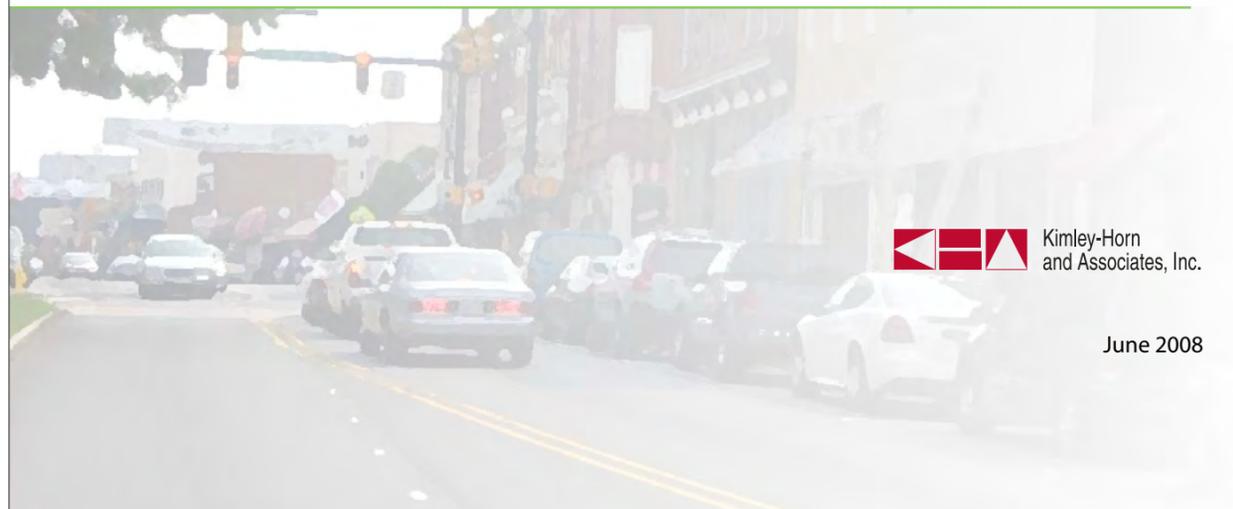




Mooresville Comprehensive Transportation Plan



Town of Mooresville



 Kimley-Horn
and Associates, Inc.

June 2008





Mooresville Comprehensive Transportation Plan

Executive Summary

The citizens of Mooresville have expressed a desire to implement a transportation plan that will add to the quality of life and unique character of the Town. The resulting *Mooresville Comprehensive Transportation Plan (CTP)* that follows represents the transportation recommendations that were determined to best accomplish the goals and objectives of the Town. These recommendations include project and policy suggestions as well as implementation and funding strategies related to transportation improvements. This plan was developed in coordination with the North Carolina Department of Transportation (NCDOT), Lake Norman Rural Planning Organization (RPO), and Iredell County. The Plan likewise reflects the hard work and dedication of a Citizens' Advisory Committee as well as area residents and business owners.

The *Mooresville Comprehensive Transportation Plan* is an innovative plan that recognizes the inherent relationship between land use and transportation. This plan was developed in conjunction with the *Mooresville Comprehensive Land Use Plan*; close coordination throughout both planning processes has provided the Town with a set of holistic recommendations that are sensitive to the surrounding context of the natural and built environment. Scenario planning was performed to analytically evaluate the influence of development intensities and land use patterns on the efficiency of the proposed transportation system. Through recognizing the relationship between land use and transportation, the Town of Mooresville will be able to better implement the vision of the Town. This approach to planning has been encouraged by NCDOT and the Federal Highway Administration.



The *Mooresville Comprehensive Transportation Plan* includes an evaluation and translation of 1997 *Thoroughfare Plan*. During this planning process the Town's investment in previous plans was used to establish a basis of analysis and assessment. Where recently completed plans, such as the *Mooresville Pedestrian Plan* existed, the *Comprehensive Transportation Plan (CTP)* deferred to the current recommendations.



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The study area encompasses approximately 130 square miles. To accommodate the needs of such a broad area, an extensive public involvement process was conducted which included three public workshops and a fully involved Citizens' Advisory Committee that met on a regular basis throughout the planning process. In addition, surveys were conducted and also used to guide the transportation recommendations. Chapter 3 provides more detailed results of the public involvement process and survey results.



The *Mooresville Comprehensive Transportation Plan* addresses the NCDOT required CTP elements: Highways, Bicycles and Pedestrians, Transit, and Freight. Maps representing each of these elements are also included in the Appendix of the plan. In addition, the town of Mooresville considered community strategic corridors and collector street planning. Each of these elements has specific recommendations that are discussed in Chapter 5.

The Highway element includes specific improvement recommendations for roadways that were classified within the NCDOT standard classifications. The improvement recommendations were based on needs identified by the public and local staff, deficiencies found by the Metrolina Regional Travel Demand Model, or scenario planning analysis. Figure 5.1 displays a summary of the highway recommendations by NCDOT classification type and segment (descriptions can be found in Chapter 5). The Town took additional interest in eleven community strategic corridors that were identified by the Citizens' Advisory Committee. Each of these corridors was considered more closely and feedback from the public, committee, and local staff was solicited to appropriately address the issues that were identified.



The Mooresville Comprehensive Transportation Plan also includes a Collector Street element that identifies recommendations for connections throughout the study area. It is expected that the collector street element will be used extensively in the site plan approval process to ensure a consistent, connected network of collector streets that will be implemented incrementally as development occurs. The implementation of this network will ease congestion and increase safety on the main



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arterials throughout the Town by distributing traffic and allowing for more accessible routes.

The Bicycle and Pedestrian element recommendations are summarized in Chapter 5 as well. This portion of the plan references the recently completed *Mooresville Comprehensive Pedestrian Plan* and soon to be completed *Mooresville Comprehensive Bicycle Plan*. In addition, general policy recommendations are provided to aide in the implementation of each plan.

The Transit and Freight elements summarize recommendations that will improve the ridership, efficiency, and connectivity of the current systems. The transit element recommends additional fixed-route services and park-and-ride facilities and considers future commuter rail service to Mooresville. The freight element recommends future connections and truck routes. More detailed information about these recommendations can be found in Chapter 5.



Chapter 6 provides general policy recommendations, reviews funding opportunities, and presents an action plan to assist local decision-makers and planning staff in the implementation of the *Mooresville Comprehensive Transportation Plan*. Table 6.1 clearly defines action items to be accomplished and identifies key stakeholders as well as the lead party for each action item. The Town should use this action plan matrix as a guide in implementing the *Mooresville Comprehensive Transportation Plan*.

The first action item identified in the action plan matrix requires the adoption of the *Mooresville Comprehensive Transportation Plan*. The Town Board officially adopted the plan on September 4, 2007. NCDOT adopted the *Comprehensive Transportation Plan* maps on June 5, 2008. As with any planning document, it is anticipated that Mooresville will continually update and maintain the information presented in this plan; therefore it is expected that the plan is subject to change without notice, but that the vision and intent of the plan be maintained and implemented.





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Acknowledgements

The development of the *Mooresville Comprehensive Transportation Plan* was a collaborative process that involved numerous stakeholders, including the Town of Mooresville, North Carolina Department of Transportation, and Mooresville citizens.

Transportation Advisory Committee

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Mitch Abraham, Commissioner Ward I
Thurman Houston, Commissioner Ward II
Mac Herring, Commissioner Ward III
Chris Carney, Commissioner Ward IV
Frank Rader, Commissioner at Large
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Chapter 1 – History

Over the years, Mooreville has changed. From a small train stop on the route north out of Charlotte, to today’s burgeoning community complete with businesses and recreational opportunities ranging from the arts to stockcar racing, Mooreville continues to evolve to meet the needs of its citizens.

Town Origins

European settlers who came to the area built their cabins and farms near the Catawba River, named for the Catawba Indians. In 1856, the Atlantic, Tennessee and Ohio Railroad Company had 44 miles of railroad stretching from Charlotte to Statesville. The company wanted to create a train depot and sidetracks. Railroad officials requested land for the project, and property was donated by John Franklin Moore. The railroad influenced the growth of businesses and development in the area, and in 1873 the town was renamed Mooreville, in honor of the man who donated land to the community’s foundation.

Much has changed in the 150 years that followed the railroad’s request. From the first acres given to build the railroad side track, Mooreville has grown to encompass more than 1,500 paved highway miles including the original Main and Broad Streets. In 2000, the U.S. Census estimated that Mooreville was the 38th largest city (by population) in North Carolina with a population of more than 18,823.



Source: Town of Mooreville Website

Business and Industry

Downtown Businesses

Main Street once served as the heart of business in Mooreville. The original train depot was constructed at the corner of Main Street and Center Avenue. Eventually this depot was replaced in the 1920’s by a





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Southern Railroad passenger station, which has recently been converted to the Depot Visual Arts Center.

The railroad tracks run through the middle of the town parallel to Main and Broad Streets. Accounts in the 1930's suggest that the people of Mooresville moved north and south in the community with ease but had trouble moving east to west even when no trains were running.



Source: Town of Mooresville Website

Despite any complications presented by trains, businesses once thrived downtown, including Rayless department store, Belk's department store, and Rose's 5 and 10 Cent Store. During their peak business years, these stores offered a variety of goods for sale and were popular shopping destinations.

Another historic business was housed in the building constructed on the corner of Main Street and Center Avenue. Goodman's drug company featured noteworthy floors and a soda fountain shop. Residents along Main Street residents could also find quality furniture and household items in Blackwelder's furniture store. The store gave credit and helped many in town upgrade to modern furniture and appliances.

While time has seen some businesses close their doors, D.E. Turner and Company has offered merchandise downtown for 101 years. This hardware store specializes in items that cannot be found in big-box discount stores, such as Radio Flyer wagons and tin ice cream freezers. Another long-time Mooresville business is the Mooresville Ice Cream Company, which has remained in the same location on Broad Street since the 1940's.

As the area developed and transportation infrastructure grew, much of the once successful downtown fell victim to the community's success as a port city for Lake Norman. Many businesses relocated to shopping centers and strip malls along NC Highway 150 closer to Interstate I-77.



Lake Norman

The past and present impacts Lake Norman has had on Mooresville cannot be ignored. At the turn of the 20th Century, James “Buck” Duke, president of the American Tobacco Company, and his brother, Ben, saw the potential for a textile industry in the Carolinas with the help of hydroelectric power. The Southern Power Company was formed and would be renamed the Duke Power Company in 1927.

Through this initiative to create hydroelectric power, the Catawba River Valley would be transformed. In 1963, Cowan’s Ford Dam was completed, forming a 32,500 acre reservoir to provide water as well as power to the local area.

Named for Duke Power President Norman Cocke, Lake Norman is 34 miles long at its widest point, 8 miles wide, and 130 feet deep. Its size makes it the largest lake in North Carolina. Citizens of Mooresville rely on Lake Norman for their water supply, as do residents of Charlotte-Mecklenburg, Lincoln County, Davidson, and Huntersville. Three generating plants are located on Lake Norman today — Cowan’s Ford Hydroelectric Station, Marshall Steam Station, and McGuire Nuclear Station. In addition to the water and power supply, Duke Power also provides 1,300 acres for the Duke Power State Park and 10 public access areas around the lake.

Mooresville Cotton Mill

The area around Mooresville has been influenced by industry as well as business. The largest industry in Mooresville was started in 1893 by James Sherrill and a small group of investors. The Mooresville Cotton Mill was featured in *The State Magazine* in March 1937 in the article “Mooresville, A Thriving City in Iredell County.” The cotton mill provided manufacturing jobs and produced towels, drapery and upholstery fabric, flannels, curtain goods, dress goods, and men’s suiting materials. While small villages appeared around the mill, those who did not live nearby were bused to



Source: Town of Mooresville Website



work. Childcare for working mothers and the community house facilities were provided to mill employees, and a large gymnasium and nine-hole golf course were built for mill employees in the 1940's.

Race City USA

In recent years, Mooresville has transformed itself from a southern farming and textile community to one of the premiere locations supporting National Association for Stock Car Auto Racing (NASCAR). During the 1990's, many of the premiere racing teams moved to Mooresville. Today, Mooresville is home to the North Carolina Auto Racing Hall of Fame and more than 60 auto racing teams. The presence of these teams has boosted the tourism industry in Mooresville, attracting almost 180,000 people every year. During the week between the All-Star Race and Coca-Cola 600 race, approximately 30,000 visitors travel from nearby Lowe's Motor Speedway to Mooresville.

In addition to attracting tourists to the area, the racing industry also accounts for more than 1,500 jobs. This kind of job market diversification is one factor in the explosion in Mooresville's population — 70% growth in population between 1990 and 1998.

Development and Transportation

Development Patterns

Reviewing the Town's growth clearly shows how the once compact town evolved to include a sprawling development with construction of Lake Norman and Interstate I-77. Initially, areas surrounding the central business district were developed with a primarily rectilinear grid of streets. The next band of developments looked less like a grid and is more easily identified today by curvilinear streets and commercial centers. Adjacent to Lake Norman the grid is isolated and follows the geography of the peninsulas.

By the late 1950's the focus of new residential development began to shift to areas outside the town center. Although the central business district remained a hub of activity, businesses would soon begin to relocate to the rapidly developing suburban business parks and shopping centers. These centers were developed beginning in the late 1960's and created competition for the once thriving downtown.



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The early 1990's marked the beginning of a renaissance in the redevelopment of downtown Mooresville. In recent years, Mooresville has focused on revitalizing its downtown through streetscape projects and facades restoration. Phase I Downtown Improvements were recently completed and Phase II improvements are currently under design. Since the redevelopment, businesses have begun to prosper. Though attracting downtown development remains a challenge, the town continues to strive towards the goal of a healthy downtown through investment in the public realm.

