

3.1 Study Area Description

One of the most important early activities associated with a large scale, regional transportation corridor study is the development of a clear and understandable description of the geographic area within which the analysis is to be conducted. The definition of a study area requires a balance between the need to account for the majority of traffic flows that would be affected by a significant transportation investment and the resources available for the study.

In this study, “study area definition” refers to the geographic extent over which findings are presented and recommendations made. However, various elements of the study, and especially the travel demand analysis, extend beyond the boundaries of the study area definition. For example, the geographic extent of the demand analysis actually encompasses the entire state, so that major external travel flows affecting the study area can be considered.

The original Request for Proposals (RFP) for this project issued by NCDOT in December 2002 defined the general corridor study limits as follows:

“US 64 from Raleigh to Asheboro with spurs along US 64 to Statesville (connecting to I-40 in both locations) and NC 49 to Charlotte (connecting to I-85)”

The RFP went on to note that “ ... US 64 with both spurs provides a logical relief route for the I-40/I-85 corridor due to the fact this corridor is expected to experience capacity problems within the next 20 years. US 64 also provides connections to the three major urban areas in the state (Triangle, Triad, and Metrolina).” The study area definition builds upon this initial definition.

3.1.1 Regional Study Area

One of the first aspects of defining the study area is determining how best to define the regional travel shed for the US 64–NC 49 Corridor. Clearly, many of the current travel movements along the existing I-40/I-85 Corridor through the central portion of the state have origins and destinations that extend beyond the boundaries of the US 64–NC 49 study area as defined in NCDOT’s RFP. Therefore, the regional study area was defined to capture both the local and intra-regional travel patterns as well as longer distance intrastate and interstate travel movements within the primary study area. The regional study area as defined for the US 64–NC 49 Corridor Study is shown in **Figure 3.1**.

The regional study area encompasses a total of 19 counties in central North Carolina. By using entire counties as the basic geographic area for the definition of the regional travel shed, it was possible to include all of the potentially effected urban areas as well as all of the important junctions along the Interstate and primary state highway systems in this portion of the state. By including both geographic areas (counties) and important highway facilities



such as I-77 that do not directly connect with the defined segments of the US 64–NC 49 Corridor, it is possible to account for decisions that drivers in these “external” areas might make relative to their potential diversion to use US 64 or NC 49, as opposed to other routes serving common destinations.

This latter consideration is particularly important since one of the primary criteria used to define a Statewide Strategic Highway Corridor is its current or potential ability to serve as a reliever route to an existing Interstate facility. It was thus necessary to include a more comprehensive description of the regional and statewide highway network in order to be able to account for all reasonable diversion paths through the study area that might be used by current travelers along I-40 and I-85 and their major feeder routes.

3.1.2 US 64–NC 49 Corridor Study Limits

Figure 3.2 highlights the US 64–NC 49 Corridor within the study area boundaries. No set width surrounding the existing roadways was established. It varied depending on the type of analysis and typically extended one mile or more on either side of the existing highways. The US 64–NC 49 Corridor is approximately 200 miles in total length, traversing ten counties.

The US 64 Corridor extends from I-77 (including I-40 from I-77 to Mocksville) in Statesville (Iredell County) to I-40 in Raleigh (Wake County). The NC 49 Corridor extends from I-85 in Mecklenburg County northeast to US 64 in Asheboro (Randolph County).

The corridor limits build upon the connectivity and Interstate relief criteria established for Strategic Highway Corridors. The US 64–NC 49 Corridor connects three major urban areas in the state including the Triangle, Triad, and Metrolina. Furthermore, US 64 and NC 49 within the corridor limits could provide a logical relief route for I-40 and I-85.

3.1.3 Corridor Overview

The US 64–NC 49 Corridor was segmented into areas with consistent transportation characteristics. For Phase 1 of the study, five segments were identified as described below:

- Statesville to Lexington: I-40 from Statesville to Mocksville and US 64 from Mocksville to just west of Lexington.
- Lexington to Asheboro: US 64 from west of Lexington to NC 49 in Asheboro.
- Asheboro to Pittsboro: US 64 from NC 49 to west of Pittsboro.
- Pittsboro to Raleigh: US 64 from west of Pittsboro to I-440 in Raleigh.
- Charlotte to Asheboro: NC 49 from I-85 in Charlotte to US 64 in Asheboro.

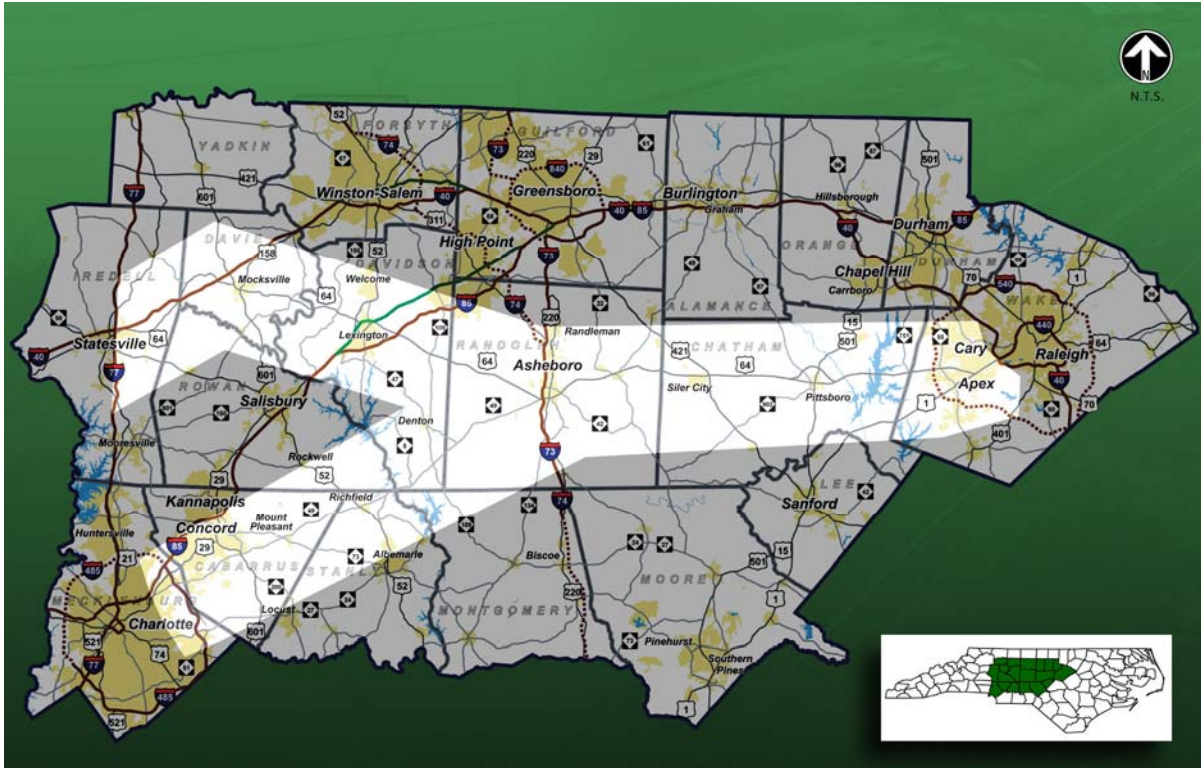
Figure 3.1: Regional Study Area





The following sections provide a general overview of US 64 and NC 49 in terms of facility type and surrounding area.

Figure 3.2: US 64–NC 49 Corridor Study Limits



3.1.3.1 US 64 – Statesville to Lexington

This segment of the corridor begins in Statesville and passes through the town of Mocksville, the small community of Fork, ending at the west side of the city of Lexington. From Statesville to Mocksville, the corridor, as defined for this study, utilizes I-40. I-40 from I-77 to the I-40/US 64 Interchange (Exit 168) is a four-lane, rural freeway with a posted speed limit of 65 mph.



US 64 through Mocksville

Outside the municipal areas of Lexington and Mocksville, the surrounding land use consists of agricultural and forested land with pockets of commercial and large parcel residential use. In the cities, the corridor is developed with commercial and residential uses typical of small to medium sized towns.



From the I-40/US 64 interchange (Exit 168), US 64 heads east to Mocksville as a two-lane, rural road with a 55 mile per hour (mph) posted speed limit.

Through Mocksville, US 64 is a three-lane, winding section with a posted speed limit of 35 to 45 mph.

In the historic district of Mocksville, the posted speed limit is 35 mph. There are safety issues along US 64 in the Mocksville area with its narrow, winding section and numerous access points in historic downtown Mocksville.

East of the US 601 intersection, US 64 transitions to 45 mph, then to 55 mph. From the east side of Mocksville, through Fork, to the west side of Lexington, US 64 is a two-lane, rural roadway through rolling terrain.

3.1.3.2 US 64 – Lexington to Asheboro

This segment of the corridor extends from just west of Lexington to the US 64–NC 49 intersection west of Asheboro. Between the municipal areas of Lexington and Asheboro, the surrounding land use consists of agricultural and forested land with pockets of commercial and large parcel residential use. In the municipal areas, the corridor is heavily developed with commercial and residential uses typical of small to medium sized towns. This segment of US 64 primarily serves as a connector between Asheboro (US 220) and Lexington (I-85).



US 64 through Lexington

Through Lexington, US 64 is a variety of facility types: a four-lane roadway with no access control, partial access control, and full access control; and a five-lane roadway. US 64 overlaps with a section of Business I-85 through Lexington.



US 64 between Lexington and Asheboro

From east of Lexington to west of Asheboro, US 64 is a two-lane, rural highway in hilly terrain with a 55 mph posted speed limit. There are areas of poor sight distance and safety concerns with high-speed travel.

3.1.3.3 US 64 – Asheboro to Pittsboro

This section of the corridor extends from just west of Asheboro to the US 64 Pittsboro Bypass just west of Pittsboro. In between, it passes through small commercial areas associated with Franklinville, the town of Ramseur and the town of Siler City. Through

Asheboro, Franklinville, Ramseur, and Siler City, US 64 serves as a primary commercial corridor. Outside the towns, the land uses primarily are agricultural and forest.

Access is critical to towns and communities that are not directly on, but adjacent to US 64, such as Cedar Falls, Franklinville, and Silk Hope. Although commuter congestion is currently not an issue in this section, safety, speed, and trucking concerns are important.

In general, US 64 is a five-lane roadway through the towns and communities with a posted speed limit of 35 to 45 mph.



US 64 through Asheboro

Through Asheboro, US 64 is a five-lane section with a 45 mph posted speed limit. US 64 is a primary commercial corridor for Asheboro, with uses such as public schools, large shopping centers, automobile sales, hotels, and restaurants having numerous driveways along both sides of the roadway. There are also numerous at-grade intersections, many with traffic signals.



US 64 east of Asheboro

Outside the towns, US 64 is a four-lane, divided highway with generally no control of access and a 55 mph posted speed limit. Crossroads outside the towns are infrequent and are primarily controlled by stop signs. The driveways outside the town areas are widely spaced and provide access to rural residences.



US 64 through Siler City

3.1.3.4 US 64 - Pittsboro to Raleigh

This section of the corridor extends from the western terminus of the Pittsboro Bypass to I-40 in Raleigh. There is significant development in the Wake County portion of this section compared to other sections of the corridor. This section of US 64 is a heavily used commuter corridor with peak-hour directional travel. Approximately 11 percent of the workers who live in Chatham County commute to Wake County based on the 2000 US Census. Existing and planned development will increase weekday congestion and a lengthening of peak-periods on the weekdays. Also, there is some recreational traffic associated with the Jordan Lake state recreational area, especially on summer weekends.



Pittsboro Bypass

The Pittsboro Bypass is a recently constructed four-lane freeway with full control of access around the north side of Pittsboro. It is designated as US 64. The old US 64 through the center of Pittsboro is now US 64 Business. Currently, there are few developed areas along this new freeway, but land use plans for Pittsboro indicate future commercial and/or office development at the Bypass termini and the interchange with US 15-501.

East of the Pittsboro Bypass, the corridor crosses over the Haw River and Jordan Lake and continues into Wake County. US 64 is a four-lane roadway with a grass median, and no access control. The posted speed limit is 55 mph.



US 64 near Jordan Lake

In Wake County, US 64 is an important commercial strip for Cary and Apex. Land uses adjacent to US 64 are primarily commercial with some larger residential subdivisions. Commercial uses include a car dealership mall (Cary Auto Park), strip shopping centers, and offices. There are traffic signals at major cross streets, with the exception of NC 55 and Salem Street, which have interchanges. Most of this section is four-lane, divided with a grass median and partial access control.



US 64 through Apex

US 64 connects to US 1 via an interchange in Cary. From there, the corridor extends north to I-40 in Raleigh. This segment is a four-lane freeway with full control of access and a posted speed limit of 55 mph. The study corridor terminates at the US 64/US 1/I-40/I-440 interchange.

3.1.3.5 NC 49 – Charlotte to Asheboro

This segment of the corridor extends from I-85 in the northern fringes of Charlotte to US 64 just west of Asheboro. In between, NC 49 passes near the University of North Carolina - Charlotte, through the city of Harrisburg, the eastern fringe of the city of Concord, the town of Mount Pleasant, through the town of Richfield, over Badin Lake on the Yadkin River, and past the northwestern edge of the Uwharrie National Forest.

Badin Lake, Tuckertown Reservoir and the Uwharrie National Forest all attract recreational traffic.

Outside the municipal areas, the surrounding land use consists of agricultural and forested land with occasional pockets of commercial, industrial and large parcel residential use. In the

municipal areas, the corridor is developed with commercial and residential uses typical of small to medium sized towns. One area of industrial uses is on NC 49 west of Asheboro (Klaussner Furniture, Matlab, and a plastics corporation).

From I-85 to I-485, NC 49 is a four-lane, divided roadway with driveways and turn lanes. The posted speed limit is 45 mph. The connection of NC 49 to I-85 is via directional ramps to and from the south.

From east of I-485 to just west of Harrisburg in Cabarrus County, NC 49 is a four-lane, divided roadway with turn lanes and a posted speed limit of 55 mph. NC 49 is one of the main connecting roads between Cabarrus and Mecklenburg County and it carries significant commuter traffic. About 34 percent of Cabarrus County's approximately 66,000 workers commute to Mecklenburg County (2000 US Census).



NC 49 through Harrisburg

In Harrisburg, NC 49 is the main artery of the town, serving businesses in the town as well as commuter and truck traffic. East of town, NC 49 is presently being widened to a five-lane urban roadway (curb and gutter and sidewalk) with a posted speed limit of 35 mph and numerous driveways and signalized intersections.

East of Harrisburg to west of Mount Pleasant, NC 49 is presently being widened to a four-lane, divided roadway with no control of access as part of TIP Project R-2533. From Mount Pleasant east, NC 49 is generally a two-lane road with a 55 mph posted speed limit. Exceptions are described below.

In Mount Pleasant and Richfield, NC 49 has a posted speed limit of 45 mph. There is an interchange with NC 73 in Mount Pleasant.

NC 49 changes to four-lane, divided highway near the intersection with NC 8 just west of the Yadkin River. The posted speed limit is 55 mph. East of the River, NC 49 is a two-lane road to NC 109. From NC 109 to the interchange with Old Highway 49 (just west of Asheboro), NC 49 is a four-lane, divided highway. East of the interchange with Old Highway 49, NC 49 is a two-lane roadway to US 64.

3.2 Population

3.2.1 Existing Population (Year 2000)

Population growth in the study area has been rapid over the last few years. According to the 2000 US Census estimates, growth between 2000 and 2003 has been highest in Charlotte and



Raleigh where the corresponding metropolitan statistical areas have grown at rates of 7.6% and 11.3%, respectively. As **Figure 3.3** indicates, population density (persons per square mile) in the year 2000 was highest in these same metropolitan areas. As of 2000, the population of all of the counties in the study area totaled over 3.5 million; Charlotte and Raleigh, with a combined population exceeding 1,300,000 at the time, made up 38% of that total. This growth has been attributed to a number of factors, including new job opportunities in banking sector in Charlotte and technology sector in Research Triangle Park (RTP). The growth in these sectors is accompanied by growth in the service sector, particularly services that support the other two sectors.

3.2.2 Forecasted Population (Year 2030)

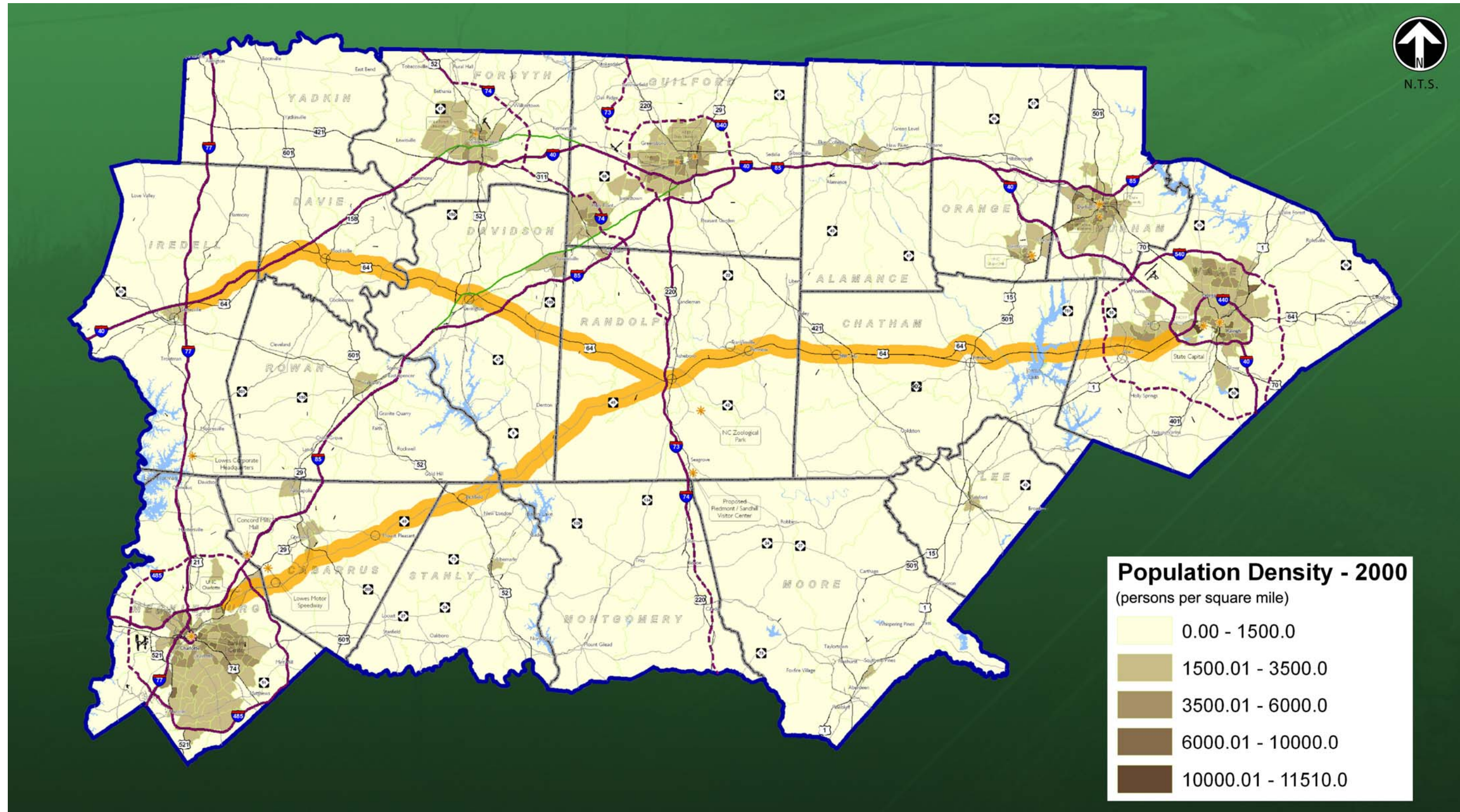
Figure 3.4 shows the population density forecast for the year 2030 in the regional study area, according to census tract demographic forecasts prepared by Global Insight, a commercial forecasting company, in January 2004. The forecast reflects expectations for economic growth, industrial composition, migration patterns and birth rates at local levels of geography. **Figure 3.5** shows the percent population change from the year 2000 to 2030.

The greatest population changes throughout the regional study area are projected to occur in Mecklenburg, Cabarrus, Chatham, and Wake Counties. Increasing employment growth from the Charlotte metropolitan area and the Research Triangle region will continue to have an impact on nearby cities and counties.

In portions of northeastern Mecklenburg County, a significant change (an increase of 80 percent or more) in population is projected, increasing population density to over 10,000 persons per square mile in some places. Consistent with recent growth patterns, some of this growth is expected to spill over growth into the western portion of Cabarrus County. While the resulting population densities are expected to be relatively low in this area by the year 2030 (up to 3,500 persons per square mile), the change from rural-agricultural land with only a few residents to suburban residential subdivisions with many residents is a dramatic one. For this reason, western Cabarrus County is also anticipating an increase in population of 80 percent or more. Much of this growth will be in response to the availability of relatively large parcels of less expensive, developable land near some of the region's major destinations, such as UNC-Charlotte, Concord Mills Mall, Lowe's Motor Speedway, and the Concord Regional Airport.

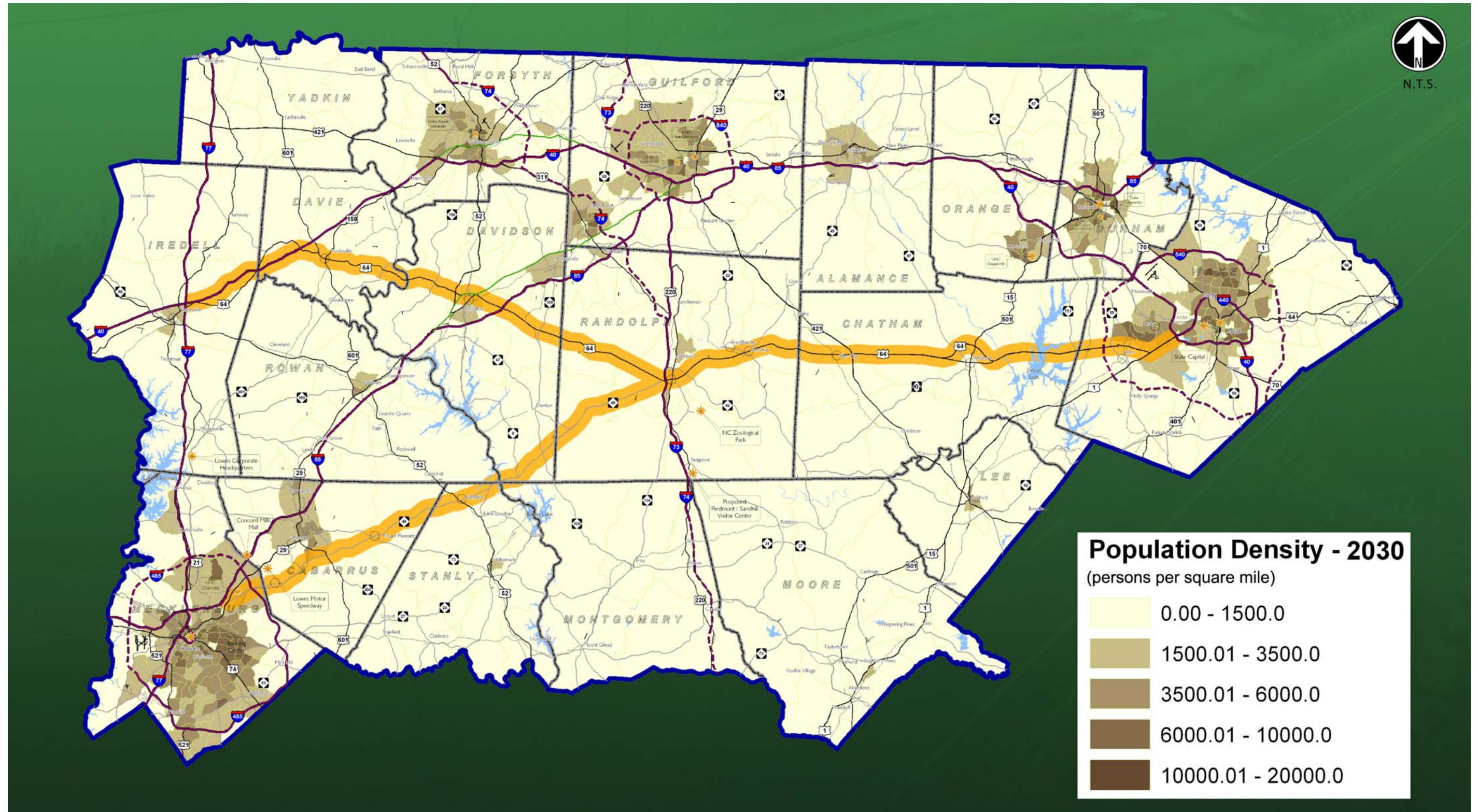
The city of Concord is projected to have a large net population increase, mostly from anticipated future annexations coupled with new residential development.

Figure 3.3: 2000 Population Density



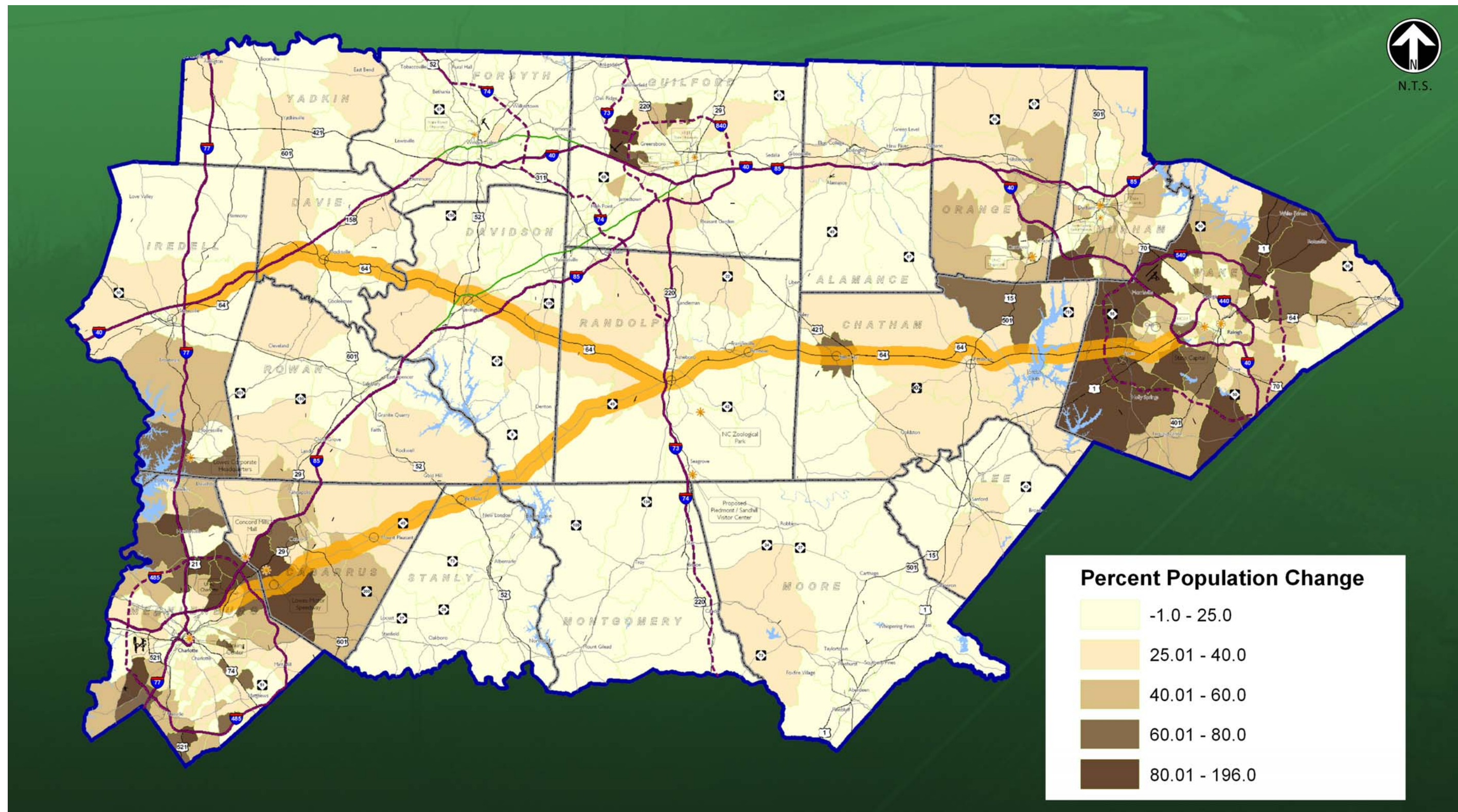
Source: 2000 US Census data

Figure 3.4: 2030 Population Density



Source: Global Insight (January 2004)

Figure 3.5: Projected Percent Population Change (2000-2030)





The city of Harrisburg is projected to have a significant increase in population growth due to its close proximity to both Concord and Charlotte. The central portion of Cabarrus County will have growth rates comparable to those projected for the state, or on the order of approximately 45.5 percent. Increases in this area where the percent change in population is lower will occur in currently developing areas that, today, are almost built out.

Wake County is expected to experience a major population increase by the year 2030, especially in the southwestern portion of the county where I-540, also known as the Western Wake Freeway, will be constructed. As the Research Triangle Park expands in population and employment, areas to the south will continue to see new growth pressures. Morrisville, Cary, Apex, and Holly Springs, the four towns situated in this part of Wake County, are all bracing for population increases projected to be at least 80 percent by 2030.

Chatham County, which has been described as a “modest growth” area based on recent US Census estimates, is expected to experience a 60 percent to 80 percent increase in residential population in this 30-year period. Two areas in particular are expected to be the recipients of the growth: Siler City and the portion of the county that lies immediately to the south of the Orange County line and which flanks the US 15-501 corridor. Based on discussions with local planning staff, Siler City projects growth to be due to its continuing development as a bedroom community to Chapel Hill, Greensboro, and the Research Triangle Park. The availability of large parcels of relatively inexpensive land, good regional highway connectivity, and small town charm contribute to Siler City’s growth, while the US 15-501 corridor growth is due to current and future spillover growth from Chapel Hill where UNC-Chapel Hill, a long-time catalyst of growth in Orange County, is located.

Modest population gains are anticipated to occur in the other counties along the US 64–NC 49 Corridor, but not at the rates expected for areas within Wake, Chatham, Mecklenburg, and Cabarrus Counties. Three areas that will have stable growth rates (meaning a growth rate roughly comparable to the state’s projected rate between 2000 and 2030 of 45 percent) include Iredell, Davie, and Randolph Counties. Iredell and Davie Counties are projected to experience a 25 percent to 40 percent population increase, respectively, by 2030. Davie County, although largely a rural county in 2000, will gradually be urbanizing as new development is anticipated in the northeastern portion of the county, stemming from Mocksville toward Winston-Salem along I-40. Randolph County is predicting an influx of both urban and suburban residential growth. Relocations to Randolph County from other areas of the Piedmont Triad region are likely to result as incoming residents seek lower tax and utility rates, more modest housing prices, and a lower overall population density.

Relatively low population increases are anticipated in Stanly County (6.8 percent), Davidson County (17 percent), and the northern portion of Iredell County (18 percent). This projected lack of growth is due in part to the existing and anticipated future local economy of each jurisdiction. The decline of manufacturing has had a significant impact on these counties.



Places like Lexington, the county seat of Davidson County, which had a strong furniture manufacturing base in the past are now finding themselves having to reinvent their economic base.

3.3 Household and Employment Growth

A significant proportion of the state’s current economic activity is centered in the US 64–NC 49 Corridor. Household and employment forecasts for the next 30 years confirm that this trend will continue well into the future. The corridor encompasses the state’s two largest metropolitan areas which are national centers for banking, insurance, and higher education. Other infrastructure-related factors, which support growth, such as the regional commercial airports, rail, and highway infrastructure systems are discussed in other sections of this text. Many in the business community regard the state as “business friendly” and North Carolina’s relatively low taxes and temperate climate are viewed as factors that have attracted households from other regions in the United States.

3.3.1 Household Growth

Between 1990 and 2000, the number of households in the US 64–NC 49 regional study area grew by 22 percent. As **Table 3.1** shows, Wake County and Mecklenburg County experienced the highest levels of growth in the US 64–NC 49 regional study area during the 1990s.

Table 3.1: Household Growth (1990 and 2000)

COUNTY	1990	2000	Change	COUNTY	1990	2000	Change
Alamance	42,652	51,584	21%	Iredell	35,573	47,360	33%
Alexander	10,331	13,137	27%	Lee	15,689	18,466	18%
Cabarrus	37,515	49,519	32%	Lincoln	18,764	24,041	28%
Catawba	45,700	55,533	22%	Mecklenburg	200,219	273,416	37%
Chatham	15,293	19,741	29%	Montgomery	8,290	9,848	19%
Davidson	48,944	58,156	19%	Moore	23,827	30,713	29%
Davie	10,785	13,750	27%	Orange	36,104	45,863	27%
Durham	72,297	89,015	23%	Randolph	41,096	50,659	23%
Forsyth	107,419	123,851	15%	Rowan	42,512	49,940	17%
Gaston	65,347	73,936	13%	Stanly	19,747	22,223	13%
Guilford	137,706	168,667	22%	Wake	165,743	242,040	46%
Harnett	25,150	33,800	34%	Yadkin	12,068	14,505	20%
Total					1,238,771	1,579,763	22%

Source: 2000 US Census



The 2030 Household Forecast used for the transportation analysis shows a continued upward trend in household growth. In the US 64–NC 49 regional study area, an additional 1.2 million households are forecast. As shown in **Table 3.2**, this will bring the total number of households to 2.8 million, near the current number of households in the entire state, which, according to the 2000 US Census, totals 3.1 million.

Table 3.2: Forecast Household Growth (2000 and 2030)

COUNTY	2000	2030	Change	COUNTY	2000	2030	Change
Alamance	51,584	91,526	77%	Iredell	47,360	80,829	71%
Alexander	13,137	23,389	78%	Lee	18,466	28,840	56%
Cabarrus	49,519	83,853	69%	Lincoln	24,041	42,804	78%
Catawba	55,533	91,583	65%	Mecklenburg	273,416	534,498	95%
Chatham	19,741	30,484	54%	Montgomery	9,848	14,588	48%
Davidson	58,156	97,806	68%	Moore	30,713	52,194	70%
Davie	13,750	23,644	72%	Orange	45,863	77,240	68%
Durham	89,015	169,146	90%	Randolph	50,659	87,599	73%
Forsyth	123,851	194,675	57%	Rowan	49,940	85,799	72%
Gaston	73,936	118,557	60%	Stanly	22,223	39,864	79%
Guilford	168,667	267,659	59%	Wake	242,040	498,762	106%
Harnett	33,800	53,074	57%	Yadkin	14,505	24,566	69%
Total					1,579,763	2,812,979	78%

Source: 2000 US Census, Global Insight, and Cambridge Systematics

While the counties encompassing the Charlotte and Raleigh urban areas are forecast to experience high levels of growth in households (95 percent in Mecklenburg County, 106 percent in Wake County, and 90 percent in Durham County), Forsythe and Guilford counties in the Triad are also anticipated to experience significant increases as well.

3.3.2 Employment Growth

Between 1990 and 2000 employment grew at a slightly slower pace than households. Employment growth by county is illustrated in **Table 3.3**. According to the 2000 US Census, employment in the US 64–NC 49 regional study area grew by about 22 percent with the largest employment generation occurring in Mecklenburg County and Wake County, which grew by 43 and 31 percent, respectively.

Figure 3.6 presents industry employment changes from 1990 to 2000. Of industries that lost jobs, manufacturing, wholesale and retail trade, and agriculture industries saw the steepest decline, with an over 50 percent drop in employment. By contrast, the service industries gained the most workers, over 51 percent, between 1990 and 2000.

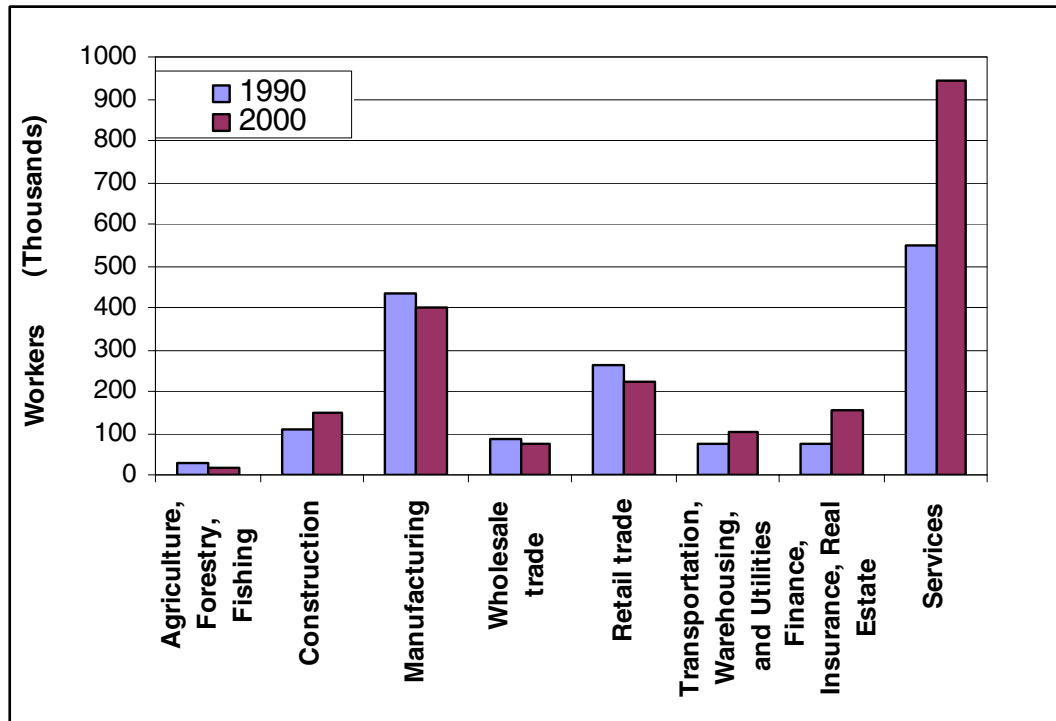


Table 3.3: Employment Growth (1990 and 2000)

COUNTY	1990	2000	Change	COUNTY	1990	2000	Change
Alamance	57,514	64,895	13%	Iredell	48,907	61,204	25%
Alexander	15,084	18,223	21%	Lee	19,590	23,012	17%
Cabarrus	51,808	66,970	29%	Lincoln	26,148	32,331	24%
Catawba	66,768	75,192	13%	Mecklenburg	281,201	369,275	31%
Chatham	20,878	25,095	20%	Montgomery	11,205	11,830	6%
Davidson	68,344	74,150	8%	Moore	26,342	32,051	22%
Davie	14,623	16,947	16%	Orange	50,671	62,509	23%
Durham	96,658	114,375	18%	Randolph	59,463	67,150	13%
Forsyth	136,304	150,831	11%	Rowan	54,730	61,687	13%
Gaston	89,280	91,354	2%	Stanly	26,260	27,977	7%
Guilford	188,433	217,104	15%	Wake	240,692	343,426	43%
Harnett	29,629	39,096	32%	Yadkin	15,301	17,687	16%
Total					1,695,833	2,064,371	22%

Source: 2000 US Census

Figure 3.6: Service Industry Employment Changes (1990 to 2000)



Presently, and likely well into the future, employment is most highly concentrated along I-40 and I-85 between Raleigh and Winston-Salem, and in the Charlotte region. Agricultural employment is the exception and is more dispersed throughout the regional study area



relative to transportation facilities. **Figure 3.7** presents the distribution of service employment with each employee displayed as a dot on the map. This illustration clearly shows the alignment of transportation capacity with population and employment centers between Raleigh and Charlotte.

Employment between 2000 and 2030 is forecast to increase by 69 percent, according to data prepared for this study by InfoUSA and Cambridge Systematics, as shown in **Table 3.4**. Growth forecasts show similar patterns to household forecasts with the counties around the Greensboro, Winston-Salem, Raleigh, and Charlotte urban centers leading the growth. Total employment in Mecklenburg County and Wake County are projected to increase by approximately 93 percent and 96 percent, respectively over this time period. Similarly, employment growth in Forsyth County and Guilford County is projected to increase by 38 percent and 62 percent, respectively.

Table 3.4: Forecast Employment Growth (2000 and 2030)

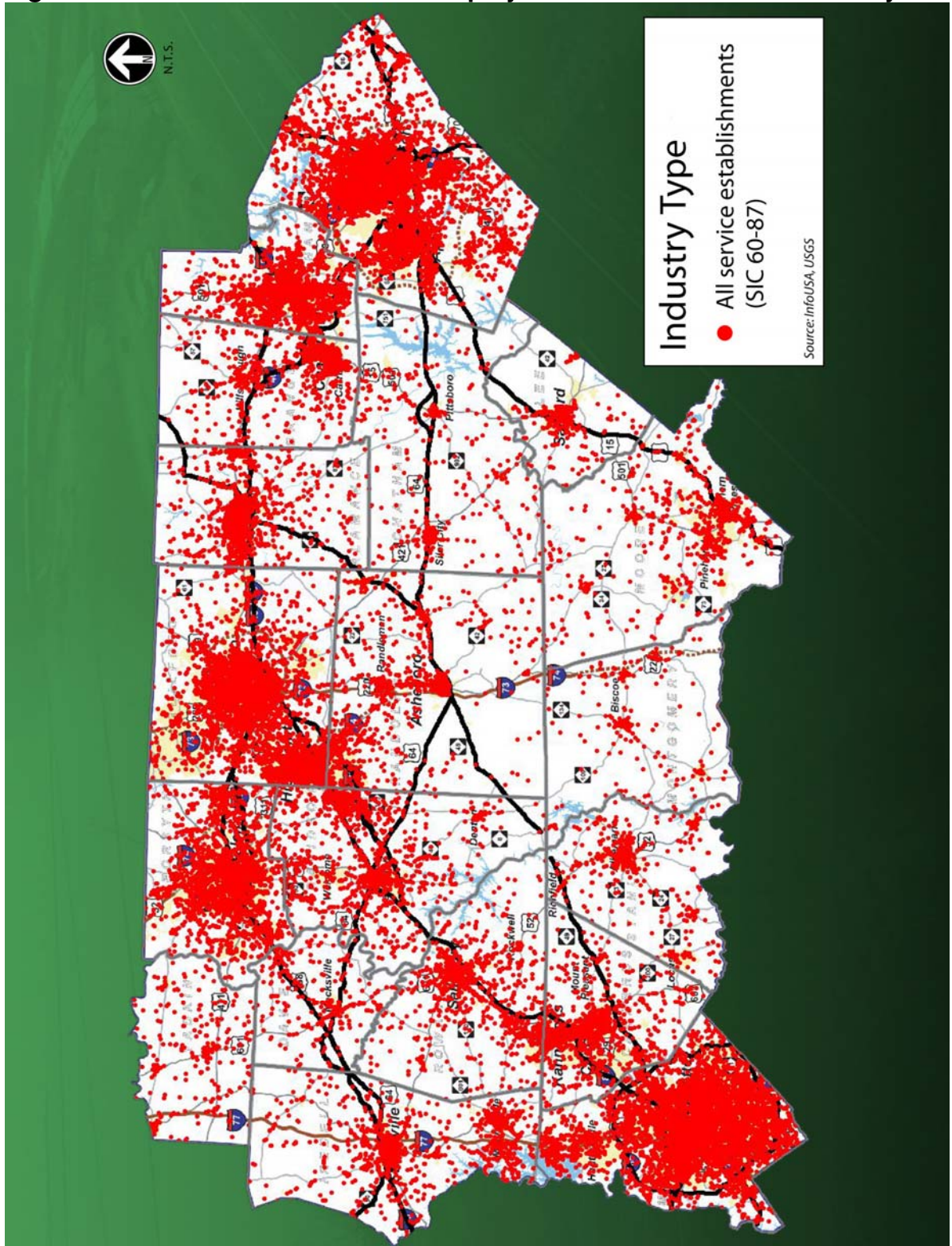
COUNTY	2000	2030	Change	COUNTY	2000	2030	Change
Alamance	58,960	81,219	38%	Iredell	53,850	70,706	31%
Alexander	10,171	12,535	23%	Lee	26,434	36,888	40%
Cabarrus	57,648	96,215	67%	Lincoln	18,877	23,631	25%
Catawba	89,195	125,450	41%	Mecklenburg	499,468	962,297	93%
Chatham	15,666	21,665	38%	Montgomery	10,974	10,150	-8%
Davidson	46,500	58,422	26%	Moore	30,768	60,406	96%
Davie	10,223	12,120	19%	Orange	57,209	93,785	64%
Durham	160,299	284,545	78%	Randolph	46,800	73,638	57%
Forsyth	174,910	242,180	38%	Rowan	44,769	68,261	52%
Gaston	68,164	105,617	55%	Stanly	19,229	29,020	51%
Guilford	262,865	425,964	62%	Wake	371,821	727,378	96%
Harnett	21,202	29,062	37%	Yadkin	9,659	15,692	62%
Total					2,165,661	3,666,846	69%

3.4 Land Use

The way in which a roadway or any other transportation facility serves and functions within particular areas varies depending on the nature of the development in those areas. An analysis of existing and future development patterns, zoning, and population distribution is required to fully understand the importance of any transportation facility in terms of how adequately it connects activity centers along its route, the access it provides to various land uses, and, perhaps most importantly, how it will serve the future demand for the movement of people and goods. The analysis of the US 64–NC 49 Corridor began with the study of local land use projections as determined by each county and municipality and expressed in adopted land use plans, population data, zoning data, and land cover data. Data was collected and



Figure 3.7: Distribution of Service Employment in the US 64–NC 49 Study Area



Source: InfoUSA.



analyzed only for the counties through which the defined corridor passes, namely, Mecklenburg, Cabarrus, Stanly, Iredell, Davie, Davidson, Randolph, Chatham, and Wake. (Note: Rowan County is going through a comprehensive planning process therefore land use information for the county was not available at the time of data collection. The process is scheduled to be completed by late 2005 or early 2006.) Once mapping had been prepared, interviews with the planning staff and officials of the municipalities and counties in the study area were conducted to verify and supplement the information revealed through the analysis. The results of the land use analysis are described in the following sections.

