-74 serve as the connections between southern Gaston County and Mecklenburg County. Approximately 80 percent of the existing traffic volumes between the counties are provided by the I-85 and US 29-74 corridors. The next closest crossings are 2 ½ miles to the north on NC 27 and 11 miles to the south on NC 49, neither of which are practical for access to/from southern Gaston County.

Many segments of I-85 in the study area currently operate at or above capacity, and congestion is

projected to continue to worsen through the design year 2025. Also, there are high incident rates on I-85, contributing to unexpected delays. US 29-74 is not access controlled and has numerous closely-spaced signalized intersections, so speeds are limited. This road also has high accident rates well above statewide averages.

Residential growth projected in southern Gaston County and residential and employment growth in western Mecklenburg County will continue to place demands on accessibility and connectivity between the two counties. Gaston County expects future residential growth to be focused in southeastern Gaston County due to its proximity to Mecklenburg County (the economic center of the region) and distance away from the watershed area of Mountain Island Lake to the northeast.

The Charlotte-Douglas International Airport in western Mecklenburg County employs approximately 16,000 people and is planning on expanding through construction of a new runway. In the future, the airport also could have an intermodal facility combining rail, truck and air cargo transport that would generate employment opportunities and substantial numbers of regional truck trips.

The Westside Strategic Plan and the I-485/Dixie-Berryhill Strategic Plan call for mixed use and transit-oriented development in the currently sparsely developed part of western Mecklenburg County directly across the Catawba River from southeastern Gaston County. This mixed-use area will create more employment opportunities in proximity to Gaston County in addition to existing office and industrial parks and the Charlotte-Douglas International Airport.

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