Travel in Modern Mooresville

In the past 150 years, travel modes and patterns have changed dramatically in Mooresville. The 1800's through the early 1900's were dominated by horse, mule-drawn, and foot travel. Those who were fortunate could travel long distances by passenger train, with the presence of Atlantic, Tennessee and Ohio Railroad Company.

The 20th century brought the automobile, a travel revolution, and an entirely new set of challenges. First mass-produced and made affordable to the American public by Henry Ford, the automobile entered Mooresville in earnest in the early 1900's. In the mid-1940's, Kemit Smith's taxi stand was located downtown and provided transportation; it closed, however, after many townspeople found they could afford to own their own automobiles. With a private automobile, it became easier to cover longer distances in short periods of time. This offered people the opportunity not only to cover greater distances for leisure, but also to live greater distances from work, thereby fueling the expansion of Mooresville.



Source: Town of Mooresville Website

The area's highway infrastructure continues to evolve as a way of addressing the needs of changing traffic and development patterns.



Major highways in the area include:

- Interstate I-77
- US Highway 21
- NC Highway 115
- NC Highway 150
- NC Highway 152
- NC Highway 3
- NC Highway 801

Each of these highways carries a high percentage of through traffic – traffic with neither an origin nor destination within the Mooresville area. The area includes several major thoroughfares such as Brawley School Road, Mazeppa and Shearers Road which carry a higher proportion of locally oriented traffic as well as some through traffic.

Similar to the influence of the railroads in the 1850's, the proliferation of commercial air transportation in the 1950's and 1960's revolutionized long-distance travel. Air travel is an increasingly accessible form of travel. The Charlotte Douglas International Airport is located approximately 30 miles from Mooresville and the Statesville airport is located 20 miles to the north.

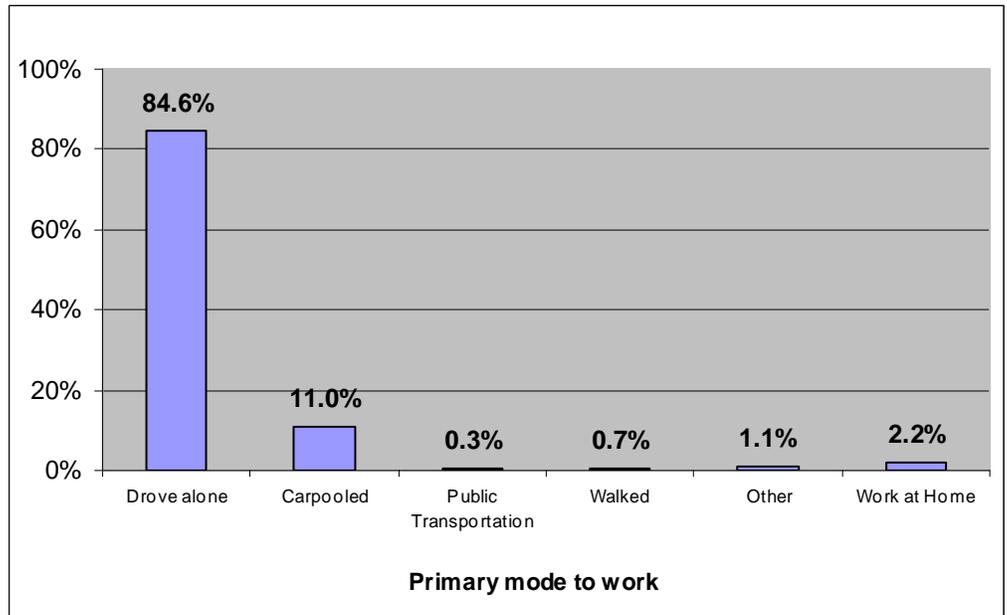
Mooresville's Commute

As part of the U.S. Census 2000, "commuting to work" information was collected. The data was collected to study travel characteristics of the American population. For Mooresville (shown in Figure 1.1), statistics indicated that the most popular mode of transportation to and from work was the privately owned vehicle, driven alone (85%). Of the survey respondents, 11% rideshared or carpooled to work, while only 0.3% of respondents reported using public transportation and 0.7% reported walking to work. Only 1% of the survey respondents reported using other means of transportation to travel to work and 2% of respondents said that they worked from home.

Information compiled in 2000 by the North Carolina State Data Center (NCSDC) indicated that the 41,787 workers do not leave Iredell County when they commute to work. The information shows that 18,404 Iredell County worker's commute to jobs that are located outside Iredell County; however, 13,182 worker's commute from their residence in another county to a job in Iredell County.



Figure 1.1 – Mooresville Journey to Work



Source: US Census 2000





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Chapter 2 – Existing Conditions

Introduction

As mentioned in Chapter 1, Mooreville and the immediate surrounding areas have seen tremendous growth recently. This trend is expected to continue as Mooreville reinforces its reputation as a dynamic community by addressing new challenges and providing valuable opportunities. As a community that accommodates catalysts for growth like Lowe's Home Improvement headquarters and the expanding raceway industry, Mooreville is in an excellent position to address emerging issues.

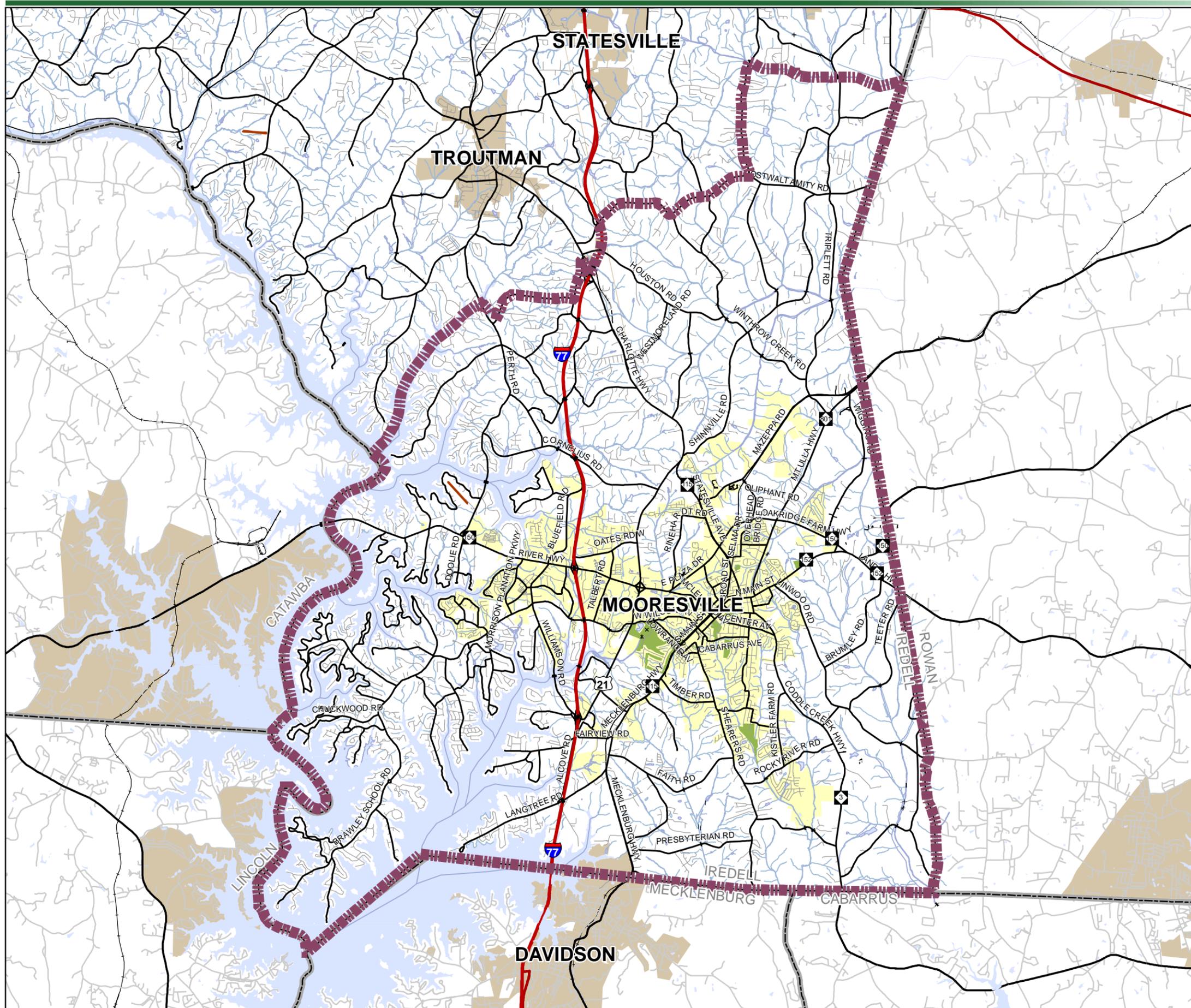
Developing the *Mooreville Comprehensive Transportation Plan* is one indication of the community's efforts to support growth proactively. This potential for growth is shown by the expanse of the plan's study area (illustrated in Figure 2.1), which includes Mooreville and the areas on which the Town can reasonably be expected to implement change.

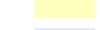
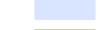
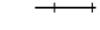
This plan addresses the area's transportation needs by identifying both general and specific transportation system improvement recommendations and strategies. It is important to acknowledge that these recommendations are intended to support a diversified transportation system that considers not only the automobile, but also the bicyclist, the pedestrian, and the transit patron. The *Mooreville Comprehensive Transportation Plan* considers the Town's previous and ongoing planning work, including the *Comprehensive Land Use Plan*, the *Town of Mooreville Comprehensive Pedestrian Plan*, the *Parks and Greenways Master Plan Through the Year 2010*, the *Mount Mourne and South Iredell Master Plan*, the *Downtown Mooreville Master Plan*, and the *Cascade Neighborhood Master Plan*.

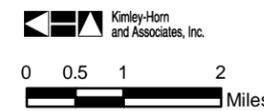
This plan is not intended to simply plan for the sake of planning, but to plan ways to implement projects to benefit and build the community. As a result, the *Mooreville Comprehensive Transportation Plan* considers practical issues and includes discussion on strategies, methods, and sources of funding for implementation.



Figure 2.1
Study Area Map



-  Study Area
-  County Boundary
-  Other Municipal Limits
-  Town of Mooresville
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Airport Runways
-  Railroads

 Kimley-Horn and Associates, Inc.
0 0.5 1 2 Miles



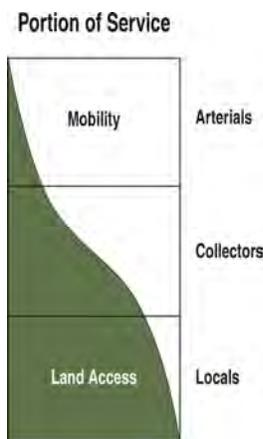
Roadway Element

Functional Classification

Functional classification is the process by which streets of different characteristics and usage are grouped into broad categories depending on the service they are intended to provide. These categories are defined by the roadway character and traffic operation of streets. NCDOT criteria were used to evaluate and identify existing and future highways.

Classifying Mooresville's street system required close examination of roles that each street performs in the overall transportation system.

Classification groups typically include:



Arterials primarily serve mobility needs whereas local streets primarily serve land access

- **Arterials** — These facilities provide high mobility, operate at higher speeds (45 mph and above), provide significant roadway capacity, have a great degree of access control, and serve longer distances. Arterials include facilities with full access control such as freeways and expressways, as well as boulevards and major thoroughfares. Examples of arterials include NC Highway 150 and Interstate I-77.
- **Collectors** — These facilities bridge the gap between arterials and locals by intercepting traffic from the locals and expediting their movement. They provide critical connections in the roadway network. Collectors operate at lower posted speeds (35 mph or less) and serve shorter distances than arterials. Examples of collectors include Talbert Road and Morrison Plantation Parkway.
- **Locals** — These facilities provide greater access and the least amount of mobility. They are typically connected to one another or to collector streets and provide a high level of access to adjacent land uses/development (i.e., frequent driveways). Locals serve short distance travel and have low posted speed limits (25 mph to 35 mph). Most subdivision streets are considered local streets.

Classification Criteria

To classify Mooresville's streets, a set of qualitative and quantitative criteria was applied uniformly to the street system. These criteria were provided by the NCDOT Transportation Planning Branch and included information relating to access (and control), intersection control, mobility function, types of trips served, number of travel lanes, and other characteristics that define the particular class street. These classifications were used when considering possible facility upgrades and recommendations. The NCDOT classification criteria follow.