3.4.1 Zoning Patterns

Examining the pattern of zoning districts reveals each county or municipality's intentions for development patterns within its jurisdiction, even if that development has not yet occurred or non-conforming development currently exists. Existing zoning for the study area is shown in **Figure 3.8**. The entire US 64–NC 49 Corridor is subject to zoning by either a county or a municipality, although some parts of the Existing Zoning Map show no data. In many cases, this lack of data is within a municipality that has its own zoning, but is not near enough to the study area for the pattern of that zoning to be relevant. However, no zoning information is shown for Chatham County, which does have an adopted zoning ordinance, but does not have digital zoning data available. Even where data was available to create the Existing Zoning Map, the quality of the digital information was a limiting factor. *Therefore, the map should only be used to identify the general pattern of zoning, not the specific zoning of individual parcels.*

The portions of the corridor that are zoned for the most intense development are at the western terminus of NC 49 in Mecklenburg County and Cabarrus County, and at the eastern end of US 64 in Wake County. In Mecklenburg County and the western half of Cabarrus County, the zoning pattern closely resembles the pattern of existing development, since much of NC 49 is already developed. A large portion of the urbanized sections of NC 49 in Mecklenburg County and Cabarrus County is zoned for "Urban Residential," with a few exceptions. Near the western terminus of the study area where NC 49 meets US 29, some commercial and industrial parcels surround the large area of Office and Institutional zoning in the University of North Carolina at Charlotte area. Just north of NC 49 near the western border of Cabarrus County, Concord Mills and Lowe's Motor Speedway lie at the middle of a very large area of Industrial, Commercial, and Office and Institutional zoning, which also extends north along I-85 and east along US 29 and the rail line. Industrial zoning is also located along the southern side of NC 49 near the city of Harrisburg. In Wake County, urban and suburban residential zoning makes up the majority of the parcels along the US 64–NC 49 Corridor. Exceptions include Commercial parcels clustered around the interchange with I-40, along with some Office and Institutional zoned parcels; a large amount of Office and Institutional zoned area with some Industrial parcels forming a wedge between US 64 and US 1; commercial parcels extending north and south along NC 55; a large amount of Industrial



property south of US 64 near the NC 55/US 1 intersection; and loosely clustered Rural/Agricultural parcels forming a ring around Apex.

The remainder of the corridor follows a fairly consistent pattern: Rural/Agricultural zoning is prevalent, with the largest clusters of other types of zoning located at the municipalities. Some counties, such as Davidson and Randolph, have small pockets of residentially zoned parcels scattered throughout the county, while others, notably Cabarrus, Stanly, and Iredell, avoid this dispersion in favor of consolidating the urbanized parcels in and near the municipalities. In general, municipalities within the corridor consist mostly of Urban and Suburban Residential zoning, with large pockets of Industrial zoning and smaller pockets of Commercial and Office and Institutional zoning. These non-residential parcels sometimes lie near the downtown, but are most often located along important roadways, at key intersections, and around airports.

3.4.2 Existing Land Use Patterns

Existing land use is that which is actually in place. Such patterns may or may not be consistent with zoning patterns, which as mentioned in Section 3.4.1 represent development intentions. The existing land use pattern for the US 64–NC 49 Corridor is shown in **Figure 3.9**. Existing (2004) land use was only available for Mecklenburg County, the Lexington area of Davidson County, Randolph County, the town of Pittsboro in Chatham County, and Wake County (only data for the relevant quadrants of Wake County is shown). For the remaining corridor area, 1996 land cover data from the North Carolina Center for Geographic Information and Analysis (NCCGIA) is shown to create an illustration of the probable development pattern. *As such, **Figure 3.9** should not be considered to be a reliable source of information with regard to current land use or development.* However, it is useful in portraying the broad development patterns of the corridor. The general pattern of existing land use is similar to that of existing zoning, with residential and vacant land in outlying portions of the counties and more non-residential uses clustered in and near towns and cities. Similar to the zoning patterns, the most urbanized portions of the study area lie at the western end of NC 49 in Mecklenburg County and at the eastern end of US 64 in Wake County. The western terminus features commercial development as well as a large amount of institutional development in and surrounding the University of North Carolina at Charlotte. The rest of the Mecklenburg County section of NC 49 is surrounded by residential development, as well as a pocket of industrial development.

US 64 through Lexington is bordered mainly by scattered residential and vacant parcels, mixed with a few commercial and institutional parcels. The exceptions to this pattern lie near the center of Lexington where there are concentrations of industrial and governmental/institutional uses. Some larger pockets of commercial development surround the intersection of US 64 and US 52, and the scattered commercial, institutional, and industrial parcels become more common along US 64 between US 52 and I-85.

Figure 3.8: Existing Zoning in the US 64–NC 49 Corridor

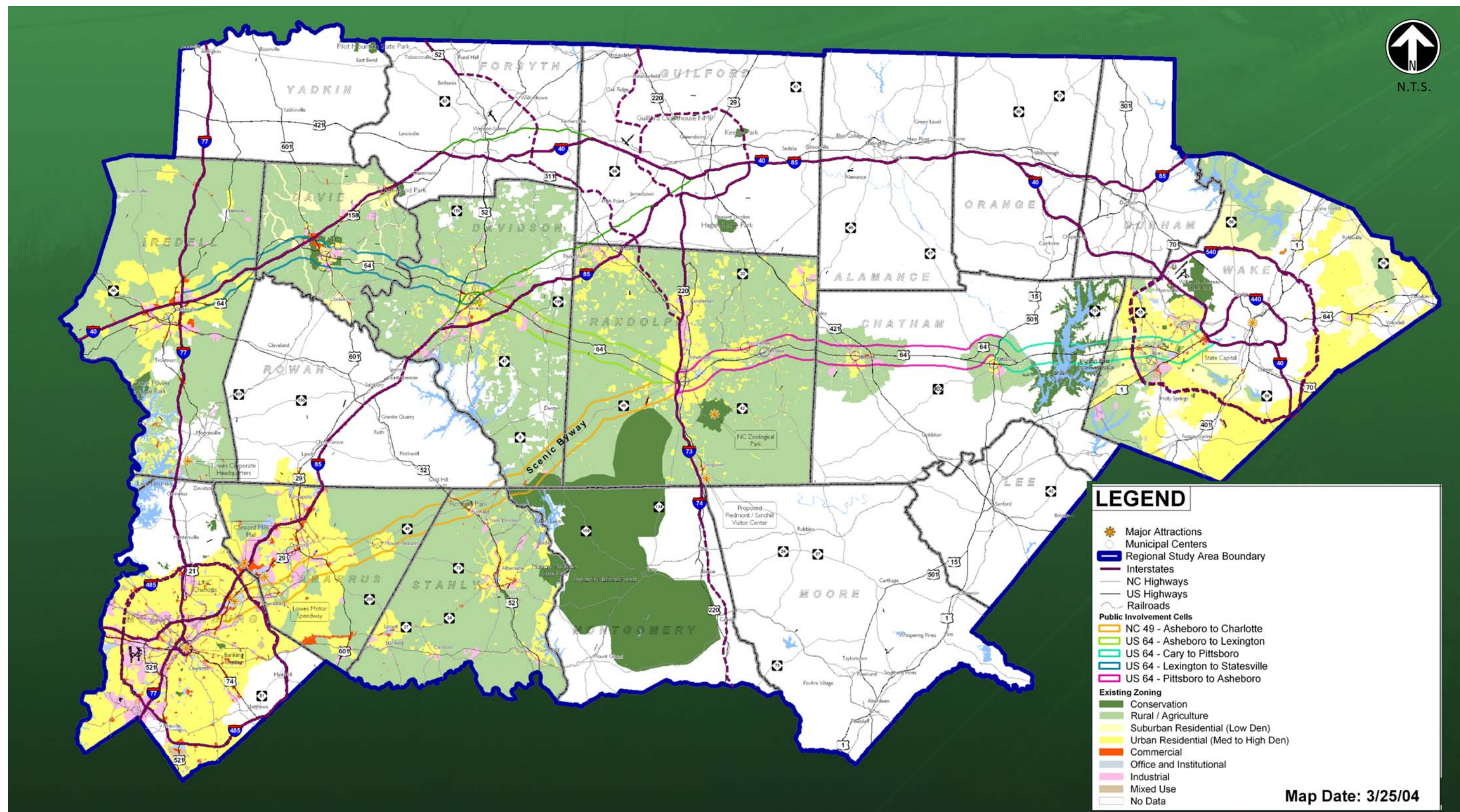
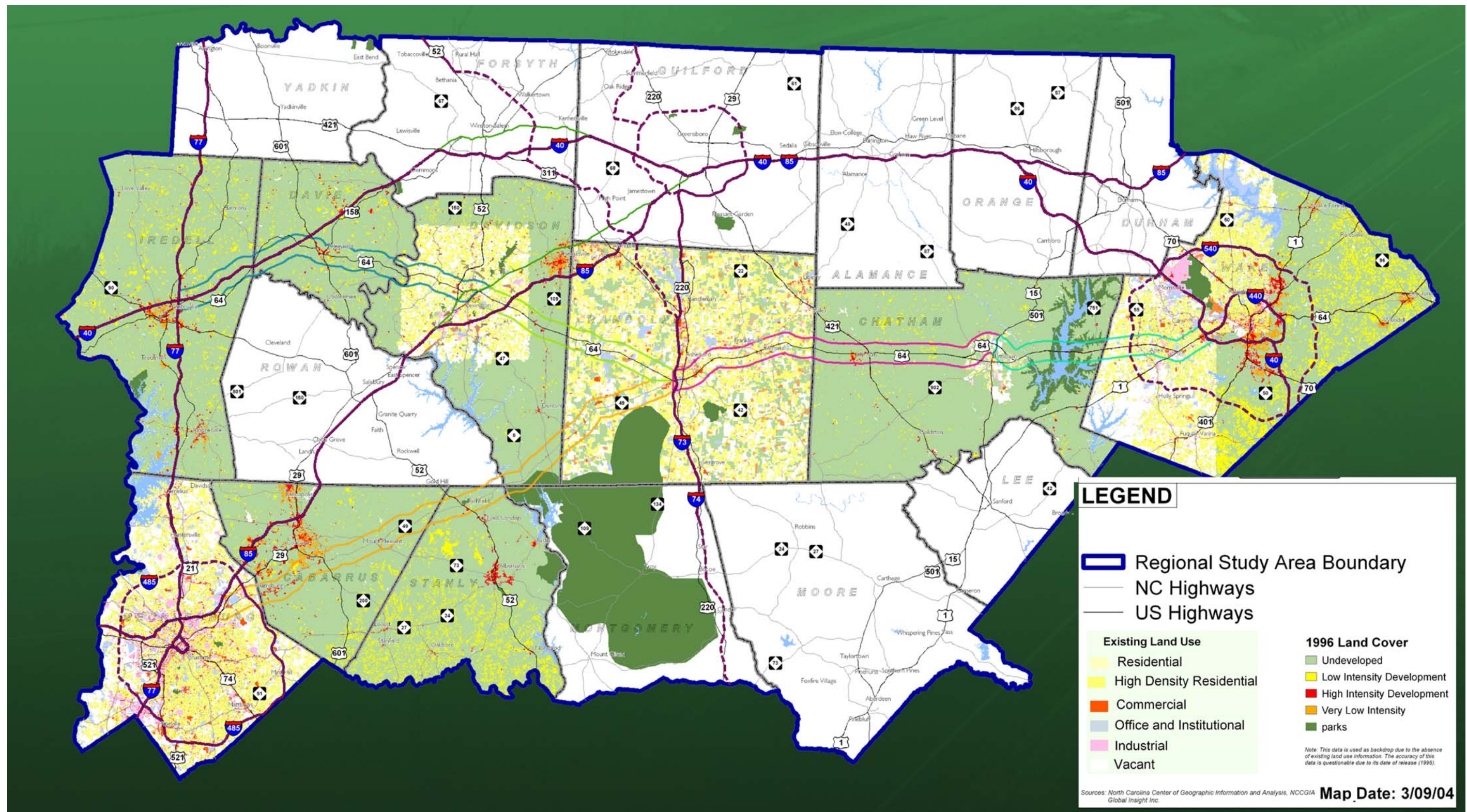


Figure 3.9: Existing Land Use





Near the center of Randolph County, NC 49 joins US 64 in the city of Asheboro. In this area, commercial uses with pockets of institutional and industrial uses line the highway, especially at the important intersections. Commercial, office and institutional and industrial uses form a north/south spine along US 220 (I-73/I-74) in Asheboro. The North Carolina Zoo is located about five miles south of US 64 to the east of US 220 (I-73/I-74), and is an important tourist destination in Randolph County.

Pittsboro remains largely rural/agricultural or undeveloped, with residential uses and some small pockets of non-residential development concentrated near US 64 and other historical regional highways such as US 15-501.

Western Wake County is characterized by a large amount of residential uses throughout the areas in and near US 64. Industrial and commercial uses are found mainly at key intersections, including at NC 55 in Apex and, to a greater extent, at US 1 in Cary, where major employment and institutional facilities are located.

3.4.3 Future Land Use Patterns

Not all counties and municipalities have future land use plans available. In the absence of a formal plan, future land use was determined using an examination of existing zoning, watershed protection ordinances, and/or growth management plans. To create a common set of land use categories throughout the entire corridor, each jurisdiction's land use categories were matched to a set of land uses specifically defined for this process. Land use category definitions and the Land Use Conversion Table developed for this study are provided in **Appendix B**. The future land use map for the US 64–NC 49 Corridor is shown as **Figure 3.10**.

Land use changes are anticipated to occur due to the expanding economies of Charlotte and the area encompassing the Research Triangle Park. Increasing growth pressures from the two metropolitan areas are expected to greatly transform adjacent cities and counties. Most city and county governments have prepared plans for managing anticipated growth for the next 20 to 30 years. Each plan expresses a vision for future land use based on assumptions about future growth patterns informed by a wide range of data including projections for population, employment, and infrastructure availability. These local land use plans document anticipated land use changes. Brief land use descriptions are provided below by county.



3.4.3.1 Iredell County

The eastern portion of Iredell County is expected to primarily remain a rural setting with very low density residential uses. Growth is foreseen to occur in the southern portion of the County, close to Mecklenburg County.

3.4.3.2 Davie County

The Davie County Land Use Plan recommends that the county moderate the overall rate of population growth and preserve its quality of life. The agricultural base is giving way to more areas for industrial development and service employment. However, both the town of Mocksville and Davie County have a vision of becoming a leading distribution center due to their strategic location in the larger Triad region. To this end, their plans include the designation of a large amount of land for industrial development. Situated with good access to Interstates 40, 85, and 77, this area is attractive to industrial development.

3.4.3.3 Davidson County

Minor land use changes are foreseen to occur in Davidson County by 2030. Davidson County projects an 11 percent per decade increase in population growth and has produced a guiding growth plan. It has identified locations for new growth in accordance with the desired density, character of development and extent of services that can be provided. Medium and high density residential growth is planned to locate within and around the City of Lexington.

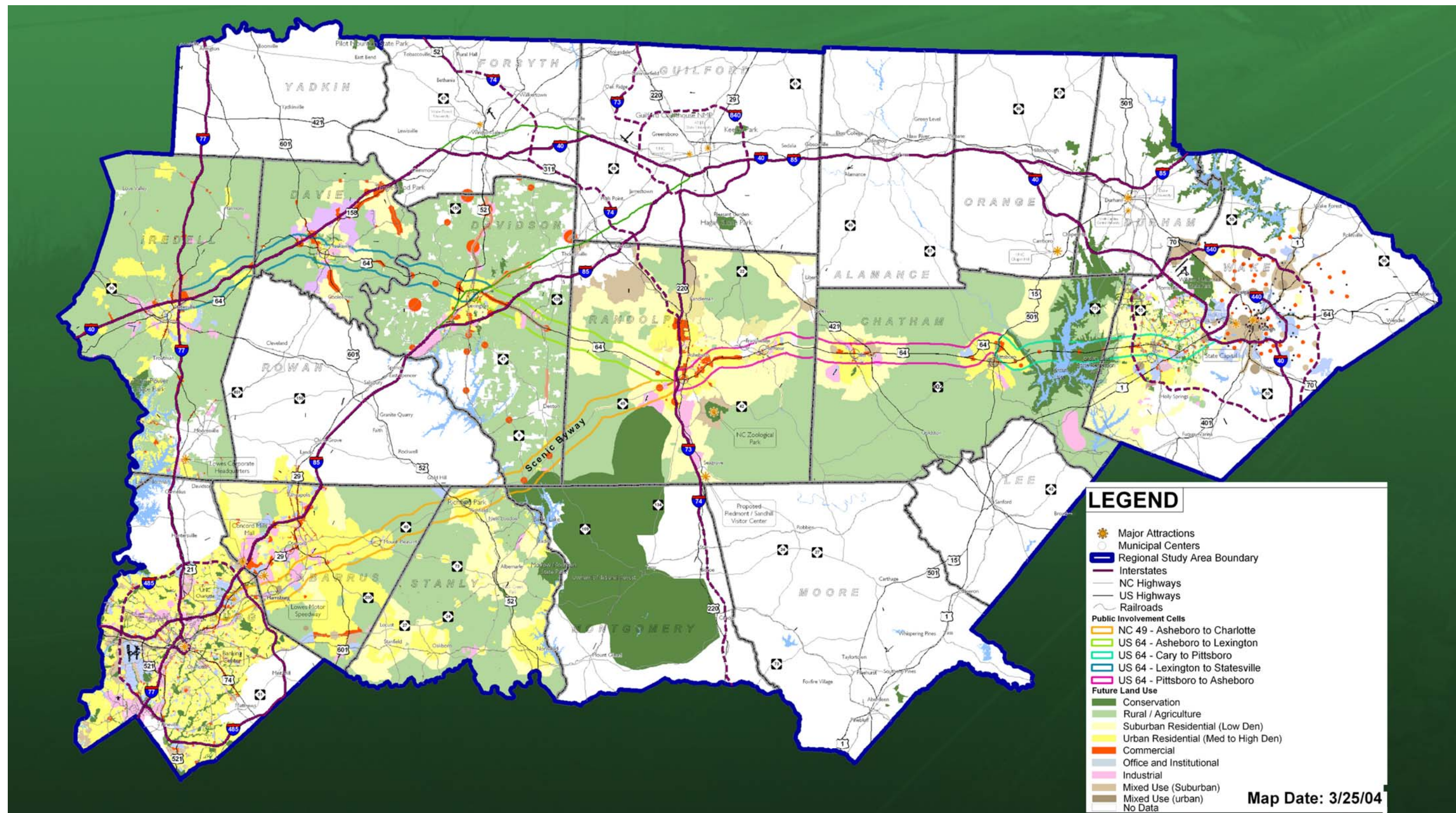
3.4.3.4 Randolph County

Randolph County's excellent regional access, provided by numerous major highways, have put urban centers such as Greensboro and Winston-Salem within commuting distance. As a result, Asheboro and Randolph County are predicting an influx of both urban and suburban residential growth. The residential growth is anticipated to spread outwards from the core of Asheboro to the northern, western, and eastern boundaries of Randolph County. A future Interstate highway corridor (I-73/I-74) along the current routing of US 220 and Asheboro's Southern Bypass (TIP Project R-2536) will change land use patterns in the southern part of the county by attracting high intensity uses (retail and employment) at major intersections.

3.4.3.5 Chatham County

The Chatham County comprehensive plan anticipates more residential growth pushing down from Chapel Hill along the US 15-501 corridor, and the town of Pittsboro anticipates that suburban residential development will extend north of US 64 along US 15-501, allowing this corridor to be flanked with thousands of new housing units by 2030. Significant residential growth is also anticipated in Siler City, mainly due to its continuing evolution into a bedroom

Figure 3.10: Future Land Use





community for the regional employment centers in Greensboro, Chapel Hill and Research Triangle Park. Relatively inexpensive land, good regional highway connectivity, and small-town charm will contribute to its continued growth. Poor soils and environmental restrictions are expected to limit growth elsewhere in the county.

3.4.3.6 Wake County

Three regional centers are identified for new growth to occur by the Raleigh Comprehensive Plan, including downtown Raleigh, the Northeast District Area, and the Northwest/Research Triangle Area. Raleigh plans to expand residential and employment uses through redevelopment and infill development in its downtown. The Northeast Area has large undeveloped land tracts, developing infrastructure, and the Neuse River making the area attractive for new development. In the Northwest Area, employment-generating land uses are planned for corridor transition areas and existing employment areas.

The town of Cary is located at the heart of the Triangle region with an economy highly interconnected to the Triangle. The proximity of the RTP and Raleigh-Durham International Airport places Cary in a favorable position to receive supporting and spin-off high-technology, and service industry, and office uses.

The Apex 2025 Vision Plan has called for a clearly defined development area, delineated by an urban growth boundary (UGB). Urban development uses are planned right up to the UGB, with very low intensity uses occurring outside the boundary. Major retail development around US 64 and the NC 55 interchange is anticipated to change land use patterns in the northwest part of town.

3.4.3.7 Mecklenburg County

One of the major goals identified in the Charlotte Northeast District Plan is to encourage development of commercial and mixed-use centers along its thoroughfares. There is an ample amount of undeveloped land that will provide an opportunity for new employment growth to occur, including light industrial and office uses. The Northeast District Plan supports the expansion of research uses to the north and east of the University Research Park boundaries. A major area of expansion of business park development is planned to be located around the future interchange of I-485 and NC 115, northwest of the I-485/NC 49 interchange.

Spillover growth from Mecklenburg County and Charlotte will continue to create demand for land in Cabarrus County. New Interstate and highway improvements such as I-485 in Mecklenburg County will increase access to western Cabarrus County and create new development possibilities in this area. With the expansion of I-485 and NC 49, growth moving from the northeast of Charlotte is anticipated to include residential, office and industrial uses.



3.4.3.8 Cabarrus County

In recent years, Cabarrus County has experienced tremendous growth in the tourism industry. Attractions such as Lowes Motor Speedway and Concord Mills retail center have brought an increasing number of visitors to Concord. The City of Concord expects to see strong growth and demand for local retail businesses, restaurants, and lodging in conjunction with the continued success of these two destinations.

Harrisburg's close proximity to Concord and Charlotte has helped spur residential and industrial growth in recent years and will likely continue. Harrisburg's proximity to the Interstate Highway System and the Norfolk Southern rail line is expected to continue to attract industrial development. The Town of Harrisburg is looking to create a prime industrial employment corridor for the southwest portion of Cabarrus County with the future provision of water and sewer utilities.

Mount Pleasant anticipates its desirable rural town setting will bring additional growth in the future. Suburban residential growth is identified to stretch from Mount Pleasant along NC 49 to a locally defined Future Urban Service Boundary.

The Town of Richfield anticipates growth in the form of residential development along US 52.

3.4.3.9 Stanly County

According to the Stanly County Land Use Plan (2002), the county is anticipating growth of 10 percent per decade through 2020. Residential growth is the predominant form of development that is foreseen to occur in the county by 2020. Also according to the plan, primary growth areas are going to attract a higher density development of approximately 3 to 4 dwelling units per acre. However, secondary growth areas will have lower density development. Future development along the US 52 corridor is expected to impact NC 49 by attracting higher intensity development near the intersection of the two major roads.

3.4.4 Land Use Plans Compared to Population Projections

Land use projections shown in **Figure 3.10** suggest the intensification of specific areas within the corridor that are not consistent with the high growth areas identified in the population projections (see **Figure 3.4**). Likewise, some areas that are expected to experience significant increases in population are not envisioned as areas where a notable change in land use will occur. The following comparison provides more specific information about where those discrepancies have been identified.

- Randolph County (around Asheboro) and Stanly County (around Richfield) are projected to have a low to moderate growth rate as shown in **Figure 3.5**, though the



- corresponding local land use plans reflect an expectation for greater rates of growth and higher intensity uses.
- Apex and Pittsboro are projected to have a high growth rate as shown in **Figure 3.5**, although the corresponding local land use plans reflect a desire and/or expectation of limited growth and lower intensity uses. Although Wake County is projected to attract a high population increase throughout most of the western portion of the county, Apex has incorporated an urban growth boundary into its Comprehensive Plan that will prevent development from extending as far beyond the town limits as the countywide population projections predict will take place.

The reason for the discrepancies is directly related to the sources of information collected. Population projections are made at a regional level, whereas land use projections are made at the local level. Regional population projections do not take into account local growth management policies.

3.4.5 Economic Development

Economic development activity is occurring at the state and local levels, mostly in response to the dramatic loss of manufacturing jobs in the last decade. The success of economic development initiatives could greatly influence the location and size of employment centers in the US 64–NC 49 Corridor over the next 25 years. The following is a brief summary of such initiatives.

3.4.5.1 Statewide Initiatives

The following is an overview of the current State Economic Development Programs within North Carolina. They include:

- Tax Credits
- State Development Zone Program
- Job Development Investment Grant
- One North Carolina Fund
- Industrial Revenue Bonds
- Community Development Block Grants
- Community Economic Development Strategy

Tax Credits

To further improve the business climate in North Carolina, the William S. Lee Quality Jobs and Expansion Act was passed during the 1996 legislative session and was enhanced in 1998, 1999, and 2000. This program allows for qualifying new and expanding companies in North Carolina to take advantage of tax credits for job creation, investment in machinery and



equipment, worker training, research and development, and investment in business property. Information about who is taking advantage of this program is not currently available.

State Development Zone Program

North Carolina's State Development Zone (SDZ) program offers incentives for businesses that locate in designated development areas. The intent of the SDZ is to stimulate investment and job creation to improve conditions in high poverty areas. Companies that meet the minimum requirements in a SDZ can receive higher tax credits for job creation, worker training, and investments in equipment. Businesses qualify if they are in one of six categories, including warehousing, manufacturing/processing, air courier service, distribution, data processing, and central administration office.

There are currently six municipalities along the US 64–NC 49 Corridor that have defined SDZ, including Asheboro, Charlotte, Concord, Lexington, Raleigh, and Statesville.

The SDZ in Concord contained mostly industrially zoned land. The zone, which included land adjacent to NC 49, expired in December 2004. Success is difficult to measure; the city does not currently keep track of the number or type of jobs created or any private benefits. However, interest in the program increased with more companies contacting the city of Concord to see if a particular piece of property was in the SDZ.

Job Development Investment Grant

The state of North Carolina recently implemented a Job Development Grant Program for major investment/job creation projects considering the state. The program will rebate a portion of “new employees” personal income tax withholdings back to the county in which these jobs are created for a period of up to 12 years. The program is limited to 15 projects per year statewide. Projects that create a minimum of 20 new full-time positions may apply for a grant.

One North Carolina Fund

The One North Carolina Fund may provide financial assistance to those businesses or industries deemed by the Governor to be vital to a healthy and growing state economy and are making significant efforts to expand in North Carolina. The fund is a competitive fund and the location or expansion must be in competition with another location outside of North Carolina. No information is available at this time regarding the allocation of funds, and the impact of this fund is not known as it is in its infancy and it is too early to measure success.

Industrial Revenue Bonds

Industrial Revenue Bonds (IRBs) have a variety of names, such as Industrial Development Bonds (IDBs) or qualified small issue bonds, but essentially are of three basic types: tax exempt, taxable, and exempt facility/solid waste disposal bond. The state's principal interest in these bonds is in assisting new and expanding industry while ensuring that North Carolinians attain higher wage jobs. The regulations governing bond issuance are a combination of federal regulations and North Carolina statutes. The amount each state may



issue annually is determined by population. In 2003, \$20.8 million in IDB funds was distributed in North Carolina. Since 2000, five companies in Mecklenburg County have been awarded IRBs, creating 116 new jobs. In Randolph County, 70 new jobs have been created since 2000 through this program.

Community Development Block Grants

The Community Development Block Grant (CDBG) program of the US Department of Housing and Urban Development (HUD) has been administered by the state of North Carolina since 1982. The funds may be accessed by a local government applicant (municipal or county, excluding entitlement cities or designated urban counties). Proposed projects must involve a specific business that will create new jobs (or sometimes retain existing jobs). Assisted project activities must benefit persons (60 percent or more) who were previously (most recent 12 months) in a low or moderate family income status, based on income levels published for the state annually by the U. S. Department of Housing and Urban Development (HUD). The town of Mocksville received \$976,000 in CDBG money in 2003 to support expansion of the Ingersoll Rand and VentLab/Comfort Bilt facilities.

Community Economic Development Strategy

A Community Economic Development Strategy (CEDS) is the result of a local planning process designed to guide the economic growth of an area. A CEDS process is used to help create jobs, foster more stable and diversified economies, and improve living conditions. It provides a mechanism for coordinating the efforts of individuals, organizations, local governments, and private industry concerned with economic development. To date, no counties within the US 64–NC 49 Corridor have been the subject of a CEDS study, and none is expected to have a CEDS study in the foreseeable future.

3.4.5.2 Local and Regional Initiatives

Of the nine counties through which the US 64–NC 49 Corridor passes, six have taken specific steps in recent years to stimulate local economic development. These economic development programs are at varying levels of maturity and have had varying degrees of success. Below are brief descriptions of the programs.

Mecklenburg County

Charlotte/Mecklenburg Investment Grant Program. The City of Charlotte and the County of Mecklenburg have adopted a Business Investment Program (BIP) to encourage new and expanding businesses to locate in identified areas where economic stimulus is a community priority. This has been successful along with properties adjacent to Charlotte-Douglas International Airport and for major thoroughfares such as Wilkinson Blvd. It is intended to work closely with the State Development Zone.

Large Project Investment Grants. If a project will create 300 new jobs and will invest a minimum of \$10 million, an investment grant may be available from local government. The



City of Charlotte and Mecklenburg County have adopted a policy that allows them to consider projects on an individual basis and determine if the project warrants the offer of an incentive grant.

Cabarrus County

Cabarrus County and its largest municipalities offer a unique Industrial Grant Program for qualified new and expanding companies. This program provides a cash grant calculated on the tax-appraised value of the client's investment and the annual amount of property taxes paid to the county and the city.

Stanly County

Companies looking to relocate to Stanly County enjoy a low tax rate and a strong economic aid package that includes low interest rates for facility renovations and the purchase of equipment as well as the provision of a tax credit for every newly created job. Employers also benefit from investment, job creation, and worker training tax credits. Many companies are able to realize a credit of up to 50 percent against state income or franchise taxes. Information about which businesses along the corridor, if any, have taken advantage of this was not available during this study.

Chatham County

The Chatham County Land Development & Conservation Plan envisions the creation of Economic Development Centers to provide the elements necessary to recruit new business and industry in an increasingly competitive market. These centers would be planned in advance for development, with allowable activities specified and uses subject to performance standards and design criteria.

Wake County

Wake County participates in the William S. Lee Quality Jobs and Expansion Program of North Carolina. A portion of Wake County has been designated a State Development Zone. Companies eligible for tax credits under the William S. Lee Act gain additional tax credits when located in the SDZ.

Randolph County

Businesses that locate or expand an industrial or office enterprise in Randolph County may qualify for incentives such as economic development grants, utility and energy assistance, transportation access and workforce assistance. These are in addition to incentives offered by the State of North Carolina.

Randolph County and its individual municipal governments support and encourage the location and expansion of manufacturing, distribution, and office enterprises within the county. Businesses may be eligible for economic development grants that are structured to meet project specific needs and take into consideration approximately three to five years of prospective property tax revenues.



Local governments work in partnership with state and private allies to improve and extend utility access to service the needs of companies that are locating or expanding in the county. Companies may be eligible for discounted energy rates if they meet certain usage and job creation thresholds. Discounted rates are also available for eligible businesses that locate or expand into industrial buildings that have been vacant for two months.

Assistance may be provided by Randolph County to improve and extend road access to an eligible business that locates or expands in the county. Assistance is available to construct rail spur tracks to service new or expanding businesses.

Yadkin-Pee Dee Lakes Project

The Yadkin-Pee Dee Lakes Project is a formal effort to develop the region as a major player in the tourism/recreational and cultural/historic destination. Although the region already possesses these features (i.e. Badin Lake, Seagrove Pottery, Uwharrie National Forest, North Carolina Zoo, etc.), there is a strong desire to promote the concept of the area as a distinct region in terms of its geographic and economic significance. The Yadkin-Pee Dee Lakes Project, also known as the "Central Park Project," seeks to take advantage of the area spanning Charlotte to Raleigh/Durham.

The Yadkin-Pee Dee Lakes region is located in the Piedmont of North Carolina, and consists of the following seven counties: Anson, Davidson, Montgomery, Randolph, Richmond, Rowan, and Stanly. It was initiated approximately 12 years ago as a nonprofit organization to develop and promote the concept of the area as a distinct region. Recognizing the geographic and economic significance of the region, the goal of the Yadkin-Pee Dee Lakes Project is to "provide a foundation for sound economic growth while maintaining the environmental integrity of the area." It is hoped that the Yadkin-Pee Dee Lakes Project will generate lifestyle jobs that attract hospitality resources for overnight visitors, not just day visitors.

Some of the existing attractions in the region include Badin Lake Recreational Area, High Rock, Lake Tillery, Pee Dee National Wildlife Refuge, the North Carolina Zoo, and Seagrove Pottery. Significant projects planned include the Village of Misenheimer/Pfeiffer University cycling center, which will attract the large population of cycling enthusiasts in the region. Another project is known as *Chautauqua* in Badin, which will somewhat emulate the western NY Chautauqua, which is a lakeside community that focuses on arts, education, religion and recreation with various programs, classes, and events for residents and visitors to attend. Accommodations for visitors at Chautauqua, NY range from rental houses and condos to hotels and bed and breakfasts. Other projects include possible use of freight lines (around Aberdeen) for dining and lodging.

Proponents of the Yadkin-Pee Dee Lakes Project maintain that appropriate transportation infrastructure, with consideration to the "visual integrity and scenic protection is key to implementing the "Central Park" strategy. Proponents also noted the importance of the US 64 and NC 49 corridors to the Project's existing and future endeavors, and propose that the seven-county area be a destination, not populated with "drive-by" businesses.



3.5 Major Environmental Features

Figure 3.11 (Sheets 1 through 13) shows major environmental features in the vicinity of the study corridor. Data on environmental features was obtained on a county-wide scale from the NCDOT GIS Unit. The data was current as of February 2004. NCDOT is a partner with the NC Center for Geographic Information and Analysis (NCCGIA). The NCCGIA database contains information on the following:

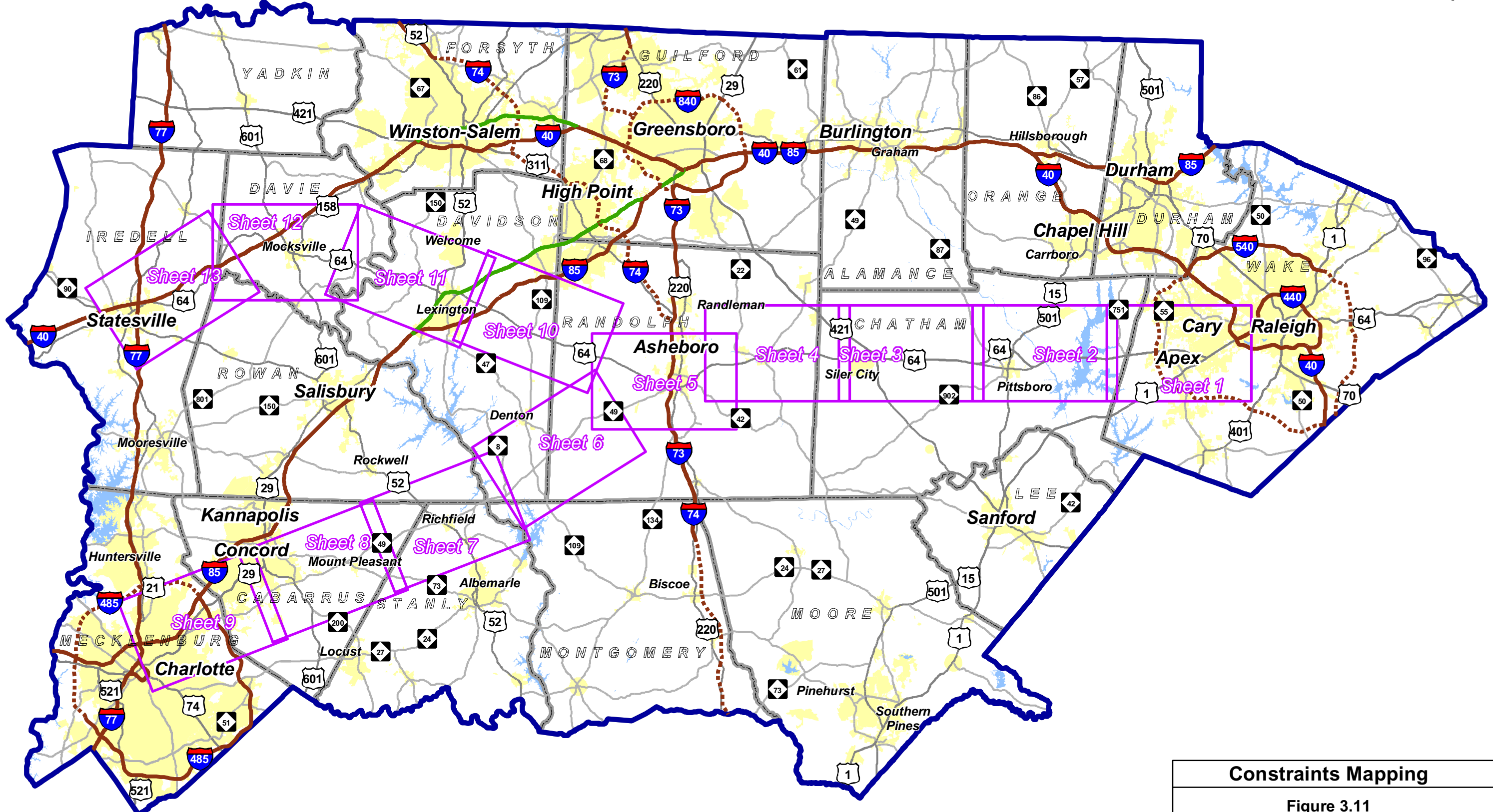
- Wetlands on the National Wetlands Inventory
- Streams and Water Bodies
- Outstanding/High Quality Waters
- Impaired Waters (EPA's 303d list)
- Watershed Areas
- Natural Heritage Program sites
- State and Federally Owned Lands
- Hazardous Materials/Superfund Sites
- Historic Resources

A limited windshield survey was conducted along US 64 and NC 49 to review the features shown in the database.

The Natural Heritage Program elements, parks, and hazardous materials/Superfund sites located on or near the US 64–NC 49 Corridor are numbered from 1 to 91 on **Figure 3.11**. **Table 3.5** contains a description of each numbered resource.

3.5.1 Water Resources

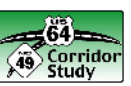
Wetlands, streams, and open waters (Waters of the United States) are regulated by the US Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act. The North Carolina Department of Environment and Natural Resources – Division of Water Quality (NCDWQ) also has regulatory input through Section 401 Water Quality Certification. Wetlands, as defined in 33 CFR 328.3, are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Any action that proposes to place fill into these areas falls under the jurisdictional of the USACE under Section 404 of the Clean Water Act (33 USC 1344).