- Freeways
 - Functional purpose – high mobility, high volume, high speed
 - Posted speed – 55 mph or greater
 - Cross-section – minimum four lanes with continuous median
 - Multi-modal elements – high occupancy vehicle (HOV)/high occupancy toll (HOT) lanes, busways, truck lanes, park-and-ride facilities at or near interchanges, adjacent shared use paths (separate from roadway and outside ROW)
 - Type of access control – full control of access
 - Access management – interchange spacing (urban – one mile; non-urban – three miles); at interchanges on the intersecting roadway, full control of access for 1,000' or for 350' plus 650' island or median; use of frontage roads, rear service roads
 - Intersecting facilities – interchange or grade separation (no signals or at-grade intersections)
 - Driveways – not allowed
- Expressways
 - Functional purpose – high mobility, high volume, medium-high speed
 - Posted speed – 45 to 60 mph
 - Cross-section – minimum four lanes with median
 - Multi-modal elements – HOV lanes, busways, very wide paved shoulders (rural), shared use paths (separate from roadway but within ROW)
 - Type of access control – limited or partial control of access
 - Access management – minimum interchange/intersection spacing 2,000 feet; median breaks only at intersections with minor roadways or to permit U-turns; use of frontage roads, rear service roads; driveways limited in location and number; use of acceleration/deceleration or right turning lanes
 - Intersecting facilities – interchange; at-grade intersection for minor roadways; right-in/right-out and/or left-over or grade separation (no signalization for through traffic)
 - Driveways – right-in/right-out only; direct driveway access via service roads or other alternate connections
- Boulevards
 - Functional purpose – moderate mobility; moderate access, moderate volume, medium speed
 - Posted speed – 30 to 55 mph
 - Cross-section – two or more lanes with median (median breaks allowed for U-turns per current *NCDOT Driveway Manual*)





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- Multi-modal elements – bus stops, bike lanes (urban) or wide paved shoulders (rural), sidewalks (urban - local government option)
- Type of access control – limited control of access, partial control of access, or no control of access
- Access management – two lane facilities may have medians with crossovers, medians with turning pockets or turning lanes; use of acceleration/deceleration or right turning lanes is optional; for abutting properties, use of shared driveways, internal out parcel access and cross-connectivity between adjacent properties is encouraged
- Intersecting facilities – at grade intersections and driveways; interchanges at special locations with high volumes
- Driveways – primarily right-in/right-out, some right-in/right-out in combination with median leftovers; major driveways may be full movement when access is not possible using an alternate roadway
- Other Major Thoroughfares –
 - Functional purpose – balanced mobility and access, moderate volume, low to medium speed; will include all US and NC routes not designated as freeway, expressway, or boulevard
 - Posted speed – 25 to 55 mph
 - Cross-section – four or more lanes without median (US and NC routes may have less than four lanes)
 - Multi-modal elements – bus stops, bike lanes/wide outer lane (urban) or wide paved shoulder (rural), sidewalks (urban)
 - Type of access control – no control of access
 - Access management – continuous left turn lanes; for abutting properties, use of shared driveways, internal out parcel access and cross-connectivity between adjacent properties is encouraged
 - Intersecting facilities – intersections and driveways
 - Driveways – full movement on two lane with center turn lane as permitted by the current *NCDOT Driveway Manual*
- Minor Thoroughfares –
 - Functional purpose – balanced mobility and access, moderate volume, low to medium speed
 - Posted speed – 25 to 45 mph
 - Cross-section – ultimately three lanes (no more than one lane per direction) or less without median
 - Multi-modal elements – bus stops, bike lanes/wide outer lane (urban) or wide paved shoulder (rural), sidewalks (urban)
 - ROW – no control of access
 - Access management – continuous left turn lanes; for abutting properties, use of shared driveways, internal out parcel access and cross-connectivity between adjacent properties is encouraged



- Intersecting facilities – intersections and driveways
- Driveways – full movement on two lane roadway with center turn lane as permitted by the current *NCDOT Driveway Manual*

System Deficiencies

Figure 2.2 illustrates 2005 average annual daily traffic (AADT) volumes on study roadways in the Mooresville area. Corridors that displayed noticeably high traffic volumes included sections of the following:

- Interstate I-77 south of Williamson Road – 83,000 vpd
 - Interstate I-77 south of NC Highway 150/River Highway – 61,000 vpd
 - Interstate I-77 north of NC Highway 150/River Highway – 51,000 vpd
 - NC Highway 150/River Highway east of US Highway 21 – 39,000 vpd
 - US Highway 21 east of Interstate I-77 – 25,000 vpd
 - Brawley School Road west of Williamson Road – 24,000 vpd
 - Plaza Drive south of Statesville Highway – 22,000 vpd
 - Statesville Highway north of NC Highway 150/River Highway – 14,000 vpd
- vpd = vehicles per day



Example LOS F

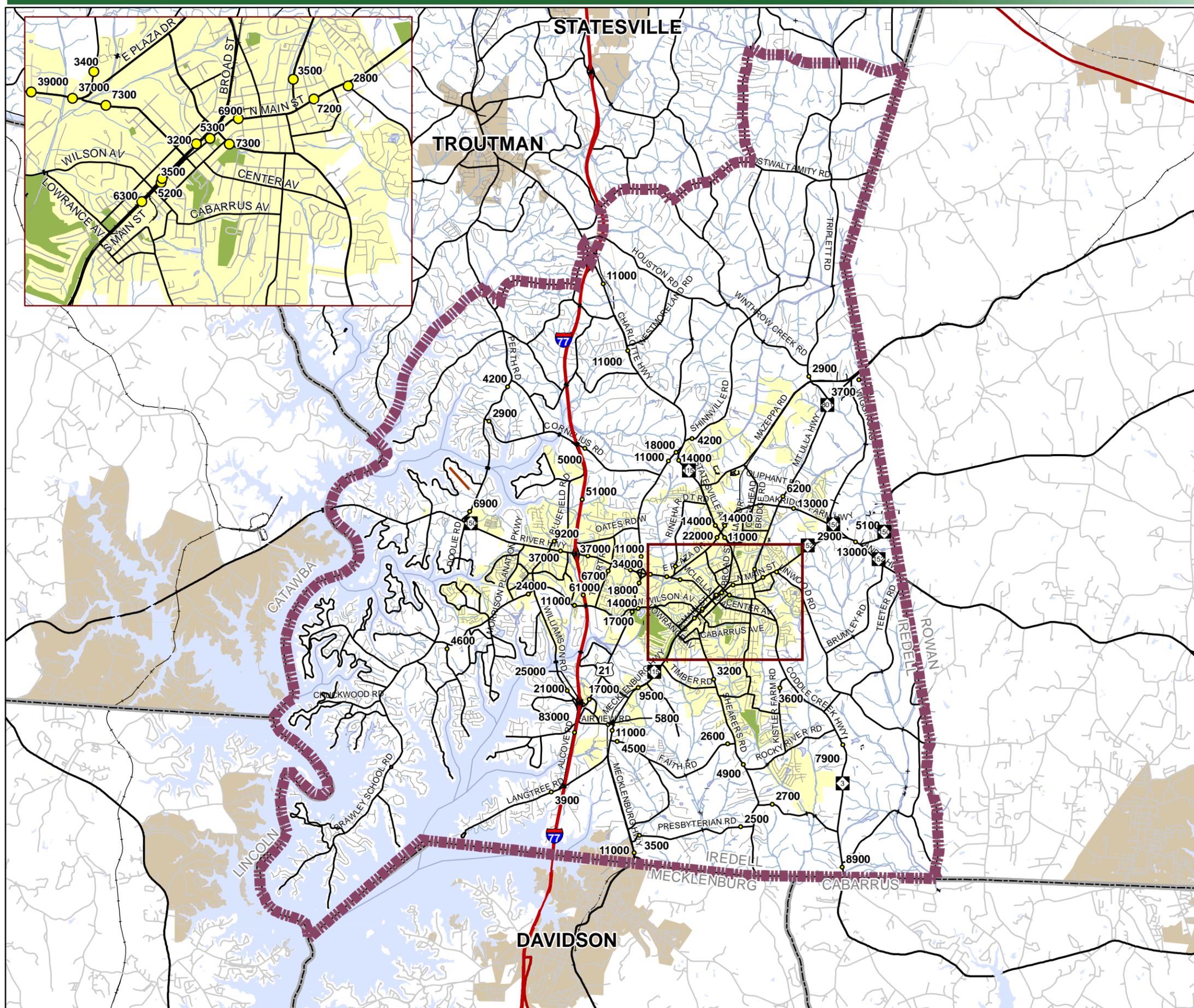
The rapid growth of Mooresville has resulted in peak hour traffic congestion along many roadway corridors. During morning and afternoon peak travel periods, sections of commuter corridors are frequently congested. In some cases, travel speed is even reduced to a crawl. Several roadways in the study area that are heavily congested include sections of NC Highway 150, Brawley School Road, Interstate I-77 and US Highway 21. These roadways experience heavy traffic and long delays during peak hours.

Figure 2.3 illustrates existing levels of service.

According to the *Highway Capacity Manual*, level of service (LOS) is a measure used to describe the operation conditions that drivers experience in a traffic stream. Level of service is designated by letter, similar to grades in school, with A representing the best conditions and F the worst. LOS A is generally free-flow with few delays, while LOS F constitutes highly congested, stop-and-go conditions. LOS D or better is generally considered acceptable. At LOS D, the roadway is busy, but traffic is still flowing at a reasonable speed.



Figure 2.2
2005 AADT Map

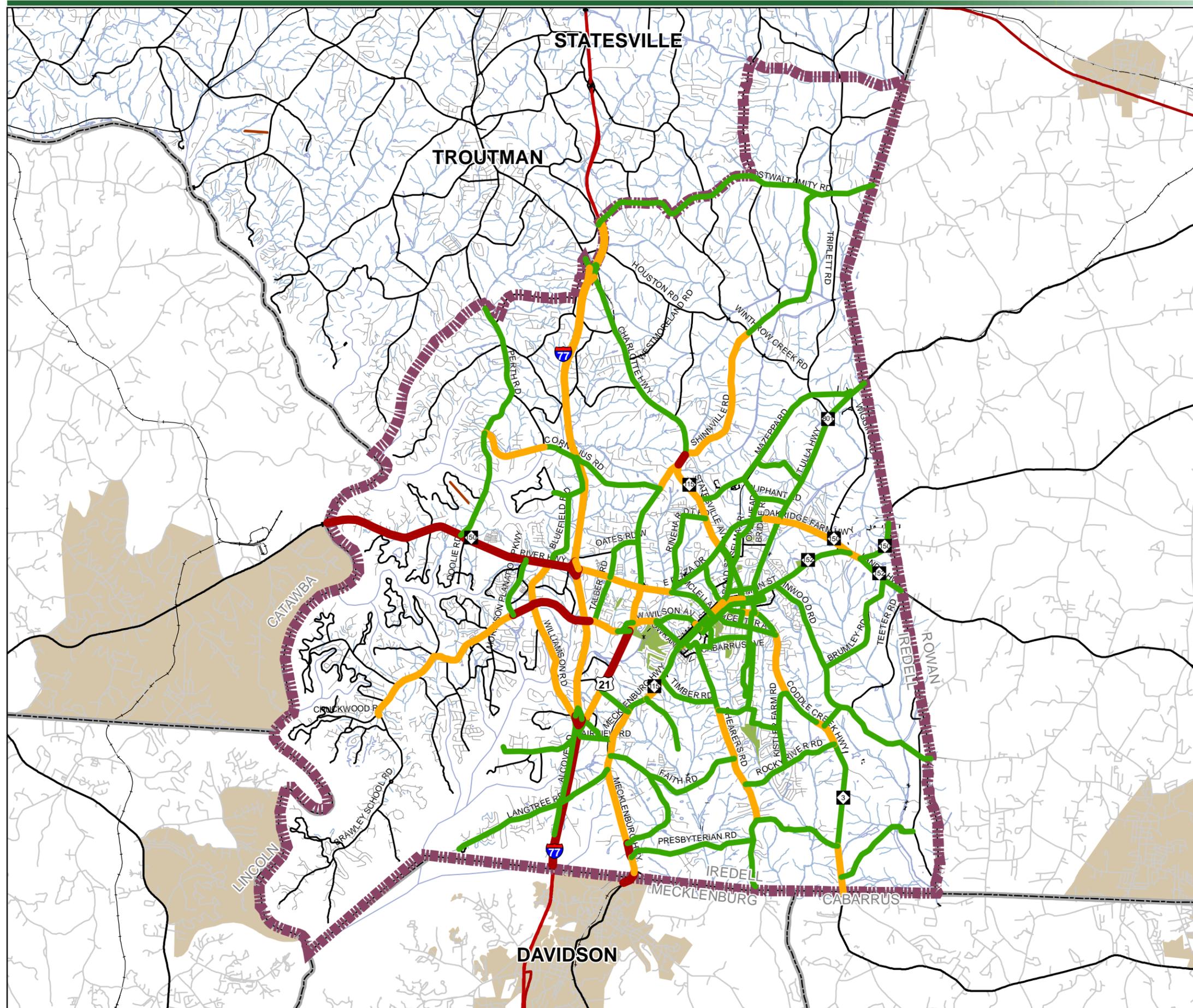


- Study Area
- County Boundary
- Other Municipal Limits
- Town of Mooresville
- Bodies of Water
- Parks, Golf, Cemeteries
- Airport Runways
- Railroads
- 2005 AADT

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0 0.5 1 2 Miles



Figure 2.3
Existing Conditions - 2000



- Study Area
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Airport Runways
- Railroads

2000 Level of Service (LOS)

- LOS A - B
- LOS C - D
- LOS E - F

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0 0.5 1 2 Miles



Traffic Safety and Crash History

Assessing traffic safety is a key component to any successful transportation plan, and a thorough examination of crash history and traffic patterns can typically predict key locations where an improvement in traffic safety will be beneficial. According to data published by the NCDOT, the cost of an average crash to the community is typically \$42,000¹. This cost includes medical care, emergency services, victim work loss, employer cost, traffic delay, property damage, and the overall quality of life. Costs for various types of crashes are provided in Table 2-1. Crash Type A refers to injuries that are disabling, Type B injuries are those which are evident, but not disabling, and Type C injuries are possible injuries, perhaps not reported at the time of the crash.