Constraints Mapping










Figure 3.11

Index





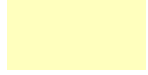


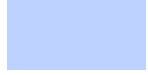




Legend









-  Study Corridor
-  Creeks & Streams
-  Impaired Water (303d Listed)
-  High Quality Outstanding Resource Water Zones
-  Critical Watersheds
-  Major Water Bodies
-  NWI
-  Counties
-  Municipal Limits



-  Superfund Areas
-  Parks
-  Historic Sites
-  Historic Study List Districts
-  Federally Owned Land
-  Significant Natural Heritage Areas

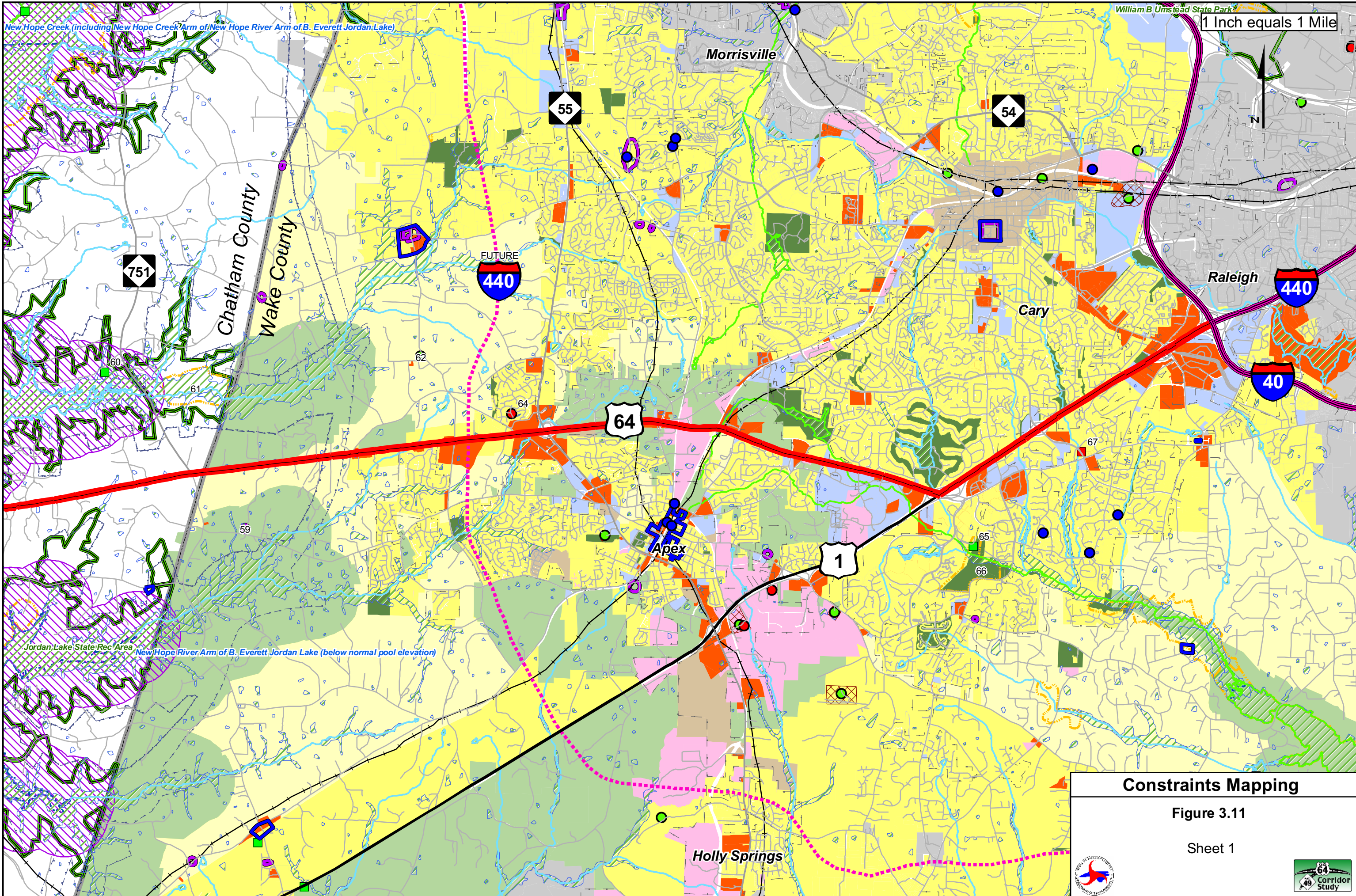
Zoning

-  Conservation
-  Rural Agriculture
-  Suburban Residential (Low Den)
-  Urban Residential (Mid to High Den)
-  Commercial
-  Office and Institutional
-  Industrial
-  Mixed Use
-  Other
-  No Zoning

Natural Heritage Element Occurance

-  Vertebrate Animal
-  Invertebrate Animal
-  Special Animal Habitat
-  Regulated Hazardous Waste Facilities
-  Unregulated Hazardous Sites (Superfund)
-  Historic Points
- 20 Environmental Inventory Number

Constraints Mapping	
Figure 3.11	
Legend	
	



Constraints Mapping

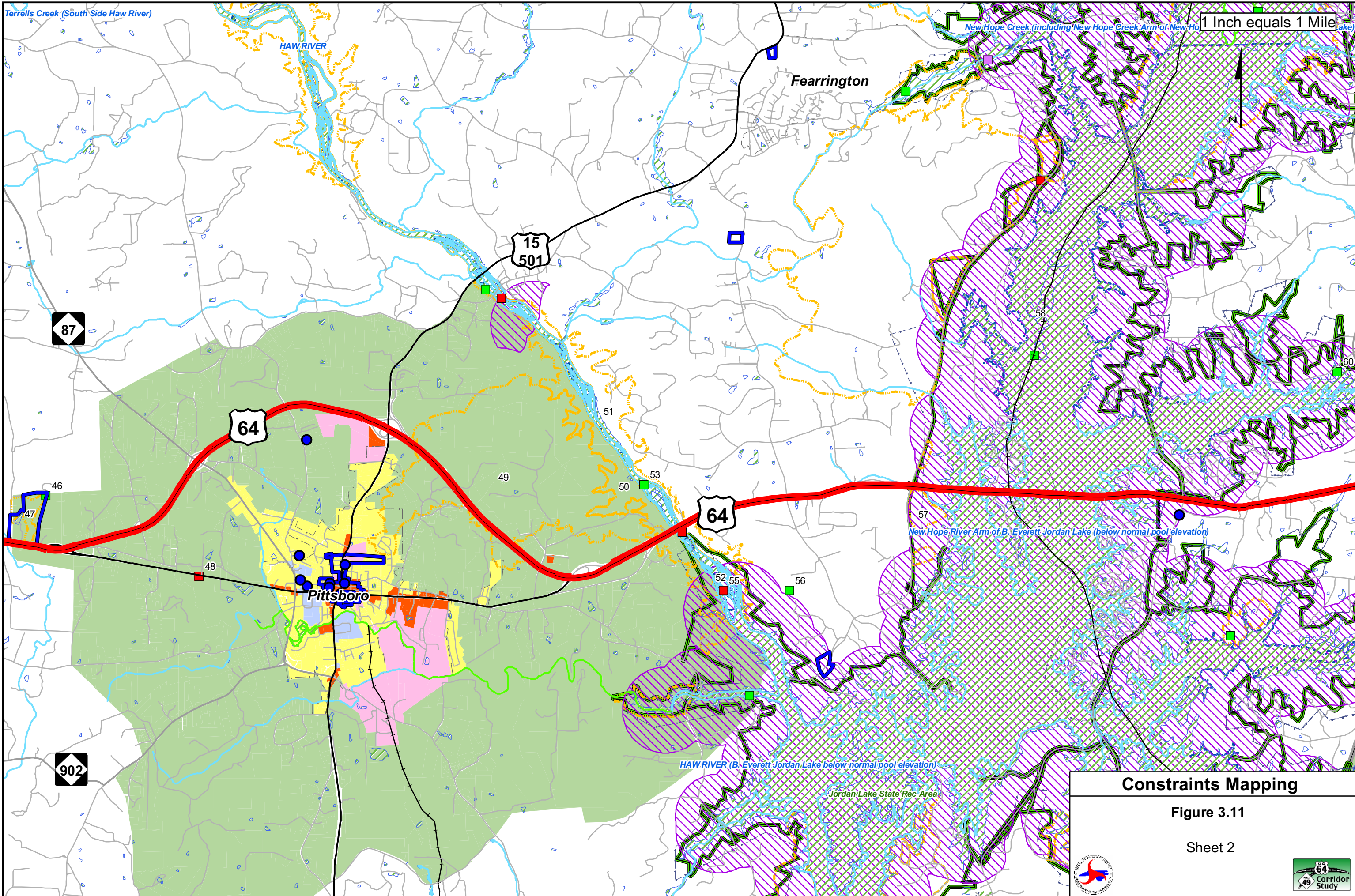
Figure 3.11

Sheet 1



Terrells Creek (South Side Haw River)

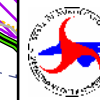
1 Inch equals 1 Mile



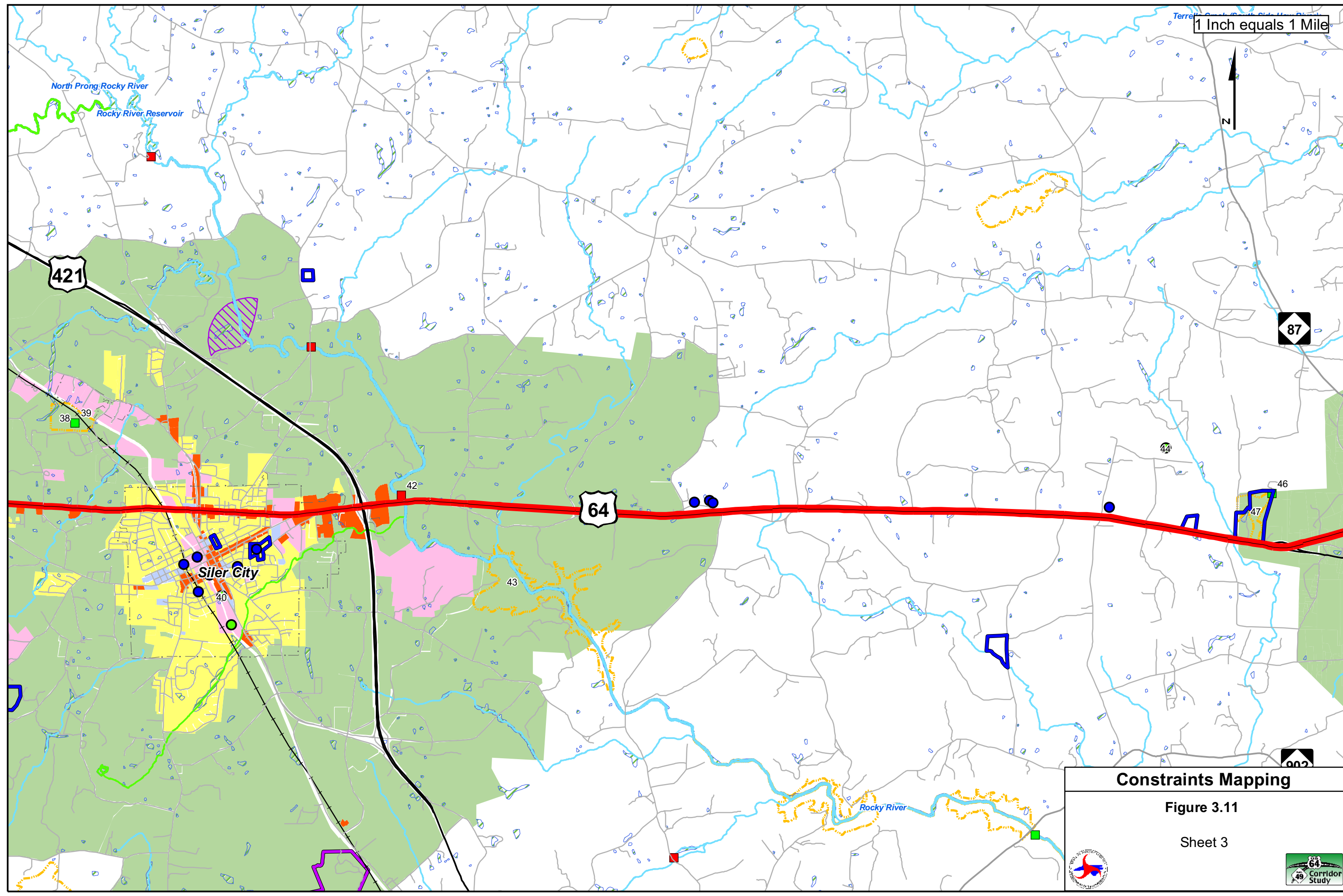
Constraints Mapping

Figure 3.11

Sheet 2



1 Inch equals 1 Mile



421

64

87

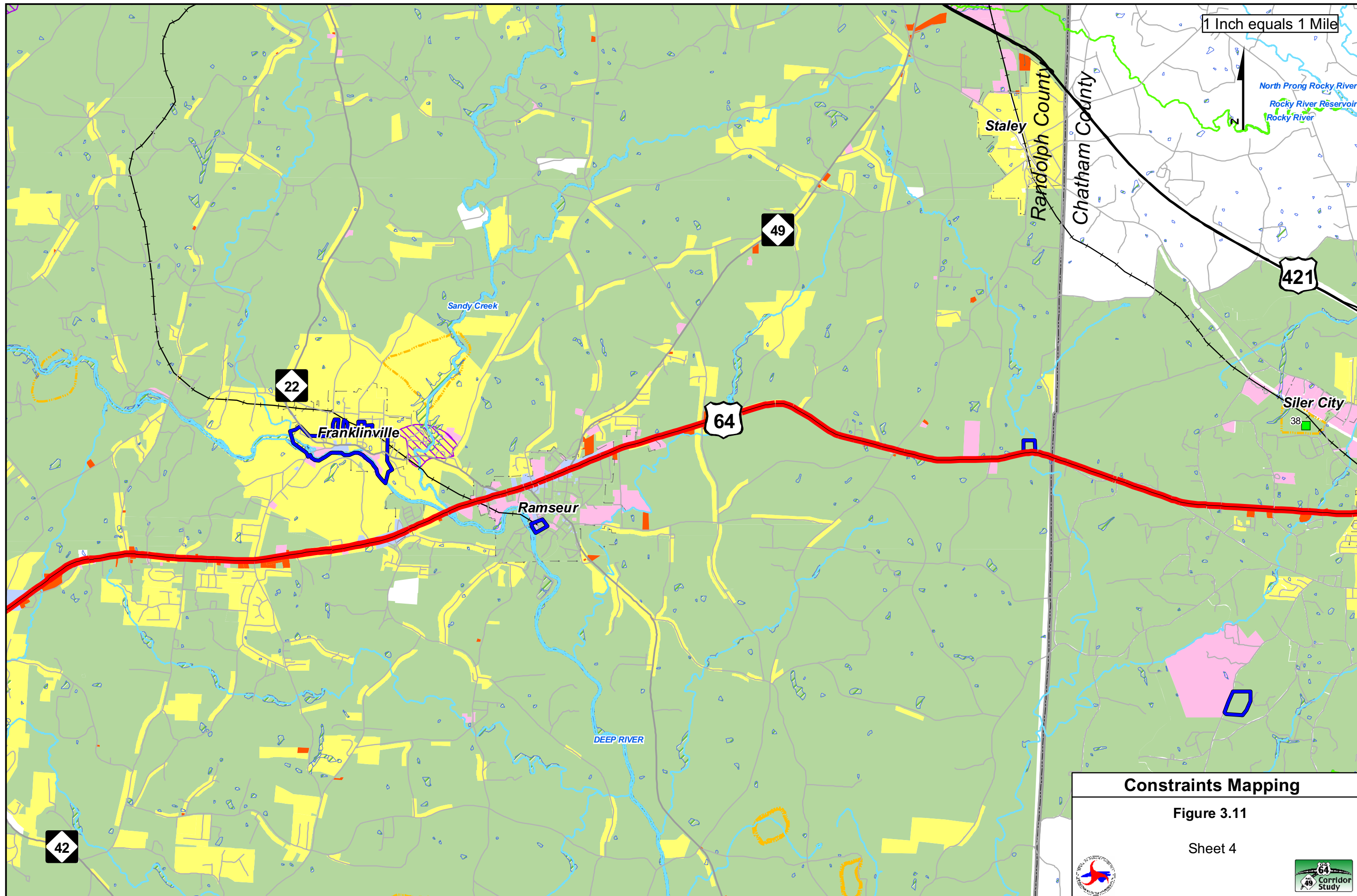
Siler City

Constraints Mapping

Figure 3.11

Sheet 3





1 Inch equals 1 Mile

North Prong Rocky River
Rocky River Reservoir
Rocky River

Staley

Randolph County

Chatham County

421

49

22

Franklinville

Sandy Creek

64

Ramseur

Siler City

38

DEEP RIVER

Constraints Mapping

Figure 3.11

Sheet 4



42

1 Inch equals 1 Mile



Franklinville

DEEP RIVER

Back Creek (Back Creek Lake)



Back Creek

Asheboro

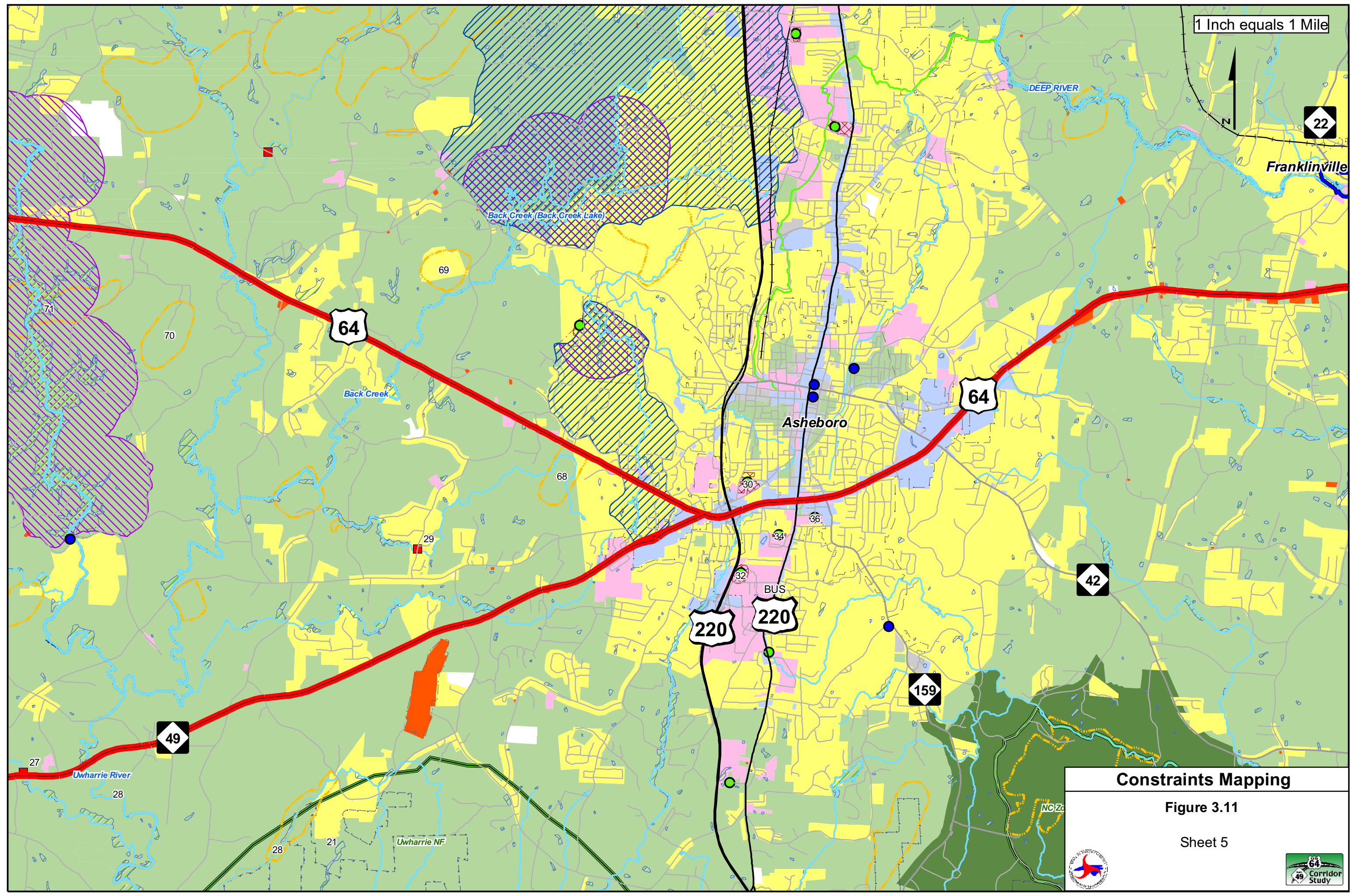


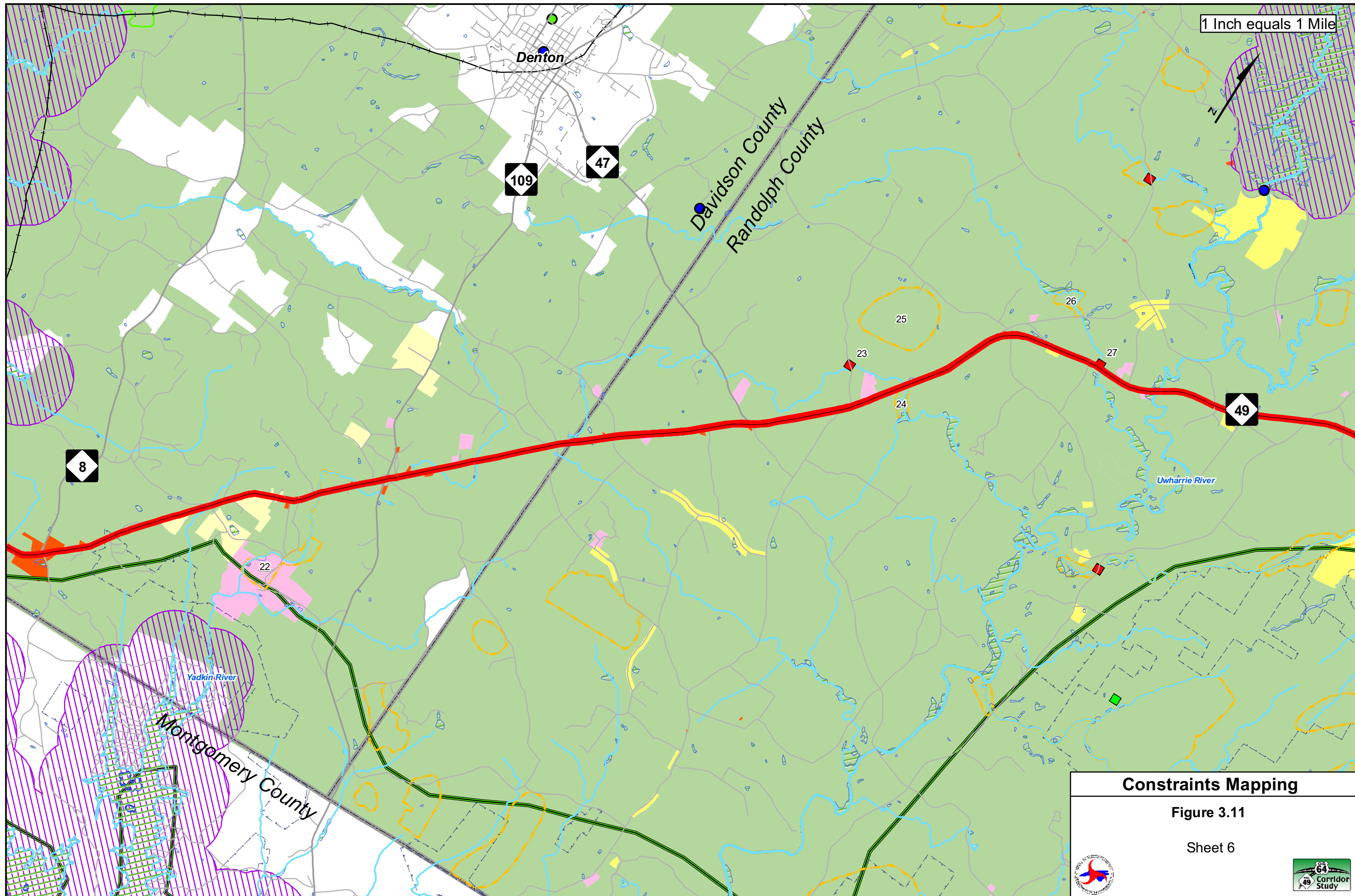
Uwharrie River

Constraints Mapping

Figure 3.11

Sheet 5



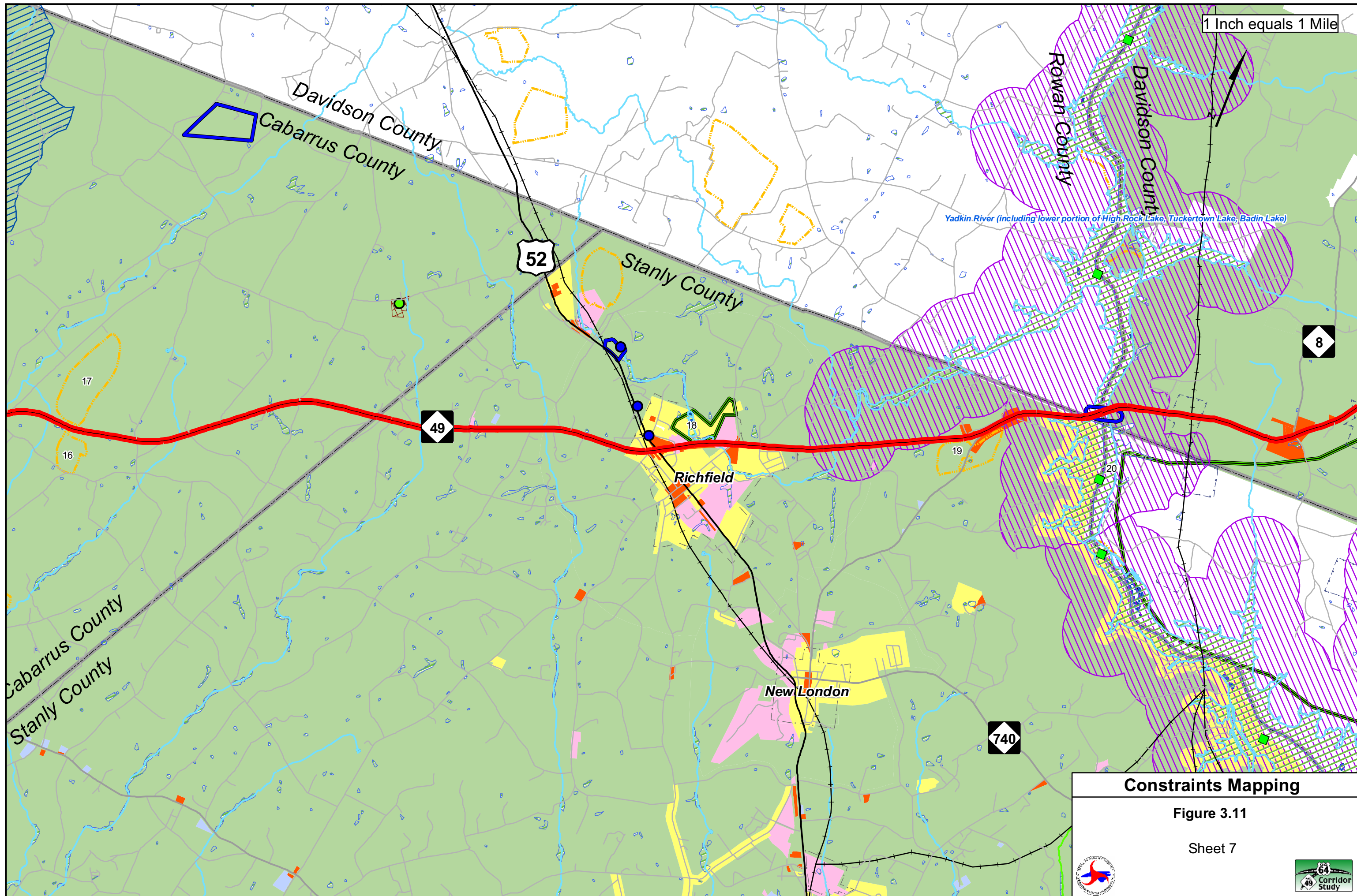


Constraints Mapping

Figure 3.11

Sheet 6





1 Inch equals 1 Mile

Davidson County
Cabarrus County

Stanly County

Rowan County

Davidson County

Yadkin River (including lower portion of High Rock Lake, Tuckertown Lake, Badin Lake)

52

49

8

Richfield

New London

740

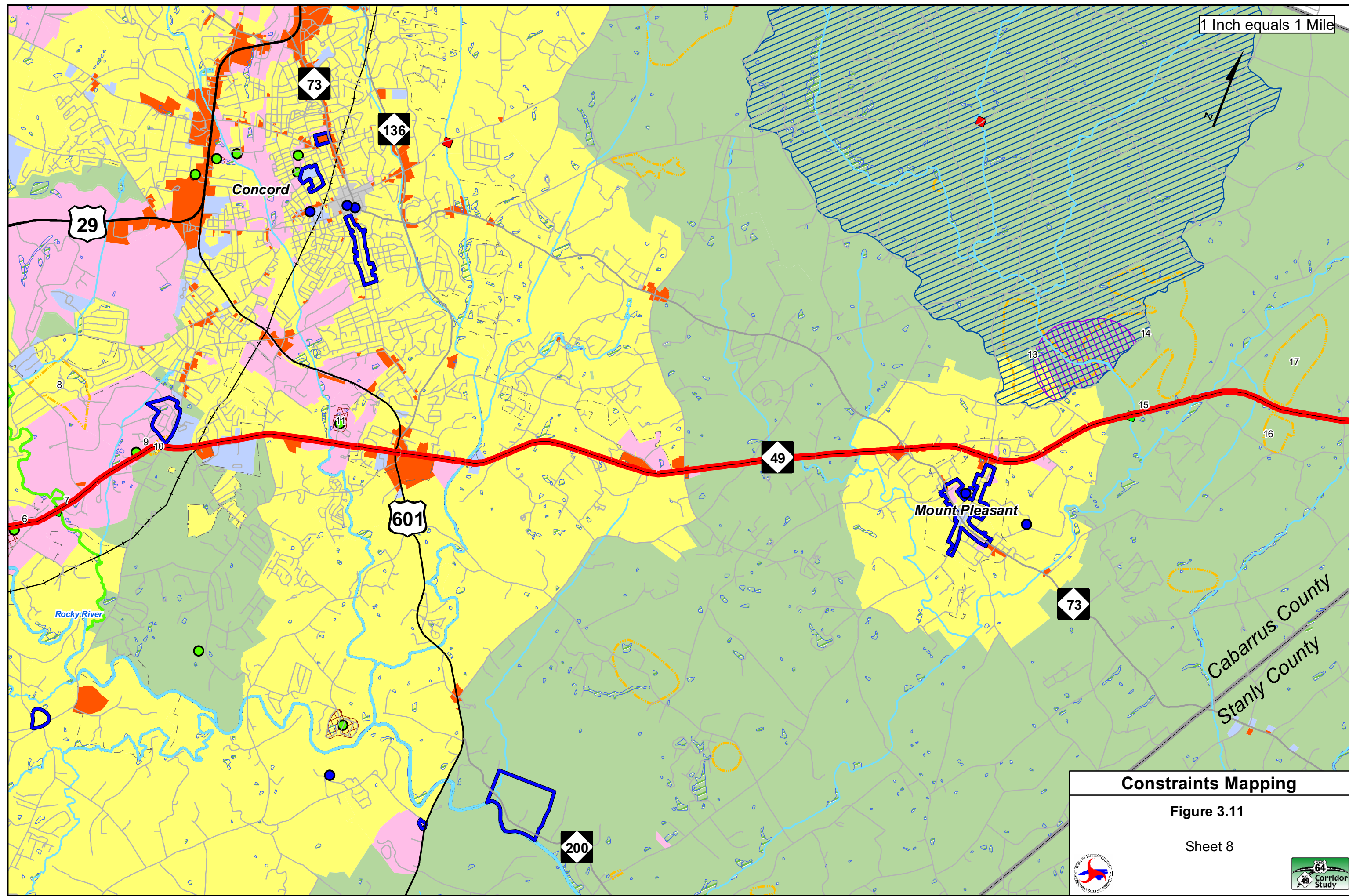
Constraints Mapping

Figure 3.11

Sheet 7



1 Inch equals 1 Mile



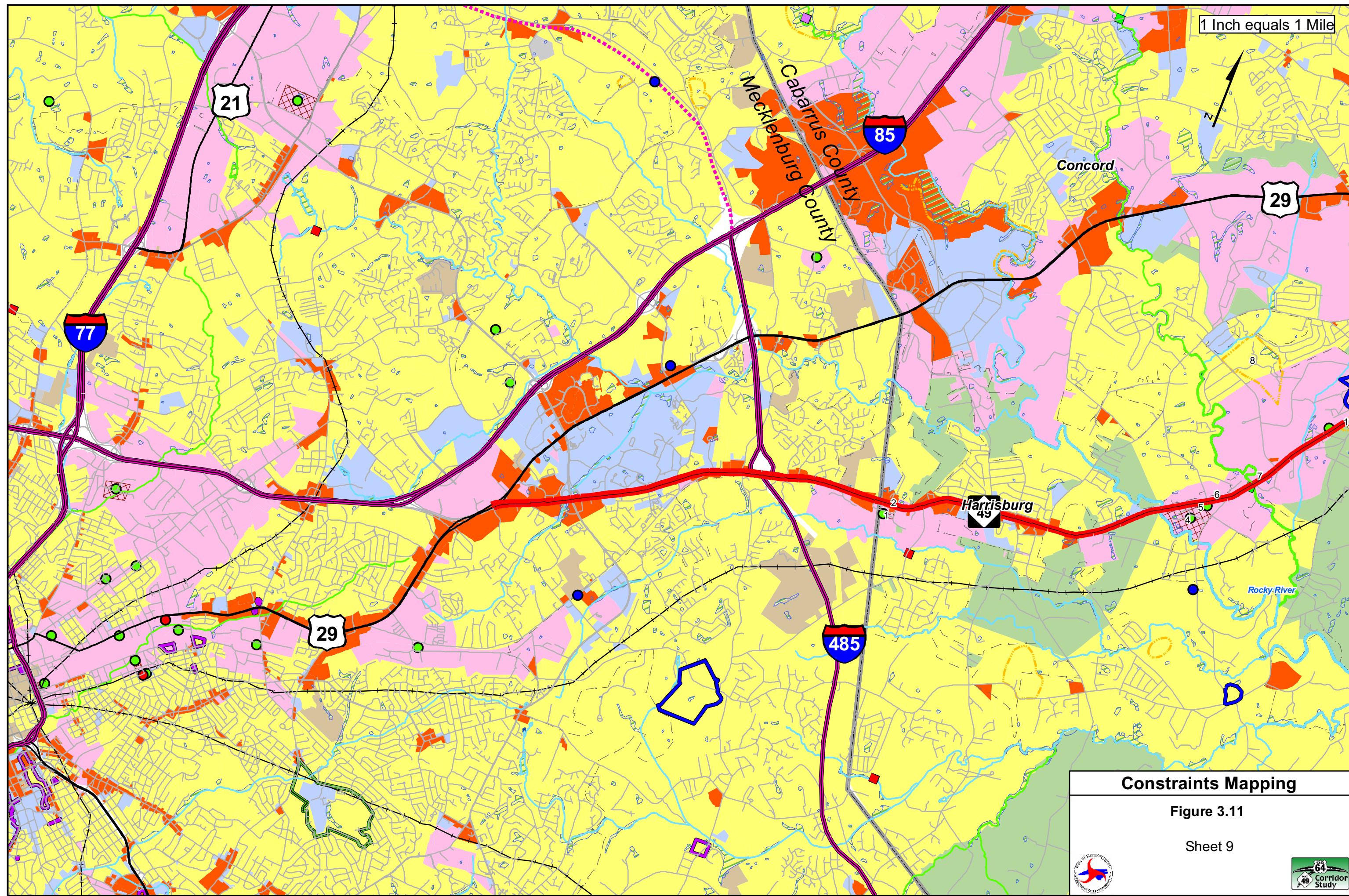
Constraints Mapping

Figure 3.11

Sheet 8



1 Inch equals 1 Mile



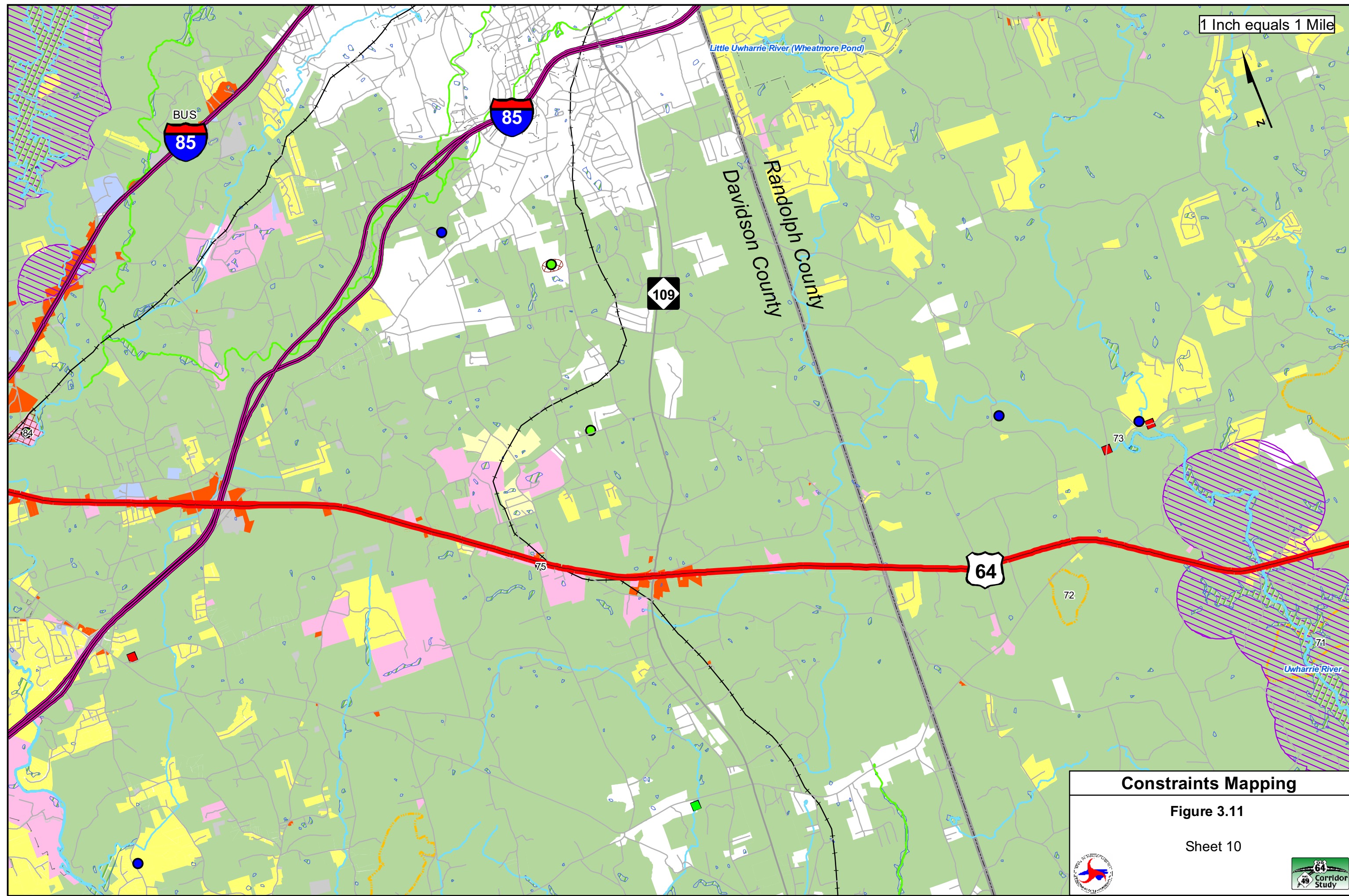
Constraints Mapping

Figure 3.11

Sheet 9



1 Inch equals 1 Mile



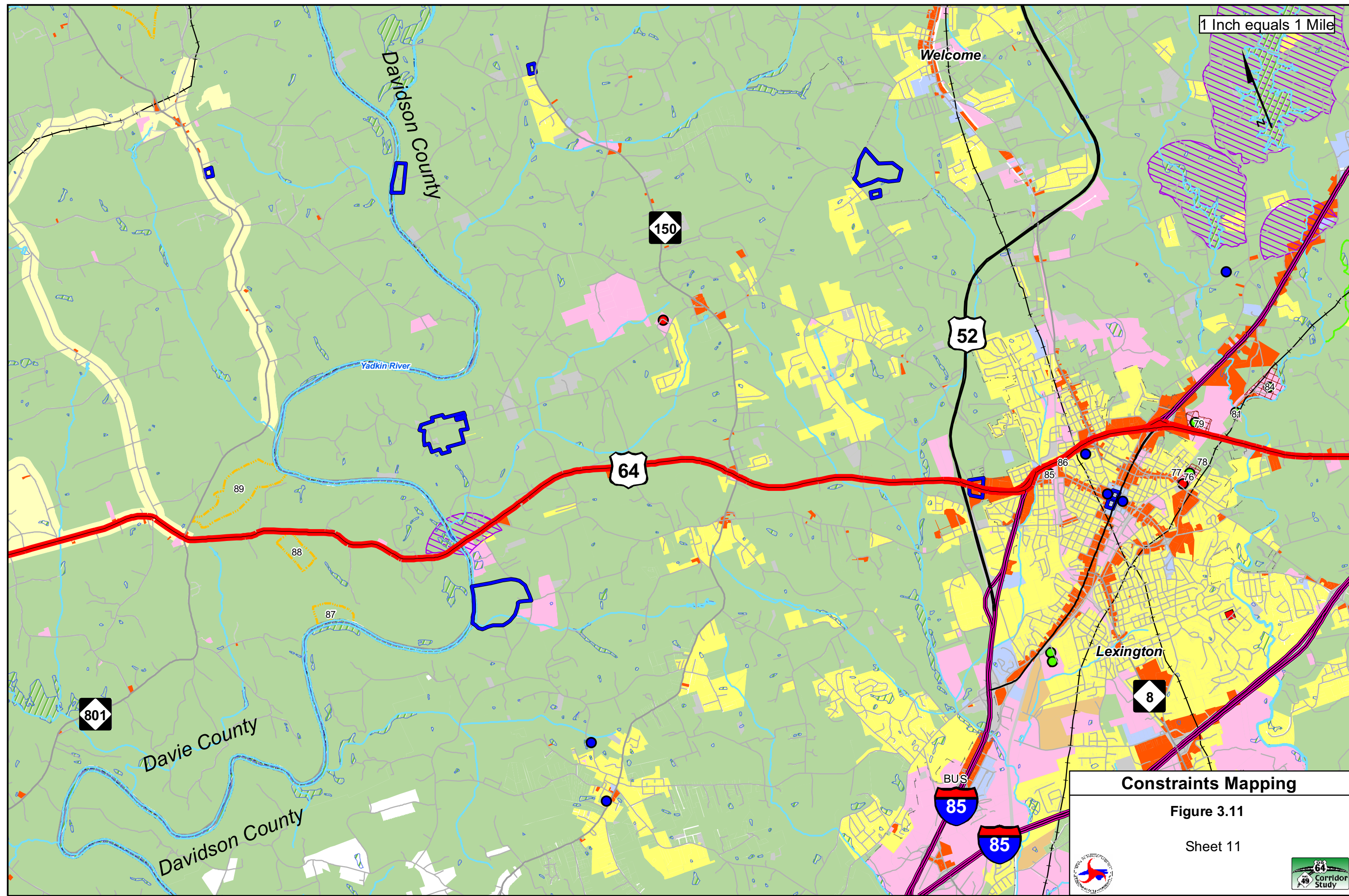
Constraints Mapping

Figure 3.11

Sheet 10



1 Inch equals 1 Mile

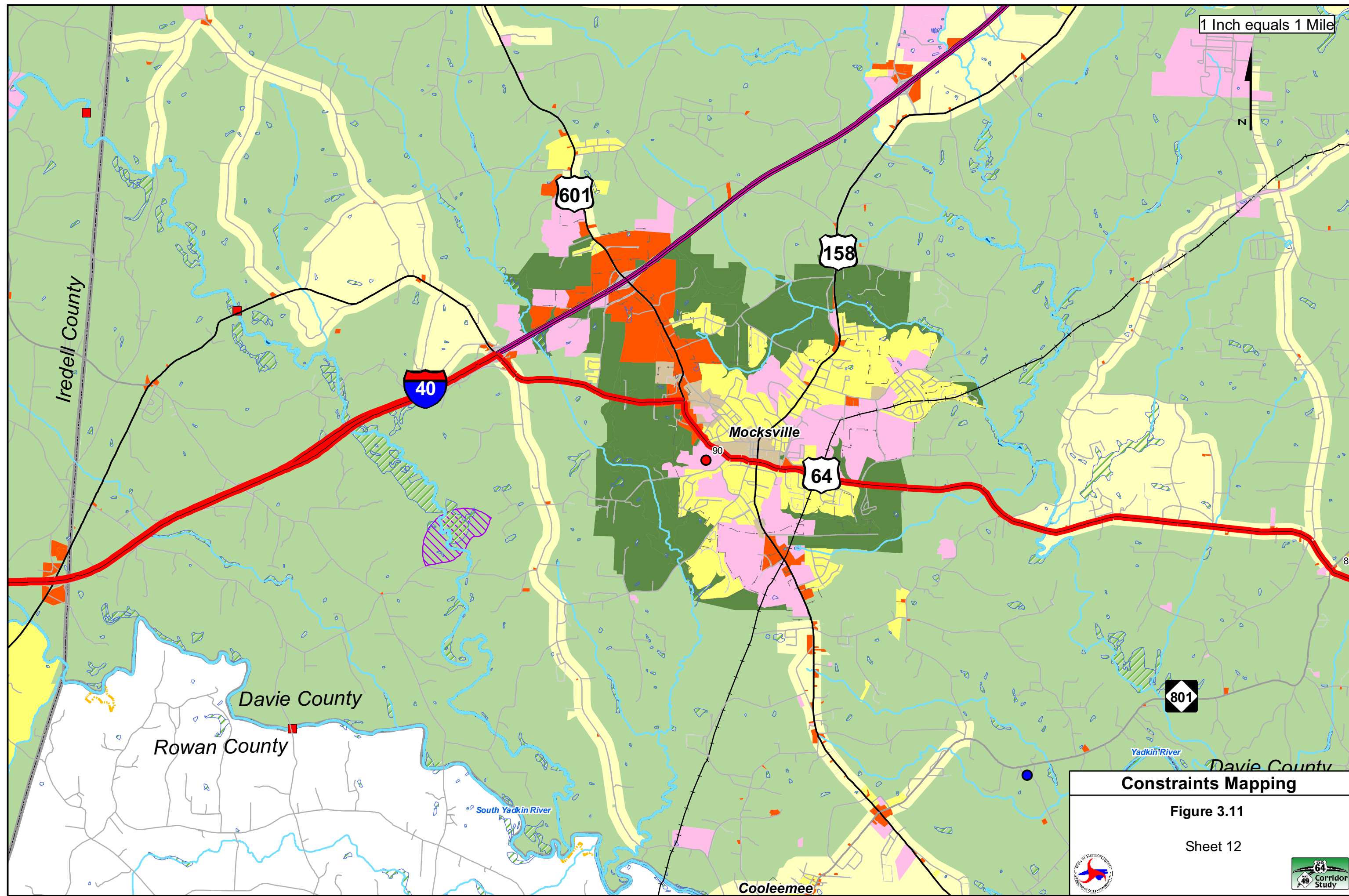


Constraints Mapping

Figure 3.11

Sheet 11

1 Inch equals 1 Mile



Iredell County

Davie County

Rowan County

Mocksville

Cooleemee

Yadkin River

South Yadkin River

Davie County

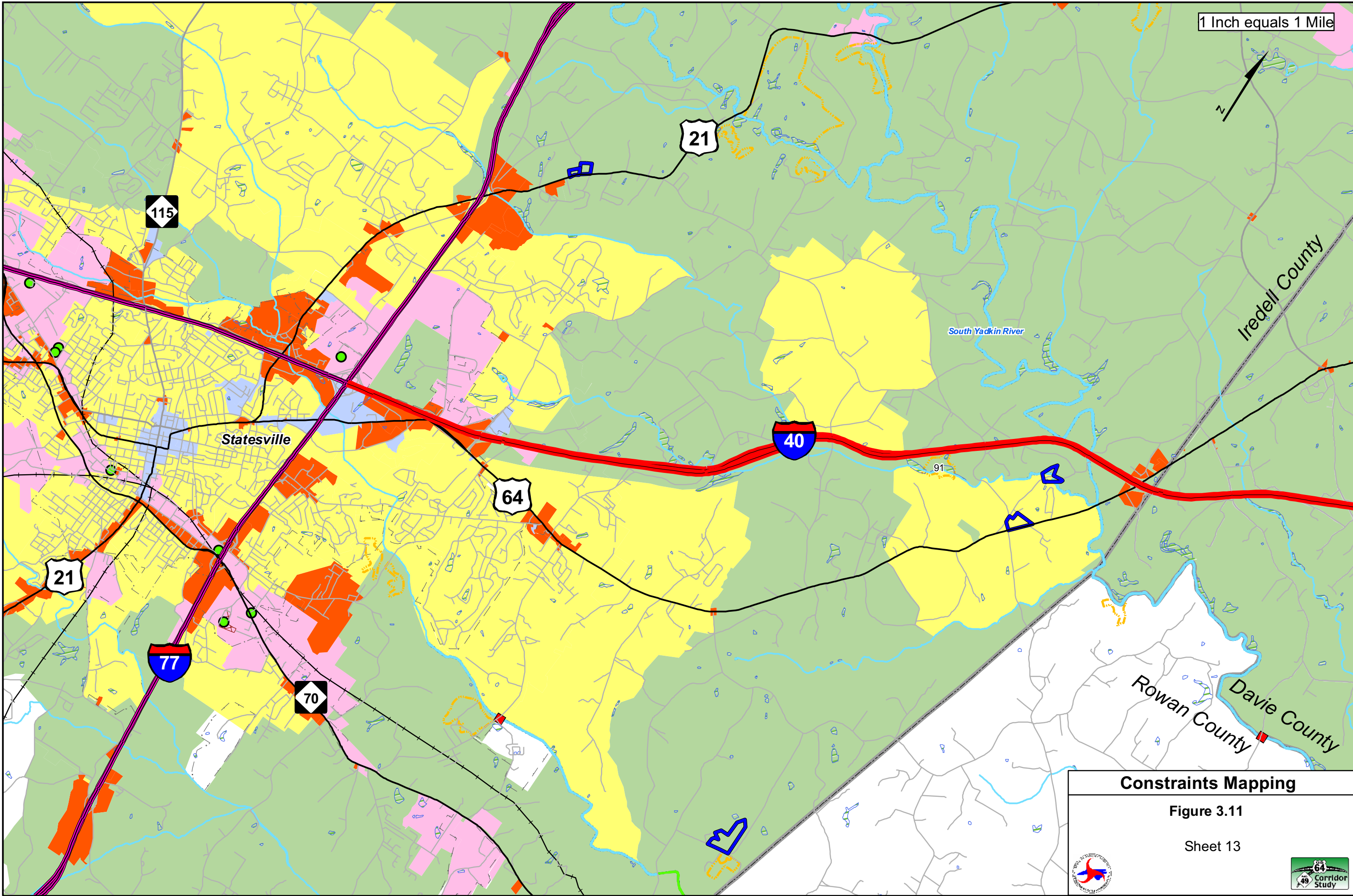
Constraints Mapping

Figure 3.11

Sheet 12



1 Inch equals 1 Mile



Statesville

South Yadkin River

Iredell County

Rowan County

Davie County

Constraints Mapping

Figure 3.11

Sheet 13





Table 3.5: Environmental Constraints Map – Descriptions of Numbered Features

Feature Number on Figure 3.11	Feature Type	Description	Federal/State Status (Where Applicable)*
1	Superfund Areas	Galvin Industries, Inc.	
2	Unregulated Hazardous Sites (Superfund)	Olin Corp. Ecusta Paper & Film Group	
3	Natural Heritage Element Occurrence	Villosa Vaughaniana (Carolina Creekshell – Mollusk)	E
4	Superfund Areas	Mineral Research and Development Corp.	
5	Unregulated Hazardous Sites (Superfund)	Harrisburg Battery	
6	Unregulated Hazardous Sites (Superfund)	FL Steel Corp.	
7	Natural Heritage Element Occurrence	Etheostoma Collis Population 1 (Carolina Darter [Central Piedmont Population] – Fish)	SC
8	Significant Natural Heritage Areas	Frank Lisk Park	
9	Unregulated Hazardous Sites (Superfund)	Lee County Landfill	
10	Significant Natural Heritage Areas	Concord Ring Dike/Jackson School Natural Area	
11	Superfund Areas	Brey McNar Wastewater Treatment Plan (WWTP)	
12	Unregulated Hazardous Sites (Superfund)	Goldsboro Coal and Gas Plant #1	
13	Significant Natural Heritage Areas	Charity Church Hardwood Forest	
14	Significant Natural Heritage Areas	Dutch Buffalo Creek Dam	
15	Natural Heritage Element Occurrence	Etheostoma Collis Population 1 (Carolina Darter [Central Piedmont Population] – Fish)	SC
16	Significant Natural Heritage Areas	Butcher Branch Forest	
17	Significant Natural Heritage Areas	Lower Butcher Branch Depression Swamps	
18	Parks	Richfield Park	
19	Significant Natural Heritage Areas	New London Ridges	
20	Natural Heritage Element Occurrence	Haliaeetus Leucocephalus (Bald Eagle – Bird)	T
21	Parks	Uwharrrie National Forest	
22	Significant Natural Heritage Areas	Beaverdam Creek/Grassy Fork Creek	
23	Natural Heritage Element Occurrence	Alasmidonta Varicosa (Brook Floater – Mollusk)	E



Table 3.5: Environmental Constraints Map – Descriptions of Numbered Features

Feature Number on Figure 3.11	Feature Type	Description	Federal/State Status (Where Applicable)*
24	Significant Natural Heritage Areas	Second Creek Slopes	
25	Significant Natural Heritage Areas	Cody Mountain	
26	Significant Natural Heritage Areas	Toms Creek Basic Forest	
27	Natural Heritage Element Occurrence	Alasmidonta Varicosa (Brook Floater – Mollusk)	E
28	Significant Natural Heritage Areas	Uwharrie River Aquatic Habitat	
29	Natural Heritage Element Occurrence	Villosa Vaughaniana (Carolina Creekshell – Mollusk)	E
30	Superfund Areas	Union Carbide Corp.	
31	Unregulated Hazardous Sites (Superfund)	Sorrell Landfill	
32	Superfund Areas	Jung Corp	
33	Unregulated Hazardous Sites (Superfund)	Ethan Allen Furniture	
34	Superfund Areas	General Electric Co.	
35	Unregulated Hazardous Sites (Superfund)	Harrelson Rubber Co, Inc.	
36	Superfund Areas	Harrelson Rubber Co, Inc.	
37	Unregulated Hazardous Sites (Superfund)	Aycock Property	
38	Significant Natural Heritage Areas	Donnelly Hardpan Bog	
39	Natural Heritage Element Occurrence	Hemidactylum Scutatatum (Four-Toed Salamander – Amphibian)	SC
40	Superfund Areas	Harrelson Rubber Co.	
41	Unregulated Hazardous Sites (Superfund)	Grant Creek Regional Wastewater Treatment Plant (WWTP)	
42	Natural Heritage Element Occurrence	Villosa Vaughaniana (Carolina Creekshell – Mollusk)	E
43	Significant Natural Heritage Areas	Rocky River Basalt Bluffs and Levees	
44	Superfund Areas	Chatham County Landfill	
45	Unregulated Hazardous Sites (Superfund)	Gray Farm Site	
46	Natural Heritage Element Occurrence	Hemidactylum Scutatatum (Four-Toed Salamander – Amphibian)	SC
47	Significant Natural Heritage Areas	Lessler Montmorillonite Forest	
48	Natural Heritage Element Occurrence	Cambarus Davidi (Carolina Ladle Crayfish – Crustacean)	SR



Table 3.5: Environmental Constraints Map – Descriptions of Numbered Features

Feature Number on Figure 3.11	Feature Type	Description	Federal/State Status (Where Applicable)*
49	Significant Natural Heritage Areas	Pittsboro Firetower Wilderness	
50	Significant Natural Heritage Areas	Duke Forest Haw River Levees and Bluffs	
51	Significant Natural Heritage Areas	Duke Forest Haw River Levees and Bluffs	
52	Significant Natural Heritage Areas	Haw River Aquatic Habitat	
53	Natural Heritage Element Occurrence	Notropis Mekistocholas (Cape Fear Shiner – Fish)	E
54	Natural Heritage Element Occurrence	Alasmidonta Varicosa (Brook Floater – Mollusk)	E
54	Natural Heritage Element Occurrence	Lampsilis Cariosa (Yellow Lampmussel – Mollusk)	E
55	Natural Heritage Element Occurrence	Gomphus Septima (Septima’s Clubtail – Insect)	SR
56	Natural Heritage Element Occurrence	Haliaeetus Leucocephalus (Bald Eagle – Bird)	T
57	Significant Natural Heritage Areas	Parkers Creek Ridges	
58	Parks	Jordan Lake State Recreation Area	
59	Historic Study List Districts	HT Lawrence Farm – Circa 1898 Tobacco Farm	
60	Natural Heritage Element Occurrence	Haliaeetus Leucocephalus (Bald Eagle – Bird)	T
61	Significant Natural Heritage Areas	White Oak Creek Floodplain	
62	Superfund Areas	Pierce (Lynn) Property	
63	Unregulated Hazardous Sites (Superfund)	Romarco Ltd	
64	Regulated Hazardous Waste Facilities		
65	Natural Heritage Element Occurrence	Hemidactylum Scutatatum (Four-Toed Salamander – Amphibian)	SC
66	Significant Natural Heritage Areas	Hemlock Bluffs State Natural Area	
67	Natural Heritage Element Occurrence	Lampsilis Radiata Radiata (Eastern Lampmussel – Mollusk)	T
68	Significant Natural Heritage Areas	Cable Creek Headwaters	
69	Significant Natural Heritage Areas	Back Creek Ravines	



Table 3.5: Environmental Constraints Map – Descriptions of Numbered Features

Feature Number on Figure 3.11	Feature Type	Description	Federal/State Status (Where Applicable)*
70	Significant Natural Heritage Areas	Ridges Mountain	
71	Significant Natural Heritage Areas	Camp Woodfield Forests	
72	Significant Natural Heritage Areas	Westfield Church Basic Forest	
73	Natural Heritage Element Occurrence	Villosa Delumbis (Eastern Creekshell – Mollusk)	SR
74	Unregulated Hazardous Sites (Superfund)	Burke County School Property	
75	Superfund Areas	Burlington Furniture/Lumber Plant #1	
76	Superfund Areas	Burlington Furniture/Cent Main	
77	Regulated Hazardous Waste Facilities		
78	Unregulated Hazardous Sites (Superfund)	Southern Resins	
79	Superfund Areas	Battery Tech	
80	Unregulated Hazardous Sites (Superfund)	Lexington Municipal Landfill	
81	Superfund Areas	Lexington Coal Gas Plant	
82	Unregulated Hazardous Sites (Superfund)	Edgecombe County Landfill	
83	Unregulated Hazardous Sites (Superfund)	Martins Creek Road	
84	Superfund Areas	Lexington Municipal Landfill	
85	Superfund Areas	Raleigh Road Furniture Corp.	
86	Unregulated Hazardous Sites (Superfund)	Howard Johnsons/Crabtree Valley	
87	Significant Natural Heritage Areas	Cooleemee Plantation/Adkin River Slopes	
88	Significant Natural Heritage Areas	Cooleemee Plantation/Orbicular Diorite Area	
89	Significant Natural Heritage Areas	St. Johns School Bluffs	
90	Regulated Hazardous Waste Facilities		
91	Significant Natural Heritage Areas	Cool Springs Fen	

* E=Endangered (federal), T=Threatened (federal), SC=Species of Special Concern (federal)
SR=Significantly Rare (state).

Source: North Carolina Center for Geographic Information and Analysis Database (February 11, 2004)



3.5.1.1 Wetlands

The National Wetland Inventory (NWI) is a program administered by the US Fish and Wildlife Service (USFWS) of the US Department of the Interior (DOI). The NWI program produces information on the characteristics, extent, and status of the Nation's wetlands and deepwater habitats. The National Wetlands Inventory information is used by federal, state, and local agencies; academic institutions; US Congress; and the private sector. Congressional mandates in the Emergency Wetlands Resources Act require the USFWS to map wetlands, and to digitize, archive, and distribute the maps.

The NWI provides information on wetlands on a regional scale. As shown in **Figure 3.11**, NWI wetlands are relatively small and scattered throughout the US 64–NC 49 study area, and are generally associated with stream courses. This distribution pattern is typical of the Piedmont region. There are no large areas of known wetlands along US 64 or NC 49.

When individual projects along US 64 and NC 49 are identified for development, field surveys and delineations of wetland areas and streams, and an evaluation of impacts and mitigation, will be required for permitting under Section 404 of the Clean Water Act.

3.5.1.2 Streams, Water Bodies, and Watersheds

Rivers, lakes and major streams are shown on **Figure 3.11**. The figure does not show minor perennial and intermittent tributaries.

US 64 and NC 49 are primarily in the Cape Fear and the Yadkin-Pee Dee River Basins. A small portion of the eastern end of the study corridor is in the Neuse River Basin. In the Cape Fear River Basin, US 64 crosses the following rivers and their tributaries: the Jordan Lake portion of the Cape Fear River, the Haw River, the Rocky River, and the Deep River. These rivers are, from east to west, in subbasins 03-06-05, 03-06-12, and 03-06-09 of the Upper Cape Fear River Basin.

In the Yadkin River Basin, US 64 crosses the Uwharrie River, the Yadkin River, and the South Yadkin River and their tributaries. These rivers are, from east to west, in sub basins 03-07-09 of the Lower Yadkin-Pee Dee River Basin and 03-07-07, 03-07-04, 03-07-05, and 03-07-06 of the Upper Yadkin-Pee Dee River Basin. US 49 crosses the following rivers and their tributaries: the Uwharrie River, the Yadkin River just north of Badin lake, and the Rocky River. These rivers are, from east to west, in subbasins 03-07-09, 03-07-08, 03-07-13, 03-07-12, and 03-07-11 of the Lower Yadkin-Pee Dee River Basin.

Critical watershed areas along US 64 and NC 49 are found at Jordan Lake (US 64 in Chatham County), the Uwharrie River (US 64 in Randolph County), and Badin Lake (NC 49 at the boundary of Rowan County and Davidson County). “Critical watershed area” is defined as land within one-half mile upstream and draining to a river water supply intake or within one-half mile and draining to the normal pool elevation of water supply reservoirs.



3.5.1.3 Water Quality

There are three major lakes along the corridors: Jordan Lake, Badin Lake, and High Rock Lake. Jordan Lake is currently supporting its designated uses and there are no public health advisories for swimming, fish consumption, or drinking water use. However, water quality standards related to eutrophication are not consistently achieved.¹ Eutrophication is the process by which a water body becomes rich in dissolved nutrients, often leading to algae blooms, low dissolved oxygen, and changes in community composition.

High nutrient concentrations have been a concern in High Rock Lake and Badin Lake. Potential sources of nutrient loading to Badin Lake include development in the immediate watershed and the inflow of nutrient-rich water from High Rock Lake upstream.²

There is one High Quality Water area along the US 64–NC 49 Corridor. This area is along an unnamed tributary to Back Creek just west of Asheboro (**Figure 3.11**, Sheet 5).

Section 303(d) of the Clean Water Act requires states to identify waters not meeting standards set by the US Environmental Protection Agency (EPA). A list of waters not meeting these standards is submitted to the EPA every two years. The EPA reviews and approves the listed waters. Waters placed on this list require the establishment of total maximum daily loads (TMDLs) intended to guide the restoration of water quality.

The US 64–NC 49 Corridor crosses two streams included on the 303(d) list and they are near and upstream of two other streams on the 303(d) list. The first stream, in the upper reaches of Swift Creek, is located just west of the US 64/US 1 interchange in Wake County (**Figure 3.11**, Sheet 1) and this stream is crossed twice by US 64. The second stream is Coddle Creek, a tributary of Rocky River located just north of Harrisburg (**Figure 3.11**, Sheet 8). It is crossed by NC 49. Roberson Creek is located just south of US 64 in Pittsboro (**Figure 3.11**, Sheet 2) and Loves Creek is located just south of US 64 in Siler City (**Figure 3.11**, Sheet 3).

3.5.2 Natural Heritage Program Sites

The NCDENR Natural Heritage Program (NHP) maintains a database of rare species and unique habitat that is included in the county-wide GIS data obtained from the NCDOT GIS Unit. NHP elements are shown in **Figure 3.11**. These areas represent unique or rare habitats and/or known occurrences of federal or state protected species.

¹ Cape Fear River Basin Plan, NC DWQ, August 2000

² Yadkin Pee Dee River Basin Plan, NC DWQ, March 2003



The known occurrences of federally designated Threatened and Endangered species in the US 64–NC 49 Corridor vicinity are freshwater mussels, a fish (Cape Fear shiner), and the American bald eagle. Individual projects along US 64 and NC 49 would require field surveys for federally protected species and their habitats.

3.5.3 State and Federally Owned Lands

State and federally owned land along the US 64–NC 49 Corridor includes land owned by the federal government surrounding Jordan Lake (US Army Corps of Engineers) and in the Uwharrie National Forest (US Forest Service of the US Department of Agriculture). State-owned lands include the North Carolina Zoo in Randolph County. County-owned land includes Richfield Park in Richfield, north of NC 49.

Any individual project proposed along US 64 or NC 49 that involves the potential for impact on federal funds would be subject to Section 4(f) of the Department of Transportation Act of 1966 (49 USC § 303) and 23 CFR § 771.135. In accordance with this Act, the FHWA may not approve the use of land from a significant publicly owned park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that: (i) there is no feasible and prudent alternative to the use of land from the property; and (ii) the action includes all possible planning to minimize harm to the property resulting from such use.

3.5.4 Hazardous Materials and Superfund Sites

Known regulated and unregulated (Superfund) hazardous materials sites are located throughout the corridor, with concentrations in urbanized areas. Road construction through these types of sites can require remediation of the site, and can result in increased construction costs. The following are sites located on or immediately adjacent to US 64 or NC 49.

Galvan Industries and Olin Corporation/Ecusta Paper and Film Group. These two sites are Superfund sites located on the south side of NC 49 in south Harrisburg (Feature Numbers 1 and 2 on **Figure 3.11**, Sheet 9).

FL Steel Corporation. This Superfund area is located on the south side of NC 49 north of Harrisburg and north of the Rocky River (Feature Number 6 on **Figure 3.11**, Sheet 9).

Lee County Landfill. This Superfund area is located on the north side of NC 49 north of Harrisburg and north of the Rocky River (Feature Number 9 on **Figure 3.11**, Sheet 9).



Burlington Furniture/Lumber Plant #1. This Superfund area is located on the north side of US 64 in Davidson County, just west of NC 109 (Feature Number 75 on **Figure 3.11**, Sheet 10).

Battery Tech and Lexington Municipal Landfill. These Superfund sites are located in the northeast quadrant of the US 64/US 29/I-85 junction (Feature Numbers 79 and 80 on **Figure 3.11**, Sheet 11).

3.5.5 Historic Resources

The records on file at the State Historic Preservation Office (SHPO) were reviewed in October 2004 to identify known historic resources that are either presently listed on or that have been determined to be eligible for listing on the National Register of Historic Place (NRHP) that are located within a four-mile wide corridor centered around US 64 and NC 49.

Based on the file search conducted at the SHPO, there are 78 historic resources within two miles of the US 64–NC 49 Corridor that are on file at the State Historic Preservation Office (SHPO). As shown in **Figure 3.11**, these are scattered throughout the corridor study, with concentrations in the older communities along the roadways. There are seven resources that are adjacent to US 64 or NC 49. These resources are listed in **Table 3.6**.

Any individual project proposed along US 64 or NC 49 that involves the use of federal funds would be subject to Section 4(f) of the Department of Transportation Act of 1966 (49 USC § 303) and 23 CFR § 771.135, as described in Section 7.8.3, which includes protection for significant historic sites. Section 106 of the National Historic Preservation Act of 1966 and the *Advisory Council on Historic Preservation Regulations for Compliance with Section 106*, codified as 36 CFR Part 800, would apply to all proposed roadway projects along US 64 or NC 49.

Table 3.6: Historic Properties Adjacent to US 64 and NC 49

SHPO Site Number	Site Name	Status	Location	Figure 3.11 Sheet Number
CH-1	Alston-DeGraffenreid House and Plantation	On the NRHP	North side of US 64, just west of western junction of US 64 Pittsboro Bypass and US 64 Business.	Sheets 2 and 3
CH-9	Aspen Hall	On the NRHP	North side of US 64, just west of Site CH-1.	Sheet 3
CH-392	--	Determined eligible for the NRHP	North side of US 64, just west of CH-1 and CH-9.	Sheet 3



Table 3.6: Historic Properties Adjacent to US 64 and NC 49

SHPO Site Number	Site Name	Status	Location	Figure 3.11 Sheet Number
RD-21	Marley House	On the NRHP	North side of US 64, just west of the Randolph/Chatham County line.	Sheet 4
RW-653	Bridge over Yadkin River	Determined eligible for the NRHP	Old NC 49 bridge over the Yadkin River near Rowan/Davidson County line.	Sheet 7
CA-45	Stonewall Jackson Training School	On the NRHP	North side of NC 49, west of the railroad tracks that cross NC 49 west of US 601.	Sheet 8
DV-342	Henry Shoaf Farm	On the NRHP	Both sides of US 64, between the US 64/I-85 Business interchange and the US 64/US 52 intersection in west Lexington.	Sheet 11

Source: North Carolina State Historic Preservation Office (SHPO)

3.5.6 Air Quality

Air pollution originates from various sources with emissions from industrial processes and internal combustion engines being the most prevalent sources. Other sources of outdoor air pollution include (1) solid waste disposal and combustion and (2) any form of fire. The impacts resulting from highway construction can range from intensifying existing air pollution problems to improving the ambient air conditions.

The Federal Clean Air Act of 1970, as amended (42 USC 750(c)), was enacted for the purposes of protecting and enhancing the quality of the nation’s air resources to benefit public health, welfare, and productivity.

The US Environmental Protection Agency (EPA) has established primary and secondary National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone (O₃), particulate matter, and lead (Pb). For ozone, North Carolina adopted the 8-hour standard on April 1, 1999.

Table 3.7 lists the National Ambient Air Quality Standards (EPA Web Site, March 2005). The primary standards are set at a limit intended to “*protect the public health with an adequate margin of safety,*” and the secondary standards are set at a limit intended to “*protect the public welfare from known or anticipated adverse effects (effects to aesthetics, crops, architecture, etc.).*”³ The primary standards are established with a margin of safety, and

³ Federal Clean Air Act 1990: Section 109



consider long-term exposures for the most sensitive groups in the general population (i.e., children, senior citizens, and people with breathing difficulties).

Table 3.7: National Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Standard	Standard Type
Carbon Monoxide	8-hour Average	9 ppm	Primary
	1-hour Average	35 ppm	Primary
Nitrogen Dioxide	Annual Arithmetic Mean	0.053 ppm	Primary and Secondary
Ozone	1-hour Average	0.12 ppm	Primary and Secondary
	8-hour Average	0.08 ppm	Primary and Secondary
Lead	Quarterly Average	1.5 mg/m ³	Primary and Secondary
Particulate < 10 micrometers (PM ₁₀)	Annual Arithmetic Mean	50 mg/m ³	Primary and Secondary
	24-hour Average	150 mg/m ³	Primary and Secondary
Particulate < 2.5 micrometers (PM _{2.5})	Annual Arithmetic Mean	15 mg/m ³	Primary and Secondary
	24-hour Average	65 mg/m ³	Primary and Secondary
Sulfur Dioxide	Annual Arithmetic Mean	0.03 ppm	Primary
	24-hour Average	0.14 ppm	Primary
	3-hour Average	0.50 ppm	Secondary

Source: US EPA Website: <http://www.epa.gov/oar/oaqps/greenbk/>, March 2005

Figure 3.12 and Table 3.8 shows the NAAQS attainment status of the 19 counties in the US 64–NC 49 regional study area. A designation of “attainment” for a pollutant means the county is meeting the National Ambient Air Quality Standards for that pollutant. A designation of “non-attainment” means the county currently is violating the NAAQS for that pollutant. “Maintenance” means the county was previously designated non-attainment for a pollutant, but is now meeting the standard.

Most of the counties in the regional study area, and all the counties that US 64 and NC 49 pass through, do not currently meet the 8-hour ozone standard. The Triad area (counties include Surry, Stokes, Rockingham, Caswell, Yadkin, Forsyth, Guilford, Alamance, Davie, Davidson, and Randolph) has entered into an Early Action Compact (EAC) with the EPA to aid in achieving the 8-hour ozone standard⁴.

The EPA is working with communities like the Triad to achieve the 8-hour ozone standard as soon as possible by entering into EACs that will reduce ground-level ozone, commonly known as smog. Communities close to or exceeding the 8-hour ozone standard that have elected to enter into an EAC will start reducing air pollution at least two years sooner than

⁴ US EPA Web Site: www.epa.gov/ttn/naaqs/ozone/eac/index.htm, March 2005

required by the Clean Air Act. Communities participating in the EACs must submit plans in 2004 for meeting the national 8-hour ozone air quality standard, rather than waiting until 2007, which is the plan submittal deadline for other areas not meeting the 8-hour ozone standard. EACs require communities to:

- Develop and implement air pollution control strategies.
- Account for emissions growth.
- Achieve and maintain the national 8-hour ozone standard.

EPA designated these areas as “non-attainment” in April 2004. However, as long as EAC areas meet agreed upon milestones, the impact of non-attainment designation for the 8-hour ozone standard will be deferred. On September 24, 2004, the NC DENR Division of Air Quality submitted *North Carolina’s 8-hour Ozone Attainment Demonstration* for all four EAC’s in North Carolina, including the Triad EAC. As of March 2005, the Triad EAC has met the milestones and the non-attainment designation is deferred.

Figure 3.12: NAAQS Attainment Status

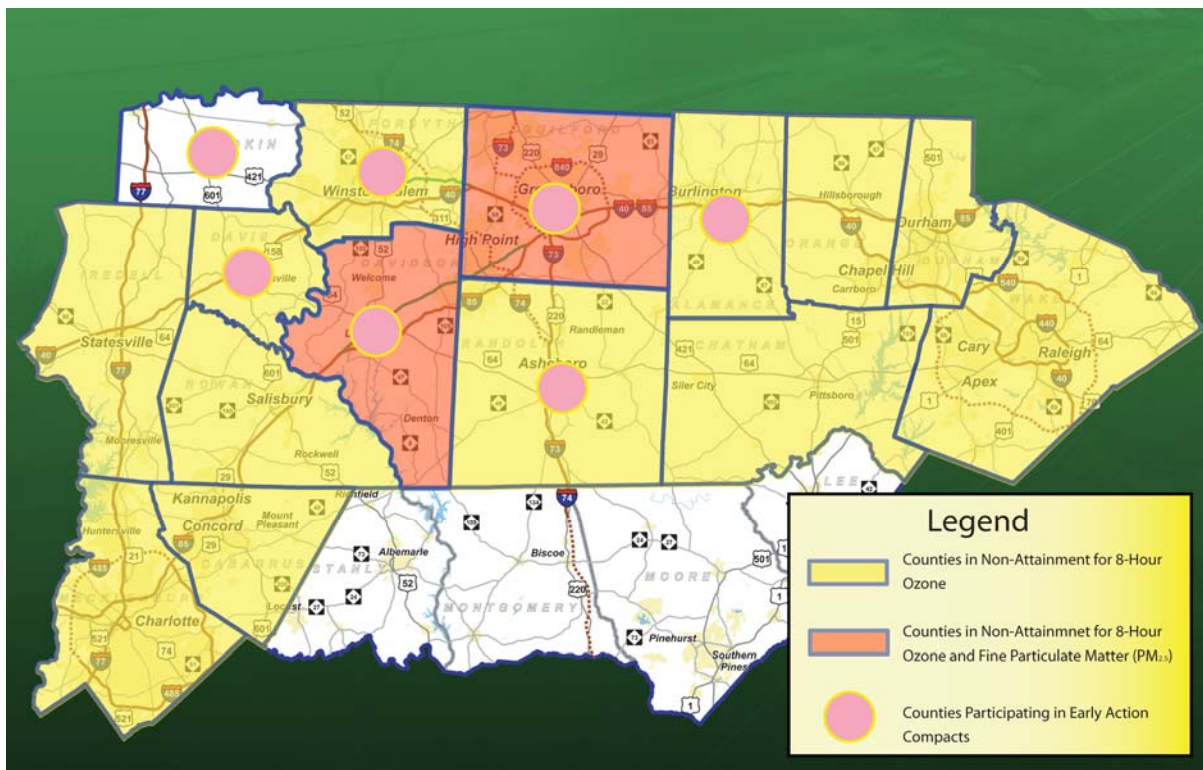




Table 3.8: US 64–NC 49 Study Area NAAQS Attainment Status

County ¹	Carbon Monoxide ²	Nitrogen Dioxide ²	Ozone 1-hour ²	Ozone 8-hour ²	Lead ²	Particulate Matter – 10 micron ²	Particulate Matter – 2.5 micron ^{2,3}	Sulfur Dioxide ²
Alamance				NonAtt (EAC)				
Cabarrus				NonAtt				
Chatham				NonAtt(P)				
Davidson			Maint	NonAtt (EAC)			NonAtt	
Davie			Maint	NonAtt (EAC)				
Durham	Maint		Maint	NonAtt				
Forsyth	Maint		Maint	NonAtt (EAC)				
Guilford			Maint	NonAtt (EAC)			NonAtt	
Iredell				NonAtt(P)				
Lee								
Mecklenburg	Maint		Maint	NonAtt				
Montgomery								
Moore								
Orange				NonAtt				
Randolph				NonAtt (EAC)				
Rowan				NonAtt				
Stanly								
Wake	Maint		Maint	NonAtt				
Yadkin				(EAC)				

Source: EPA’s Green Book: www.epa.gov/oar/oaqps/greenbk, March 2005.

1. If cell is blank, the County is in attainment for that pollutant
2. Maint = Maintenance area for pollutant (an area that was previously not in attainment but is now)
 NonAtt = Non attainment area for pollutant. (P) means only a portion of the county is non attainment.
 EAC means that the county is a member of an Early Action Compact and impacts of a non-attainment designation are deferred.
3. PM-2.5 – EPA final determinations. EPA Web Site www.epa.gov/pmdesignations/finaltable.htm, March 2005.

3.6 Transportation Profile

The transportation profile presents an overview of the existing multimodal transportation system within the defined US 64–NC 49 study area. This system includes major commercial airports; Class I freight rail lines; Interstates, primary and local highways; and a wide variety of local and intercity public transportation services. The sections that follow summarize the principal characteristics of the system’s major transportation components.



3.6.1 Existing Roadway Network

The defined regional study area contains many of North Carolina’s most important highway facilities, including some of the highest volume sections of the state’s Interstate Highway System. **Figure 3.1** (page 3-3) illustrates the major highway facilities in the study area. Interstate facilities in the study area include I-40, I-73, I-74, I-77, I-85, I-440, I-485, and I-540. Other significant routes include US 1, US 64, US 220, US 421, NC 49, and NC 24/27.

All of the public roadways in the state of North Carolina are owned and maintained by NCDOT, other than those owned and maintained by cities and towns. There is thus a large network of local roads within the study area over and above these primary Interstate, US, and NC designated routes. As would be expected from such a large geographic area, a significant percentage of the state’s total highway system is contained within these 19 counties. **Table 3.9** illustrates the roadway centerline mileage of primary, secondary, and urban system routes in each of the study area counties for the entire 19-county study area and for the entire state in the study base year of 2002. As shown in **Table 3.9**, the state-maintained highway system in the study area consists of approximately 2,082 miles of primary routes, 3,153 miles of urban

Table 3.9: North Carolina Roadway Mileage by Facility Type

County	State Highway System Mileage			
	Secondary System	Urban System	Primary System	Total System
Alamance	702.98	129.22	101.85	934.05
Cabarrus	543.47	179.68	71.76	794.91
Chatham	887.50	33.53	153.29	1,074.32
Davidson	1,191.53	136.44	167.68	1,495.65
Davie	400.33	14.24	99.61	514.18
Durham	455.67	224.82	53.25	733.74
Forsyth	638.62	314.95	86.65	1,040.22
Guilford	1,098.38	496.96	138.90	1,734.24
Irdell	1,210.98	97.17	184.62	1,492.77
Lee	347.88	80.27	53.71	481.86
Mecklenburg	432.63	512.88	72.29	1,017.80
Montgomery	506.33	37.18	123.64	667.15
Moore	834.44	103.21	143.84	1,081.49
Orange	648.33	64.99	106.11	819.43
Randolph	1,398.21	117.16	182.34	1,697.71
Rowan	948.63	112.18	104.90	1,165.71
Stanly	671.64	82.19	92.28	846.11
Wake	1,584.93	387.61	64.73	2,037.27
Yadkin	597.08	28.52	80.21	705.81
Study Area Totals	15,099.56	3,153.20	2,081.66	20,334.42
State System Totals	59,320.56	7,243.89	11,925.75	78,490.20
<i>Percent of State System Within Study Area</i>	<i>25.5%</i>	<i>43.5%</i>	<i>17.5%</i>	<i>25.9%</i>

Source: Adapted from Table NC 106 TL, North Carolina DOT 2002 Highway and Road Mileage Report.



routes, and 15,100 miles of secondary routes for a total of about 20,334 centerline miles, according to 2002 highway data provided by NCDOT. This represents 17.5 percent of the total of 11,926 miles of primary system in the state, 43.5 percent of the total urban system mileage, and 25.5 percent of the total secondary system mileage. Overall, the study area contains 25.9 percent of the total state-maintained highway system mileage in North Carolina.

The following sections provide a description of the primary Interstate, US, and NC routes that facilitate regional travel in the study area. These facilities (or sections thereof) provide important connections to major activity centers in the study area

3.6.1.1 Interstate Highways

Figure 3.13 illustrates the number of mainline travel lanes along the Interstate System within the study area. While short segments of the study area's Interstate Highway System in the urban areas may have a somewhat greater number of additional mainline travel lanes, the number of lanes shown on **Figure 3.13** is illustrative of the basic roadway cross sections along these facilities as they existed in March 2005.

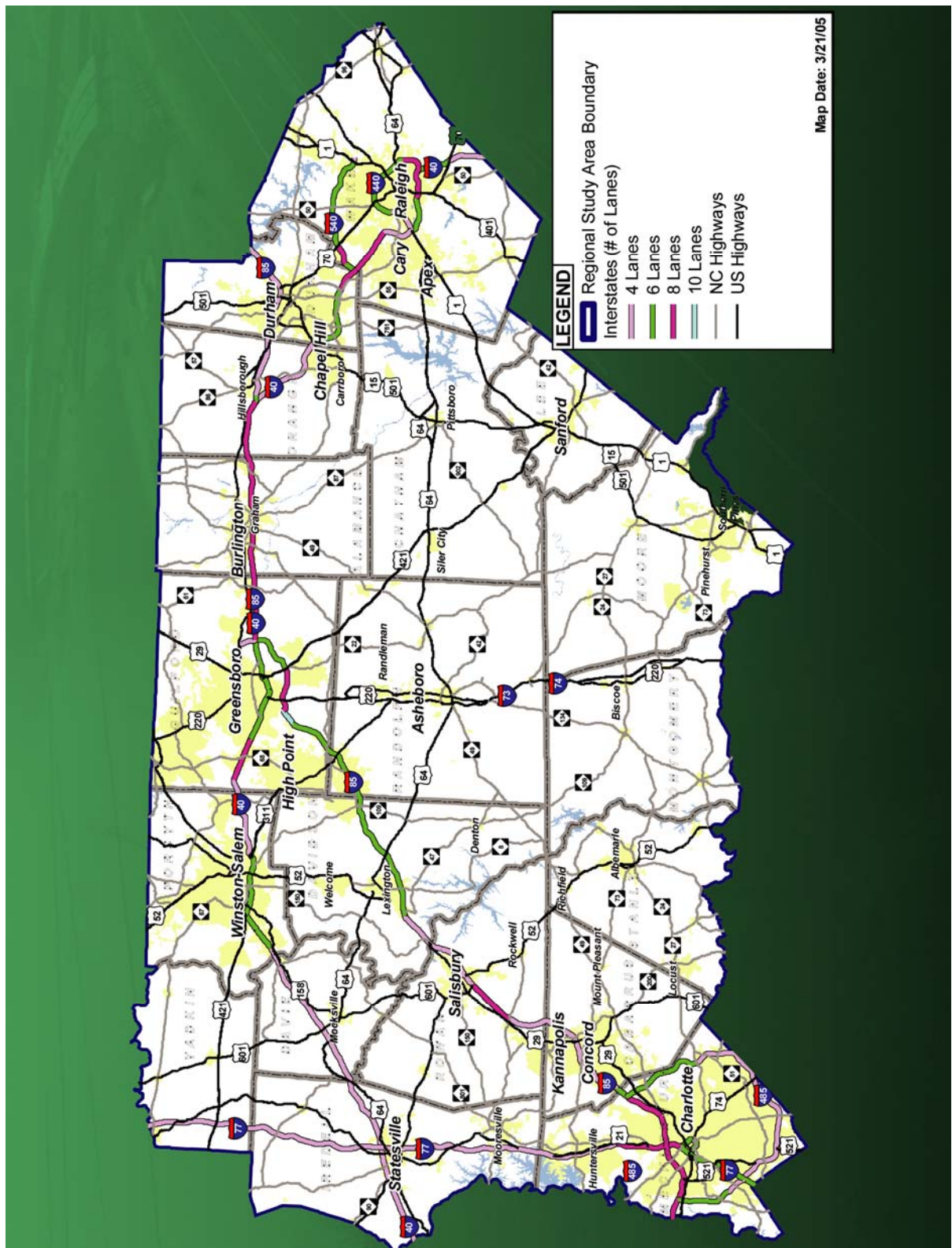
Interstate 40 (I-40)

I-40 is a national east-west Interstate corridor beginning in Barstow, CA and terminating in Wilmington, NC. The facility traverses the study area for approximately 180 miles through Iredell, Davie, Forsyth, Guilford, Alamance, Orange, Durham, and Wake Counties, connecting cities such as Statesville, Mocksville, Winston-Salem, Greensboro, Burlington, Chapel Hill, Durham, Cary, and Raleigh. The general cross-sections are as follows:

- From the Catawba/Iredell County line to just east of the Davie/Forsyth County line: Four-lane rural freeway (except near Statesville, where it is more urbanized)
- From just east of Davie/Forsyth County line to US 311: Six-lane suburban/urban freeway
- From US 311 in Forsyth County to Business I-40 in Guilford County: four-lane suburban freeway
- From Business I-40 to the future Greensboro Western Loop: eight-lane urban freeway
- From the future Greensboro Western Loop to I-85 in eastern Guilford County: six-lane urban freeway
- From I-85 in Guilford County to I-85 in Orange County: eight-lane suburban freeway (I-40 and I-85 are co-signed along this section)
- From I-85 in Orange County to US 15-501: four-lane rural/suburban freeway



Figure 3.13: Interstate Lanes





- From US 15-501 to NC 147: six-lane urban freeway
- From NC 147 to Wade Ave: eight-lane urban freeway
- From Wade Ave to I-440/US 1/US 64: four-lane urban freeway
- From I-440/US 1/US 64 to Lake Wheeler Road: six-lane urban freeway (co-signed with US 64)
- From Lake Wheeler Road to I-440/US 64: eight-lane urban freeway (co-signed with US 64)
- From I-440/US 64 to US 70: six-lane suburban freeway
- From US 70 to Wake/Johnston County line: four-lane suburban freeway

Interstate 85 (I-85)

I-85 is primarily a southeast Interstate facility, stretching from Birmingham, AL to Petersburg, VA. The facility traverses the study area for approximately 137 miles through Mecklenburg, Cabarrus, Rowan, Davidson, Randolph, Guilford, Alamance, Orange, and Durham Counties, connecting cities such as Charlotte, Concord, Kannapolis, Salisbury, Lexington, High Point, Greensboro, Burlington, and Durham. The general cross-sections are as follows:

- From the Gaston/Mecklenburg County line to I-485 in eastern Mecklenburg County: eight-lane urban freeway
- From I-485 to Concord Mills Blvd: six-lane suburban freeway
- From Concord Mills Blvd to NC 152: four-lane suburban freeway
- From NC 152 to US 601 (Jake Alexander Blvd): eight-lane suburban freeway
- From US 601 to I-85 Business/US 52 in Davidson County: four-lane suburban/rural freeway (part under construction)
- From I-85 Business/US 52 in Davidson County to I-85 Business in Guilford County: six-lane rural freeway
- From I-85 Business to Greensboro Loop/I-85 Business: ten-lane urban freeway
- From I-85 Business to US 421: eight-lane urban freeway
- From US 421 to I-40 in eastern Guilford County: six-lane suburban freeway
- From I-40 in Guilford County to I-40 in Orange County: eight-lane suburban freeway (I-40 and I-85 are co-signed along this section)
- From I-40 in Orange County to Orange/Durham County line: four-lane rural freeway
- From Orange/Durham County line to US 15-501: six-lane suburban freeway
- From US 15-501 to Durham/Granville County line: four-lane freeway (part under construction)

Interstate 77 (I-77)

I-77 is a north-south interstate facility traversing the Ohio Valley and Appalachian Mountain areas of the US. This facility begins in Columbia, SC and terminates in Cleveland, OH. Of importance to the study area are the sections located in Mecklenburg and Iredell Counties, connecting Charlotte, Mooresville, and Statesville. The general cross-sections are as follows:



- From the South Carolina/North Carolina State line to I-277 (north): six-lane urban freeway
- From I-277 north to future I-485: eight-lane urban freeway (includes HOV lanes)
- From future I-485 to Iredell/Yadkin County line: 4 lane suburban/rural freeway

Interstate 73 (I-73)

I-73 is a recently designed Interstate route, added to the Interstate System in 1991 by the Intermodal Surface Transportation Efficiency (ISTEA). This facility is designated to begin in the Myrtle Beach region in South Carolina and traverse northward to Sault Ste. Marie, MI. Sections of I-73 are proposed to be co-signed with I-74 in North Carolina and West Virginia. Of importance to the study area is the section through Asheboro in Randolph County to I-40 in Guilford County. Through Randolph County the facility is primarily a four-lane rural freeway, with the section near Asheboro more urbanized. This section is also co-signed with I-74 and US 220. North of the future I-74 connection to High Point to I-40 is primarily a four-lane rural freeway, with the section near Greensboro more urbanized.