Table 2-1 – NCDOT Cost per Crash Statistics

Crash Type	Cost Per Crash (2005 dollars)
Fatal Crash	\$3,900,000
A Injury Crash	\$230,000
B Injury Crash	\$66,000
C Injury Crash	\$32,000
Property Damage Only Crash	\$4,500
Average Crash	\$45,000
Non-Fatal Injury Crash	\$49,000
Severe Injury Crash (F+A)	\$1,400,000
Moderate Injury Crash (B+C)	\$41,000

Source:

<http://www.ncdot.org/doh/preconstruct/traffic/safety/ses/costs/2005crashcosts.pdf>

A traditional approach to determining locations for safety countermeasures involves a thorough study of the number of crashes in a location and the associated crash rate for the location. The Mooresville analysis built on this approach, while factoring in other key components such as traffic volumes, overall severity of crashes, and facility type. The inclusion of these components allowed a priority ranking system to be established that will help money earmarked for safety projects be spent in the most efficient and cost-effective manner.

Crashes on segments of roadway and intersections of major roadways were examined, as described in the next page.

¹ Data for NCDOT Crash Cost based on 2005 dollars (published October 3, 2006)



Segment Data

NCDOT provided crash data for segments of all facilities with a classification higher than a collector street from January 1, 2003 to December 31, 2005. Priority rankings for this analysis were established, as shown in Table 2-2.

The priority rankings were developed using a scoring method based on AADT², total crashes, equivalent property damage only (EPDO) rate³, crash rate⁴, and functional classification. A score was assigned representing each characteristic based on a local distribution of the characteristic itself. For example, the equivalent property damage only (EPDO) which is a measure of the property damage that occurs in a crash weighted by injury type, was considered throughout the study area and a score was assigned to each segment based on a comparison of the EPDO within the study area. A complete breakdown of the crash statistics can be found in the Appendix of this report.

Table 2-2 — Segment Priority Rankings
Crash Data Analyzed January 1, 2003 to December 31, 2005

No.	Locations	AADT	Crashes	EPDO	Crash Rate	Functional Classification
1	West Plaza Drive	38,000	291	1122.76	5.83	Principal Arterial
2	NC Highway 150/River Highway	32,000	511	2235.68	3.14	Principal Arterial
3	E Plaza Drive	24,300	204	983.44	4.14	Principal Arterial
4	Brawley School Road	9,400	324	1462.12	3.42	Principal Arterial
5	Williamson Road	13,700	230	949.28	4.44	Principal Arterial
6	Oak Ridge Farm Road	11,600	163	973.52	4.58	Principal Arterial
7	US Highway 21/Charlotte Highway	11,200	203	818.68	3.04	Principal Arterial
8	Wilson Avenue	7,000	99	599.24	7.18	Principal Arterial
9	Mecklenburg Highway	8,800	122	823	2.21	Principal Arterial
10	Iredell Ave/Coddle Creek Highway	8,000	142	498.68	2.54	Principal Arterial

² AADT taken from crash data provided by NCDOT Traffic Systems Safety Unit

³ EDPO Rate = $76.8 * (\text{Fatal} + \text{Type A Injury}) + 8.4 * (\text{Type B Injury} + \text{Type C Injury}) + \text{Property Damage Only Crashes}$

⁴ Segment Crash Rate = $(\text{Total crashes} * 1,000,000) / (\text{AADT} * 365 \text{ days per year} * 3 \text{ year analysis period} * \text{length of segment})$; reported as crashes per million vehicle miles traveled (MVM)



Intersection Data

Intersections with ten or more crashes over a three year period were analyzed based on the NCDOT segment data for the same analysis period. The priority rankings for this analysis are provided in Table 2-3.

The priority rankings were developed using a scoring method based on vehicles entering the intersection ⁵, total crashes, equivalent property damage only (EPDO) rate, crash rate⁶, and functional classification. A complete breakdown of the crash statistics and the scoring system can be found in the Appendix of this report. Figure 2.4 displays the high crash locations.

Table 2-3 — Intersection Priority Rankings
Crash Data Analyzed January 1, 2003 to December 31, 2005

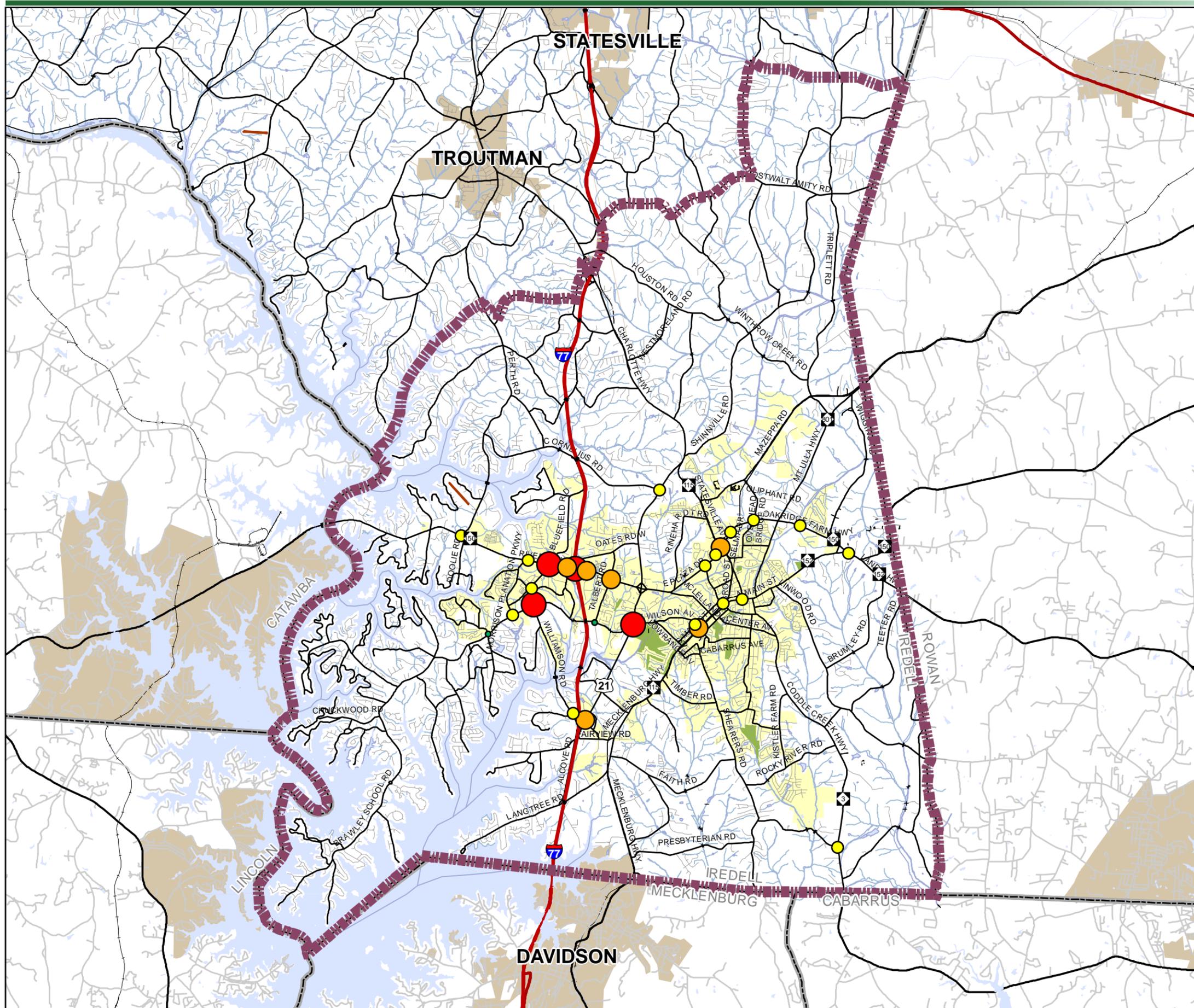
Rank	Street 1	Street 2	Vehicles Entering	Crashes	EPDO	MEV Rate	Functional Classification
1	Brawley School Road	Williamson Road	36,000	34	130.2	1.94	Principal Arterial
2	Williamson Road	NC Highway 150/River Highway	45,000	33	107	2.32	Principal Arterial
3	Brawley School Road/Wilson Avenue	US Highway 21/Charlotte Hwy	25,000	34	137.6	2.82	Principal Arterial
4	Rolling Hills Road	NC Highway 150/River Highway	33,000	30	104	27.40	Major Collector
5	Williamson Road	US Highway 21/Charlotte Hwy	29,000	29	125.2	1.66	Principal Arterial
6	West Plaza Drive	Talbert Road	42,800	29	276.16	0.756686	Principal Arterial
7	NC Highway 150/River Highway	I-77	92,000	38	75	0.99152	Principal Arterial

⁵ Number of vehicles entering based on AADT provided by NCDOT Traffic Systems Safety Unit and Traffic Counts Taken xx/xx/xxxx

⁶ Intersection Crash Rate = (Total crashes*1,000,000)/(AADT*365 days per year*3 year analysis period); reported as crashes per million vehicle entering intersection (MVE)



Figure 2.4
High Crash Locations



- Study Area
- County Boundary
- Other Municipal Limits
- Town of Mooresville
- Bodies of Water
- Parks, Golf, Cemeteries
- Airport Runways
- Railroads

- High Crash Locations**
- 0 - 10
 - 11 - 20
 - 21 - 30
 - 31 - 40

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0 0.5 1 2 Miles



Bicycle and Pedestrian Element

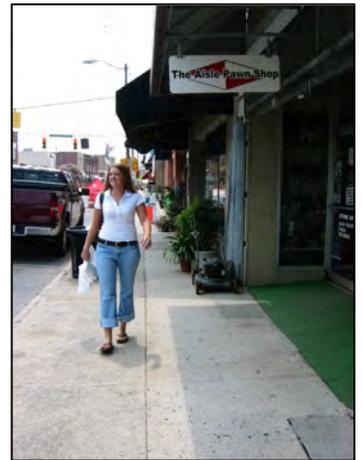
Transportation plans no longer focus solely on roadway solutions. In the quest for an improved quality of life, we now strive for livable communities that balance travel between modes. A common theme of any livable community is how well it accommodates pedestrians and cyclists.

The value of walking and bicycling has numerous benefits, including:

- Personal benefits — Cardiovascular fitness and cost savings
- Societal benefits — Reduced vehicle miles of travel, improved public health through a cleaner environment and healthier citizens, and improved mobility for those without access to private automobiles
- Environmental benefits — Reduced air and noise pollution and fewer parking lots/spaces/structures

Sidewalks

Understanding the benefits of an interconnected pedestrian network, the Town recently developed the *Mooresville Comprehensive Pedestrian Plan* (June 2006). This document identifies the conditions of pedestrian elements when the plan was prepared, as well as recommendations for improvements to the non-vehicular transportation systems. It also discusses the study area context with regard to the natural and social environment, as well as other factors affecting the existing and proposed non-vehicular environment.



Goals and objectives for the development of the *Mooresville Comprehensive Pedestrian Plan* include:

- Connect important destinations with sidewalks, greenways, and other pedestrian routes so that walking is a viable transportation option.
- Support a comprehensive multimodal transportation management program that fits into current and future land use plans.
- Improve safety and accessibility for pedestrian with a special concern for the disabled, elderly, children, and low income residents.





Mooresville

Comprehensive Transportation Plan

- Improve environmental conditions and health by reducing pollution and by increasing physical activity.
- Promote livable communities by creating new opportunities for social interactions and by reducing stress inducers.
- Educate the community on the wide-ranging benefits of pedestrian travel.

The Town of Mooresville has a subdivision ordinance requiring sidewalks. However, like most other growing communities, gaps exist throughout the sidewalk network that need to be filled. As development intensity transitions from higher to relatively lower intensities, sidewalks become less frequent. Figure 2.5 displays the existing sidewalk and bicycle facilities.

The Town's current ordinance requires that new subdivisions provide a continuous pedestrian network that complies with the Americans with Disabilities Act (ADA). The Town is in the process of updating its zoning and subdivision ordinances which are expected to reflect the policy recommendations set forth by the *Mooresville Comprehensive Pedestrian Plan*. Some of these recommendations include establishing the option for Pedestrian Oriented Development Zones as a planning tool and implementing guidelines that apply to all new development, not just subdivisions.

Pedestrian crash reports from NCDOT indicate that 8 pedestrian crashes were reported between 1997 and 2003 in Mooresville. The majority of these crashes were reported as having occurred on local streets and included one fatality, two disabling injuries, three evident injuries, and two possible injuries.



Bikeways

Although Mooresville does not have an extensive network of bicycle facilities and routes at this time, the existing sidewalk network, low volume streets, and the fledgling greenway network provide opportunities for bicycle trips. Figure 2.5 displays the existing sidewalk and bicycle facilities.

For advanced and more experienced recreational cyclists, the extensive network of roads — with comparatively lower traffic volumes and moderate traffic speeds — provides opportunities for bicycles to mix with vehicular traffic. Although no facilities are designated in the rural areas surrounding Mooresville, experienced cyclists routinely use the rural road network for bicycling.

Though the existing roadway network is utilized, many experienced and less experienced bicyclists have expressed concern for their safety. NCDOT reports indicate that 6 crashes involving bicyclists were reported in Mooresville between 1997 and 2003, the majority of which did not involve severe injury to the bicyclist. The majority of these crashes were reported as having occurred on local streets and caused evident injury.

Current bicycle plans within the area include the Lake Norman Bicycle Route which is a regional route under consideration by NCDOT and the Centralina Council of Governments. The proposed Lake Norman Bicycle Route network will provide a network of trails throughout the Mooresville study area for a variety of recreational uses. Many of the residential streets that surround Lake Norman in the southeastern section of the study area have been designated as suitable for short, family-oriented trips (*Lake Norman Bike Trail Report, Centralina Council of Governments*).