Interstate 74 (I-74)

I-74 is also a recently designed Interstate route, added to the Interstate System in 1991 by ISTEA. This facility is designated to begin in the Myrtle Beach region in South Carolina and traverse north and westward to Davenport, IA. Sections of I-74 are proposed to be co-signed with I-73 in North Carolina and West Virginia. Of importance to the study area is the section through Asheboro in Randolph County to Winston-Salem in Forsyth County. Through Randolph County the facility is primarily a four-lane rural freeway, with the section near Asheboro more urbanized. This section is also co-signed with I-73 and US 220. From I-73 north of Asheboro to I-40 in Winston-Salem, the facility is combination of a suburban and rural four-lane freeway, with the section through High Point more urbanized. This section includes the segment from I-73 to Business I-85, which is not built at this time.

3.6.1.2 Non-Interstate Routes

An extensive network of US and NC routes connect with the Interstate System and provide access to all of the communities within the defined study area. Routes of primary importance for this study include US 421, US 1, US 15/US 501, and NC 24/NC 27, all of which are Strategic Highway Corridors.

US 421

US 421 traverses the study area through Lee, Chatham, Randolph, Guilford, Forsyth, and Yadkin Counties connecting such cities as Sanford, Siler City, Greensboro, and Winston-Salem. Of particular importance to the study area is the section located between US 64 in Chatham County and I-40/I-85 in Guilford County. The general cross-sections are as follows:



- From US 64 in Chatham County to the Chatham/Randolph County line: four-lane rural freeway
- From the Chatham/Randolph County line to the Randolph/Guilford County line: four-lane expressway
- From the Randolph/Guilford County line to I-40/I-85: four-lane divided highway with traffic signals (Boulevard)

The aforementioned sections of US 421, in combination with US 64 between Siler City and Raleigh are sometimes used as an alternate to I-40 from the Raleigh to Greensboro. Future improvements to US 64 and US 421 will further enhance this route as a high-speed alternate to I-40.

US 1

US 1 traverses the study area through Moore, Lee, and Wake Counties connecting such cities as Pinehurst, Southern Pines, Sanford, Cary, and Raleigh. Of particular importance to the study area is the section located between NC 24/NC 27 in Moore County and I-40 in Wake County. The facility is primarily a four-lane rural freeway, with more urbanized sections in Sanford and Cary. The one exception is the section that is a four-lane divided and five-lane highway with traffic signals in southern Lee County. The aforementioned sections of US 1 in combination with NC 24/NC 27 from Mecklenburg County to Moore County are sometimes used as an alternate route between the Charlotte and Raleigh areas.

US 15/US 501

US 15/US 501 traverses the study area through Moore, Lee, Chatham, Orange, and Durham Counties connecting such cities as Pinehurst, Southern Pines, Sanford, Pittsboro, Chapel Hill, and Durham. Of particular importance to the study area is the section located between US 64 in Chatham County and I-40 in Durham County. This facility is primarily a four-lane urban and suburban divided highway with traffic signals, with more urbanized sections in Orange and Durham Counties. The aforementioned sections of US 15/US 501 in combination with the US 64-NC 49 Corridor from Pittsboro to Charlotte are sometimes used as an alternate to the existing interstate facilities for travel between the Chapel Hill and Charlotte areas.

NC 24/NC 27

NC 24/NC 27 traverses the study area through Moore, Montgomery, Stanly, Cabarrus, and Mecklenburg Counties connecting such cities as Pinehurst, Southern Pines, Albemarle, and Charlotte. Of particular importance to the study area is the section located between US 1 in Moore County and Mecklenburg County. The cross-section for this facility varies from a two-lane rural highway, to a three-lane urban highway, to a four-lane divided and five-lane highway. Projects are planned to improve the facility to at least four lanes throughout this section of importance. This section, in combination with US 1 from Moore County to Wake County is sometimes used as an alternate route between the Charlotte and Raleigh areas.



3.6.2 Existing Traffic Conditions

For this study, existing traffic conditions are described in terms of average annual daily traffic (AADT) volumes, the level of service (LOS) associated with these daily traffic volumes, and the percentage of the total traffic stream consisting of single and multi-unit trucks.

3.6.2.1 Base Year (2002) Average Annual Daily Traffic Volumes

Traffic volume data was obtained from NCDOT files for various locations along the Interstate, US, and NC routes within the US 64–NC 49 study area. Traffic volume data for the study's base year (2002) was used to obtain an understanding of present day travel patterns and to identify where congestion was presently being experienced. This information was also used to assist in the development of the regional travel demand forecasting model described in Chapter 6.

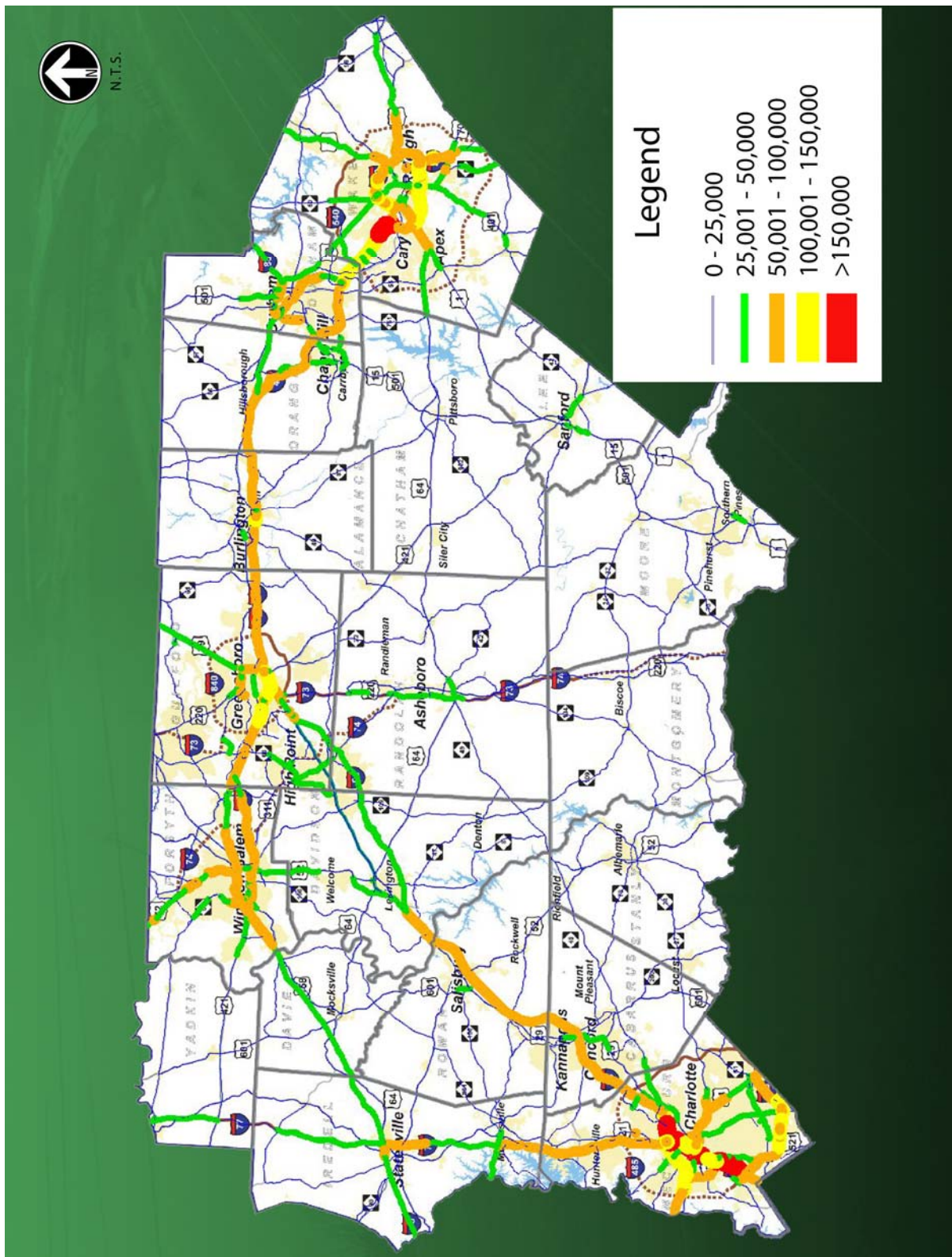
Figure 3.14 presents a summary of year 2002 average annual daily traffic volumes on the major roadways in the study area. It should be noted that these are only representative traffic volumes along each of the roadway segments identified, and that higher or lower volumes would be observed at specific locations between the identified beginning and ending points of each segment.

As illustrated on **Figure 3.14**, the largest AADT volumes are along the Interstate routes traversing the study area. Volumes along I-40 range from about 30,000 vehicles per day (vpd) between I-77 and the Forsyth County line in the more rural western portion of the study area, to 80,000 and 100,000 vpd between Greensboro and Burlington along the section co-signed with I-85, and are in excess of 130,000 vpd on sections of I-40 between Durham and Raleigh. Similarly, AADT volumes along the I-85 corridor range from about 155,000 vpd just east of I-77 in Charlotte to about 60,000 vpd in the vicinity of Business I-85/US 52 near Lexington.

AADT volumes along the primary routes of interest to this corridor study, US 64 and NC 49 are much lower than those observed on the parallel Interstate corridors and tend to exhibit much higher variations in volume. Along the US 64 corridor, for example, the average daily volumes in the Lexington area were approximately 25,000 vpd, while just a few miles to the east in Randolph County volumes along a rural section of US 64 were about 7,500 vpd. From Asheboro east to Pittsboro, average daily volumes on US 64 were typically between 10,000 and 15,000 vpd. East of Pittsboro, traffic volumes along US 64 steadily increase, from about 15,000 vpd at the Chatham/Wake County line, to about 24,000 vpd just west of the of NC 55 in Apex, to about 45,000 vpd just west of US 1 in Cary. Along the section jointly signed as US 1/US 64 in Cary, traffic volumes were approximately 75,000 vpd.



Figure 3.14: Existing AADT Volumes (2002)





Along the length of NC 49 through the study area, traffic volumes exhibit the same type of wide variations as those observed along US 64. In the Charlotte area, for example, volumes were typically on the order of about 25,000 vpd, while through the rural sections of the corridor between Charlotte and Asheboro, volumes were generally in the range of 4,000 to 6,000 vpd.

3.6.2.2 Base Year (2002) Roadway Level of Service

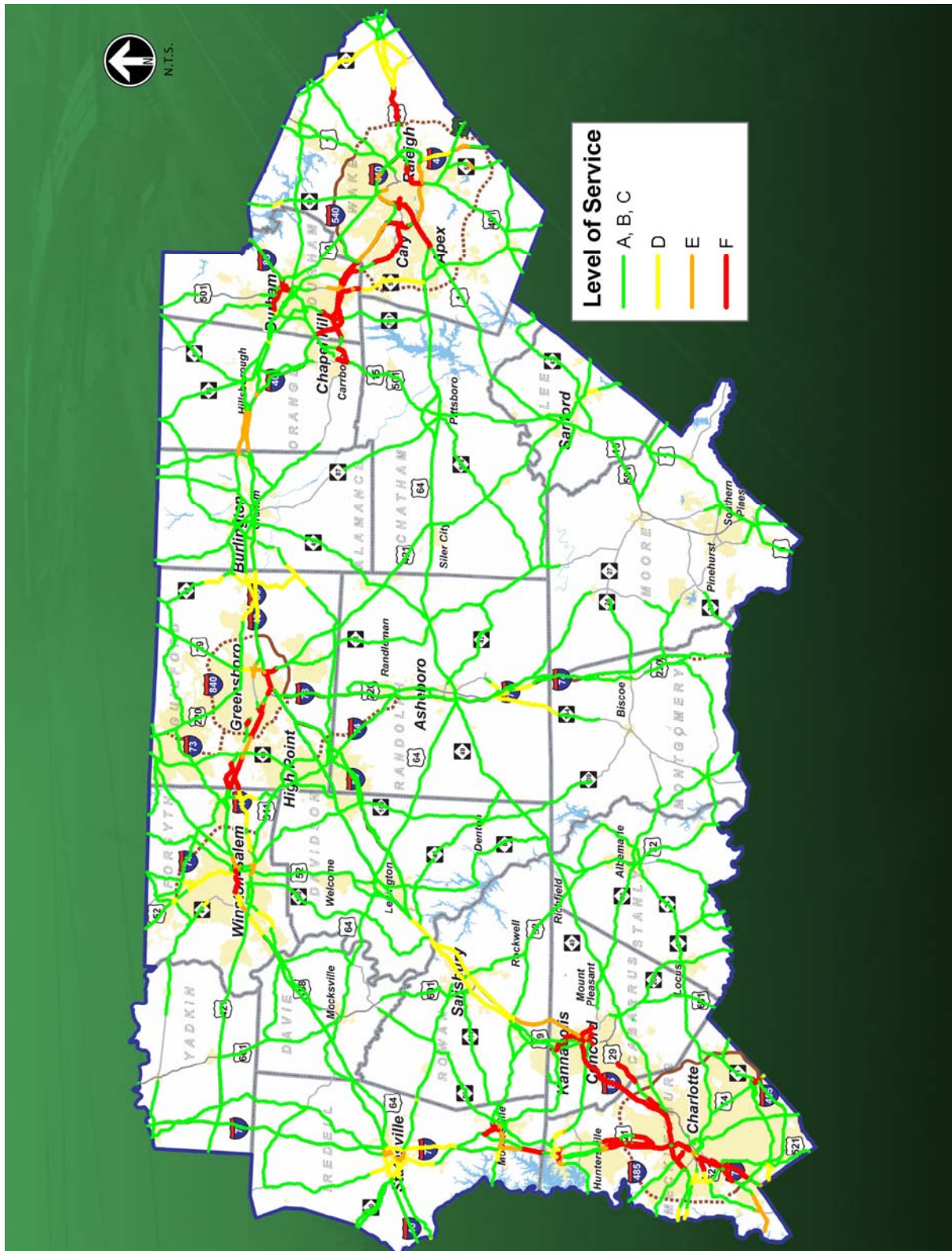
An important element of defining the potential need for any roadway improvement is the ability of the facility to adequately accommodate both existing and projected future traffic volumes. Roadway performance is rated on a level-of-service scale of A through F based on a variety of factors including average vehicle operating speed and the freedom to maneuver. Level-of-service (LOS) “A” reflects an ability to travel at the roadway’s posted speed limit and complete freedom to change lanes or to pass other vehicles. LOS “F” represents very congested, stop-and-go flow conditions with no freedom to maneuver. LOS “C” is generally considered the desirable minimum acceptable level of performance for rural highways, with LOS “D” generally considered the minimum acceptable level of performance for urban and suburban facilities.

Acceptable values of per lane capacity were defined for the general roadway categories of freeways, expressways, other major arterials, minor arterials, and collector routes which existed in the study area in 2002. These represent all of the facilities of interest in this study. These values were then used to develop estimates of the maximum daily traffic volume that could be accommodated at each level of service A – F on each type of roadway within the study area. The comparison of these maximum daily traffic volumes associated with each level of service to the year 2002 average annual daily traffic volumes allowed for a determination to be made of the relative levels of traffic congestion currently observed on the regional highway network. **Figure 3.15** presents the resulting summary of 2002 traffic congestion levels on the study area highway system.

As illustrated in **Figure 3.15**, the vast majority of mileage on the study area highway system operated at acceptable levels of service (i.e., LOS A, B, or C) on an average daily basis in 2002. This is particularly true along US 64 and NC 49. Along US 64, there are no significant pockets of congestion caused by limited roadway capacity as indicated from daily traffic volumes. However, there are several locations between Raleigh and Statesville that experience significant delay at intersections during peak hours, such as in Asheboro, Lexington, and Mocksville. Likewise, NC 49 operates at acceptable levels of service throughout the corridor, although intersection delays occur in and near the city of Charlotte.



Figure 3.15: Summary 2002 Level of Service Values





In the case of many of the other Interstate and primary routes in the study area, significant areas of moderate to heavy congestion were identified. Not unexpectedly, the majority of I-77 and I-85 in the Charlotte area was determined to be experiencing severe congestion levels (LOS E or F) in 2002. As described elsewhere in this report, a number of major improvement projects are currently underway or are scheduled for implementation in the next five to ten years to address these congestion levels.

Moderate to heavy congestion levels (LOS E/F) were also identified along I-40 between Winston-Salem and Greensboro. It should be noted that in the base year, this section was under construction to improve the facility to a six and eight-lane freeway. Sections of I-40/I-85 through Greensboro and Burlington operated at LOS D in base year as well.

High congestion levels were also observed in the Raleigh/Durham area, particularly along I-40 through Wake and Durham Counties (LOS D/E). However, sections of I-40 throughout this area have been since improved to address the congested conditions that were observed in 2002.

Another important regional highway system element is the section of US 421 between US 64 in Siler City and I-40/I-85 in Greensboro. Base year volumes range from 6,000 vpd in the rural areas in Chatham and Randolph Counties to 15,000 near I-40/I-85. In comparison to the daily capacity associated with this facility, LOS C or better conditions were observed along this section.

3.6.2.3 Base Year (2002) Truck Percentage

One of the defining characteristics of the North Carolina Strategic Highway Corridor network is that the routes which constitute this statewide network connect major activity centers around the state. While total traffic volume is one indication of this degree of connectivity, another important indicator is the portion of the total traffic stream that is made up of trucks, both single-unit and multi-unit vehicles. Particularly in the case of a multi-county, regional corridor study such as this, the identification of those highway facilities with a high percentage of trucks is a factor that can help to define the purpose and need for any potential improvements to those facilities.

Information was obtained from NCDOT on the percentage of the total traffic stream represented by large trucks. This data was supplemented by information obtained from the Federal Highway Administration's (FHWA's) national Freight Analysis Framework (FAF) to identify major truck routes through the study area. This information is summarized in **Figure 3.16**.

As shown in **Figure 3.16**, those study area roadways with a "high" percentage of truck traffic, defined as those routes carrying 15 percent or more trucks in the total traffic stream, tend to be the Interstates and other elements of the state primary highway system. Virtually all segments of the Interstate System in the study area, with the exception of some urban



segments in the Charlotte and Raleigh areas, are carrying at least 15 percent trucks. Along I-40/I-85 in the Greensboro area, this truck percentage translates into about 20,000 trucks per day. In the central portion of the I-85 corridor between Charlotte and Greensboro, about 13,000 vehicles per day are trucks. The lower truck percentages observed on the Interstate routes in the Charlotte and Raleigh metropolitan areas reflect the high level of use of the Interstate System by local traffic, which tends to primarily be private automobiles.

Those segments of the state primary highway system that are freeways or expressways, such as US 421 southeast of Greensboro and US 220 south of Asheboro (the I-73/I-74 corridor), are also carrying in excess of 15 percent trucks on an average daily basis.

Along US 64, the truck percentage varies considerably as it passes through the defined study area. Near Lexington, less than ten percent of the total traffic volume along US 64 is trucks, representing approximately 1,000 large vehicles per day. Just west of Asheboro, the average daily truck percentage on US 64 is between 10 and 15 percent, representing approximately 1,000 trucks per day. From east of Asheboro through Siler City to Pittsboro, the truck percentage is in excess of 15 percent with the number of trucks estimated to be between 1,500 to 2,000 per day. East of Pittsboro, the percentage of average daily truck traffic decreases to less than ten percent, due to the increase in total traffic near the Raleigh area. However, in this more “urbanized” section of the study area, US 64 is estimated to be carrying approximately 2,500 to 3,000 trucks per day.

On the NC 49 corridor, similar wide variations in the percentage of trucks were observed. In the Charlotte area, the truck percentage on NC 49 is relatively low (between five and ten percent) because of the high volumes of commuter traffic. This translates into approximately 1,500 to 2,000 trucks per day along this section of NC 49. However, in the rural areas between Harrisburg and Asheboro, more than 15 percent of the total traffic stream is comprised of trucks. This represents about 1,700 trucks per day.

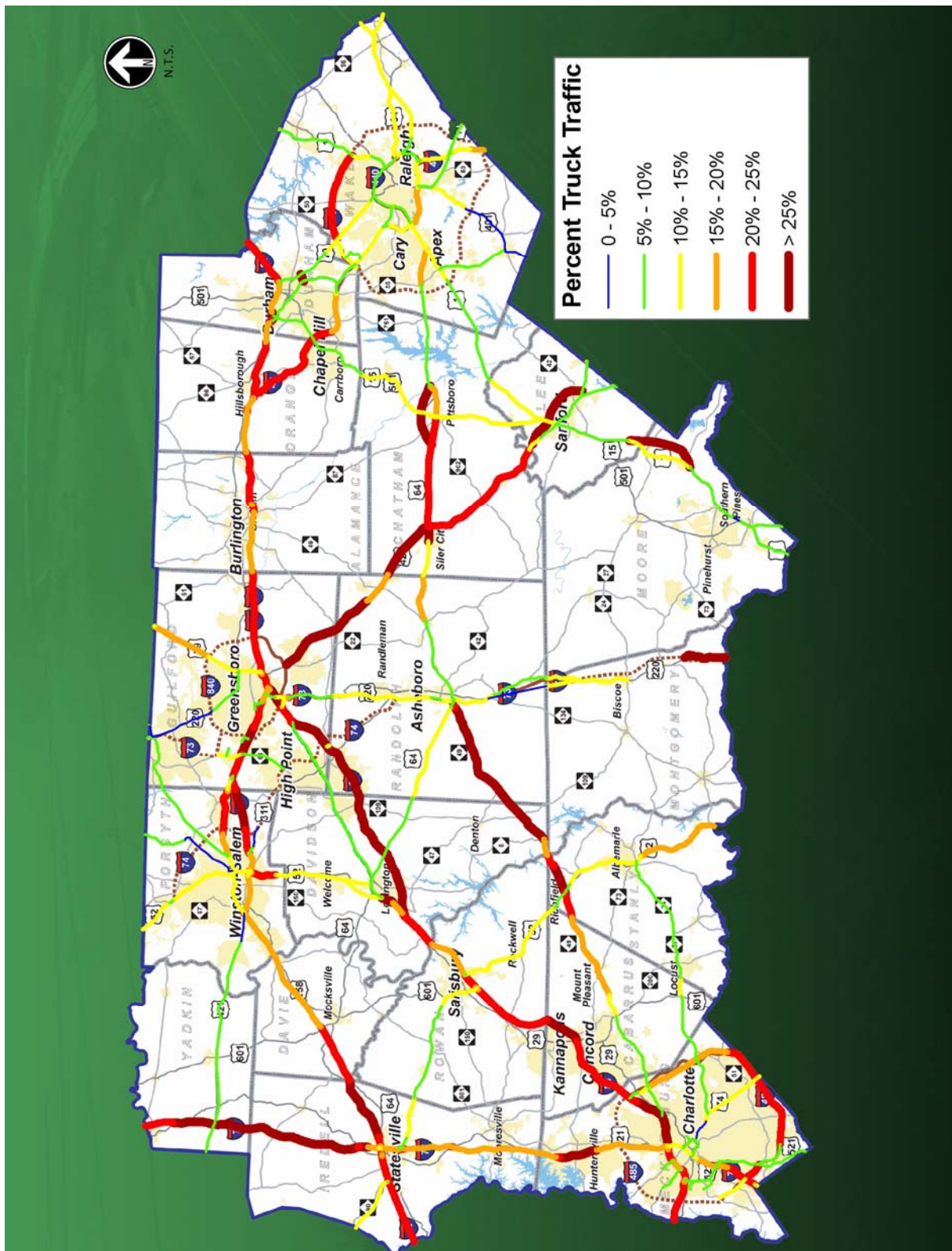
Based on stakeholder interview comments and the results of the roadside interview surveys, it is likely that a significant proportion of the trucks currently using the US 64 and NC 49 corridors are transporting goods to and from nearby agricultural and manufacturing activities located along these corridors.

3.6.3 Existing Travel Patterns and Characteristics

In addition to obtaining an understanding of the total volume of traffic using the study area highway system, it is also important to understand the travel patterns associated with these vehicles. This is particularly important as a major goal of this study is to examine the potential for improvements to the US 64 and NC 49 corridors to divert current and future-year traffic from I-40 and I-85. The determination of existing travel patterns and characteristics was conducted through the analysis of information obtained through a variety of sources. These included:



Figure 3.16: 2002 Truck Percentage





- 2000 US Census journey-to-work data.
- A video license plate origin-destination survey at five sites on I-40 and I-85.
- A postcard origin-destination survey using data obtained in the video license plate survey.
- A series of roadside origin-destination surveys at three sites on US 64 and NC 49.
- A series of travel time surveys on I-40, I-85, US 64, and NC 49.

A summary of the key findings associated with each of these data collection activities is presented below.

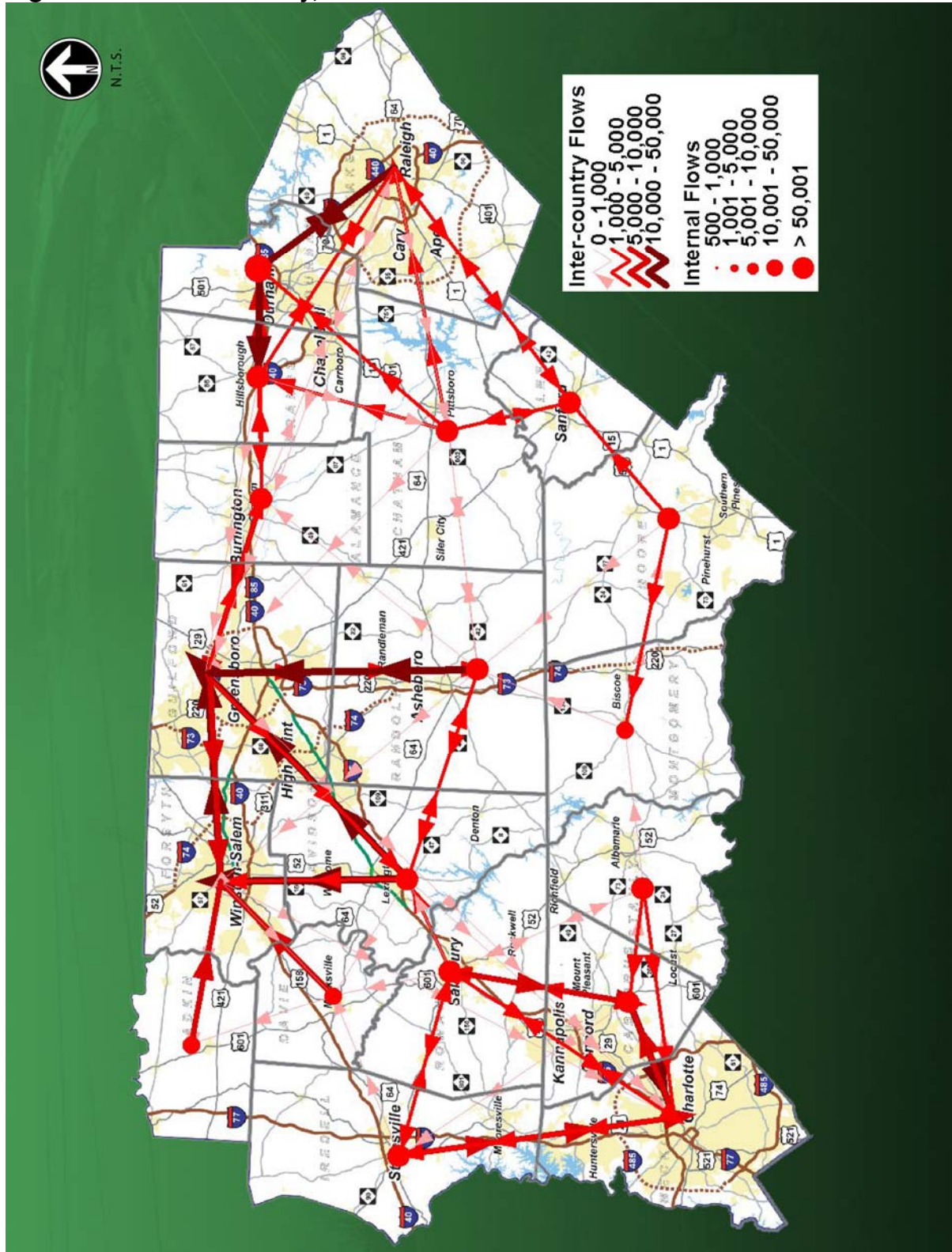
3.6.3.1 Journey-to-work Data

Since 1970, the decennial United States Census has collected information on the origins, destinations, and mode of travel for home-based work trips. The 2000 Census surveyed approximately one in 15 households across the United States using the “long form” that contained these questions. These sample survey results were then factored to represent 100 percent of the households identified by the census. For the purpose of this large scale regional study, 2000 US Census journey-to-work data was aggregated to the county level. **Figure 3.17** presents the resulting inter-county, home-based work travel patterns in the 19-county study area.

As illustrated on **Figure 3.17**, home-based work trip travel patterns tend to be focused on the three major urban areas within the region. In the western portion of the study area, Mecklenburg County is the dominant destination for work trips, both for those trips beginning in Mecklenburg County and those beginning in surrounding study area counties such as Cabarrus, Stanly, Rowan, and Iredell. Within the 19-county study area, the home-based work travel shed for the Charlotte/Mecklenburg County area appears to be generally bounded by the cities of Statesville to the north, Salisbury to the northeast, and Albemarle to the east. Some portion of the interaction between Cabarrus County and Mecklenburg County would be expected to use NC 49.

In the central portion of the study area, the Triad cities of Greensboro, High Point, and Winston-Salem are the primary home-based work trip destinations, with the study area communities of Lexington and Asheboro also being important destination areas. The largest county-to-county travel patterns utilize major corridors such as US 220 between Randolph County (Asheboro) and Guilford County (Greensboro) and I-40 between Forsyth County (Winston-Salem) and Guilford County (Greensboro). There is also a significant movement between Davidson County (Lexington) and Randolph County (Asheboro) that could reasonably be expected to use this portion of US 64.

Figure 3.17: Inter-County, Home-based Work Travel Patterns



Source: Analysis of 2000 US Census data by Cambridge Systematics, Inc.



In the eastern portion of the study area, the Raleigh/Durham/Chapel Hill urban area is the primary home-based work trip destinations. While the majority of work trips appear to take place between these three urban centers and their immediately surrounding suburbs, the 2000 US Census data identified a number of other significant travel patterns of interest to this study. The most significant of these home-based work travel patterns include the following movements:

- Between Chatham County (Pittsboro and Siler City) and Wake County (Raleigh and Cary) that would principally use the US 64 corridor.
- Between Chatham County, Orange County (Chapel Hill), and Durham County (Durham) that would principally use the US 15-501 corridor.
- Between Lee County (Sanford) and Chatham County that would principally use the US 15-501 or US 421 corridors.
- Between Lee County and Wake County that would principally use the US 1 corridor.

Those cities and counties that are currently the largest population and job centers in the study area are anticipated to retain these rankings in the planning horizon year of 2030. Thus, while the absolute magnitude of the 2000 US Census journey-to-work travel patterns can be expected to increase, the basic orientation of these travel patterns can be expected to continue.

3.6.3.2 I-40 and I-85 Video Origin–Destination Survey

As part of the data collection phase of this project, several traffic surveys were conducted to obtain better information on trip origins, trip destinations, and trip purpose of travelers using key routes within the study area. The first of these surveys used high-speed video cameras to capture license plate images of vehicles passing through the study area at one of five locations on I-40 and I-85:

- Site #1: I-40 at Davis Drive in Durham County
- Site #2: I-40/I-85 at Mount Hope Church Road in Guilford County
- Site #3: I-40 at Gallimore Dairy Road in Guilford County
- Site #4: I-40 at Pinebrook School Road in Davie County
- Site #5: I-85 at Centergrove Road in Cabarrus County

Figure 3.18 displays the location of the video survey sites. At each location, a number of high-speed video cameras were placed on a highway overpass, with one camera recording all vehicles passing the location in each lane. Vehicles were recorded in both directions of travel over a 12-hour period. Details on the survey process are contained in the *Video Origin-Destination Survey Technical Report, May 2004*.

Figure 3.18: Video Origin-Destination Survey Sites



The license plate images of vehicles passing the five survey stations in both directions over the course of the 12-hour survey period were obtained from the video survey. The origin, destination, and entry/exit times of these vehicles were recorded by analyzing individual license plate images at each survey station. Thus, for example, a vehicle first observed traveling westbound at Site #1 could be tracked as it traveled past Sites #2, #3, and #4 if it stayed on I-40, or could be tracked past Sites #2 and #5 if it followed I-40 and I-85 between the Raleigh and Charlotte urban areas. It was also possible to account for those vehicles which made only short trips in the corridor, such as being observed traveling both eastbound and westbound at Site #1 but not being observed at any other survey station. On the day of the survey, Wednesday, October 15, 2003, a total of 246,587 license plate images were recorded. This represented 86.5 percent of the total of 285,175 vehicles which passed the survey locations during the 12-hour period.

The successfully read license plate images (sorted by location of observation, classification, time of day, and direction) were then “matched” to create an origin-destination (O-D) matrix for all trips to and from each of the five video survey sites. O-D movement volumes were adjusted using industry accepted statistical methods to provide an estimate of O-D movement volumes for a 100 percent read rate for the survey period.

Figures 3.19 through 3.23 illustrate the distribution of traffic on a percentage basis for those vehicles entering the study area at Sites #1, #2, #3, #4, and #5.



Figure 3.19: Distribution of Traffic Passing Site #1 in Westbound Direction

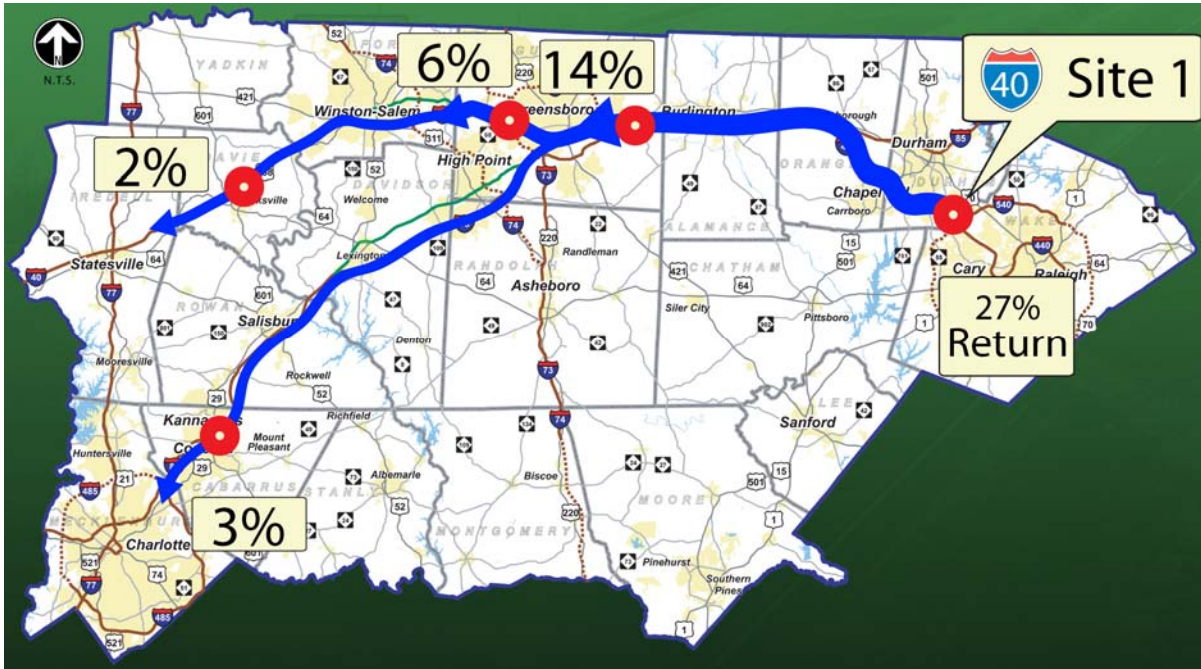


Figure 3.20: Distribution of Traffic Passing Site #2 in Westbound Direction





Figure 3.21: Distribution of Traffic Passing Site #3 in Eastbound Direction

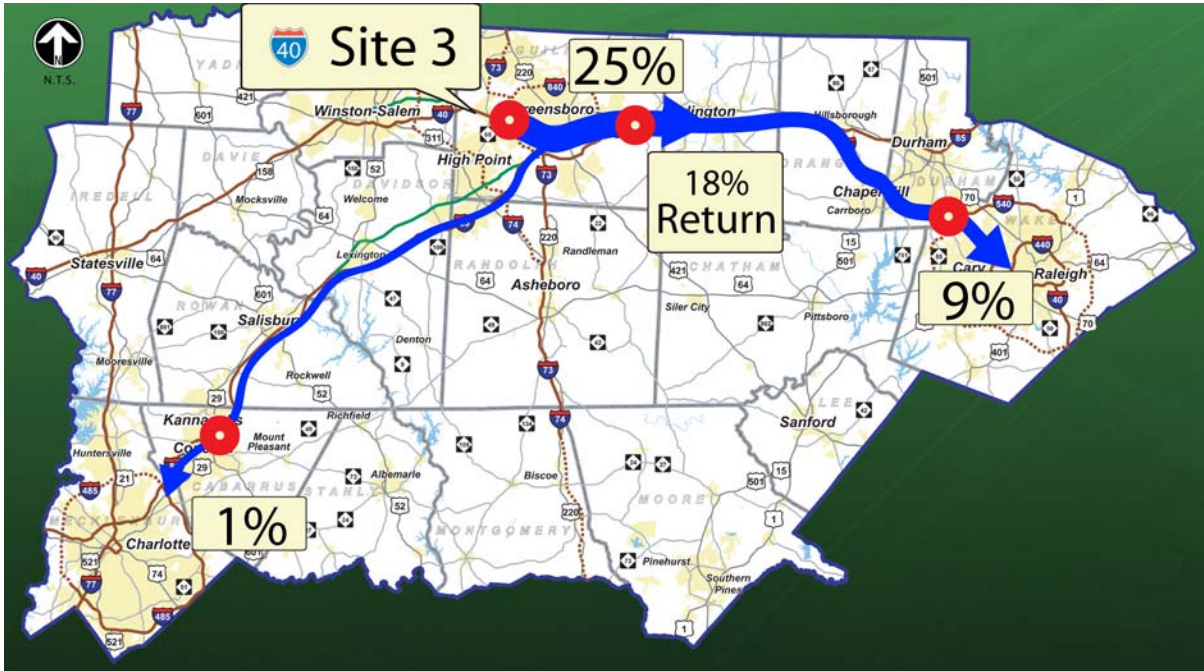


Figure 3.22: Distribution of Traffic Passing Site #4 in Eastbound Direction

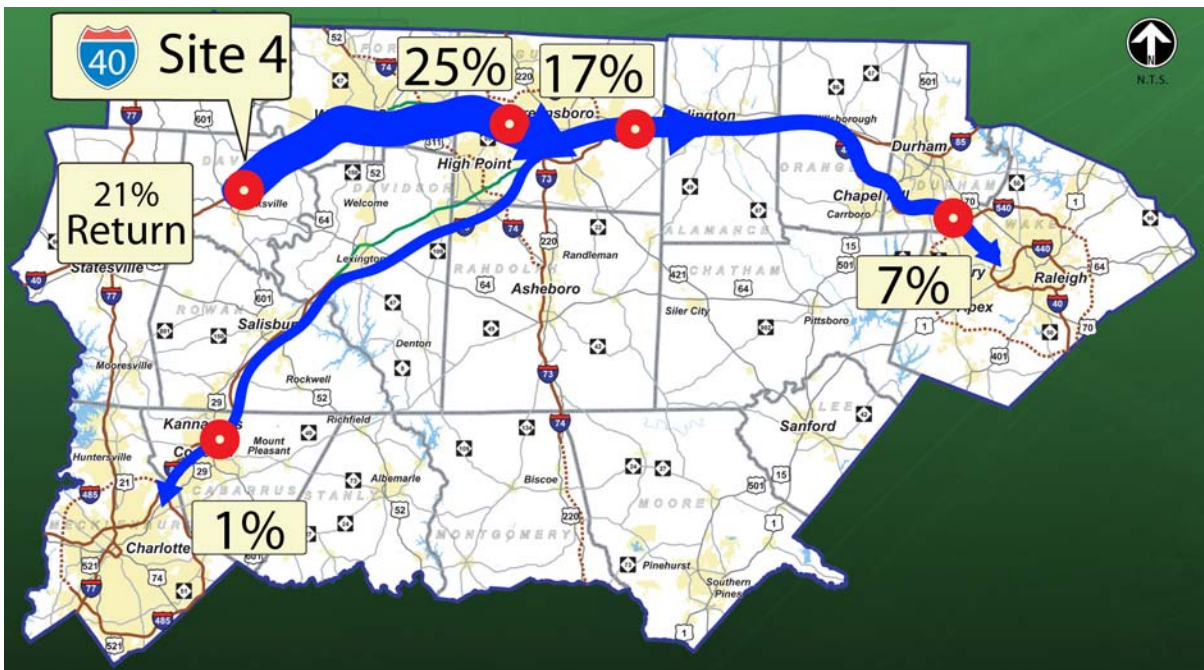
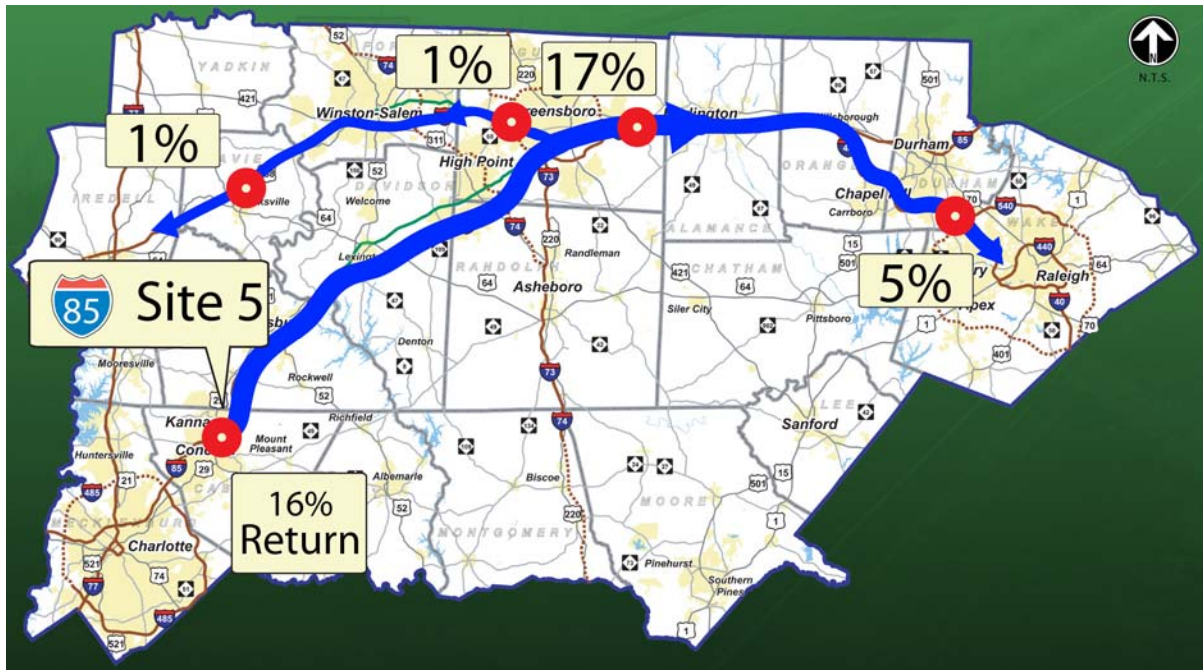


Figure 3.23: Distribution of Traffic Passing Site #5 in Northbound Direction



As illustrated in **Figures 3.19** through **3.23**, the majority of “matched” observations were what could be termed “short-” to “medium-” distance trips within the study area. For example, 27 percent of the vehicles observed heading westbound on I-40 at Site #1 over the course of the 12-hour survey period were observed passing this same location in the eastbound direction later in the day, but were not recorded passing another survey station. Such trips might be those made by residents of the Raleigh area working in the Durham or Chapel Hill areas or local delivery trucks. Conversely, only two percent of the total number of vehicles observed heading westbound on I-40 at Site #1 were observed heading westbound on I-40 near Mocksville (Site #4) and only three percent of the total vehicles observed heading westbound at Site #1 were later observed heading southbound on I-85 at Site #5. Thus, only five percent of the total westbound traffic stream passing Site #1 could be termed a “long” trip; that is, one that traverses the entire length of the study corridor.

Similar results were observed at the other video-license plate survey locations as well. At Site #4 on I-40 near Mocksville, 21 percent of the total eastbound entering traffic was later observed the same day traveling westbound through this site without having passed through another survey station. Such trips would represent travel patterns such as a movement between Statesville and Winston-Salem. Of the total number of trips observed heading eastbound at this site, only seven percent were observed traveling eastbound at Site #1 west of Raleigh.

At Site #5 on I-85 near Concord, 16 percent of the total northbound traffic was observed later the same day traveling southbound through this site without having passed through another



survey station. Such trips would represent travel patterns such as a movement between Charlotte and Salisbury. Of the total number of trips observed heading eastbound at this site, only five percent were observed traveling eastbound at Site #1 west of Raleigh.

One conclusion that can be drawn from this analysis is that there may only be a small portion of the total traffic stream along I-40 and I-85 that appears to currently follow either the entire Charlotte–Raleigh or the Statesville–Raleigh routings that are the primary focus of this study. However, even five to seven percent of a large AADT volume can represent a substantial number of vehicles. For example, the base year AADT in the vicinity of Site #2 on the I-40/I-85 overlap section east of Greensboro in Guilford County was on the order of 90,000 vpd. Five to seven percent of this total volume would represent a conservative estimate of approximately 4,500 to 6,300 vpd that could be traveling from one end of the study corridor to the other.

3.6.3.3 Postcard Survey

Using the license plate images recorded at Site #2 of the Video Origin-Destination Survey, license plates were matched to the names and addresses of the vehicle owners via the North Carolina Department of Motor Vehicles registration database. Those private and commercial vehicle owners whose vehicle license plates were recorded and matched to the registration data received a survey questionnaire asking them to provide details of their trip that occurred on the day of capture. Details of the postcard survey are documented in the *Postcard Survey Technical Report, May 2004*.

The responses received allowed for the creation of a database detailing the direction of travel, the time that the vehicle was observed passing the survey location, vehicle occupancy, trip purpose, the frequency of the trip, origin and destination location, and type of vehicle (private automobile, local commercial vehicle, over-the-road truck, etc.). This database then provided the means to create a series of county-level maps detailing the trip origin and destination patterns both internal and external to the 19-county study area.

During the day of the video survey (October 15, 2003), approximately 60,563 vehicle license plates, or 86 percent of the total traffic stream passing through the survey station, were able to be read and processed. Of these total observed license plates, 83 percent had North Carolina license plates. Matching these license plate images against the State Department of Motor Vehicles registration database generated a total of 33,000 postcard surveys that were distributed by mail. Of this total sample size, 3,400 surveys, or 10.3 percent of the total number of surveys distributed, were returned with sufficient data to allow for subsequent data processing and analysis. Based on the experience of the Study Team, this response rate is typical of that obtained in the conduct of other travel surveys of this nature.

Figures 3.24 and **3.25** present the origins and destinations of eastbound North Carolina registered vehicles passing Site #2. Similarly, **Figures 3.26** and **3.27** present the origins and destinations of westbound North Carolina registered vehicles passing Site #2.

Figure 3.24: Origins of Vehicles Passing Site #2 in Eastbound Direction

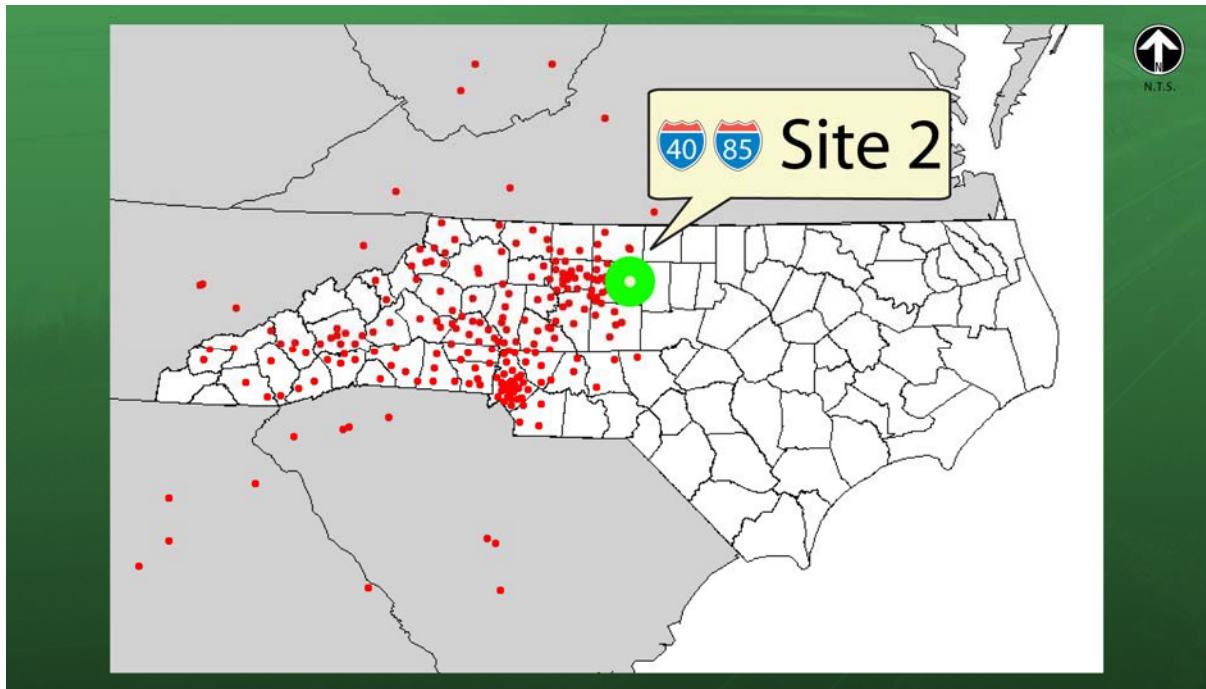


Figure 3.25: Destinations of Vehicles Passing Site #2 in Eastbound Direction

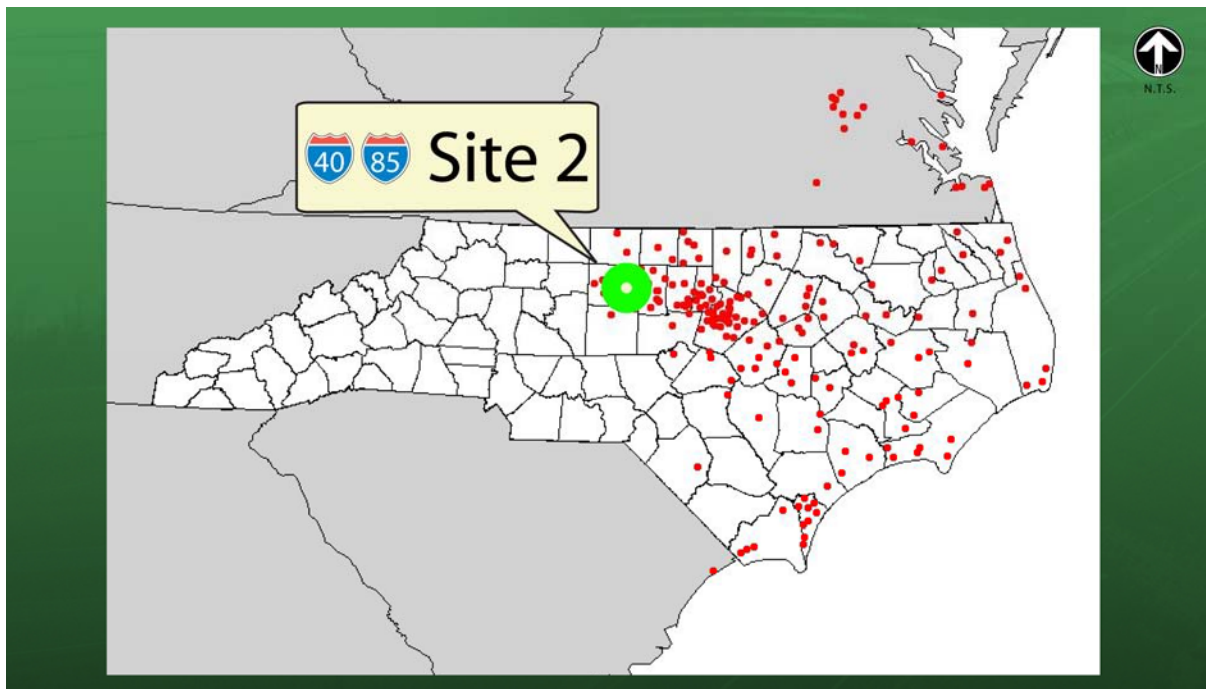


Figure 3.26: Origins of Vehicles Passing Site #2 in Westbound Direction

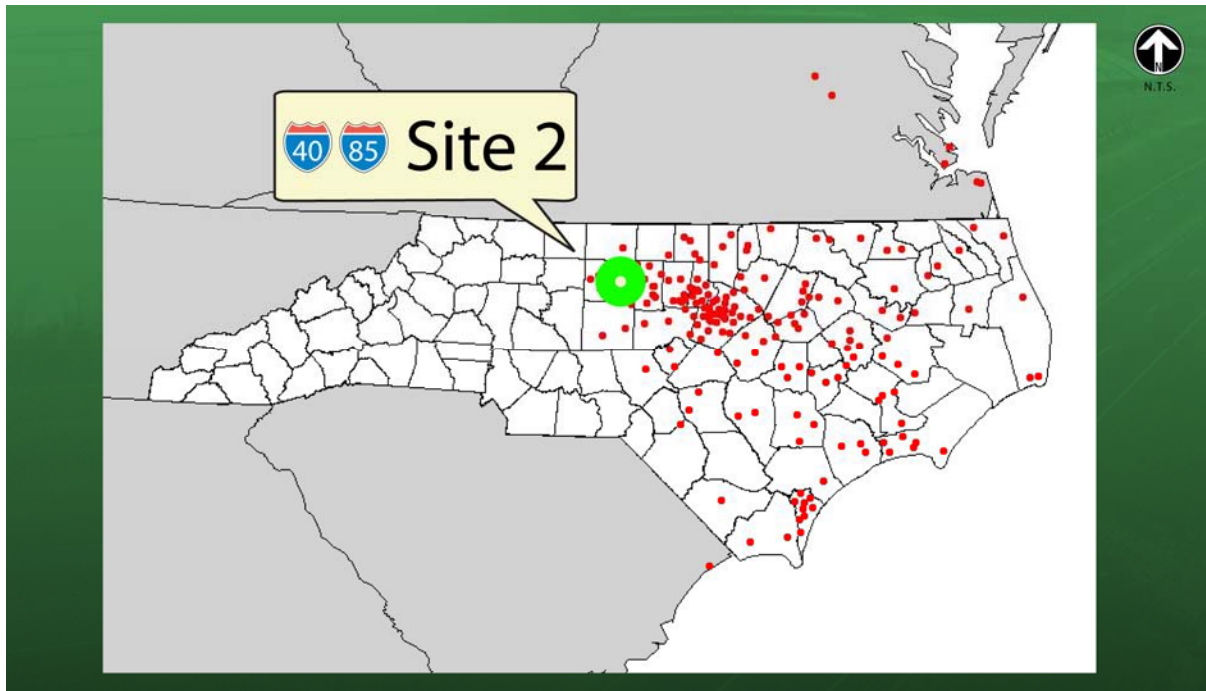
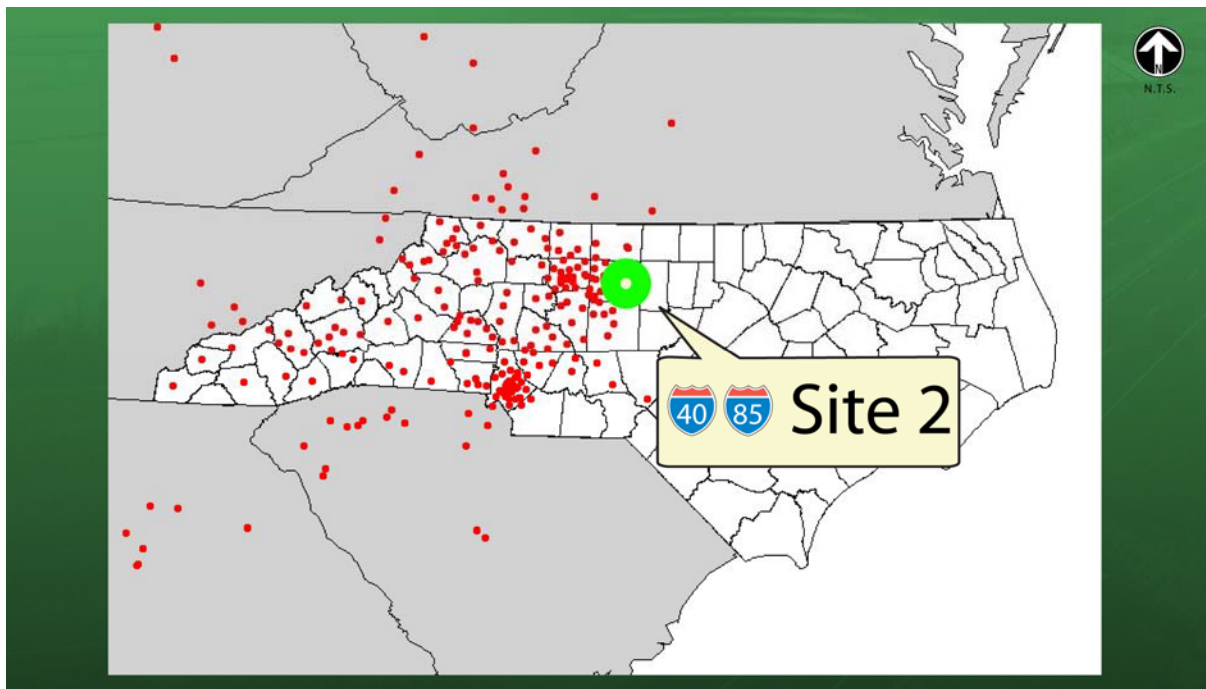


Figure 3.27: Destinations of Vehicles Passing Site #2 in Westbound Direction





As shown on **Figure 3.24**, the eastbound trip origins are concentrated in the Charlotte, Greensboro, High Point, and Winston-Salem urban areas. At the same time, it is interesting to note that there is a very large travel market shed for traffic passing this point. Trips were identified beginning in Tennessee along the I-40 west corridor, through South Carolina and in Georgia along the I-85 south corridor, and into Virginia and West Virginia along the I-77 and US 220 north corridors.

Figure 3.25 illustrates that while the majority of the eastbound trip destinations are concentrated in the Raleigh/Durham/Chapel Hill urban area there is a relatively widespread distribution of travel beyond the survey site through eastern North Carolina and into south central and southeastern Virginia. As would be expected, the terminus of I-40 in North Carolina at the port City of Wilmington has a high concentration of eastbound destinations. Similarly, the Hampton Roads region of southeast Virginia and the Richmond/Petersburg metropolitan areas were also observed as being significant destinations.

Figure 3.26 illustrates the origins of the westbound trips passing Site #2. As would be expected, the largest concentrations of trip origins were in Wake, Orange, Durham, Alamance, and Guilford Counties. Other origins were spread throughout eastern North Carolina, with a noticeable concentration in the Wilmington, NC area. A few westbound trip origins were also observed in the Hampton Roads and Richmond/Petersburg areas of Virginia.

Figure 3.27 highlights the destinations of the westbound trips passing Site #2. While the largest concentrations of destinations were in Guilford, Forsyth, and Mecklenburg Counties, destinations also tended to follow the I-40 corridor through western North Carolina and the I-85 south corridor through South Carolina into the Atlanta, Georgia area and the I-77 south corridor through South Carolina to the Columbia area. Other destinations were scattered across southwestern Virginia and into West Virginia and Kentucky.

The travel pattern data obtained through the postcard survey was combined to create a county-level, origin-destination matrix, which, in turn, was used to develop the illustration of inter-county travel patterns within the primary corridor study area shown in **Figure 3.28**.

As illustrated in **Figure 3.28**, the largest single county-to-county travel pattern identified within North Carolina was, not unexpectedly, between Forsyth County and Alamance County. The survey also identified strong travel patterns between Forsyth County and Wake County and between Guilford County and Wake County. In general, the county-to-county travel patterns tended to follow the routing of I-40 and I-85 through Durham and Orange Counties on the east and north to Mecklenburg and Cabarrus Counties on the west and south.

At the same time, a number of travel patterns were observed currently using I-40 and I-85 that would appear to be high probability candidates for diversion to an improved US 64–NC 49 Corridor. For example, a strong movement was identified between Mecklenburg County and Wake County, and a moderate to light movement was identified between Mecklenburg



Figure 3.28: Inter-county Travel Patterns from Postcard Survey





County and Chatham County. Other major movements that could be expected to use an improved US 64–NC 49 Corridor linked Cabarrus County with Chatham and Wake Counties and Wake County with Iredell County. Thus, it would appear that a significant percentage of the current traffic using the central portion of I-40/I-85 between Charlotte and Raleigh could potentially be diverted to an improved US 64–NC 49 Corridor.

3.6.3.4 US 64 and NC 49 Roadside Origin–Destination Survey

In addition to the video origin-destination survey and the associated postcard survey, roadside origin-destination surveys were conducted at three locations on US 64 and NC 49, with each location being surveyed on a separate weekday during October 2003. **Figure 3.29** illustrates the location of the three roadside survey stations.

At each of these survey locations, vehicles passing in both directions were briefly stopped and the driver was asked a series of questions, which included:

- Trip purpose
- Frequency of the trip
- Trip origin
- Trip destination

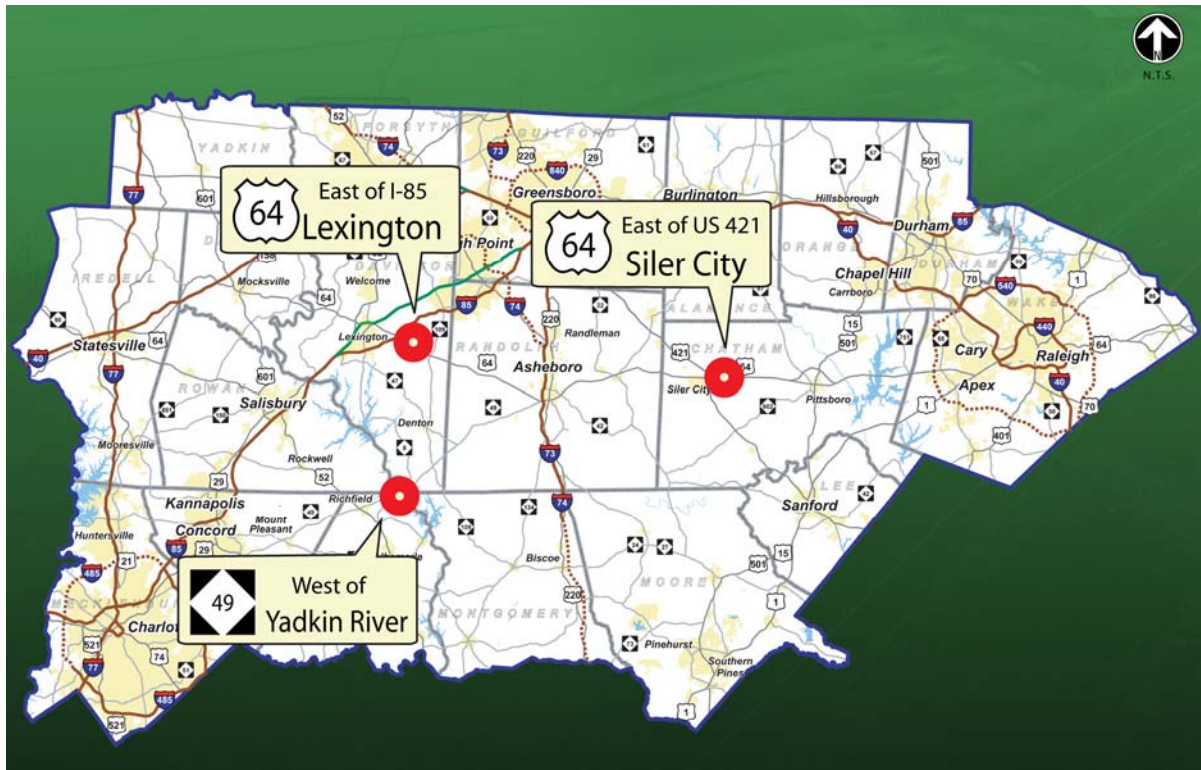
Through observation, the survey staff determined the type of vehicle (private automobile, local commercial vehicle, over-the-road truck, etc.) and the number of persons in the vehicle. An expanded discussion of the roadside survey administration and data analysis process is contained in the *Roadside Origin-Destination Survey Technical Report, May 2004*.

Table 3.10 summarizes the number of vehicles passing each survey station on the day of the survey and the number of observations made. It should be noted that not all vehicles passing through the survey station were stopped. When vehicle queues exceeded five vehicles, stopped vehicles were allowed to proceed without the drivers being questioned.

Table 3.10: Summary of Activity at Roadside Origin-Destination Survey Stations

Roadside Survey Location	Date of Roadside O-D Survey	Total Daily Traffic Volume	No. of Vehicles Surveyed	Percent of Total Traffic Volume Surveyed
US 64 – Lexington	October 15, 2003	10,000	1,554	15.5%
NC 49 – Yadkin River	October 16, 2003	6,600	1,543	23.4
US 64 – Siler City	October 21, 2003	9,000	1,848	20.5

Figure 3.29: Location of Roadside Origin-Destination Survey Stations



The overall results of the three roadside origin-destination surveys on US 64 and NC 49 appear to further validate the findings of the postcard survey; namely, there is significant utilization of US 64 and NC 49 for travel between the Charlotte and Raleigh urban areas. Moreover, there appears to be a potential to divert some portion of the traffic that is now using I-40 and I-85 between the Charlotte and Raleigh onto an improved US 64–NC 49 Corridor.

Summaries of the roadside survey results by location are provided below.

US 64 - Lexington

Figures 3.30 and 3.31 present the origins and destinations of the eastbound US 64 vehicles. Similarly, **Figures 3.32 and 3.33** present the origins and destinations of the westbound US 64 vehicles passing through this survey station.

As shown in **Figure 3.30**, the origins of the eastbound US 64 vehicles are concentrated either in Mecklenburg County and the immediately adjacent counties to the east and west, in Davidson County, or in Forsyth County. A noticeable portion of the trips had their origins in the I-85 south corridor through South Carolina and into Georgia, in the I-40 west corridor through North Carolina, or to the northwest into Virginia and West Virginia in locations served by the I-77 north corridor. **Figure 3.31** illustrates that the destination of the eastbound

Figure 3.30: Origins of Eastbound Vehicles Passing the US 64 – Lexington Roadside Survey Station

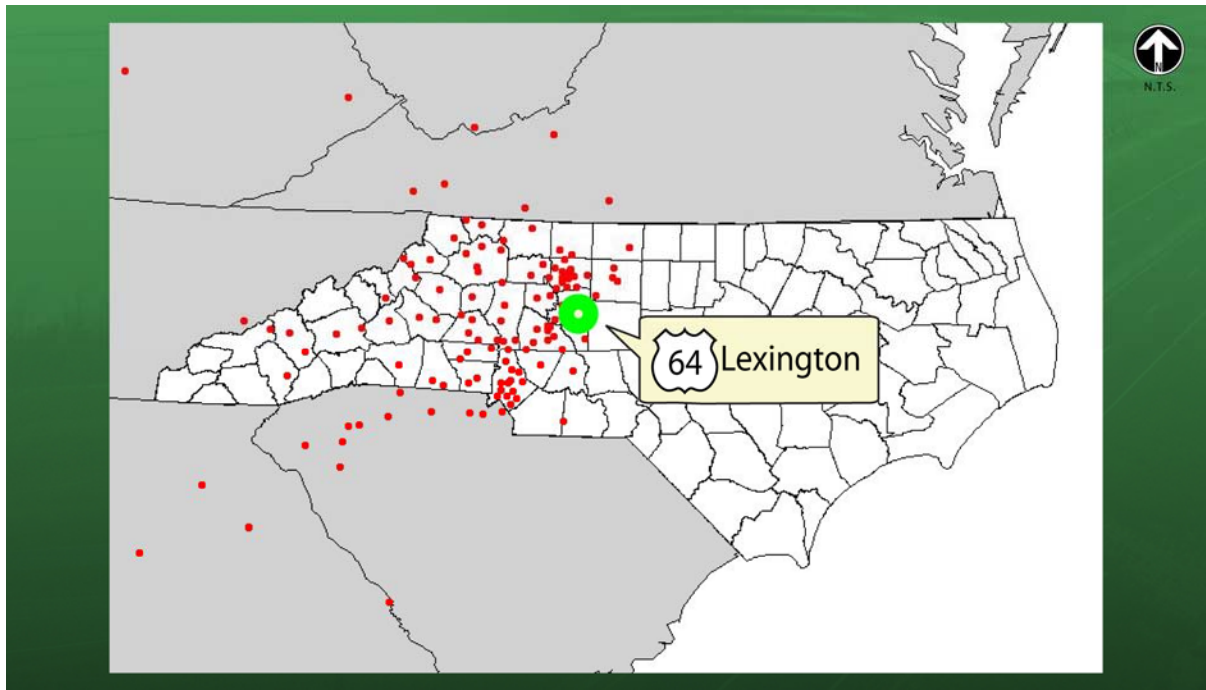


Figure 3.31: Destinations of Eastbound Vehicles Passing the US 64 - Lexington Roadside Survey Station

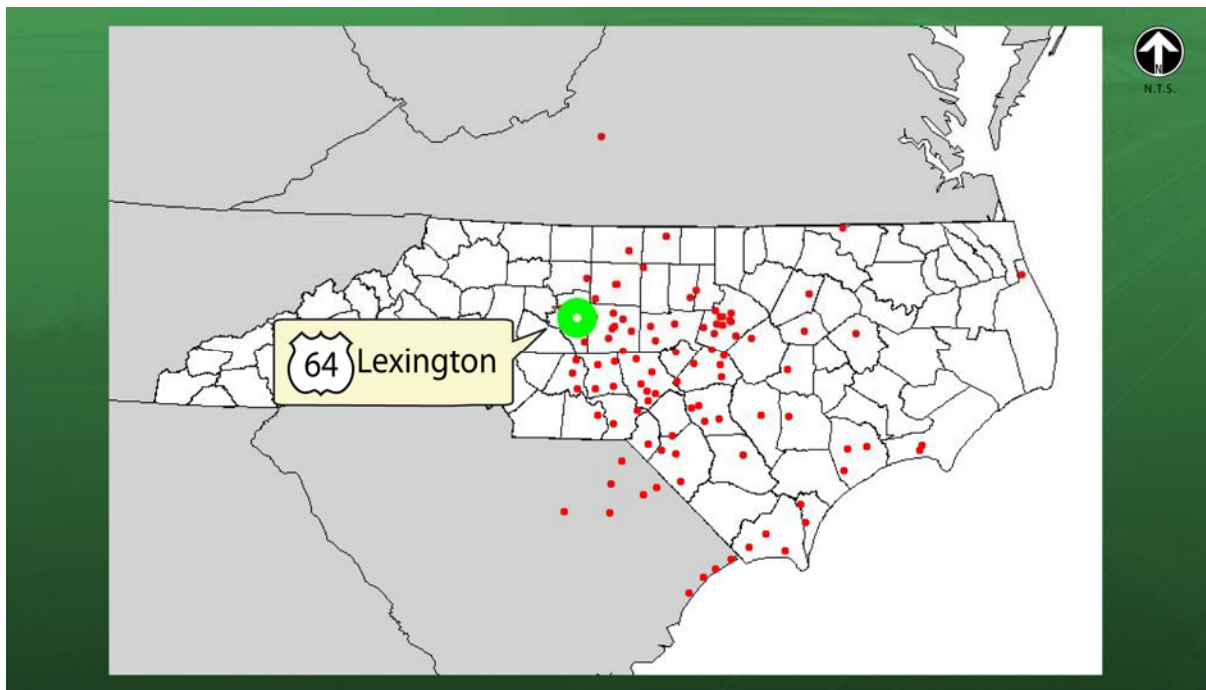


Figure 3.32: Origins of Westbound Vehicles Passing the US 64 – Lexington Roadside Survey Station

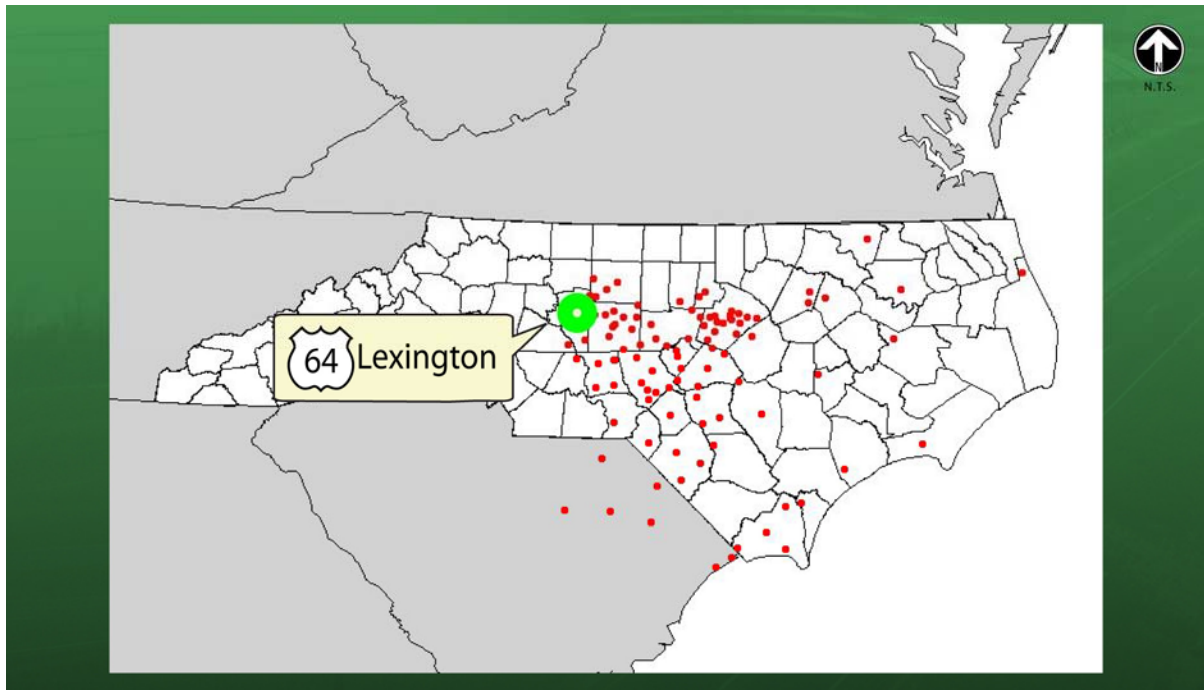
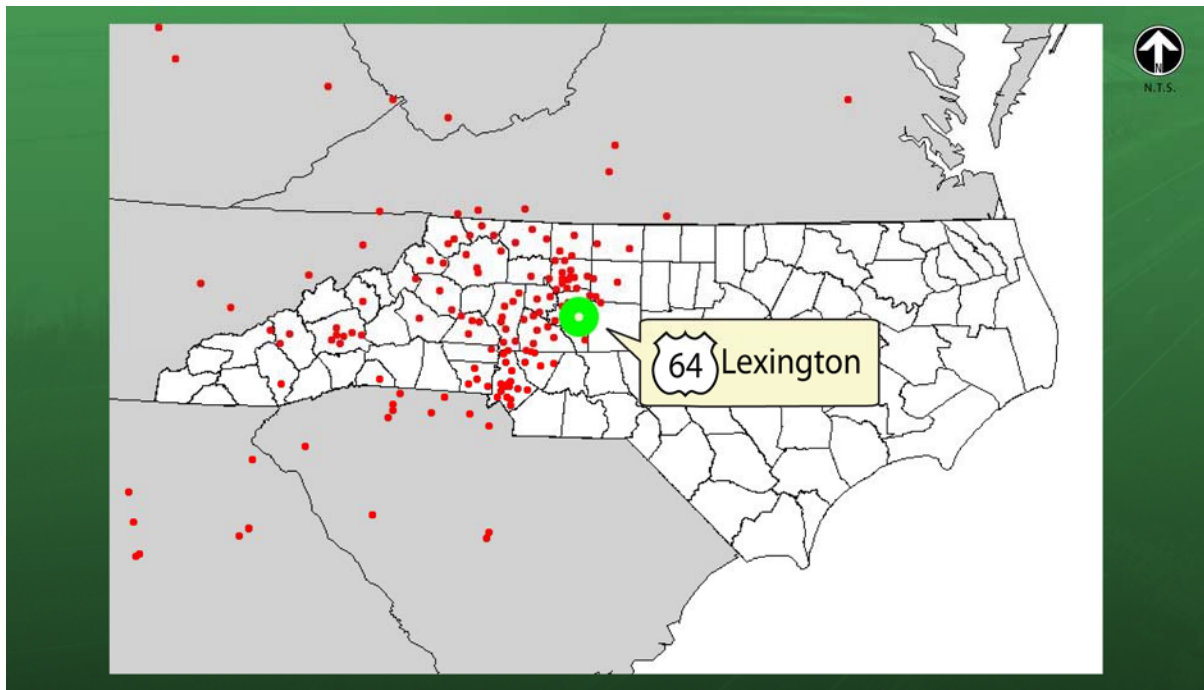


Figure 3.33: Destinations of Westbound Vehicles Passing the US 64 - Lexington Roadside Survey Station





US 64 vehicles are widely dispersed throughout the counties of central and eastern North Carolina, with most of the destinations located to the south of the US 64–NC 49 Corridor. The only immediately obvious concentration of destinations is in Wake County. A small number of trips are destined for locations in northeastern South Carolina and communities along the Atlantic Coast.

Figure 3.32 illustrates the origins of the westbound US 64 vehicles passing through this survey station. While generally concentrated in the counties along US 64 between Asheboro and Raleigh, the trip origins include locations scattered throughout central and eastern North Carolina and adjacent portions of northeastern South Carolina. As was the case with the eastbound destinations, the majority of the westbound origins were observed in the portions of central and eastern North Carolina south of US 64. As shown on **Figure 3.33**, the destinations of the vehicles traveling westbound on US 64 past this roadside survey station appear to be concentrated in the following counties: Cabarrus, Davidson, Davie, Forsyth, Iredell, Mecklenburg, and Rowan. These counties are generally contained within the triangle formed by the junctions of I-40 and I-77 at Statesville, I-40 and I-85 at Greensboro, and I-77 and I-85 at Charlotte. Trip destinations also appear to follow the I-40 west corridor through North Carolina into Tennessee, and the I-85 south corridor beyond Charlotte into South Carolina and Georgia. The destinations of other trips observed passing this survey station along US 64 were scattered across southwest Virginia, the southern portion of West Virginia, and eastern Kentucky.

Figure 3.34 summarizes the eastbound and westbound origin-destination travel data at this US 64 roadside survey station to present a county-level aggregation of traffic flow patterns within the 19-county study area. As shown in this exhibit, a number of significant movements were identified. Not unexpectedly, the largest single movement identified was between Randolph County and Davidson County. Other major movements included links between Randolph and Forsyth Counties, Randolph and Iredell Counties, and Davidson and Forsyth Counties. In addition to these shorter length county-to-county trips, the survey also identified a number of longer travel patterns. Of particular interest here were connections between Randolph County and Mecklenburg County, and Mecklenburg County to Wake County.

NC 49 – Yadkin River

Figures 3.35 and **3.36** present the origins and destinations of the northbound NC 49 vehicles passing through this survey station. Similarly, **Figures 3.37** and **3.38** present the origins and destinations of the southbound NC 49 vehicles passing through this survey station.



Figure 3.34: County-to-County Travel Patterns of Vehicles Passing US 64 – Lexington Roadside Survey Station



Figure 3.35: Origins of Northbound Traffic Passing the NC 49 – Yadkin River Roadside Survey Station

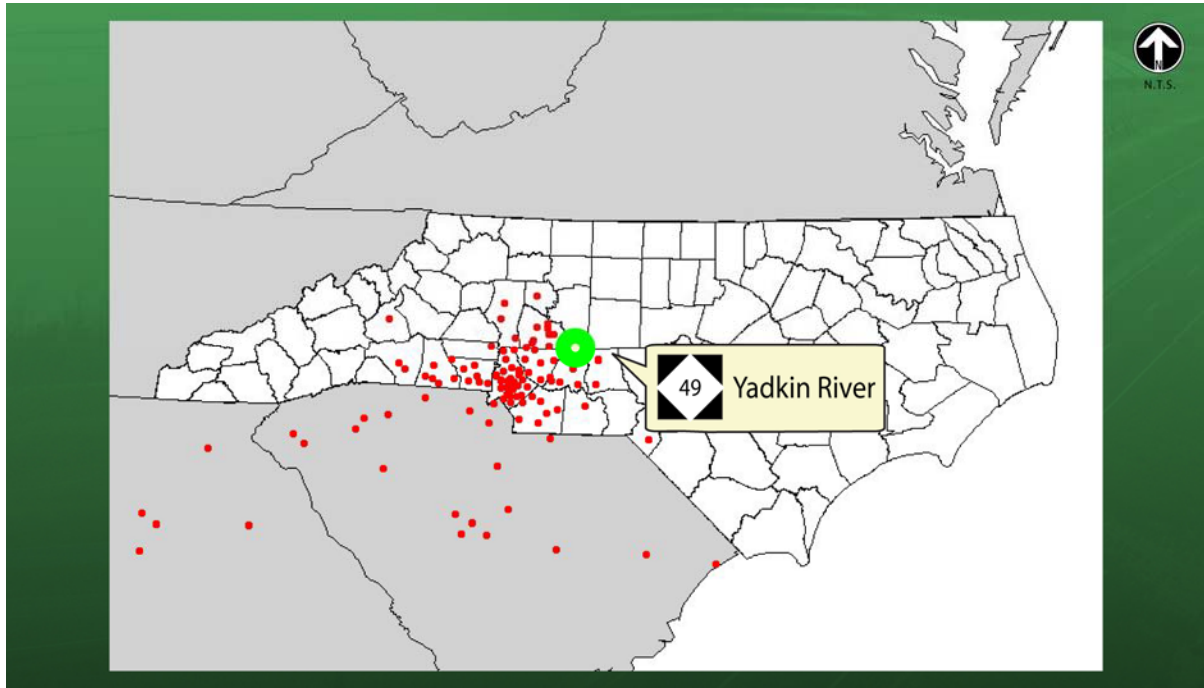


Figure 3.36: Destinations of Northbound Traffic Passing the NC 49 – Yadkin River Roadside Survey Station

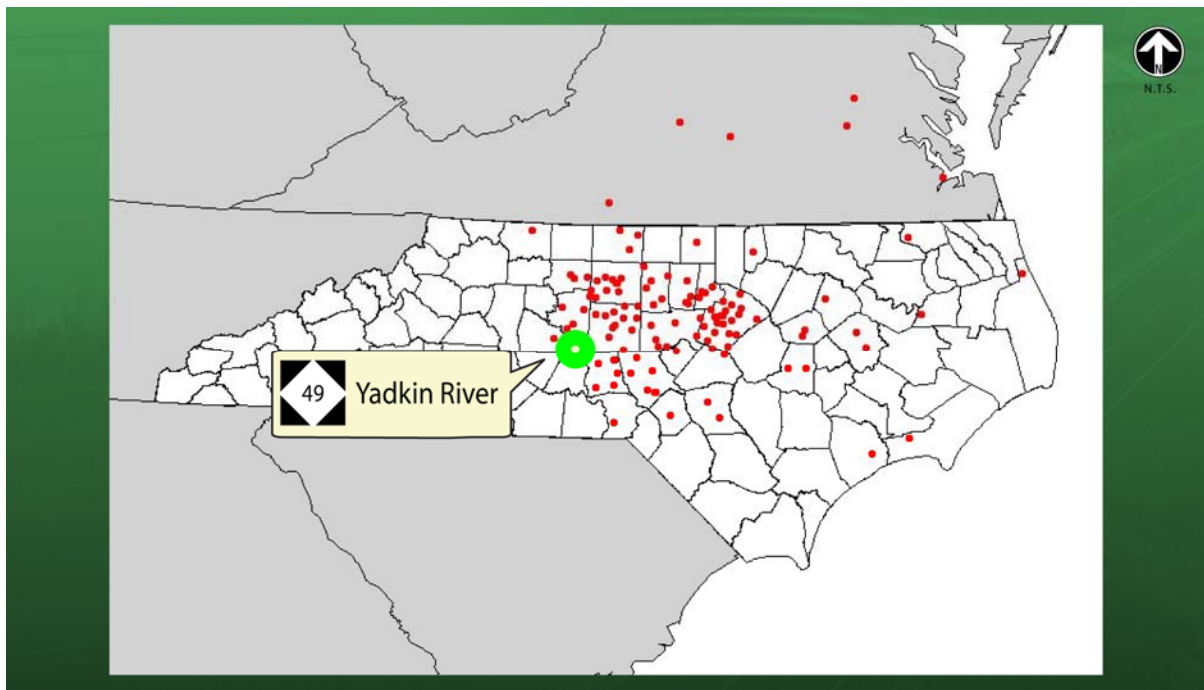


Figure 3.37: Origins of Southbound Traffic Passing the NC 49 – Yadkin River Roadside Survey Station

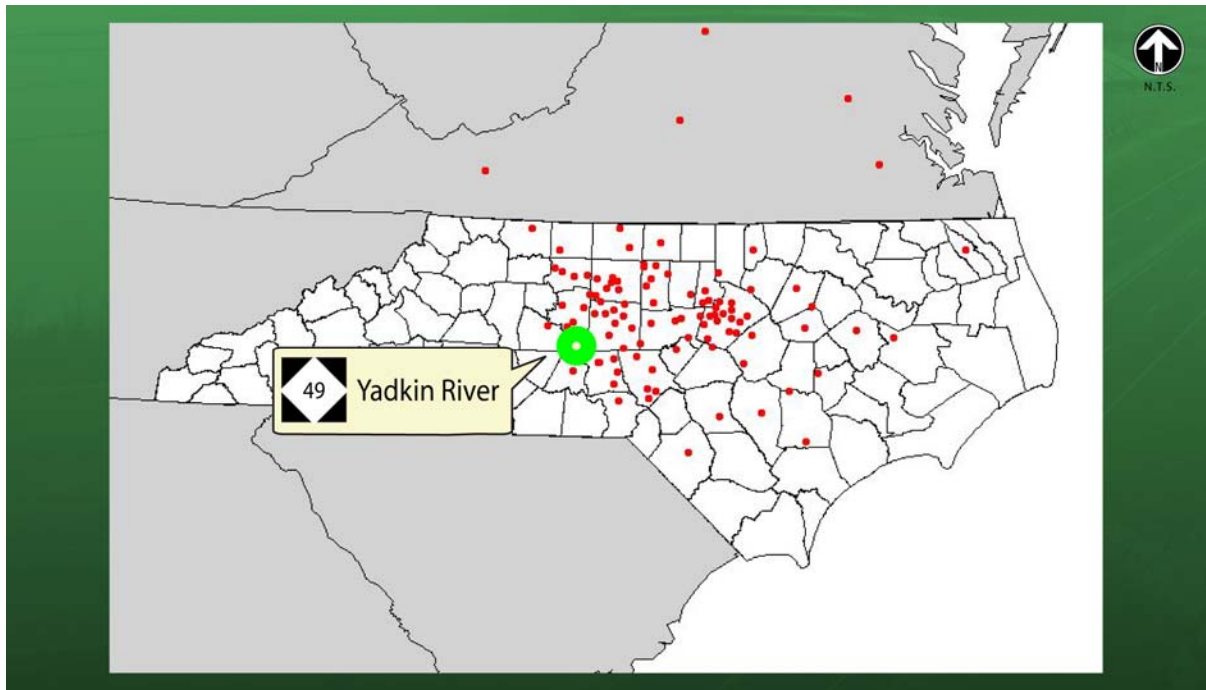
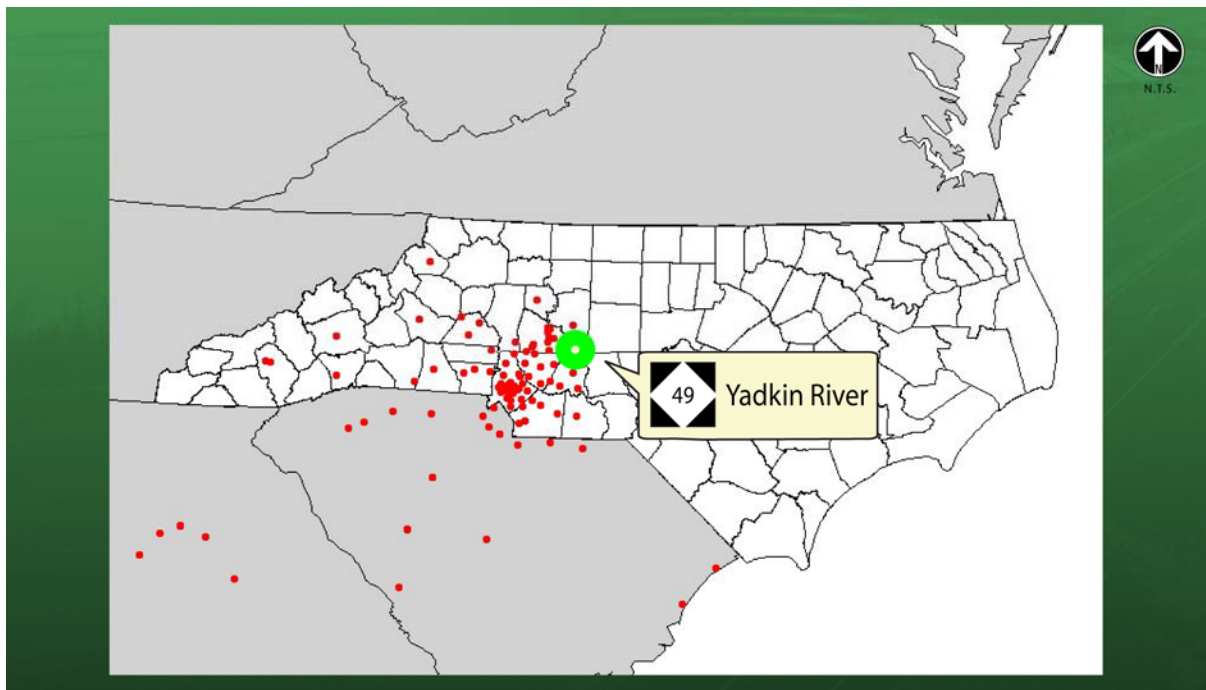


Figure 3.38: Destinations of Southbound Traffic Passing the NC 49 – Yadkin River Roadside Survey Station





As shown on **Figure 3.35**, the origins of the northbound NC 49 vehicles are concentrated in and around Mecklenburg County and the immediately adjacent counties to the east and west. A noticeable portion of the trips had their origins in either South Carolina along the I-77 corridor between Charlotte and Columbia, or along the I-85 corridor through South Carolina and into Georgia. Similarly, **Figure 3.36** illustrates that the destination of the northbound NC 49 vehicles, while generally concentrated in the Triad (Winston-Salem/Greensboro/High Point) and Triangle (Raleigh/Durham/Chapel Hill) areas, include locations throughout central and eastern North Carolina. Several of the northbound trips passing through this survey station reported destinations in central Virginia.