In addition, the Town of Mooresville has been awarded a grant by NCDOT that will help fund the completion of the *Mooresville Comprehensive Bicycle Plan*. This planning process is expected to begin late 2007 or early 2008. It is recommended that the results of the *Mooresville Comprehensive Bicycle Plan* be incorporated into the *Mooresville Comprehensive Transportation Plan*.



Greenways

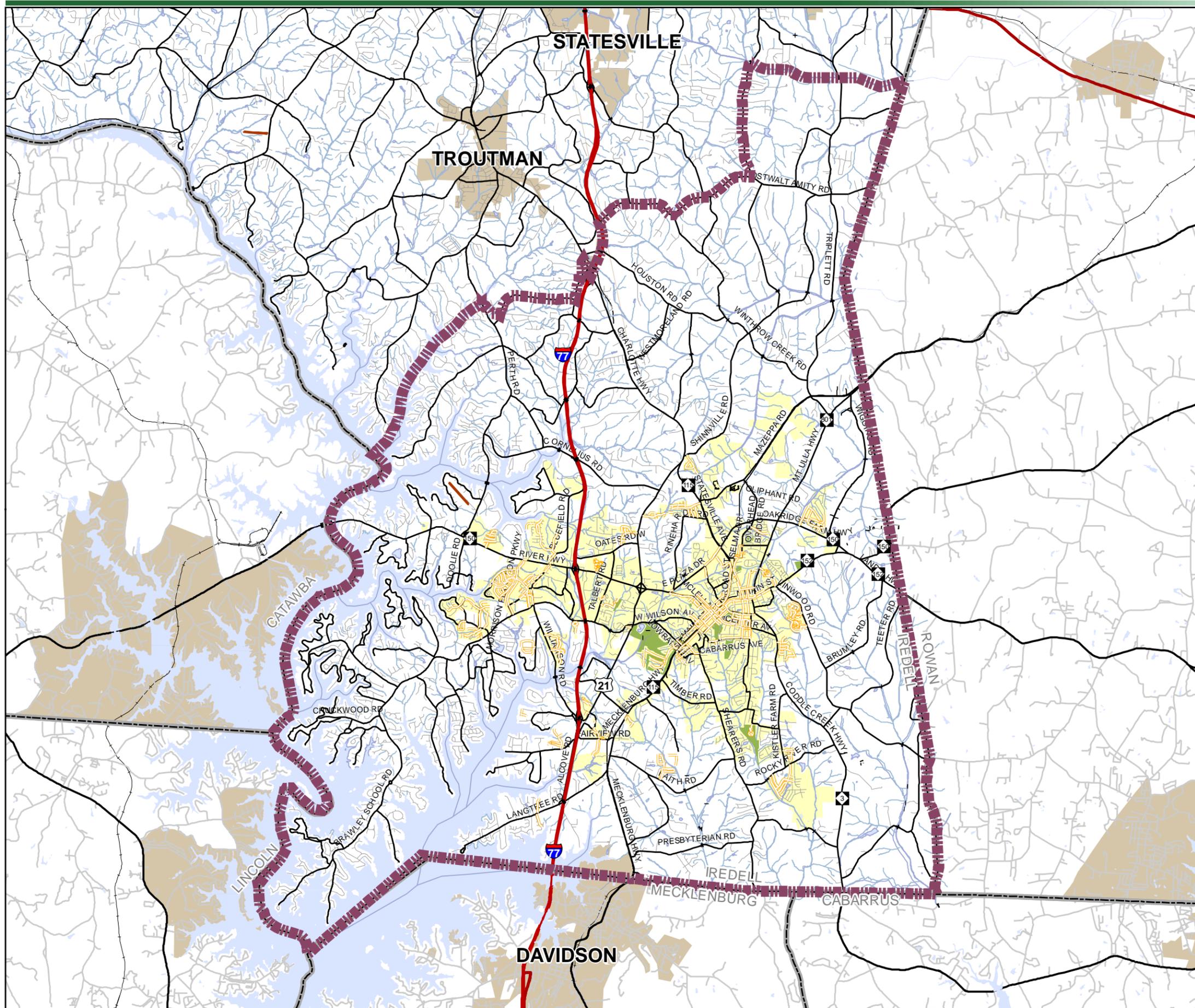
Mooresville currently does not have a greenway system, but the recently completed *Mooresville Comprehensive Pedestrian Plan* and *Mooresville Parks and Greenways Comprehensive Master Plan (March 2003)* identify a number of corridors for potential future use. Greenway facilities, also called 'multi-use paths', generally are independent of the road network, but may run parallel to facilities carrying motorized traffic. They are different from sidewalks in that they typically do not share right-of-way with streets.

Greenways can be paved or have a gravel surface, but are generally designed in an environmentally sensitive and aesthetically pleasing fashion. Around the state, greenways have been designed along creeks, through utility easements or in 'rails-to-trails' conversions. As the Town of Mooresville grows, greenways are an important element to conserve a positive attitude towards the environment and enable residents to enjoy these paths through nature on bikes or by foot. Greenways also are an ideal outlet for exercise trips and are commonly associated with community-building athletic events such as 5K and 10K runs.

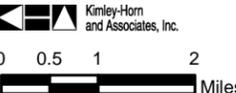
For a more detailed discussion and design criteria of greenways, refer to the *Mooresville Comprehensive Pedestrian Plan*. The proposed greenways from that document are also included in Chapter 4 of this report.



Figure 2.5
Existing Bicycle and Pedestrian Facilities



-  Study Area
-  County Boundary
-  Other Municipal Limits
-  Town of Mooresville
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Airport Runways
-  Railroads
-  Existing Sidewalks

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0 0.5 1 2 Miles



*No Existing Bicycle Lanes



Transit Element

Travel by private vehicle is — and will continue to be — the predominant mode of transportation for the majority of citizens. As a result, it will remain a primary focus of long-range transportation planning. Transportation plans, however, must also consider pedestrians, bicycles, and public transportation as they set the course of transportation in a community in the years to come. Existing public transit systems available within the study area are explained in detail below.

Overview

Public transportation includes modes ranging from taxis and shuttles to commercial airlines and inter-city buses, all of which can have a greater or lesser impact on our lives on any given day. Public transit, on the other hand, is local and greatly affects the daily lives of those who rely on it to get to and from work, to and from medical appointments, to and from the grocery store — in other words, to and from any location that otherwise might be reached by private automobile.



Source: <http://busexplorer.com>

The Nationwide Personal Transportation Survey indicated that mobility constraints affect subgroups of the population, creating a mobility gap between those with access to jobs, services, recreation, and other services, and those whose access is limited or non-existent. Improvements in public transportation can help bridge the mobility gap.

Transit services that are on-time, reliable, efficient, stop at the right places and popular, bridge the gap between the mobility-constrained and those who move about freely, and provide real travel choices. It is hoped that in the future, public transportation will become a travel mode of choice for a greater portion of the population and reduce reliance on the private automobile. For this to become a reality, continued investment needs to be made in public transportation to provide and improve service.



Existing Services

Transit in Mooresville currently consists of available for-hire taxi services, a ridesharing public transportation system provided by Iredell County, and the Mooresville Express which is part of the Charlotte Area Transit System. In addition there are two regional airports and one international airport within the vicinity of Mooresville. Due to the projected growth, expansion of existing transit services and the addition of passenger rail are likely in the future.

Taxis

Three taxi service businesses currently operate in Mooresville in typical taxi fashion with drop-off, per-mile, and waiting time rates consistent with a standard industry-wide range. The number of taxicabs in the Town does not directly correlate to any level of anticipated ridership for transit. The fact that a number of cabs are operating, however, supports the assumption that people are in need of alternatives to private automobile transportation in Mooresville.

Iredell County Area Transportation Services (ICATS)

Iredell County Area Transportation Services (ICATS) is the operator of county-wide human transportation to those individuals qualifying for services — usually the elderly, disabled, and low income. The county-wide service responds to demand, and users call the service to arrange trips. Service is available Monday through Friday from 6:00 a.m. to 9:00 p.m. and Saturdays from 6:00 a.m. to 5:00 p.m. This service regularly operates at capacity and is forced to focus on providing for clients in need of transportation for medical reasons and scheduled employment passengers. Fees are \$2 for those within Mooresville town limits and \$4 outside of town limits. The fare is typically covered by Medicaid for those passengers who qualify.

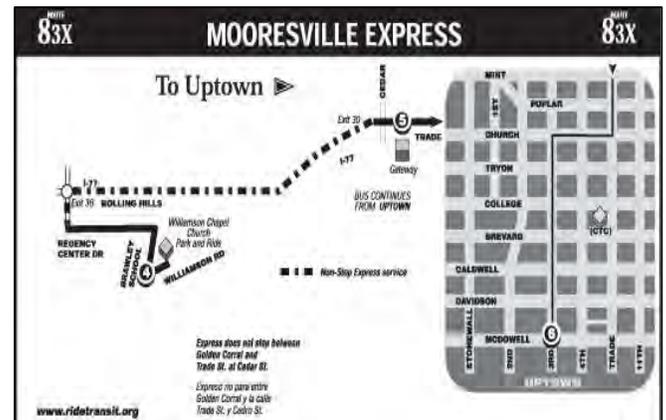


Mooresville

Comprehensive Transportation Plan

Charlotte Area Transit System (CATS)

Charlotte Area Transit System operates a single fixed-route public non-stop transit service to and from downtown Charlotte. The Mooresville Express operates Monday through Friday from 4:45 a.m. to 7:11 p.m. (from Charlotte) and from 5:40 a.m. to 7:08 p.m. (to Charlotte). The service makes one stop within the study limits, at a park and ride lot located at Williamson Chapel Church.



- \$1.65 for Express routes within Mecklenburg County
- \$2.40 for Express Plus routes to neighboring Counties

Through this planning process, the Mooresville community expressed the need for future expansion of the existing transit system.

The proposed North Corridor rail line is intended to provide an alternative to the congested Interstate I-77 corridor for commuters from the northern section of Mecklenburg County and Mooresville to uptown Charlotte.

The North Corridor rail line is approximately 30 miles long, operating on the "O" line of the existing Norfolk-Southern rail line. The graphic shows the proposed North Corridor alignment and stations. The route is proposed to run from uptown Charlotte to Mooresville, with 12 proposed stations between Williams Street and the Gateway Station. The proposed alignment will follow Graham Street within the City of Charlotte, and parallel Old Statesville Road (NC Highway 115) to the north.

The initial service is projected to have 16 daily commuter trains operating in one direction at a time. The North Corridor rail line could open for operation between Charlotte and Mooresville as early as 2012; however the project is still undergoing study.

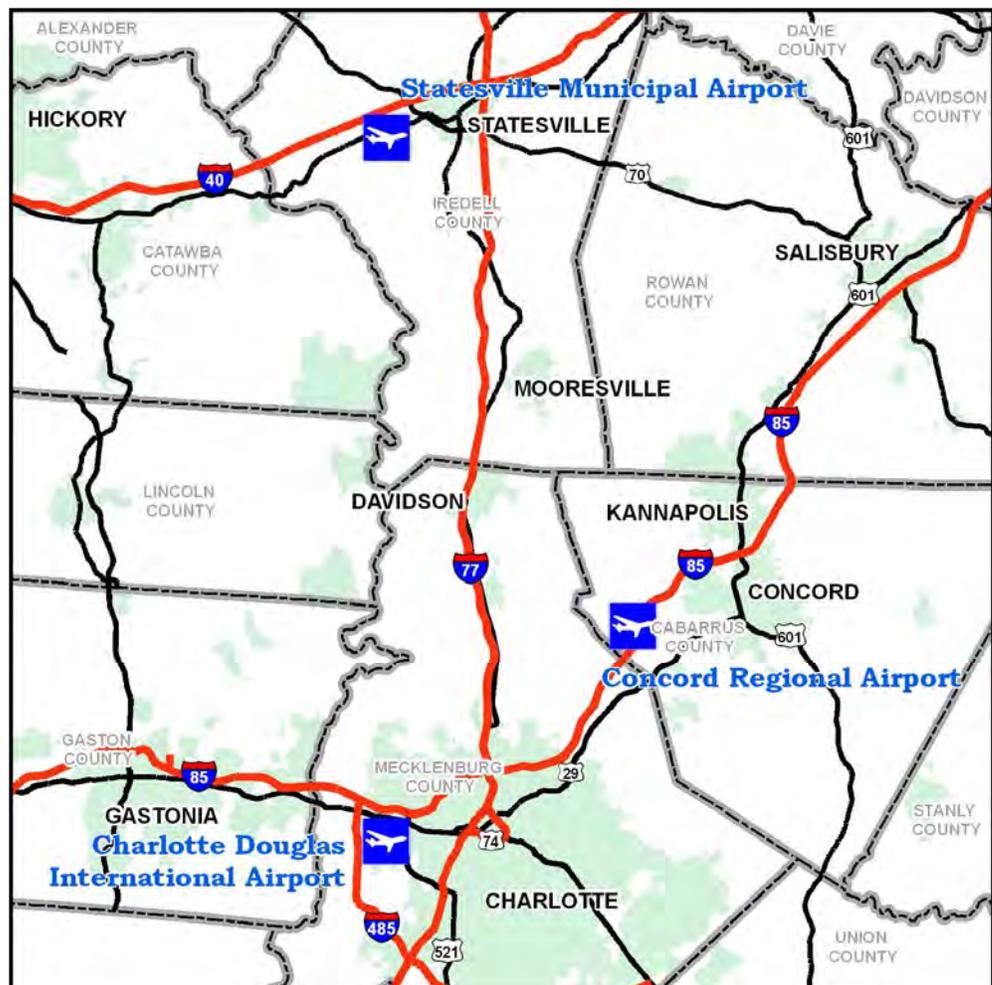


Mooresville

Comprehensive Transportation Plan

Passenger Air

Air travel is also a prevalent mode of transportation within the Mooresville area. Three airports are located within proximity to the Town of Mooresville as shown in the graphic below. Charlotte Douglas International Airport is located approximately 33 miles southwest of Mooresville and services travel throughout the world. The Concord Regional Airport is located 28 miles southeast of Mooresville and Statesville Municipal Airport is located 17 miles northwest of Mooresville. These two regional airports are used extensively by the area racing industry.