Figure 3.37 illustrates that the origins of the southbound NC 49 vehicles, while generally concentrated in the Triad and the Triangle urban areas, include locations throughout central and eastern North Carolina. Several of the southbound trips passing through this survey station reported their trip origins as being in central Virginia along the US 220 and I-85 corridors. As shown on **Figure 3.38**, the destinations of the southbound NC 49 vehicles are concentrated in and around Charlotte and the immediately adjacent counties to the east and west. Other concentrations of destinations were observed in the Lexington and Statesville areas. A noticeable number of the southbound trips reported their destinations in either South Carolina along the I-77 corridor between Charlotte and Columbia, or along the I-85 south corridor through South Carolina and into Georgia.

Figure 3.39 summarizes the northbound and southbound origin-destination travel data at the NC 49 roadside survey station to present a county-level aggregation of traffic flow patterns within the 19-county study area. As shown in this exhibit, a number of significant movements were identified. Not unexpectedly, the largest single movement was between Davidson and Stanly Counties. Other major movements included links between Stanly and Rowan Counties, Stanly and Randolph Counties, and Stanly and Cabarrus Counties. In addition to these shorter length county-to-county trips, the survey also identified a number of longer travel patterns. These included: Stanly to Forsyth, Stanly to Guilford, Mecklenburg to Randolph, and Mecklenburg to Wake.

US 64 – Siler City

Figures 3.40 and **3.41** present the origins and destinations of the eastbound US 64 vehicles passing through this survey station. Similarly, **Figures 3.42** and **3.43** present the origins and destinations of the westbound US 64 vehicles passing through this survey station.

As shown on **Figures 3.40**, the origins of the eastbound US 64 vehicles are concentrated in the following counties: Cabarrus, Davidson, Davie, Forsyth, Iredell, Mecklenburg, and Rowan. A noticeable portion of the trips had their origins along the I-85 corridor in South Carolina and Georgia, in the I-40 corridor through North Carolina, or to the northwest into Virginia in locations served by the I-77 and US 220 corridors. **Figure 3.41** illustrates that the destination of the eastbound US 64 vehicles are highly concentrated in and around Wake County. Other destinations tend to follow either US 64 to the east of Raleigh or I-40 south of Raleigh to Wilmington.



Figure 3.39: County-to-County Travel Patterns of Vehicles Passing NC 49 – Yadkin River Roadside Survey Station



Figure 3.40: Origins of Eastbound Vehicles Passing US 64 - Siler City Roadside Survey Station

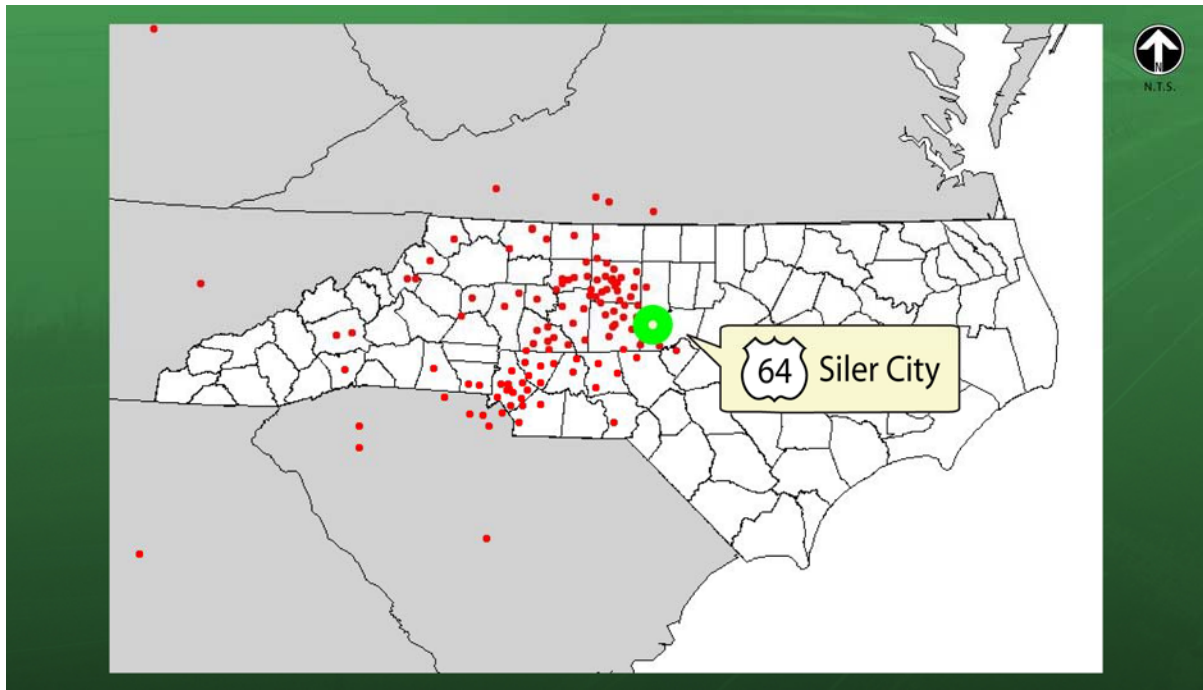


Figure 3.41: Destinations of Eastbound Vehicles Passing US 64 - Siler City Roadside Survey Station

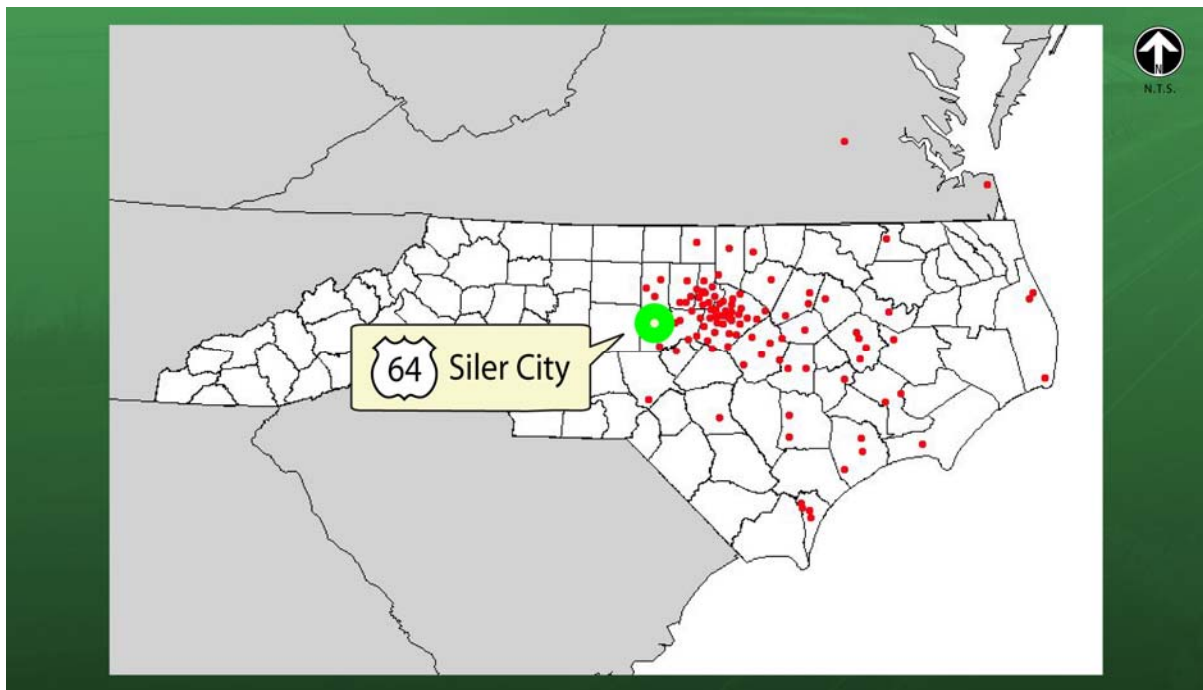


Figure 3.42: Origins of Westbound Vehicles Passing US 64 - Siler City Roadside Survey Station

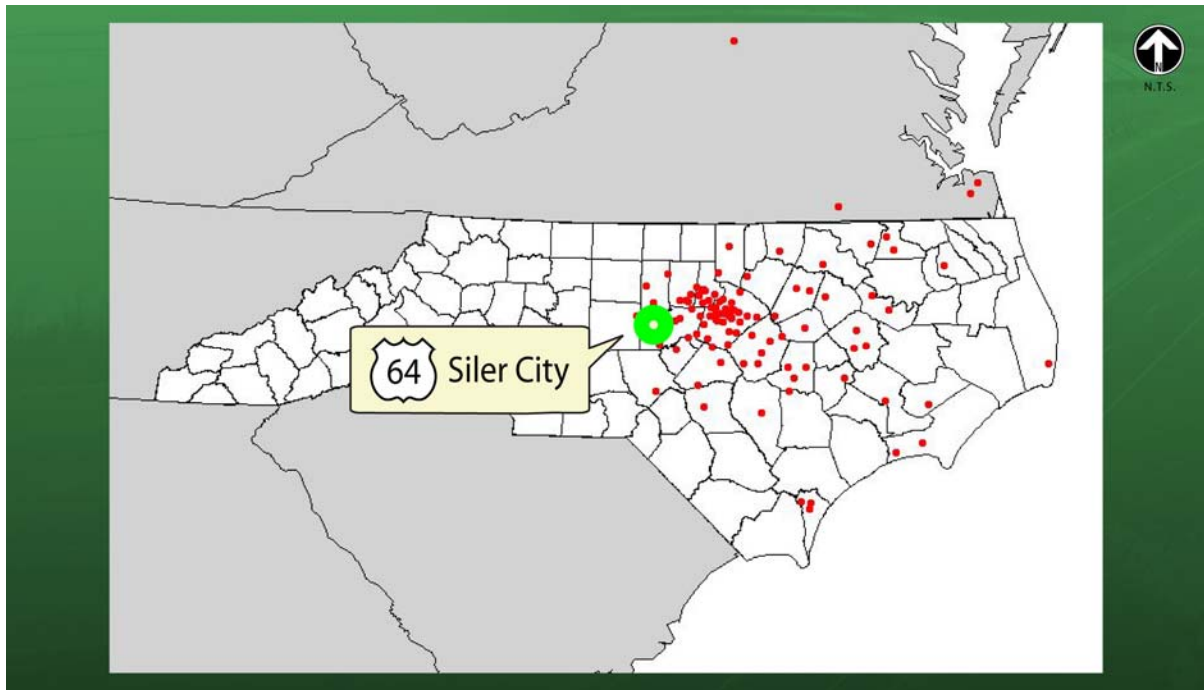


Figure 3.43: Destinations of Westbound Vehicles Passing US 64- Siler City Roadside Survey Station

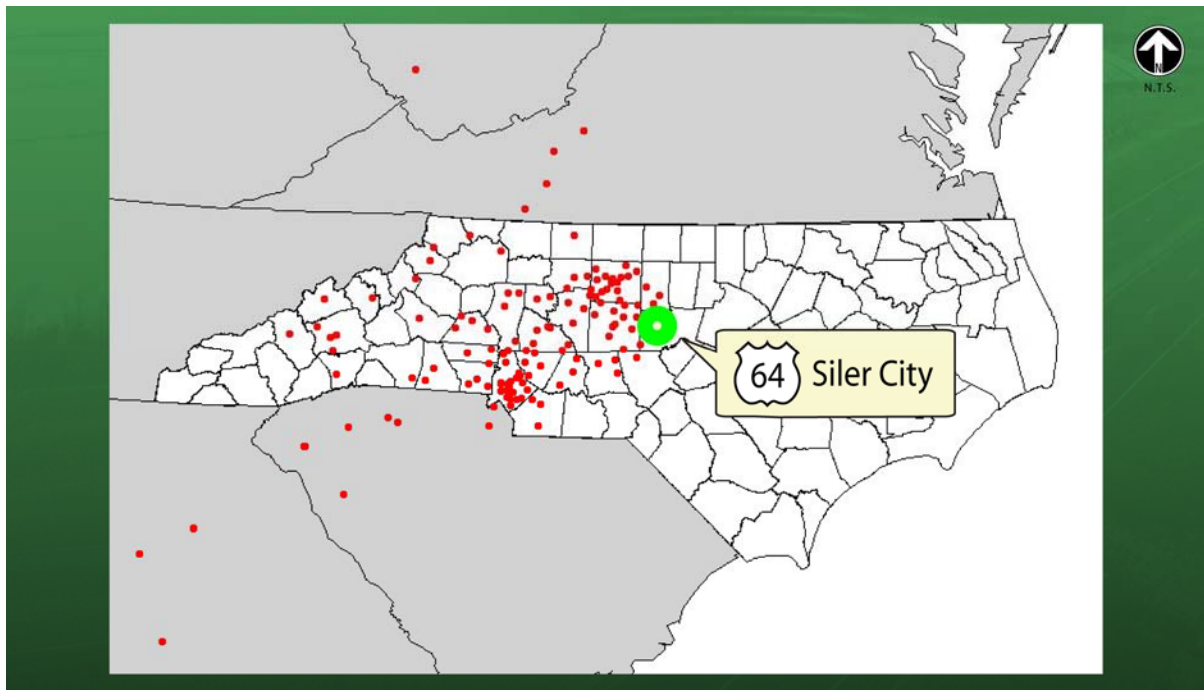




Figure 3.42 illustrates that the origins of the westbound US 64 vehicles passing through the US 64 - Siler City survey station. While heavily concentrated in Wake and Durham Counties, the trip origins include locations scattered throughout most of eastern North Carolina and generally follow the routings of US 64 and US 264 east of Raleigh. As shown on **Figure 3.43**, the destinations of the westbound US 64 vehicles traveling past this site are concentrated in the following counties: Cabarrus, Davidson, Davie, Forsyth, Iredell, Mecklenburg, and Rowan. Trip destinations also appear to follow the I-40 corridor through the western counties of North Carolina, and the I-85 corridor from Charlotte into South Carolina and Georgia. Other trips were scattered across southwest Virginia along the I-77 and I-81 corridors.

Figure 3.44 summarizes the eastbound and westbound origin-destination travel data at the Siler City roadside survey station along US 64 to present a county-level aggregation of traffic flow patterns within the 19-county study area. As shown in this exhibit, a number of significant movements were identified. Not unexpectedly, the largest movements were between Chatham County and Wake County, and between Randolph County and Wake County. A similar large scale county-to-county travel pattern was identified between Randolph County (Asheboro) and Davidson County (Lexington). Other major movements included links between Wake and Guilford Counties, and between Chatham County and its neighbors to the north (Durham, Orange, Alamance, and Guilford). In addition to these shorter length county-to-county trips, the survey also identified a number of longer travel patterns. Of particular interest here were connections between Orange County and Mecklenburg County, and between Mecklenburg County and Wake County.

3.6.3.5 *Travel Time Survey*

A series of travel time surveys were undertaken to record the average vehicle travel times and speeds for trips between Charlotte and Raleigh and Statesville and Charlotte utilizing I-40 and I-85, and US 64 and NC 49. The surveys were conducted over a period of six weekdays between November 19, 2003 and December 9, 2003. Multiple trips were taken in each direction along each route during both peak and off-peak periods. Details of these surveys are described in the *Travel Time Survey Technical Report, May 2004*.

As expected, the slowest sections of the Interstate were those located in the largest urban areas with the highest traffic volumes. Peak-period travel times along I-85 north of Charlotte, for example, were less than 30 mph until well into Cabarrus County. Once beyond the boundaries of the Charlotte urban area, travel speeds along I-85 north were almost always at or above the posted speed limit, with only minor slowdowns observed in the Salisbury area during peak periods.



Figure 3.44: County-to-County Travel Patterns of Vehicles Passing US 64 - Siler City Roadside Survey Station





One of the more consistently congested segments of the Interstate was the I-40/I-85 overlap section between Greensboro and Burlington. Throughout most of the survey period, speeds in this area were at or below 30 mph reflective of stop and go conditions. However, it should be noted that these travel time runs were conducted in late 2003 prior to the completion of Interstate improvements in the Greensboro area, and thus illustrate conditions that were significantly worse than what would be observed today if new data were collected.

Continuing east along the I-40 corridor beyond Burlington, travel times were consistently at or above the posted speed limit until entering the Raleigh/Durham/Chapel Hill urban area. From about the Orange County/Durham County line east to I-440, travel speeds along the I-40 corridor were less than 30 mph during peak periods.

Along US 64, traffic generally moved at the posted speed limits except for occasional small pockets of localized congestion and traffic signal delay. Between I-40 at Mocksville and I-85 at Lexington, travel speeds along US 64 were between 45 and 60 mph except when traversing the communities of Mocksville and Lexington, where average travel speeds were at times 15 mph. East of the I-85 interchange at Lexington, travel speeds along US 64 were at the posted speed limit to Asheboro.

From the US 64/NC 49 junction on the west side of Asheboro east along US 64 through Ramseur, traffic congestion was typically encountered. This resulted in fluctuations in the observed travel speed from less than 15 mph to more than 45 mph. These fluctuations are typical of conditions along multilane suburban arterial highways with substantial roadside commercial development characteristics, which define this portion of US 64.

East of Ramseur, travel speeds along US 64 were typically at the posted speed limit to the east side of Pittsboro in Chatham County. The exception to this was observed in the more commercialized area of Siler City, where speeds were in the 30 to 45 mph range. From the Chatham County/Wake County line east to the end of the defined study area at the I-40/I-440/US 1/US 64 interchange, moderate to heavy congestion and delay was typically observed during peak travel periods. Much of this was attributed to intersection delays, with resulting overall average travel speeds through the area being less than 30 mph.

Along NC 49 between Charlotte and Asheboro, a wide range of travel speeds was observed. The portions of NC 49 closer to Charlotte, generally from the Concord/Mount Pleasant area south into the city of Charlotte, experienced significant fluctuations in travel time, due primarily to traffic signal delays. Peak-period speeds in this area were less than 30 mph. Once north of Mount Pleasant, travel speeds along NC 49 were at the posted speed limit to Asheboro. The only noted exceptions to this were observed at the intersection of NC 49 and US 52 in Richfield and at the NC 49/NC 109 interchange in Davidson County.

Based on the results of the travel time runs, a trip between Raleigh and Charlotte utilizing I-40 and I-85 would take approximately 2 hours and 30 minutes, covering a distance of approximately 155 miles at an average speed of 62 mph. Traveling between the identical



origin and destination points utilizing US 64 and NC 49 would also take approximately 2 hours and 30 minutes, covering a slightly shorter distance of approximately 140 miles at an average speed of 56 mph. From a total travel time perspective, these two routings are essentially identical. The travel distance on the Interstate is longer, but at a faster average speed. The same trip via US 64 and NC 49 is shorter in distance, but has a slower average travel speed.

A trip between Raleigh and Statesville along I-40 would take approximately 2 hours and 15 minutes, covering a distance of approximately 150 miles at an average speed of 67 mph. Traveling between the identical origin and destination points along US 64 would take approximately 2 hours and 30 minutes, covering a slightly shorter distance of approximately 130 miles at an average speed of 52 mph. From a total travel time perspective, the US 64 routing would take approximately 15 minutes more, or about an 11 percent increase over the Interstate travel time.

Given the relatively identical travel times between the same defined beginning and ending points along the corridor, regardless of whether the Interstate or state highway routings were used, it is reasonable that improvements to US 64 and NC 49 would allow these routings to offer lower travel times than those via the Interstate. This would create the opportunity to divert some appreciable percentage of Interstate traffic onto this defined Strategic Highway Corridor.

3.6.4 Safety

Crash data provided information on safety conditions in the study area. Traffic accident records were obtained for the most recent years available. Crash information was reviewed for I-85, I-40, US 64, and NC 49. General findings from the data review and analysis are summarized in this section.

The following sources were referenced:

- *Highway Safety Improvement Program (HSIP)(May 2003)*
- *Strip Analysis Data for US 64, NC 49, I-40, and I-85 (NCDOT, June 1, 2000 – May 31, 2003)*
- *North Carolina Moving Ahead (NCDOT Traffic Engineering and Safety Systems: 1999-2001 County Crash Data)*
- *Statewide Crash Rates (NCDOT Traffic Engineering and Safety Systems Branch: 2000-2002)*

3.6.4.1 Highway Safety Improvement Program

The *Highway Safety Improvement Program Report (May 2003)* provided information on the North Carolina's top potentially hazardous locations, including intersections, bridges,



roadway sections, and bicycle and pedestrian areas. The HSIP Report was downloaded from the following NCDOT website⁵:

The HSIP report provided a preliminary list of ranked locations that are considered potentially hazardous, meaning they are not necessarily dangerous; but simply a candidate for crash analysis and possible investigation. “Locations are weighted and prioritized using many factors. A location with a high rank in its category indicates, based upon the frequency, crash type, severity, and other miscellaneous factors, this is a priority candidate for analysis and investigation...” (HSIP Report, Page 1). The report notes that until a location is analyzed and investigated it is difficult to determine if the location is dangerous or not

“Crash data used to determine potential hazardous locations was based on crashes occurring between October 1, 1999 through September 30, 2002 (warrants based on three years of data) or based on crashes occurring between October 1, 1992 through September 30, 2002 (warrants based on ten years of data)” (HSIP Report, Page 2).

I-40 and I-85

Intersections. Three of the 400 potentially hazardous intersections statewide are located on I-40 and I-85 in the study area. Two of these are located in Wake County and two in Durham County as indicated below.

State Ranking

Durham County

- #32 • I-85 at US 70
- #48 • I-40 at SR 1973 (Page Road)

Wake County

- #190 • I-40 at SR 1497 (Cary Towne Boulevard)

Roadway Sections. Twenty-one of the 200 potentially hazardous sections of roadway statewide are located on or near I-40 and I-85 in the regional study area. One or more hazardous roadway sections are located in all counties that I-40 and I-85 pass through in the regional study area, except Cabarrus County, Mecklenburg County, and Wake County, which have none. Potentially hazardous sections of I-40 and I-85 are listed below by county.

State Ranking

Alamance County

- #14 • I-40/I-85 near SR 1007 (Mebane Oaks Road)

⁵ www.doh.dot.state.nc.us/preconstruct/traffic/safety/reports/2003_HSIP.pdf.



Davidson County

- #24 • I-85 near NC 8
- #26 • I-85 near SR 2085 (Baptist Children's Home Road)
- #54 • I-85 near SR 1295 (I-85 Service Road)
- #154 • I-85 near SR 1133 (Belmont Road)

Davie County

- #24 • I-40 near SR 1410 (Farmington Road)
- #19 • I-40 near US 64
- #30 • I-40 near US 601
- #152 • I-40 near SR 1436 (Pinebrook School Road)

Durham County

- #148 • NC 147 near I-40
- #177 • I-85 near SR 1675 (Glen School Road)

Forsyth County

- #10 • I-40 near NC 66
- #55 • I-40 near SR 1101 (Harper Road)

Guilford County

- #15 • I-40/I-85 near SR 3056 (Rock Creek Dairy Road)
- #191 • I-85 near I-85 Business

Iredell County

- #4 • I-40 near SR 2158 (Old Mocksville Road)
- #157 • I-40 near US 64
- #167 • I-40 near SR 1005 (Old Mountain Road)

Orange County

- #38 • I-40/I-85 near SR 1120 (Mt. Willing Road)

Rowan County

- #96 • I-85 near SR 1505 (Mt. Hope Church Road)
- #130 • I-85 near SR 1221 (Old Beatty Ford Road)

Bridges. Sixteen of the 113 potentially hazardous bridge locations statewide are located on or near I-40 and I-85 within the regional study area and are listed below by county.

State Ranking

Alamance County

- #77 • Bridge #130 & #131 on I-40/I-85 near NC 49
- #88 • Bridge #120 & #122 on I-40/I-85 near NC 49



Durham County

- #82 • Bridge #108 & #112 on I-85 near US 15
- #83 • Bridges #229 & #230 on I-40 near I-540
- #105 • Bridges # 17 & #21 on US 15 near I-40
- #108 • Bridge #306 on SR 1118 (Fayetteville Street) near I-40

Forsyth County

- #90 • Bridge #125 on I-40 Business near I-40

Guilford County

- #26 • Bridge #325 on US 220 near I-85
- #53 • Bridge #220 on SR 1541 (Wendover Avenue) near I-40

Mecklenburg County

- #43 • Bridge #294 on SR 2665 (Harris Boulevard) near I-85
- #73 • Bridge #354 on NC 16 near I-85
- #74 • Bridges #511 & #512 on SR 2665 (Harris Boulevard) near I-85
- #95 • Bridges #187 & #188 on US 74 near I-485
- #24 • Bridge #285 on SR 2480 (Cheshire Road) near I-85

Orange County

- #98 • Bridges #103, #106, #110, & #111 on I-85 near US 70

Randolph County

- #61 • Bridges #20 & #26 on I-85 near US 311

US 64 and NC 49

Intersections. Five of the 400 potentially hazardous intersections statewide are on or near NC 49 or US 64 in the study area and are listed below by county.

State Ranking Cabarrus County

- #51 • NC 49 at Old Charlotte Highway
- #358 • US 601 at NC 49

Randolph County

- #126 • US 64 at SR 1335 (Rush Mountain Road)
- #80 • NC 47 at NC 49

Wake County

- #336 • US 64 at SR 1163 (Kelly Road)



Roadway Sections. One of the 200 potentially hazardous sections of roadway statewide is located near US 64 in the study area and is listed below.

State Ranking Chatham County
#42 • US 421 near US 64

Bridges. Two of the 113 potentially hazardous bridge locations statewide are located on or near US 64 or NC 49 in the study area and are listed below by county.

State Ranking Randolph County
#51 • Bridge #191 on US 64 near NC 22

Wake County
#3 • Bridge #167 on US 1 near its merge with US 64

Bicycle and Pedestrian areas. Three of the top 100 potentially hazardous bicycle and pedestrian sections statewide are located on US 64 or NC 49 in the study area and are listed below by county.

State Ranking Mecklenburg County
#34 • NC 49 in rural Mecklenburg County
#79 • NC 49 in Charlotte

Randolph County
#55 • US 64 in rural Randolph County

3.6.4.2 Strip Analysis Data

Accident data for I-40, I-85, US 64, and NC 49 for the period June 1, 2000 through May 31, 2003 were generated as Strip Analysis Reports by the Traffic Safety Systems Management Branch. The Strip Analysis Reports provided detailed information on accident occurrences and types along I-40, I-85, US 64, and NC 49. A summary table of the Strip Analysis Report Summary Statistics by roadway segment is included in **Appendix C**.

I-40 and I-85

Interstate crash data for 2000-2002 was reviewed to determine accident trends along I-40 and I-85 within the regional study area. The analysis also compared crash rates (crashes/100 million vehicle miles traveled (VMT)) to average crash rates for all Interstates in North Carolina.

The Interstate Strip Analysis revealed that I-40 in Wake County from the Durham County line to the I-440/US 1/US 64 interchange and I-85 in Mecklenburg County from the US 29/49



Connector to the Cabarrus County line had notably higher crash rates than the statewide average rates for Interstates.

The Strip Analysis Data also showed that most accidents on I-40 and I-85 occur during peak (morning and afternoon) periods and are rear-end collisions. This data suggests that most accidents along I-40 and I-85 are occurring during periods of congestion.

US 64 and NC 49

The analysis compared crash rates (crashes/100 million VMT) to statewide average crash rates for rural routes, primary rural routes, and rural US routes in North Carolina.

The accident rates suggest that the US 64–NC 49 Corridor is not particularly hazardous. Accident, injury, and fatality rates generally are below statewide averages in recent years. However, data for particular sections along the corridor reveal that NC 49 through Cabarrus County and US 64 through Randolph County had crash rates that were more than 20 percent higher than the statewide average crash rate.

3.6.4.3 North Carolina Moving Ahead

Another source used to assess safety conditions along US 64 and NC 49 is the NCDOT *NC: Moving Ahead! Maps*, which contain crash rate factors. These maps contain 1999-2001 crash data by county and were reviewed for all counties through which US 64 and NC 49 pass. A crash rate is given in units of crashes per vehicle miles traveled. A crash rate factor is derived by dividing the crash rate for that road segment by the county wide crash rate for that type of road. These maps can be viewed at the following NCDOT website⁶:

Data is defined with crash rate factors that range from 0-1, 1.01-2.00, 2.01-5.00, and 5.01-111. For the purpose of this analysis, sections with crash rate factors of 2.01-5.00 and 5.01-111 were noted as “high”.

The data suggests that US 64 in Randolph and Chatham Counties have a higher occurrence of crashes and highway safety “hot spots” compared to the rest of the NC 49 and US 64 corridors. With the exception of the high rates noted along the Pittsboro Bypass (full control of access), most of these occurrences are located on sections of US 64 that have no access control.

3.6.5 Programmed and Planned Roadway Improvements

With the planning horizon for this corridor study being the year 2030, it can be expected that a considerable amount of improvements will be made to the existing highway system in the

⁶ www.ncdot.org/planning/tpb/gis/datadist/GISNCMovingAheadCenter.html.



19-county study area. These improvements will consist of a variety of small and large scale projects, from minor intersection improvements and bridge deck replacements to the widening and reconstruction of major rural and urban Interstate routes and the construction of new location highways. This portion of the report highlights those major projects that would result in the provision of increased capacity to some portion of the public highway system in the study area. For the purposes of this study, “increased capacity” is defined as the addition of through travel lanes. Minor geometric improvements such as the elimination of a low-speed curve or intersection channelization to provide additional dedicated turning lanes were not considered as resulting in capacity expansion for the purposes of this study.

The list of planned and programmed roadway improvements for the study area roadway system was prepared from a review of a variety of sources. These included:

- The current edition of NCDOT’s Transportation Improvement Program for Fiscal Years 2004-2010.
- Fiscally constrained long-range transportation plans and associated short-range transportation improvement programs prepared by the various metropolitan planning organizations (MPOs) across the 19 counties.
- Project priority lists prepared by the Regional Planning Organizations (RPOs) in the study area.

The compilation of these plans formed the basis for the definition of the “Existing plus Committed” (E+C) highway system network across the 19-county study area; that is, those highway improvement projects that can be reasonably expected to be completed and open to use by the planning horizon year of 2030. A list of those improvements included in the E+C highway system network is provided in **Appendix D**.

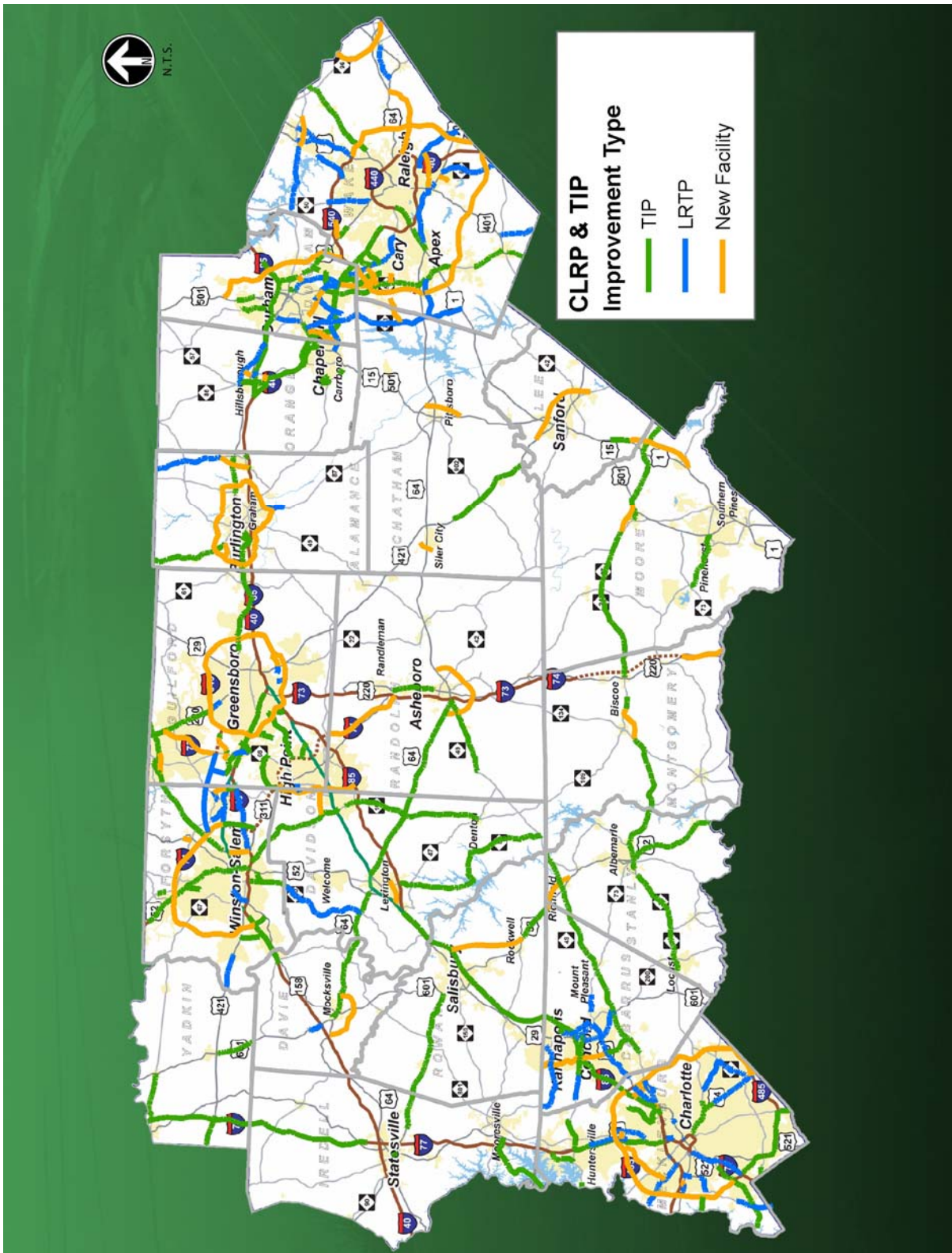
Figure 3.45 illustrates the major highway improvements that were assumed as part of the E+C highway system.

The majority of planned improvements to the study area highway system would be undertaken by NCDOT. NCDOT’s Transportation Improvement Program (TIP) identifies those projects for which funding have been allocated for planning, design, right-of-way, and construction activities over the next seven years. Individual project listings also identify those phases of project development that are anticipated to take place beyond the seven-year TIP period. Such expenditures are identified as taking place in ‘post years’. There are several improvements along the US 64–NC 49 Corridor and within the regional study area that are included in NCDOT’s *2004-2010 Transportation Improvement Program*.

The following text summarizes TIP projects for US 64, NC 49, I-40, and I-85 within the study area, and addresses long-range projects of the MPOs and RPOs.



Figure 3.45: Existing Plus Committed Improvements within the Study Area





3.6.5.1 TIP Projects Along US 64 and NC 49

TIP Projects along US 64 are described below.

TIP Project R-3111

TIP Description: US 64 east of Mocksville to US 601 west of Mocksville. Two-lane bypass of Mocksville on four-lane right-of-way, new location.
Length: 6.1 miles
Estimated Cost: \$29.6 million
Schedule: This project is unfunded in the 2004-2010 TIP. Right-of-way and construction would occur post year.

TIP Project R-3602

TIP Description: US 601 south of Mocksville to US 52 in Lexington. Widen US 64 to multi-lanes and upgrade interchange at US 52.
Length: 14 miles
Estimated Cost: \$95.2 million
Schedule: This project is unfunded in the 2004-2010 TIP. Right-of-way and construction would occur post year.

TIP Project R-2220

TIP Description: East of I-85 Business in Lexington to US 220 in Asheboro. Widen US 64 to four lanes.
Length: 28.5 miles
Estimated Cost: \$125.7 million
Schedule: (Part complete: I-85 Bus. to I-85) Right-of-way and construction is anticipated to occur post year.

TIP Project R-2536

TIP Description: Asheboro Southern Bypass. US 64 West to US 64 East. Four-lane freeway on new location with interchanges at US 220, NC 49, and zoo access at NC 159.
Length: 13.5 miles
Estimated Cost: \$163.1 million
Schedule: Construction is scheduled to begin in FY 2009 and to be completed post year.

TIP Project U-3101

TIP Description: US 1/US 64, US 64 to south of SR 1313 (Walnut Street). Rehabilitate pavement, additional travel lanes, and modify SR 1313 interchange.
Length: 2.6 miles
Estimated Cost: \$27.4 million
Schedule: Construction to occur in the FY 2004-FY 2006 time period.



TIP Projects along NC 49 are described below.

TIP Project R-2533

TIP Description: Harrisburg to Yadkin River. Widen NC 49 to multi-lanes.
Length: 29.3 miles
Estimated Cost: \$166.6 million
Schedule: A portion of this project (from Harrisburg to Mount Pleasant) is currently under construction. Construction of the remaining sections (South of Mount Pleasant to the Yadkin River) is planned to begin in FY 2010 and continue post year.

TIP Project R-2535

TIP Description: SR 1174 West of Farmer to proposed Asheboro Southern Bypass (R-2536) west of SR 1193. Widen NC 49 to a four-lane divided facility.
Length: 9.7 miles
Estimated Cost: \$31.6 million
Schedule: Right-of-way acquisition is scheduled to occur in the FY 2004-FY 2010 time period. Construction is scheduled to occur post year.

3.6.5.2 TIP Projects Along I-40 and I-85

TIP Projects for mainline improvements I-40 from Statesville to Raleigh are described below.

TIP Project I-911

TIP Description: West of NC 801 (Exit 180) to west of SR 1122. Pavement rehabilitation and construction fifth and sixth lanes.
Length: 7.1 miles
Estimated Cost: \$55.6 million
Schedule: Part complete. Part unfunded.

TIP Project I-2201

TIP Description: SR 1850 (Squire Davis Road) to west of SR 1398 (Freeman Mill Road) in Greensboro. Widen to six and eight lanes. Upgrade guardrail and lighting.
Length: 10.9 miles
Estimated Cost: \$199.1 million
Schedule: Part complete. Part under construction.



TIP Project U-2524

TIP Description: Greensboro Western Loop, North of I-85 to Lawndale Drive.
Construct Freeway on New Location. (Part of Loop to be signed as I-40)

Length: 15.0 miles

Estimated Cost: \$569 million

Schedule: Part complete. Part under construction.

TIP Project I-3306

TIP Description: I-85 in Orange County to NC 147 (Buck Dean Freeway) in Durham County. Add additional lanes.

Length: 20.7 miles

Estimated Cost: \$88.9 million

Schedule: Part under construction. Part unfunded.

TIP Project I-2204

TIP Description: NC 147 (Exit 279) in Research Triangle Park to Bradshaw Freeway at Wade Avenue (Exit 289). Widen to eight lanes.

Length: 9.4 miles

Estimated Cost: \$27.5 million

Schedule: Part complete. Part under construction.

TIP Projects for mainline improvements to I-85 from Charlotte to Greensboro are described below.

TIP Project I-3803

TIP Description: US 29-NC 49 Connector in Mecklenburg County to NC 73 in Cabarrus County. Add additional lanes.

Length: 12.8 miles

Estimated Cost: \$174.9 million

Schedule: Part under construction as design-build project. Part unfunded.

TIP Project I-2511

TIP Description: US 29-601 Connector (Exit 68) to north of SR 2120 (Exit 81). Rehabilitate bridges and widen to eight lanes.

Length: 13.2 miles

Estimated Cost: \$236.8 million

Schedule: Part complete. Part under construction.



TIP Project I-2304

TIP Description: North of SR 2120 (Exit 81) in Rowan County to US 29-52-70/I-85 Business (Exit 87). Additional lanes and bridge reconstruction.

Length: 6.8 miles

Estimated Cost: \$147.8 million

Schedule: Construction in 2006 (Design-build project)

3.6.5.3 State, Local, and Regional Highway Improvement Plans

Over and above the projects included in the current edition of the TIP, NCDOT, in association with the various metropolitan planning organizations (MPOs) and regional planning organizations (RPOs) in the study area have developed lists of longer range highway improvements. Such proposals would typically be included in the metropolitan area fiscally constrained long-range transportation plans (LRTPs), and generally have a planning horizon of 2020 to 2030. A number of these LRTPs are currently being updated by the MPOs. Because the RPO long-range transportation planning process is still evolving, NCDOT and local agency staff indicated that their current short-range TIPs were judged as identifying the majority of major project needs over the planning horizon of this corridor study.

All of the MPO and RPO identified projects were thus included in the E+C highway network for the study area that was used as the basis for the development and evaluation of alternative improvements in the US 64 and NC 49 corridors.

3.6.6 Existing Public Transit Services

Although the primary focus of this corridor study is on the regional highway system, it should be acknowledged that improvements to the highway system would be of benefit to local and intercity public transportation services. This section of the corridor study report summarizes the existing transit services in the study area.

In order to document these initiatives, information was obtained from the following agencies that coordinate and/or implement transit services throughout the region:

- North Carolina Department of Transportation, Public Transportation Division
- Charlotte Area Transit System (CATS)
- Piedmont Area Regional Transit (PART)
- Triangle Transit Authority (TTA)

Pursuant to information collected from the Public Transportation Division of NCDOT, all of the counties in the study area maintain some form of general use public transit or human service agency client transportation program. These programs provide access to



transportation through a variety of mechanisms, including fixed route, deviated fixed route, subscription, dial-a-ride, and non-emergency medical transportation.

Existing public transit services are summarized in **Table 3.11**. The following sections provide additional detail.

Table 3.11: Existing Fixed Route and Subscription Transportation Services Provided by Public Agencies in the Study Area

County	Transit Provider	Hours/Days of Operation	Services Offered
Alamance	Alamance County Transportation System, Inc. (ACTS)	6 a.m. – 6 p.m. Monday – Friday	Deviated fixed route, subscription, and dial-a-ride for residents of Alamance County.
Cabarrus	Cabarrus County Transportation System (CCTS)	6 a.m. – 6 p.m. Monday – Friday	Subscription and dial-a-ride for residents of Cabarrus County.
Cabarrus	Concord Kannapolis Area Transit (Rider)	5:30 a.m. – 9:30 p.m. Monday – Friday	Fixed route service
Chatham	Chatham Transit Network (CTN)	6 a.m. – 6 p.m. Monday – Friday	Daily subscription route non-emergency medical transportation to human service agencies. Transportation for Work First transitional/employment program participants and general public residents.
Chatham, Durham, and Wake	Triangle Transit Authority (TTA)	5 a.m. – 8 p.m. Monday – Friday	Operates fixed-route commuter bus service connecting Cary, Raleigh, Durham, and Chapel Hill with RTP, RDU and major universities.
Davidson	Davidson County Transportation System (DCTS)	6:30 a.m. – 5:30 p.m. Monday – Friday	Subscription and dial-a-ride services for residents of Davidson County.
Davie, Stokes, Surry, and Yadkin	Yadkin Valley Economic Development District, Inc. (YVEDDI)	7 a.m. – 5 p.m. Monday – Friday	Deviated fixed-route, subscription and dial-a-ride transportation services for county residents.
Durham	Durham Area Transit Authority (DATA)	5:30 a.m. – 11:30 a.m. Monday – Saturday	Fixed-route bus service and subscription and dial-a-ride transportation for residents of Durham County.
Durham	Durham County Access	6 a.m. – 6 p.m. Monday – Friday	Subscription and dial-a-ride transportation for residents of Durham County who reside outside the city of Durham.
Forsyth	Trans-AID	6 a.m. – 6 p.m. Monday – Friday	Subscription and dial-a-ride transportation for authorized residents of Forsyth County who reside outside the city of Winston-Salem.



Table 3.11: Existing Fixed Route and Subscription Transportation Services Provided by Public Agencies in the Study Area

County	Transit Provider	Hours/Days of Operation	Services Offered
Forsyth	Winston-Salem Transit Authority (WSTA)	6 a.m. – 12:00 a.m. Monday – Friday	Fixed-route buses within the city of Winston-Salem.
Forsyth and Guilford	Piedmont Area Regional Transit (PART)	6 a.m. – 7 p.m. Monday – Friday	Express bus service connecting the fixed-route systems of Greensboro, High Point, and Winston-Salem. Coordinates dial-a-ride paratransit service for cross county trips.
Guilford	Greensboro Transit Authority (GTA)	5:45 a.m. – 6:30 p.m. Monday – Friday 8:45 a.m. to 5:15 p.m. Saturday	Fixed-route buses within the city of Greensboro. Express bus service to PTIA.
Guilford	High Point Transit System (Hi Tran)	5:45 a.m. – 6:30 p.m. Monday – Friday 8:45 a.m. to 5:15 p.m. Saturday	Fixed-route buses within the city of High Point. Dial-a-ride paratransit service for city residents.
Guilford	Specialized Community Area Transportation	6 a.m. – 7 p.m. Monday – Friday	Subscription and dial-a-ride transportation for citizens of Guilford County who reside outside the cities of Greensboro and High Point.
Iredell	Iredell Transportation Authority (ITA)	6 a.m. – 6 p.m. Monday – Friday	Subscription and dial-a-ride transportation for residents of Iredell County.
Lee	County of Lee Transit System (COLTS)	7 a.m. – 5 p.m. Monday – Friday	Subscription and dial-a-ride transportation for residents of Lee County.
Mecklenburg	Charlotte Area Transit System (CATS)	5:30 a.m. – 1:30 a.m. Monday – Saturday 7 a.m. – 1:30 a.m. Sunday	Fixed-route bus service and paratransit services for the city of Charlotte and nearby suburbs. Local and express buses are available.
Mecklenburg	Mecklenburg Transportation System (MTS)	Varies	Deviated fixed route, subscription and dial-a-ride transportation for citizens of Mecklenburg County who reside outside the city of Charlotte.
Montgomery	Montgomery County Council on Aging	6 a.m. – 6 p.m. Monday – Friday	Dial-a-ride transportation for authorized residents of Montgomery County.
Moore	Moore County Transportation Services (MCTS)	7:30 a.m. – 5:30 p.m. Monday – Friday	Subscription and dial-a-ride transportation for residents of Moore County.
Orange	Chapel Hill Transit	6:15 a.m. – 12:45 a.m. Monday – Saturday	Fixed- route buses, shared-ride, and dial-a-ride paratransit services for the town of Chapel Hill, neighboring town of Carrboro, and the University of North Carolina at Chapel Hill.



Table 3.11: Existing Fixed Route and Subscription Transportation Services Provided by Public Agencies in the Study Area

County	Transit Provider	Hours/Days of Operation	Services Offered
Orange	Orange County Public Transportation (OPT)	6:30 a.m. – 6 p.m. Monday – Friday	Deviated fixed-route, subscription, and dial-a-ride transportation for citizens of Orange County who live outside of the town of Chapel Hill and the town of Carrboro.
Randolph	Randolph Coordinated Agency Transportation System	6 a.m. – 5 p.m. Monday – Friday	Subscription and dial-a-ride transportation for authorized residents of Randolph County.
Rowan	Rowan Area Transit System (RTS)	6 a.m. – 6 p.m. Monday – Friday	Subscription and dial-a-ride transportation for authorized rural residents of Rowan County
Rowan	Salisbury Transit System	6:15 a.m. to 6:45 p.m. Monday - Friday 8:45 a.m. to 4:15 p.m. Saturday	Fixed-route buses within the city of Salisbury. Dial-a-ride paratransit services for certain authorized residents of the city of Salisbury and nearby towns of Spencer and East Spencer.
Stanly	Stanly County Transportation (SCUSA)	6 a.m. – 6 p.m. Monday – Friday	Subscription and dial-a-ride transportation for residents of Stanly County.
Wake	Accessible Raleigh Transportation	6 a.m. – 10 p.m. Monday – Saturday	Dial-a-ride paratransit services within the city of Raleigh.
Wake	Capital Area Transit (CAT)	6 a.m. – 10 p.m. Monday – Saturday	Fixed-route buses within the city of Raleigh.
Wake	C-Tran	6 a.m. – 10 p.m. Monday – Saturday	Dial-a-ride paratransit services within the town of Cary
Wake	Wake Coordinated Transportation Services	6 a.m. – 6 p.m. Monday – Friday	Subscription and dial-a-ride transportation for citizens of Wake County who reside outside the cities of Raleigh or town of Cary

Source: North Carolina Department of Transportation, Public Transportation Division web site (<http://www.ncdot.org/transit/transitnet/PublicInfo/Gazetter.html>).

There are four primary agencies that offer ridesharing programs within the study area. Below is a brief description of each of these agencies and their services.

- **Ridesharing Services and Vanpooling of the Piedmont**, or RSVP, coordinates commuter transportation services for the Piedmont Triad region, including possible destinations in Guilford, Forsyth, Randolph, Davidson, and Alamance Counties.
- **Piedmont Authority for Regional Transit** also operates vanpools and bus pools in the Greensboro metropolitan region from connections in Guilford, Forsyth, Randolph, Davidson, and Alamance Counties.



- **Triangle Transit Authority** operates vanpools and bus pools in the Research Triangle metropolitan region to connect Raleigh, Durham, Cary, and Chapel Hill with Research Triangle Park, Raleigh-Durham International Airport and surrounding suburbs, including possible destinations in Chatham, Alamance, Orange, and Durham Counties. Park-and-ride facilities also are available.
- **Charlotte Area Transit System** provide commuter bus service and special-event transportation to Uptown Charlotte from surrounding suburbs, including Concord, Gastonia, Huntersville, Kannapolis, Monroe, and Rock Hill, South Carolina.

Several other smaller public and private transit providers also operate commuter buses and special-event transportation in the study area.

3.6.7 Future Transit Services

In order to accurately assess its overall mobility needs, significant initiatives for future transit improvements currently underway within the project study area must be taken into account. Major transit initiatives being undertaken within the study area include:

- 2025 Transit System Plan by the Charlotte Area Transit System
- Regional Rail by the Triangle Transit Authority
- Triad Major Investment Study by the Piedmont Authority for Regional Transit

As these initiatives are under development, alignments, technologies, and feeder bus networks associated with these initiatives are subject to change. Below are brief descriptions of these initiatives.

3.6.7.1 Charlotte Area Transit System – 2025 Transit System Plan

The Charlotte Area Transit System is in the early stages of building a state-of-the-art rapid transit system which will integrate bus, light rail, commuter rail and bus rapid transit into a comprehensive public transportation network for the 21st Century.

The Metropolitan Transit Commission (MTC) is taking the lead for planning and implementing various forms of bus and rail transit service in the city of Charlotte and the surrounding Mecklenburg County area. The 2025 Transit System Plan⁷ consists of multiple rapid transit improvements in five corridors, a series of improvements in Center City Charlotte, and bus service and facility improvements throughout the rest of the region. Rapid transit guideway services will extend to I-485 in order to intercept trips coming in and out of Mecklenburg County and to improve regional connectivity.

⁷ <http://www.charmeck.org/Departments/CATS/Home.htm>



Two corridors extend beyond Mecklenburg County to Iredell County in the North Corridor and to Cabarrus County in the Northeast Corridor. These recommendations are designed to leverage transportation investments already completed or underway in the corridors. Improvements in the West and Southeast Corridors are being planned so that future expansions into Gaston and Union Counties can be coordinated as well.

It is estimated that when completed the 2025 Transit System Plan will serve four times as many transit riders as the present system does today. There is expected to be 28 miles of bus rapid transit (BRT) guideways, 21 miles of light rail transit (LRT), 11 miles of streetcars, 30 miles of commuter rail, and an expanded network of buses and other transportation services throughout the entire region. The addition of park-and-ride lots, neighborhood transit centers, other transit facilities, and expansion of the bus fleet is projected to cost \$952 million.

3.6.7.2 Triangle Transit Authority – Regional Rail

The Triangle Transit Authority is planning a 37-mile commuter rail system that stretches from north Raleigh to downtown, through Cary, Morrisville, and the Research Triangle Park and into Durham⁸. The North Carolina Board of Transportation approved an initial funding package for the project in December, 2003. TTA expects to begin operating this service in December 2008.

TTA has recently completed an Environmental Impact Study (EIS) for Phase I of the Regional Rail project. The proposed transit system is a two-track rail diesel multiple unit (DMU) system that will run from Duke Medical Center in Durham to Durant Road in Northeast Raleigh on an existing railroad alignment. The exception to this is the construction of a 1,600-foot section of track on new alignment to avoid construction disturbance and/or existing track relocation near downtown Raleigh.

The initial segment to be constructed for operation in 2008 will run from the Ninth Street Station in Durham to the Government Center in Raleigh. Construction is scheduled to begin in 2005. The entire Phase I Regional Rail project is scheduled for completion by 2015.

3.6.7.3 The Triad Major Investment Study

In November 2002, PART completed the Triad Major Investment Study (MIS)⁹ to determine which corridors within the Triad region could support a fixed-guideway transit system. The MIS evaluated the feasibility of designing, building, operating and maintaining premium transit along the following four corridors that were deemed of the highest priority within the region:

⁸ <http://www.ridetta.org>

⁹ http://www.partnc.org/triad_major_investment_study.htm



- Burlington to Clemmons
- High Point to Greensboro
- High Point to Piedmont Triad Airport
- High Point to Winston Salem

Two technologies, diesel multiple unit (DMU) and bus-rapid transit (BRT), were evaluated in this study for each of these alignments. The Triad MIS evaluated these alternatives for access, convenience, environmental consequences, and costs. The study did not recommend a preferred alternative, but provided a comparison of these alternatives to assist the community and PART in deciding which alternatives best meets the needs of the Triad. In May 2003, the PART Board of Trustees adopted the Burlington to Clemmons alignment as the preferred alignment for premium transit. The Federal Transit Administration has requested that PART reevaluate potential technologies for the corridor. This technology evaluation is expected to be complete by 2005.

3.6.7.4 Other Transit Improvements

Other than the improvements associated with the three major initiatives discussed in this section, there are no other planned transit improvements of regional significance within the US 64–NC 49 study area. Future transit improvements in the region will be in response to population growth, increased urban and suburban development (urbanization), and associated impacts to commuter patterns. Therefore, future transit improvements will likely be limited to the following elements:

- New, extended, or modified fixed-route and express service within urban areas.
- Expanded rural and urban paratransit services.
- Expanded vanpools and ridesharing services and initiatives.

3.6.8 Intercity Passenger Bus Service

Greyhound Lines (and its wholly owned subsidiary Carolina Trailways) provides service to 88 cities in North Carolina, with 60 locations receiving full service, and the remaining 28 locations receive limited service. **Table 3.12** lists the current full-service bus stations and limited service stops served by these carriers.

Full-service bus locations are manned stations that have available information on-line including operational and ticketing schedules and contact information such as mailing address, main phone number, and phone numbers for Greyhound package express and charter services.



Table 3.12: Current Full-Service and Limited-Service Intercity Bus Stops in North Carolina

Full-Service Bus Stations in North Carolina					
Ahoskie	Durham	Hickory	Morehead City	Rocky Mount	Tarboro
Asheville	Edenton	High Point	Morganton	Salisbury	Wadesboro
Boone	Elizabeth City	Jacksonville	Mt Airy	Sanford	Wallace
Burlington	Fayetteville	Kinston	New Bern	Scotland Neck	Washington
Camp Lejeune	Gastonia	Laurinburg	Raeford	Shallotte	Waynesville
Charlotte	Goldsboro	Lenoir	Raleigh	Shelby	Williamston
Cherry Point	Greensboro	Lexington	Red Springs	Smithfield	Wilmington
Clinton	Greenville	Lincolnton	Reidsville	Southern Pines	Wilson
Concord	Henderson	Lumberton	Roanoke Rapids	Spindale	Windsor
Dunn	Hendersonville	Monroe	Rockingham	Statesville	Winston-Salem
Limited-Service Bus Stops in North Carolina					
Chapel Hill	Halifax	Kittrell Job Corp	Mooresville	Rich Sq	Whitakers
Chocowinity	Hamlet	Lewiston	Newland	Richlands	Wilson Amtrak
Duke Vet Hosp	Hampstead	Marshville	Oak City	Rocky Mount Amtrak	Wingate
Enfield	Hertford Jct	Matthews	Pinetops	Roseboro	
Farmville	Holly Ridge	Maysville	Raleigh Durham Arpt Connector	Scotts Hill	

Greyhound and Carolina Trailways provide information on bus schedules and special services including package shipment and charter bus service through their web site¹⁰. Additionally, the web site has phone numbers and address information for each of the full-service bus stop locations.

Limited service bus stops provide scheduled service for a large number of locations which do not support a full-service terminal or agency. No Greyhound ticketing or baggage facilities are available at these locations. Service to these points may vary by schedule, day, week, carrier, or season, such as restricted service to colleges when school is not in session. Greyhound and their subsidiaries do not serve some areas of North Carolina. These areas mainly consist of smaller cities and towns in the northern and western reaches of the state. However, the central portion of the US 64–NC 49 Corridor is also lacking any existing intercity bus service. Some of the areas that are currently not served include the communities of Asheboro, Siler City, and Pittsboro.

¹⁰ <http://www.greyhound.com>

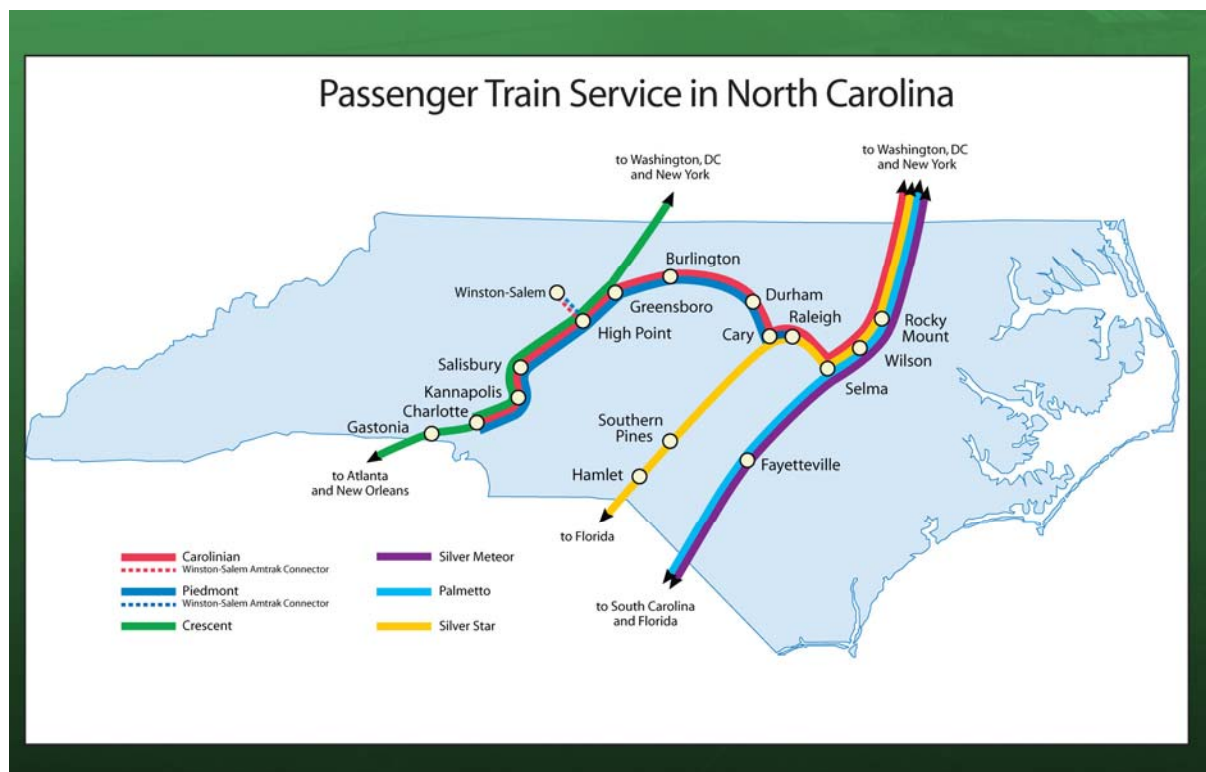
3.6.9 Intercity Passenger Rail Service

3.6.9.1 Existing Service

Amtrak is the sole intercity passenger rail carrier in North Carolina and operates three routes that travel through the study area: The Carolinian, The Piedmont, and The Crescent. These routes are shown in **Figure 3.46**. The state of North Carolina supports the operation of the Carolinian and the Piedmont through promotion and marketing and by reimbursing Amtrak for its in-state costs.

- The Carolinian - Provides roundtrip service between Charlotte and New York City. Within the study area, this route travels between Charlotte and Raleigh through Kannapolis, Salisbury, High Point, Greensboro, Burlington, Durham, and Cary. Total annual ridership for the entire route during 2004 was reported by Amtrak as 331,996.
- The Piedmont - Travels roundtrip between Charlotte and Raleigh through Kannapolis, Salisbury, High Point, Greensboro, Burlington, Durham, and Cary. This entire route is within the study area. Unlike other passenger rail services, the Piedmont is owned by the state of North Carolina and operated by Amtrak under contract. Total annual ridership for the entire route during 2004 was reported by Amtrak as 40,330.

Figure 3.46: Intercity Passenger Rail Routes





- The Crescent - Provides roundtrip service between New Orleans and New York City. Within the study area, this route travels between Charlotte and Greensboro through Salisbury, High Point, and Greensboro. Total annual ridership for the entire route during 2004 was reported by Amtrak as 254,152.

3.6.9.2 Recent Service Improvements

NCDOT is investing in rail infrastructure improvements such as rail cars, track structures, and stations. In many cases, the state is partnering with local governments and railroads in order to make the necessary improvements.

NCDOT built a maintenance facility in downtown Raleigh in 1995 to support the daily operations of the state-owned *Piedmont*. The facility is used daily to clean and perform routine maintenance on the passenger cars and locomotives used on the *Piedmont* route and the business cars on the *Carolinian*.

Working with the North Carolina Railroad (NCR), Norfolk Southern Railway (NS), and CSX Transportation (CSX), NCDOT is upgrading the state's existing rail corridors to improve safety, efficiency, and capacity for freight and passenger train services. The first phase of improvements is scheduled along the North Carolina Railroad (NCR). This 317-mile-long, state-owned corridor links Charlotte, Greensboro, and Raleigh and extends to the state-owned and -operated seaport at Morehead City. Norfolk Southern Railway operates freight trains along the entire corridor under a lease agreement with NCR. CSX Transportation shares freight operations along a portion of the NCR's corridor between Raleigh and Cary.

In 2004, NCDOT completed a first phase of work in track and signal improvements between Raleigh and Greensboro. These improvements have increased travel reliability and have reduced travel time between the two cities. The improvements included track siding extensions in Mebane, Funston, and McLeansville; improved track curvature between Cary and Charlotte to allow higher speed operations; signal improvements between Cary and Greensboro; and improved rail support facilities in Durham and Greensboro. To improve safety, rail crossings in Greensboro, Landis, Spencer, Thomasville, and China Grove were closed and rail/highway grade separations were initiated in Thomasville. In a second phase of work scheduled to commence in 2005, NCDOT will construct a second track in Durham, restore double-track operations between Greensboro and High Point, continue with the rail and signal upgrade program between Cary and Raleigh, and improve track curvature to permit higher speed operations between Cary and Raleigh.

A summary of recent rail station improvements is provided in **Table 3.13**.



Table 3.13: Recent Rail Station Improvements in North Carolina

Station Name	Improvement Projects
Burlington	North Carolina Railroad Company renovated the historic 1868 Engine House
Cary	NCDOT is planning to extend the current platform along the NCRR and construct a second platform along the CSX line. Design of the second platform was completed during 2003, with construction to be coordinated with the TTA regional rail project.
Charlotte	NCDOT is planning a new station three blocks from the city center that will incorporate conventional and high-speed intercity passenger rail, local and regional bus and rail services, intercity bus, rental cars, bicycles, and pedestrians. The project is expected to handle about 500,000 rail passengers annually by 2015. NCDOT has completed land acquisition for the new multimodal center and has initiated work on the track and platform design for the station. Development of the new Charlotte Multimodal Station and related track improvements is estimated to cost between \$110 and \$207 million.
Durham	A new \$10 to \$12 million multimodal center is planned for Durham. City of Durham voters approved \$5 million in bond revenues to go toward the multimodal center; NCDOT and Federal funds will pay for the balance of the project.
Greensboro	Plans call for the former station to become a multimodal transportation center with provisions for Amtrak, intercity buses and city transit buses. Phase I construction, which included completion of the transit portion of the station complex, began in summer 2001 and was completed in summer 2003. Phase II construction began in fall 2003. Track work and will be completed by mid-2005, when passenger service is scheduled to resume.
Hamlet	A temporary modular station is now open for passengers, and it will remain in use until restoration of the historic station is complete. Building restoration began in July 2003 and is scheduled to be completed by the end of 2004 or early 2005.
High Point	The High Point station finished a \$8.5 million dollar rehabilitation project in December 2003.
Kannapolis	A new \$2.7 million station and transportation center, which serves as a transfer point for local transit service, was completed in late 2004.
Marion	Restoration work began in August 2003 and the station should be restored to its 1916 appearance in 2005.
Morganton	Restoration work began in August 2003 and the station should be restored to its 1916 appearance in 2005.
Old Fort	Restoration work began in August 2003 and the station should be restored to its 1916 appearance in 2005.
Raleigh	Conceptual planning for a multimodal ground transportation center has been completed. After the TTA track alignment and funding have been approved, detailed design work on the new facility will begin.
Rocky Mount	The Rocky Mount Station's \$9 million dollar rehabilitation was completed in 2000.
Salisbury	Historic Salisbury Foundation, Inc. acquired the station, saving it from demolition. They raised more than \$3 million in private donations and restored the main waiting room and other parts of the station.
Selma	The Selma station is on the National Register of Historic Buildings, and underwent a renovation from 2001 to 2002 that cost \$3.4 million dollars.
Southern Pines	NCDOT intends to team with the City of Southern Pines to refurbish the structure to its early 1900s appearance and color scheme.
Wilson	The Wilson Station recently completed a \$2.4 million renovation that restored the original architecture and added long-term parking facilities. Construction was completed in April 2003.



3.6.9.3 *Planned Service Improvements*

NCDOT has worked with Amtrak, the railroads, and local communities to investigate potential improvements to existing intercity rail passenger services in the state. The most significant planned passenger rail improvements include:

- Western North Carolina Passenger Rail Initiative¹¹
- Southeastern North Carolina Passenger Rail Feasibility Study¹²
- Southeast High Speed Rail Corridor¹³

More specific route information is provided in the sections that follow. However, it should be noted that the service characteristics proposed within each of these initiatives is subject to change as each service is in the early stages of development.

Western North Carolina Passenger Rail Initiative

The North Carolina General Assembly in 2000 directed NCDOT to study the feasibility of providing passenger rail service to western North Carolina. The March 2001 Western North Carolina Passenger Rail Study, which updated a similar report from 1997, recommended a phased implementation for passenger service and outlined the costs associated with each phase, as well as criteria to measure service performance. During the course of the studies, the operation and number of freight trains in the corridor increased markedly as Norfolk Southern added and rerouted trains between Salisbury and Asheville.

In March 2001, NCDOT adopted a phased plan to extend passenger rail service to Asheville and western North Carolina via a routing linking Salisbury, Statesville, Morganton, and Hickory. The plan includes renovating or building train stations that would incorporate other uses. Current budgetary constraints have prompted NCDOT to delay the return of passenger rail service to the mountains.

In April 2002, the department submitted to the General Assembly a summary of costs to make necessary track and signal improvements to safely and efficiently accommodate the 37 existing freight trains and four proposed passenger trains. Based on the state's current financial status and cost of track improvements, NCDOT has recommended delaying the start of passenger train service to western North Carolina. The delay could likely push the start date for train service back to 2008.

In the interim, NCDOT has continued to work with communities in western North Carolina to renovate historic stations that will incorporate other community uses, as reported above. NCDOT has also continued partnering with communities along the route to develop a

¹¹ <http://www.bytrain.org/future/western.html>

¹² <http://www.bytrain.org/future/southeastern.html>

¹³ <http://www.bytrain.org/highspeed/>



program of safety improvements to prevent train-vehicle crashes at railroad crossings between Salisbury and Asheville.

Southeastern North Carolina Passenger Rail Feasibility Study

In May 2001 the final report was issued for the Southeastern North Carolina Passenger Rail Feasibility Study that evaluated three possible routes for the reinstatement of rail service to Wilmington and the southeastern part of the State. The study indicated strong interest in passenger train service along the Wilmington - Raleigh routes and recommended that the department conduct more detailed analysis to help determine the best possible route. The final report, which will identify the total estimated costs, as well as the best route for passenger service and the costs and benefits associated with enhanced freight services, was originally scheduled to be completed in early to mid-2004. As of the date of the US 64-NC 49 Corridor Study Report, the project website¹⁴ indicates that the Southeastern North Carolina Passenger Rail Feasibility Study is still ongoing. The following two candidate passenger service routings are being evaluated:

- Raleigh – Selma – Goldsboro – Warsaw – Wilmington
- Raleigh – Selma – Fayetteville – Pembroke – Lumberton - Wilmington

Southeast High Speed Rail Corridor

In October 2002, the Federal Railroad Administration and Federal Highway Administration confirmed and approved the preferred Southeast High-Speed Rail Corridor. North Carolina and Virginia are now identifying the next steps necessary to develop high-speed rail in each segment of the corridor and soon will begin more detailed environmental and engineering studies to examine different track configurations. In 2004, the state legislatures in North Carolina and Virginia passed legislation to form a bi-state compact that will facilitate implementation of high-speed rail service in the corridor.

The North Carolina and Virginia Departments of Transportation also completed a Tier I Environmental Impact Statement (EIS) for the Washington, DC to Charlotte, NC portion of the corridor. A series of agency scoping meetings and public workshops were held in summer 2003 for the Petersburg to Raleigh segment. A Draft Tier II EIS is now being prepared, which outlines the potential impacts for detailed designs through this segment. Once completed, these documents can be used to acquire the permits needed for construction based on available funding.

The Tier II EIS studies will address specific impacts within the context identified in the Tier I Record of Decision. Once the corridor has been selected, the Department will work to acquire access to the Southeast High-Speed Rail Corridor and make any necessary improvements to the rail line to accommodate freight rail service and 110 mph passenger rail service by 2010.

¹⁴ <http://www.bytrain.org/future/southeastern.html>



3.6.10 Existing Freight Systems

3.6.10.1 Railroads

The extensive network of freight railroads serving the state are shown in **Figure 3.47**. As of 2002, the American Association of Railroads (AAR) reported that there was a total of 3,345 miles of track in North Carolina.¹⁵ This is a reduction from the 3,379 miles of track that was being operated in 1999 as reported in the *North Carolina Rail Plan 2000*.¹⁶ In 2000, a total of 25 freight railroads operated on this system, two Class I railroads – CSX Transportation (CSXT) and Norfolk Southern Railway (NS) – and 23 shortline railroads. By 2002, AAR reported that the number of shortline railroads had decreased from 25 to 23. According to AAR, CSXT and NS operated a total of 2,580 miles of track in 2002 (77 percent of the total), with the remaining 765 miles operated by the 21 shortline railroads.

In 2002, AAR reported a total of approximately 109 million tons of freight carried by all of the railroads in North Carolina. This represents a decrease of about 20 percent from the reported 136 million tons of freight that was shipped or received by North Carolina railroads in 1999. Of the estimated 13.4 million tons of railroad freight traffic originating in North Carolina in 2002, the major products transported were chemicals (24 percent), nonmetallic minerals (19 percent), and lumber and wood products (14 percent). Of the estimated 58.3 million tons of railroad freight traffic terminating in the State in 2002, the major products were coal (49 percent), farm products (13 percent), and chemicals (10 percent).

In the US 64–NC 49 study area, railroad lines tend to operate either along the I-40/I-85 corridor to the north of US 64 and NC 49 (Norfolk Southern) or along the NC 24/27 corridor to the south of US 64 and NC 49 (Aberdeen, Carolina and Western Railway Company – ACWR). Branch lines off of these two main routes connect Greensboro with Siler City, High Point with Asheboro, and Lexington and Salisbury with Albemarle. The main east-west Norfolk Southern (NS) line through the region operates over the state-owned North Carolina Railroad (NCR). This 317-mile-long railroad connects Charlotte to Morehead City, and includes the most active rail corridor in the state between Raleigh and Charlotte.

3.6.10.2 Trucking and Courier Services

Within the study area there are nearly 1,400 firms specializing in trucking and courier services¹⁷. Collectively, these firms employ approximately 39,000 individual and have annual national sales of nearly \$5.0 billion. The trucking firms located in the study area are

¹⁵ Association of American Railroads, *Railroad Service in North Carolina – 2002*, Washington, D.C., January 2004.

¹⁶ North Carolina Department of Transportation, *North Carolina Rail Plan 2000*, Raleigh, North Carolina, January 2001, Page 8.

¹⁷ As derived from employment information obtained from InfoUSA.



estimated to generate nearly 30,000 daily truck trips.¹⁸ Three large trucking firms have their headquarters within the study area, including:

- Old Dominion Freight Line, Inc., a national trucking company, is based in High Point and employs more than 6,400 individuals.
- Kenan Transport Company specializes in liquid and dry bulk hauling, is based in Chapel Hill, and has more than 1,700 employees.
- Central Transport, Inc, a hazardous materials and waste transporter, is based in High Point and employs 460 persons.

Of the nearly 1,400 trucking firms in the US 64–NC 49 study area, a majority (84 percent) are engaged in traditional motor carrier services. Another eight percent of the firms specialize in moving services and six percent are engaged in specialized hauling, such as heavy hauling of oversize and overweight shipments, including mobile homes. The remaining firms specialize in other hauling activities, such as hazardous materials and waste.

3.6.11 Existing Aviation System

There are three commercial service airports within the study area: Charlotte-Douglas International Airport in Mecklenburg County, Piedmont Triad International Airport in Guilford County, and Raleigh-Durham International Airport in Wake County. A brief description of each of these facilities is presented below.

3.6.11.1 Charlotte-Douglas International Airport

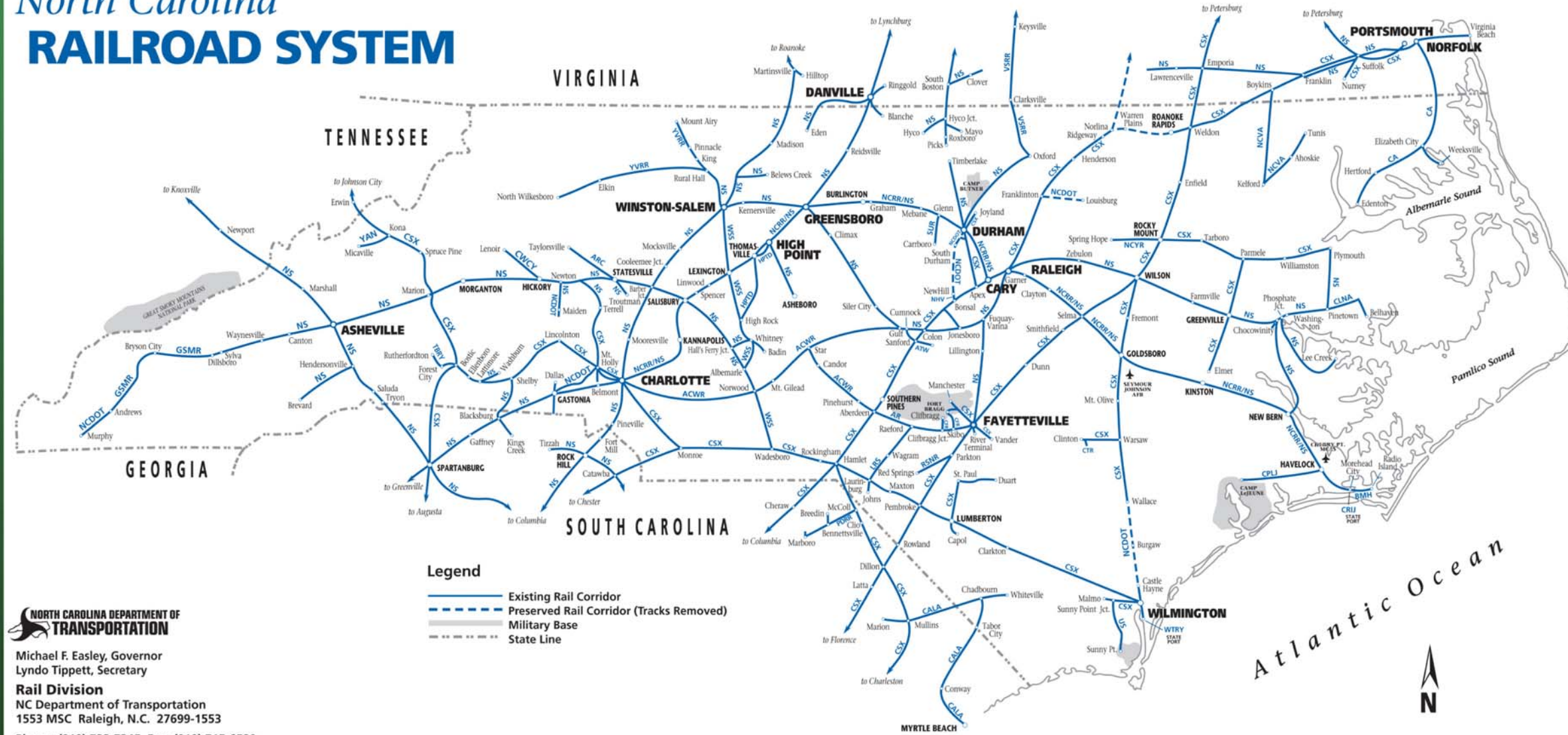
The Charlotte-Douglas International Airport (CLT) is located to the southeast of the interchange between I-77 and I-85. As reported by the Federal Aviation Administration (FAA), CLT accommodated a total of 11.7 million boarding passengers in 2002 and 11.5 million boarding passengers in 2003. This ranked CLT as the 19th busiest commercial service airport in the United States in 2002 and as the 18th busiest airport in 2003.

The airport is served by a number of mainline carriers, including Air Canada, AirTran Airways, American Airlines, ATA Airlines, Continental Airlines, Delta Air Lines, Independence Air, Lufthansa, Northwest Airlines, United Airlines, and US Airways. In 2004, CLT was US Airway's largest hub.

¹⁸ Daily truck trip generation rate per employee for SIC 42 (Truck Transportation) based on average calculated from NCHRP 298, Transportation Research Board (2001).

Figure 3.47: Freight Rail

North Carolina RAILROAD SYSTEM



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Michael F. Easley, Governor
 Lyndo Tippet, Secretary
Rail Division
 NC Department of Transportation
 1553 MSC Raleigh, N.C. 27699-1553
 Phone: (919) 733-7245, Fax: (919) 715-6580
 www.bytrain.org

AMTRAK Stations in North Carolina

Burlington	Fayetteville	High Point	Salisbury
Cary	Gastonia	Kannapolis	Selma
Charlotte	Greensboro	Raleigh	Southern Pines
Durham	Hamlet	Rocky Mount	Wilson

Information: 1-800-BY TRAIN or www.bytrain.org
 Reservations: 1-800-USA-RAIL or www.amtrak.com

April 2004

REPORTING MARK	RAILROAD NAME	REPORTING MARK	RAILROAD NAME	REPORTING MARK	RAILROAD NAME
ACWR	Aberdeen Carolina & Western Railway	NS	Norfolk Southern Corporation	PDRR	Pee Dee River Railway
AR	Aberdeen & Rockfish Railroad	CSX	CSX Transportation	RSNR	Red Springs & Northern Railroad
ARC	Alexander Railroad	CWCY	Caldwell County Railroad	SUR	State University Railroad
ATW	Atlantic & Western Railway, LP	GSMR	Great Smoky Mountains Railroad	TBRY	Thermal Belt Railway
BMH	Beaufort & Morehead Railway, LP	HPTD	High Point, Thomasville & Denton Railroad	US	US Military
CA	Chesapeake & Albemarle Railroad	LRS	Laurinburg & Southern Company, Inc.	VSRR	Virginia Southern Railroad
CALA	Carolina Southern Railroad	NCDOT	North Carolina Department of Transportation	WSS	Winston-Salem Southbound Railway
CFR	Cape Fear Railways	NCRN	North Carolina Railroad Company	WTRY	Wilmington Terminal Railroad, Inc.
CTR	Clinton Terminal Railroad Co.	NCVA	North Carolina & Virginia Railroad	YAN	Toe River Railroad
CLNA	Carolina Coastal Railway	NCYR	Nash County Railroad	YVRR	Yadkin Valley Railroad
CRU	Carolina Rail Service, Inc.	NHV	New Hope Valley Railroad		





3.6.11.2 Piedmont Triad International Airport

Piedmont Triad International Airport (PTI) is located just northwest of Greensboro near the I-40 and NC 68 interchange. It is the primary airport for the cities of Greensboro, Winston-Salem, and High Point. During 2002, there were approximately 1.26 million passenger boardings at PTI. This ranked PTI as the 77th busiest commercial service airport in the United States during that year. FAA statistics for 2003 reported approximately 1.29 million passenger boardings, ranking PTI as the 78th busiest commercial airport in the country.

PTI is served by a number of mainline and commuter carriers, including: American Eagle, Continental Express, Delta Air Lines/Delta Connection, Independence Air, Northwest Airlines, United Airlines/United Express, and US Airways/US Airways Commuter,

3.6.11.3 Raleigh-Durham International Airport

Raleigh-Durham International Airport (RDU) is located 10 miles southeast of Durham and 10 miles northwest of Raleigh, just off I-40 near the Wake/Durham County line. RDU served 4.2 million passengers in 2002 and 3.9 million passengers in 2003. RDU ranked as the 42nd busiest commercial service airport in the United States in 2002, and the 44th busiest in 2003.

RDU is served by a number of mainline and commuter carriers, including: AirTran Airways, American Airlines/American Eagle, America West Airlines, Continental Airlines/Continental Express, Delta Air Lines/Delta Connection, Independence Air, Northwest Airlines, Southwest Airlines, United/United Express, US Airways/US Airways Commuter, and Air Canada.