Freight Element

The use of transportation to move goods through and between communities is often overlooked by the general public. Freight activities play a vital role in our economy, which is increasingly dependent on our ability to transfer goods to market efficiently. Identifying elements of the transportation system to facilitate safe and efficient movement of freight is an important activity within long-range transportation planning processes.

The movement of freight often occurs using different modes and transportation system elements that include:

- Highways (using trucks, vans, cars)
- Railroads
- Airports (air transport)
- Maritime ports (ships)
- Pipelines

Historically, freight movement in the Mooresville area has been by rail. The Norfolk Southern rail line runs north/south connecting Mooresville to the established rail system throughout the United States.

Mooresville is also serviced by highway and air transport. As more highway freight movement is used, Interstate I-77, US Highway 21 and NC Highway 150 are being established as the primary highway freight routes to and from Mooresville. An increase in movement by highway freight will increase congestion on these facilities. Air transport is also accessible by the Charlotte Douglas International Airport, located approximately 33 miles southwest of Mooresville; the Concord Regional Airport located 28 miles southeast of Mooresville; or Statesville Municipal Airport 17 miles northwest of Mooresville.

The Town of Mooresville has a strong interest in improving the economic outlook of its citizen and businesses. A portion of the local economy already depends on access to a good transportation system, including local logistics companies, small and large manufacturers, industrial industries, and local and national retailers. Continuing to provide a transportation system that is efficient and has the ability to move freight will be vital to the future success of the Town.



Highway and Rail Freight Trends

Trucks and rail account for 64% of the nation's domestic freight volume, up from 57% in 1960. The rest of the volume is carried by pipelines, waterways, and air transport. Over the same period, the share of freight carried by rail has fallen minimally — from 38% to 37% of volume. Meanwhile, the volume of freight carried by truck has increased from 19% to 28%.



In terms of total ton mileage, freight carried by railroads has increased more than the other modes, as shown here. In spite of this increase, freight railroads have been experiencing a decreasing market share for decades as a result of movement of freight by truck. The trend of freight movement by truck has facilitated “just in time” delivery; it has increased truck traffic, however, and correspondingly worsened traffic congestion on many highways.

It is logical to assume that the continued loss of rail freight market share to movement of freight by truck will significantly impact many strategic and over-used highway corridors. The difficulty and continued scarcity of funding to improve many of these roadway corridors may mean that existing levels of congestion will worsen, the cost — in terms of both time and money — of moving goods by truck will increase, and the overall economic loss due to time in congestion will increase.



Mooresville Highways

The movement of freight is primarily focused on the largest transportation arteries — interstates, expressways, freeways, and major highways — many of which run through urban areas and have direct access to railroads. In Mooresville, Interstate I-77 and NC Highway 152 serve as the primary highway routes for freight movement. Interstate I-77 runs predominantly north/south and connects Mooresville to Charlotte to the south and Statesville and Virginia to the north. NC Highway 152 runs predominantly east/west and connects Mooresville to Interstate I-85, which is a major interstate facility used for freight movement along the eastern United States.

Rail

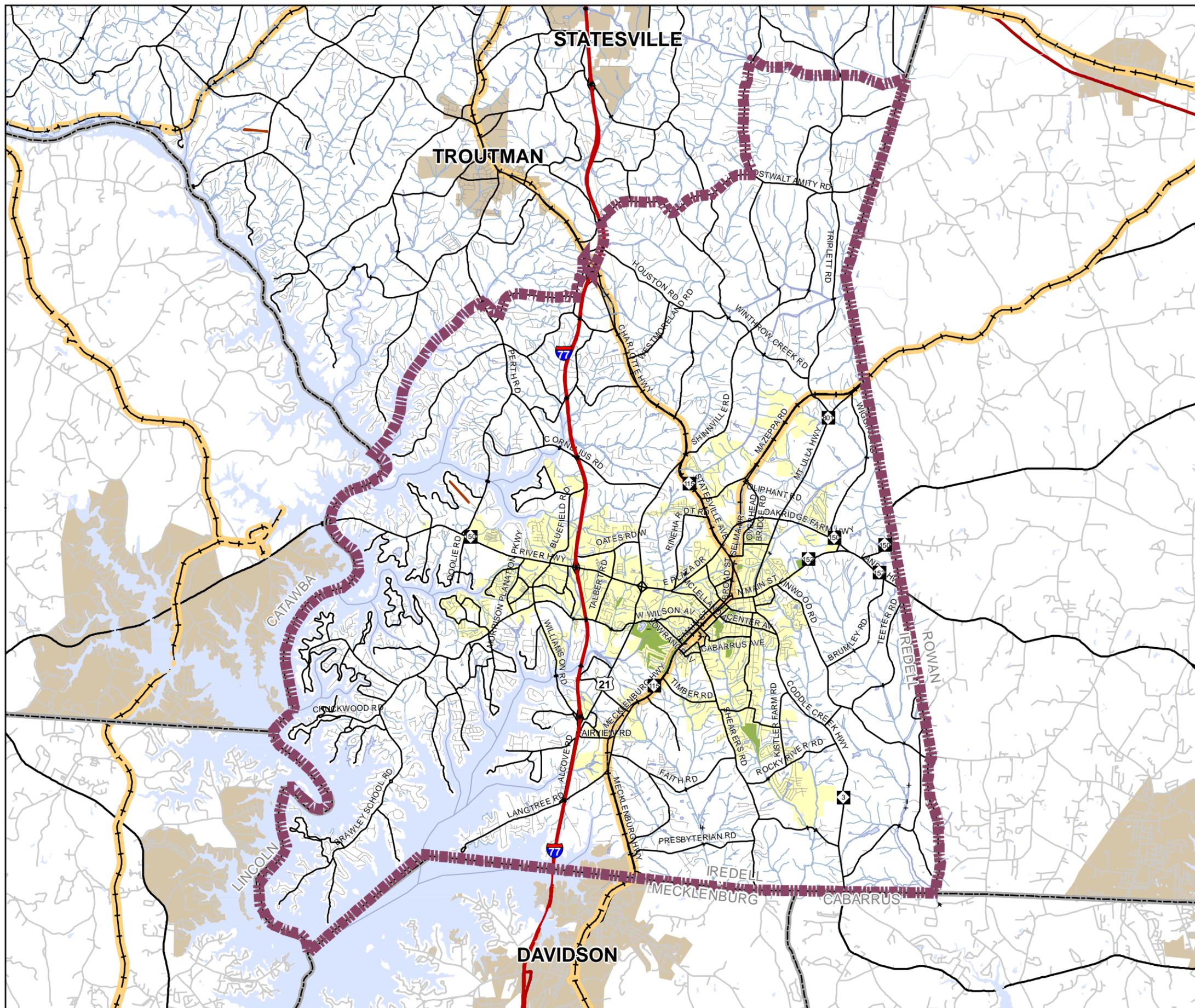
Rail freight service to Mooresville is used extensively. The two rail lines are owned by Norfolk Southern and provide services to Mooresville's industrial plants and operations. Approximately 5 trains pass through downtown Mooresville every week, some of which travel during high activity creating congestion and route changes.



Figure 2.6 shows the active rail lines within the study area.



Figure 2.6
Existing Rail Lines



-  Study Area
-  County Boundary
-  Other Municipal Limits
-  Town of Mooresville
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Airport Runways
-  Norfolk Southern Railroads
-  Parcels

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0 0.5 1 2 Miles



Environmental Impacts

The screening of potential environmental and community impacts at the system planning level is intended to identify potentially negative impacts at the earliest possible stage. Revisions to the preliminary plan can help minimize or even avoid impacts once they have been identified. If revisions are not feasible and the environmental or community impact is significant, a community may find it preferable to eliminate the proposed project. Because individual projects can significantly affect other projects, these issues must be resolved as early as possible to avoid wasting valuable time and resources. Considering these elements, results in a transportation plan that not only minimizes negative impacts on the natural and manufactured environments, but also is timely and cost-effective in its implementation.

The overwhelming majority of environmental impacts are associated with roadway projects in the transportation plan. This is understandable when considering the extensive disruption caused by the construction of several permanent roadways. Sidewalks and bicycle facilities are much more limited in the magnitude of their impacts, due to smaller cross sections and greater flexibility in being able to avoid problem areas. Furthermore, pedestrian and bicycle facilities are often built in conjunction with roadway facilities, and have only marginal impacts, if any, beyond those of the roadway.

The vast majority of transit projects in the *Mooresville Comprehensive Transportation Plan* are associated with bus route and service expansions, which have minimal negative impacts on either the natural or manufactured environments. In general, transit impacts tend to be positive because increased service tends to reduce vehicle miles traveled (VMT) and improve accessibility in disadvantaged neighborhoods.

The plan's environmental screening process is divided into two parts. The first focuses on overall impacts on the natural and built environment. The second section addresses specific issues related to environmental justice.

Natural and Built Environment

As the Mooresville area continues to urbanize and growth continues to occur, impacts to the environment are inevitable. Managing and minimizing impacts to the environment will be critical during the development of new infrastructure. Some natural features, however, should be maintained not only to satisfy residents' desire for a high quality of life that includes clean drinking water and open spaces, but also to



satisfy state and federal environmental policies and agencies. Figure 2.7 depicts important environmental features within the Mooresville area, including wetlands, bodies of water, parks, schools, gamelands, and hazardous waste sites. The study area includes large bodies of water including Catawba River and Lake Norman. These natural features should be preserved and were considered during this planning process.

Figure 2.8 depicts the slope intensity of the elevation change which guide in establishing the planning level alignments for new location roads. The slope intensity is considered because costs for building roadway facilities can be reduced by building them in areas that are relatively flat because of reduced earthwork. In addition, the alignments are more realistic which increases defensibility of the plan and reduces the conflict during the NEPA process.

Environmental Justice

Environmental justice describes practices intended to avoid the use of federal funds for projects that generate disproportionate or discriminatory adverse impacts on minority or low-income populations. This effort is consistent with Title IV of the 1964 Civil Rights Act and is promoted by the U.S. Department of Transportation (USDOT) as an integral part of the long-range transportation planning process, as well as individual project planning and design. The environmental justice assessment incorporated in the *Mooresville Comprehensive Transportation Plan* was based on three basic principles, derived from guidance issued by the USDOT:

- The planning process should avoid, minimize, or mitigate environmental impacts (including economic, social, and human health impacts) that affect minority and low-income populations with disproportionate severity
- Transportation benefits should not be delayed, reduced, or denied to minority and low-income populations
- Any community potentially affected by outcomes of the transportation planning process should be provided with the opportunity for complete and equitable participation in decision-making

As part of the *Mooresville Comprehensive Transportation Plan, 2000* Census data was used to identify the geographic distribution of low-income and minority populations. This allowed the positive and negative effects of various transportation investments in the transportation plan to be assessed. Figure 2.9 shows the population within the study area by





Mooresville

Comprehensive Transportation Plan

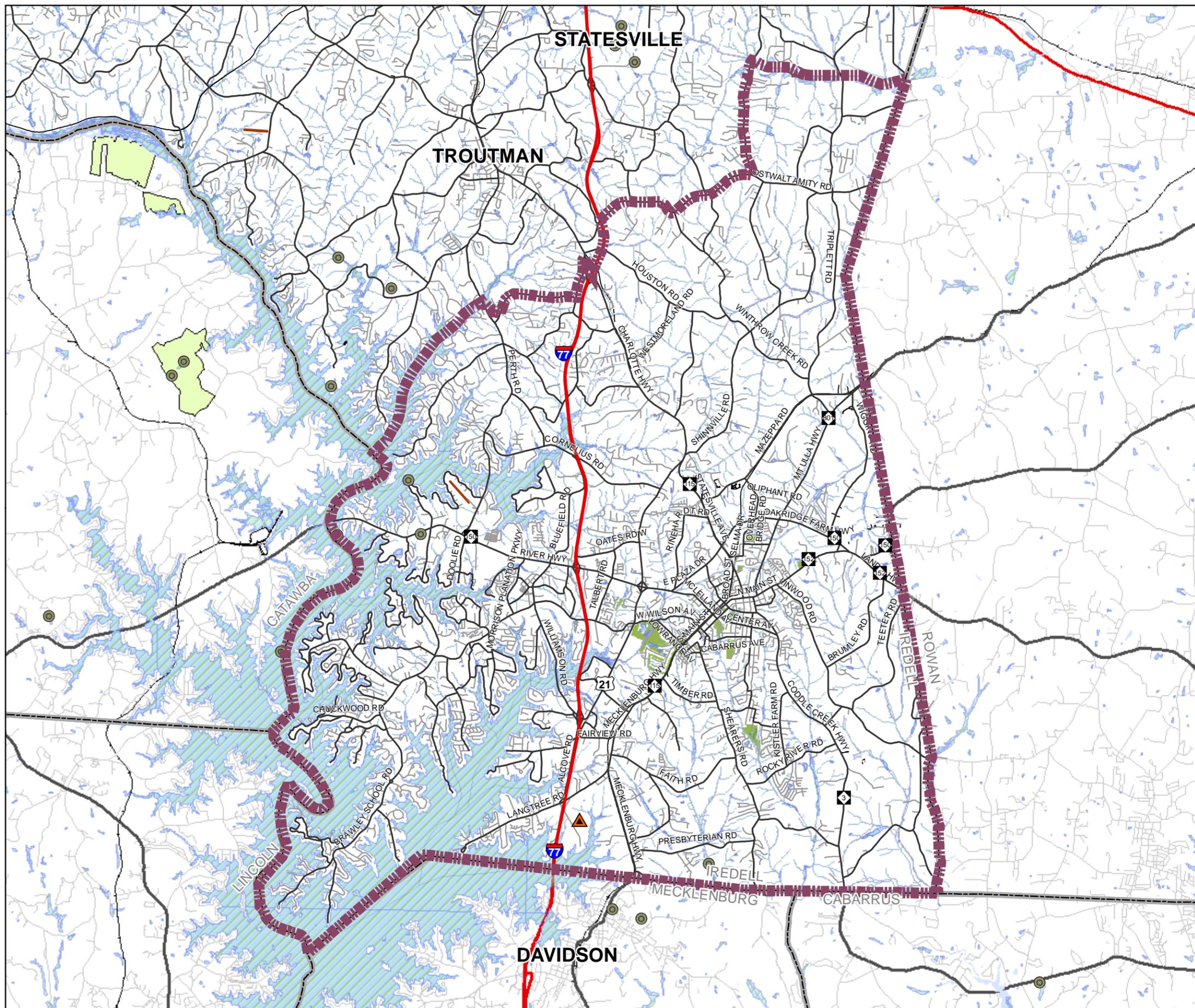
ethnicity, which is defined by the Census Bureau as either Hispanic or Non-Hispanic. Figure 2.10 shows the population by percent minorities (race). Census participants are presented with unlimited choices for race, and the Census Bureau defines minorities as any race that is not White, including African-American, Asian, Native American, or people who identify themselves as belonging to two or more races. Figure 2.11 shows the percent of the population below the poverty level, which is determined by the Census Bureau based on income versus a poverty threshold, which varies according to family size and ages of members.

While it is impossible to construct any type of infrastructure without any impacts, careful planning and early consideration will help the *Mooresville Comprehensive Transportation Plan* to effectively manage community impacts as projects are implemented. It is important to note that the environmental justice screening conducted for this study is not intended to quantify specific impacts. Instead, it is intended to provide guidance during plan development to make sure it is equitable in terms of both costs and benefits.

In addition, this screening identifies projects in the transportation plans that, due to proximity, have the potential to affect communities of special interest. When individual studies begin as part of project implementation, a more detailed analysis, including field surveys, will be needed to identify and minimize specific community impacts on a project-by-project basis.



Figure 2.7
Environmental Features



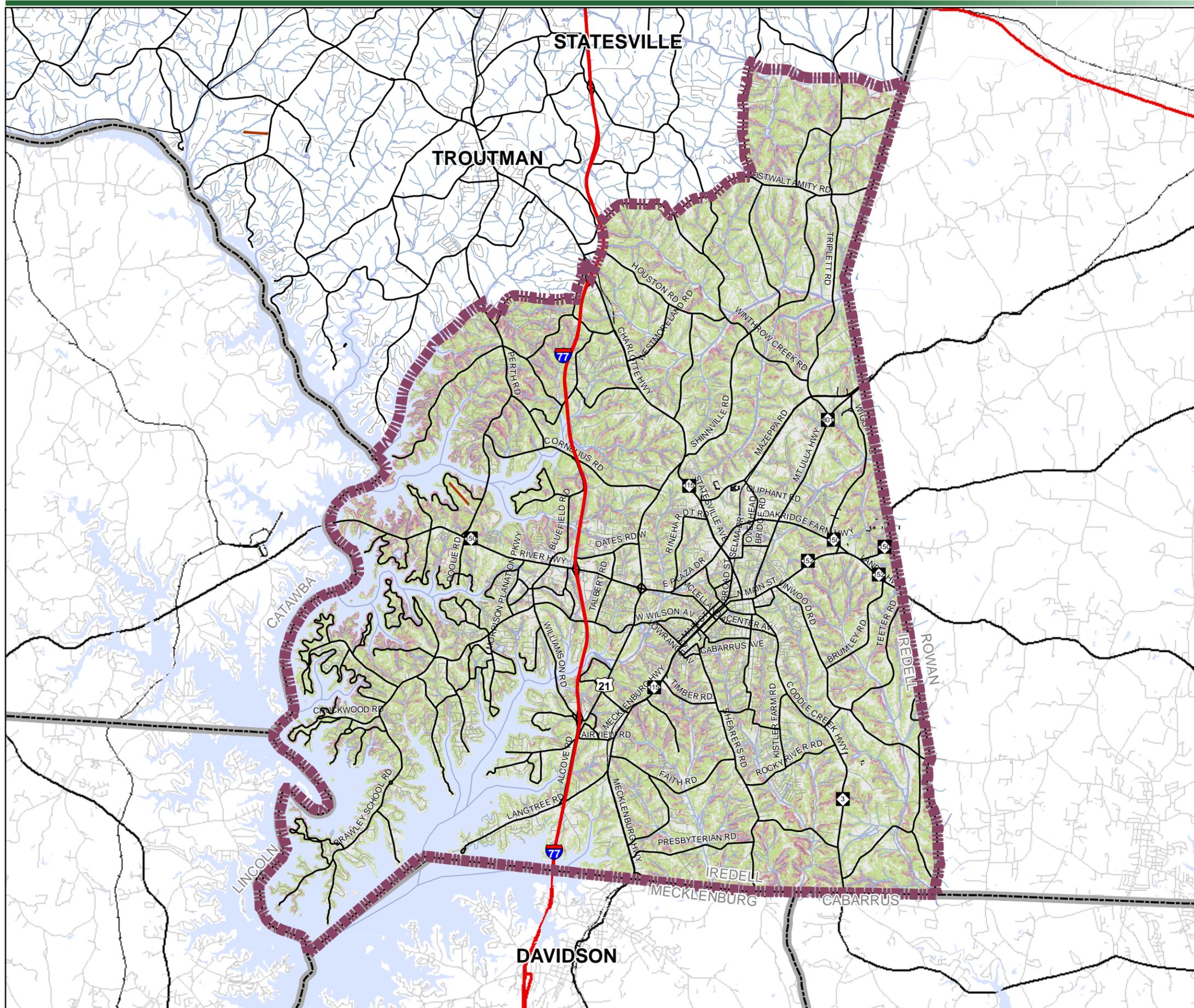
-  Study Area
-  County Boundary
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Railroads
-  Airport Runways
-  Natural Heritage Element Occurrence
-  Hazardous Waste Facility
-  NWI Wetlands
-  Gamelands

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0 0.5 1 2 Miles



Figure 2.8
Slope Intensity

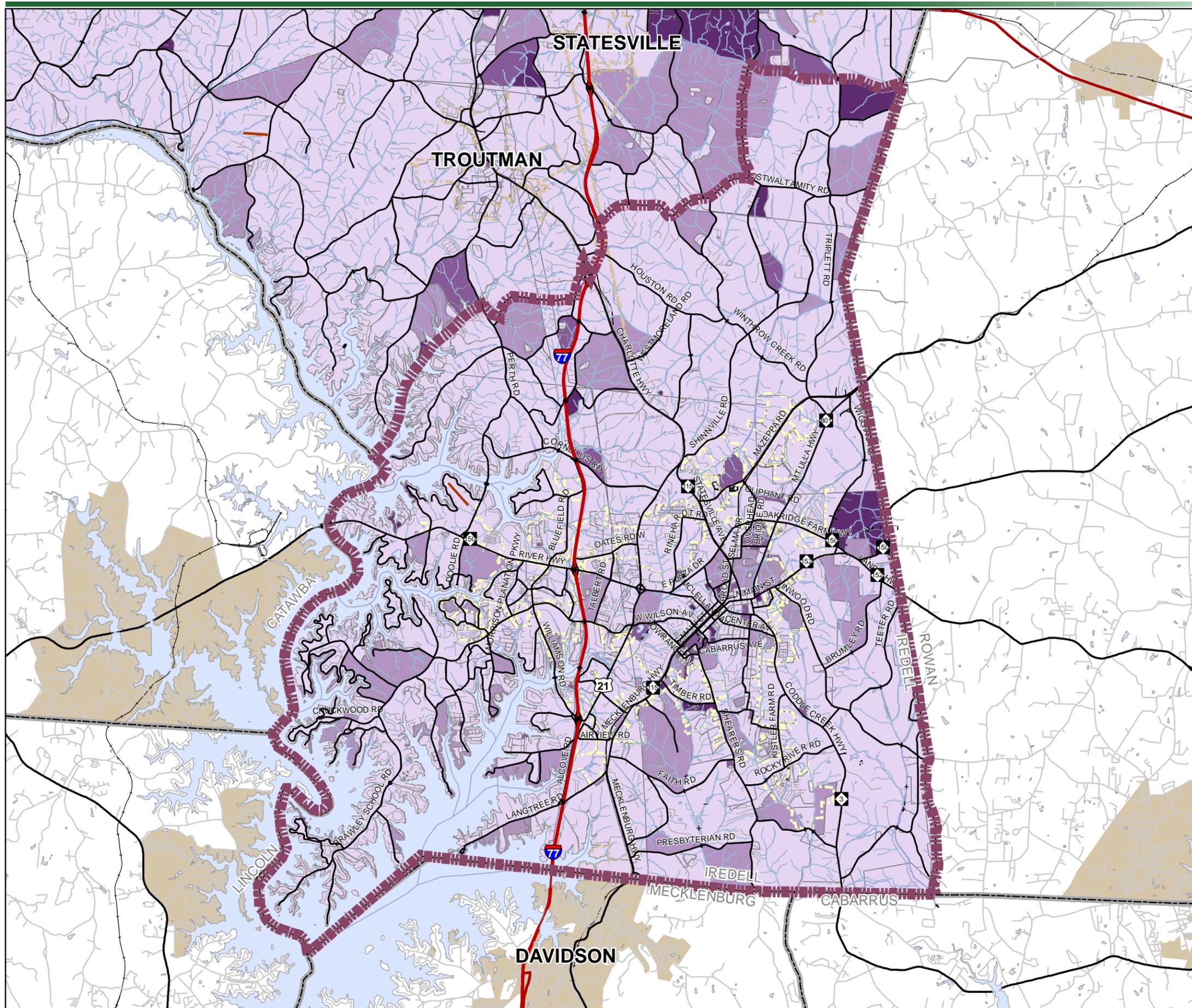


- Study Area
 - County Boundary
 - Bodies of Water
 - Railroads
 - Airport Runways
- Slope Intensity**
- 0% - 5%
 - 5.1% - 15%
 - 15.1% - 25%
 - 25.1% - greater

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and Associates, Inc.
0 0.5 1 2
Miles



Figure 2.9
Ethnicity Population



- Study Area
- County Boundary
- Other Municipal Limits
- Town of Mooresville
- Bodies of Water
- Airport Runways
- Railroads

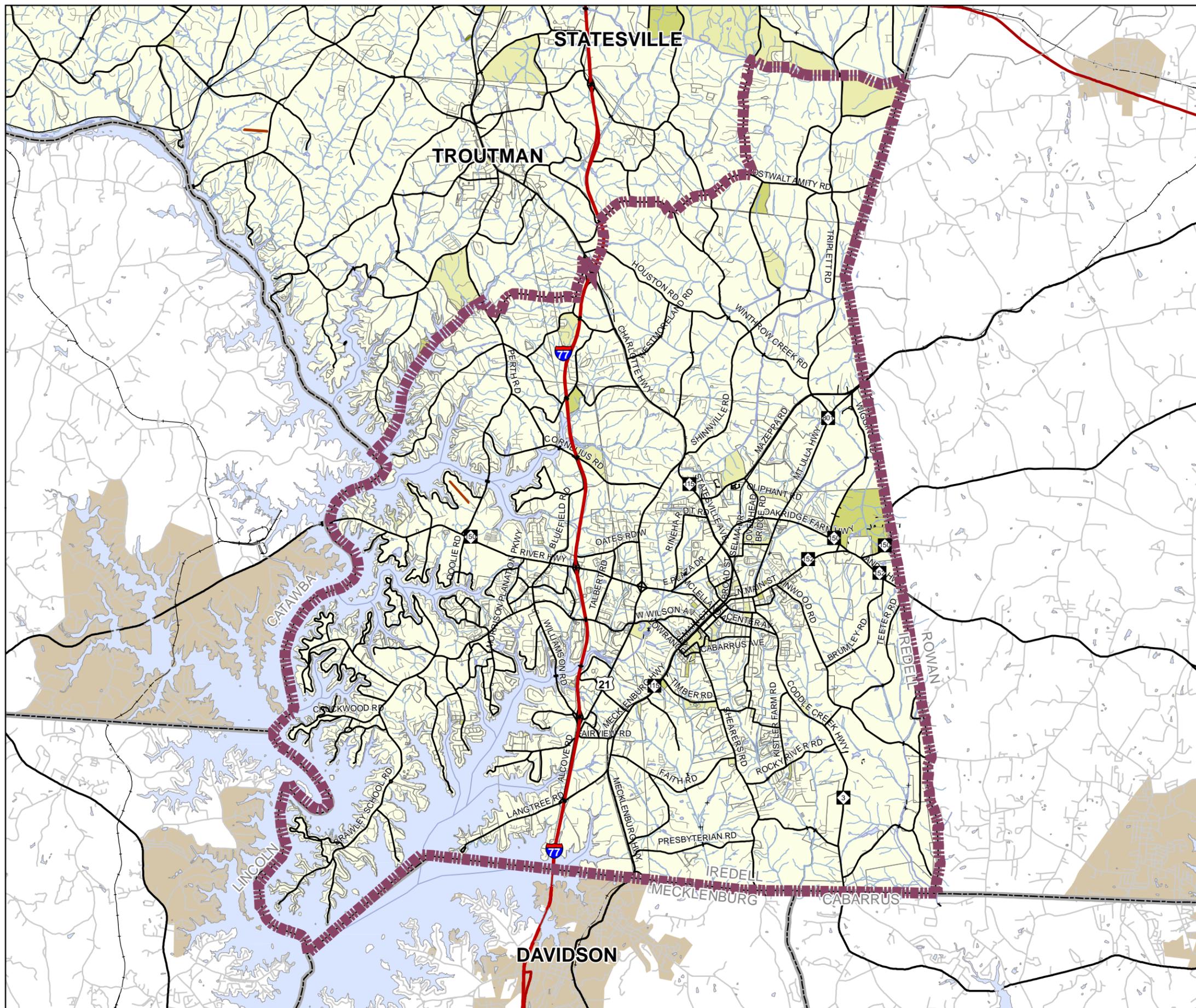
Percent Minority

- < 1%
- 2 - 5%
- 6 - 10%
- >10%

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0 0.5 1 2 Miles



Figure 2.10
Percent Minority



- Study Area
- County Boundary
- Bodies of Water
- Airport Runways
- Railroads

Percent Minority

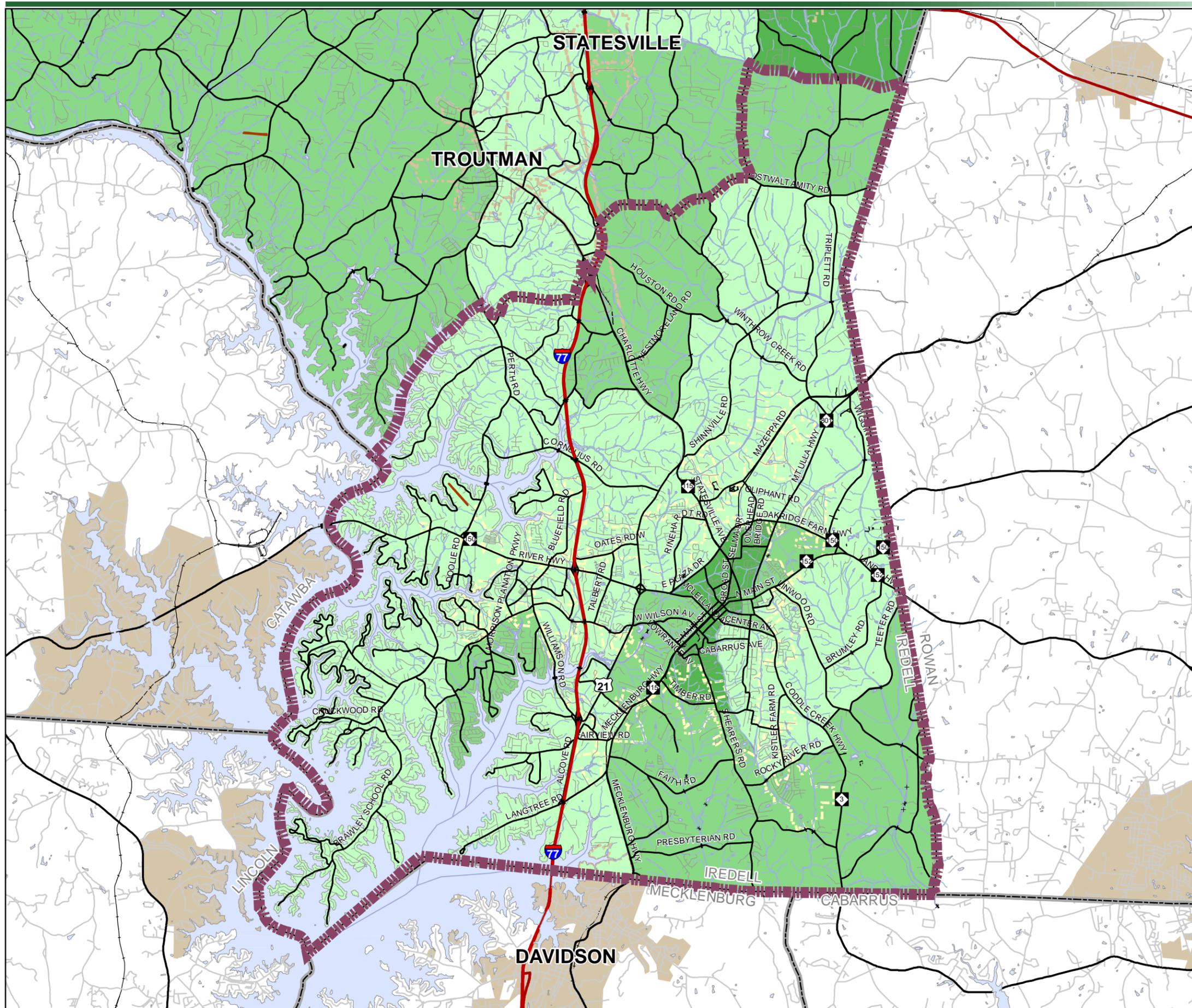
	< 5%
	6 - 15%
	16 - 25%
	26 - 50%
	> 50%

Kimley-Horn and Associates, Inc.

0 0.5 1 2 Miles



Figure 2.11
Percent Below Poverty



- Study Area
- County Boundary
- Other Municipal Limits
- Town of Mooresville
- Bodies of Water
- Airport Runways
- Railroads

- Percent Below Poverty**
- < 5%
 - 6 - 10%
 - 11 - 20%
 - 21 - 30%
 - > 30%

Kimley-Horn and Associates, Inc.
0 0.5 1 2 Miles



Planning Guidelines

During the transportation plan development, the project team used available data to avoid and minimize impacts to known environmental features. By collecting and considering this data early in the planning process, this plan expects to lessen environmental impacts and reduce potential conflicts during the permitting process. In addition, when considering new roadway alignments and extensions, a guiding set of principles were used to make sure that the following environmental considerations were adhered to:

- Avoid steep slopes and otherwise unsuitable topography
- Minimize impacts to the built environment
- Stay away from Federal Emergency Management Agency designated floodplains
- Minimize the number of wetland (National Wetland Inventory) impacts
- Minimize the amount of each wetland impact (e.g., don't cross a wide wetland when a narrower one can be crossed)
- Minimize the number of stream crossings
- Minimize the length of stream crossings
- Minimize impacts to school sites
- Minimize the number and size of impacts to historic features and districts
- Minimize the number and size of impacts to threatened and endangered species
- Minimize the number and size of impacts to hazardous waste sites
- Minimize the number and size of impacts to superfund sites
- Minimize/avoid impacts to neighborhoods
- Avoid unnecessary or disproportionate impacts to minority communities
- Do not impact parks and designated open spaces
- Minimize gameland impacts
- Minimize the number of new facilities in critical watershed areas
- Planned projects/proposals should consider existing development patterns
- Planned streets should, to the extent possible, utilize existing stub streets



Existing Community Strategic Corridors

Based on demonstrated challenges as well as perceived congestion and safety problems, eleven community strategic corridors were identified as requiring closer consideration and study. The strategic corridors analyzed for potential improvements include:

- Brawley School Road, Bay Harbour Road to Talbert Road
- Cornelius Road, Perth Road to US Highway 21
- Langtree Road, Pin Oak Lane to Mecklenburg Highway
- Mazepa Road, Overhead Bridge Road to Wiggins Road
- NC Highway 3/Coddle Creek Highway, Study Area Boundary to Eucalyptus Street
- NC Highway 115/Mecklenburg Highway, Study Area Boundary to Lowrance Avenue
- NC Highway 150/River Highway, Study Area Boundary to Charlotte Highway
- NC Highway 150/Oakridge Farm Highway, McLelland Avenue to Wiggins Road
- Perth Road, NC Highway 150/River Highway to Cornelius Road
- NC Highway 115, Charlotte Highway to Broad St
- Williamson Road, Carriage Club Drive to Interstate I-77

Existing Conditions

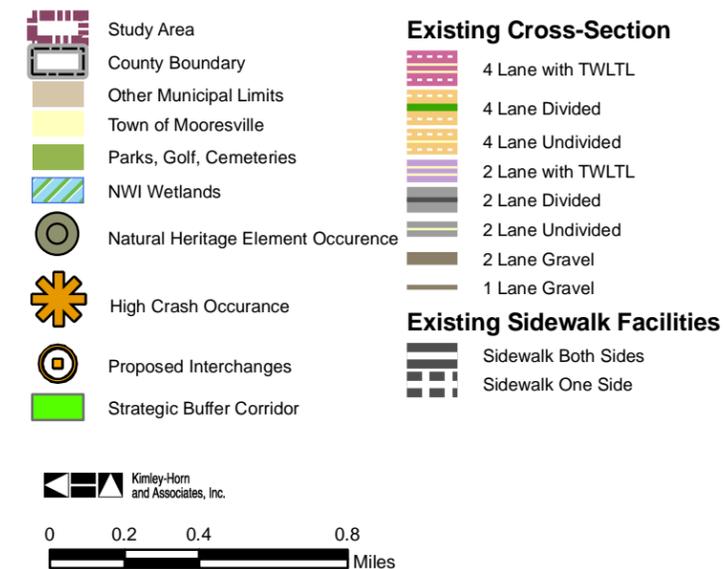
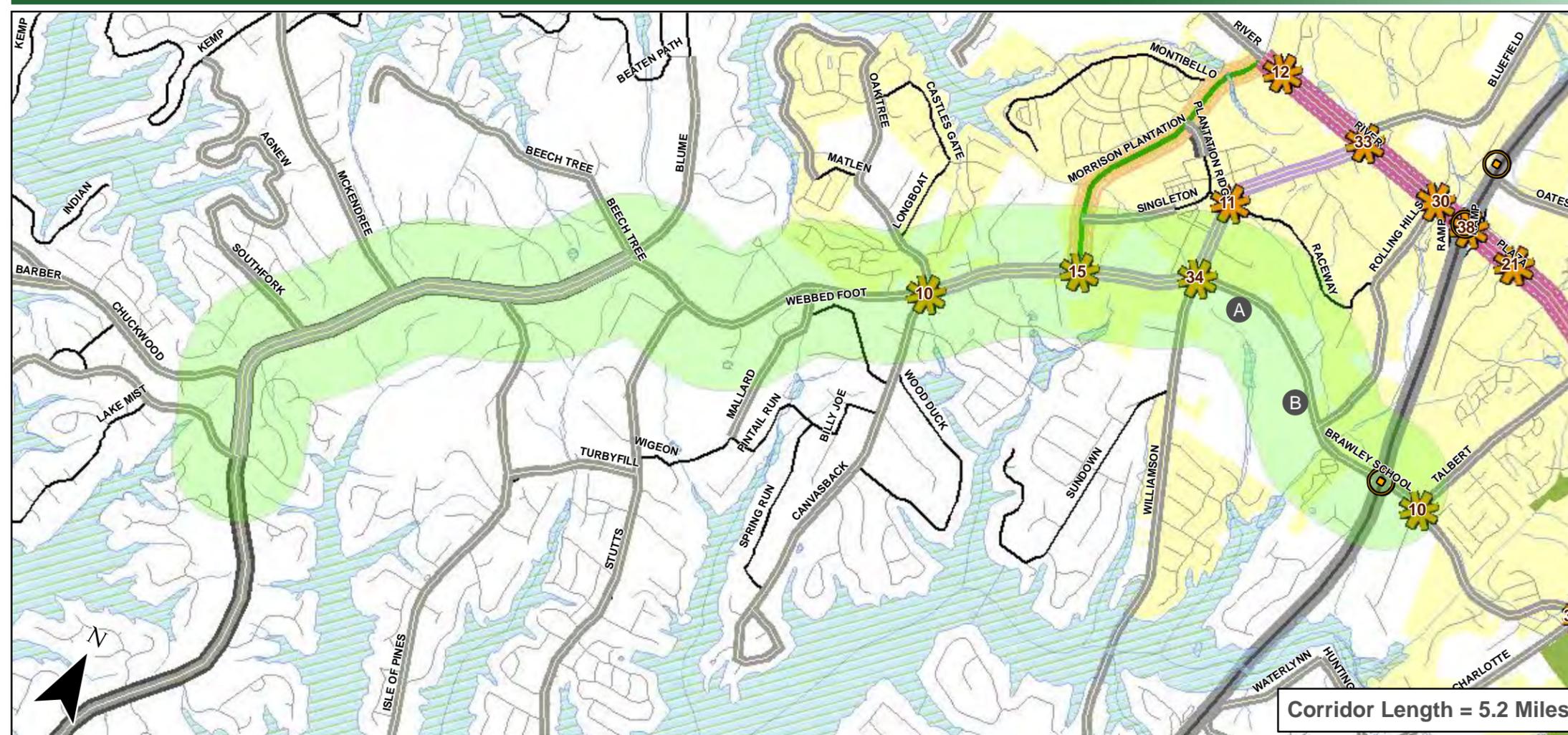
Members of the Citizens' Advisory Committee were actively involved in defining and evaluating strategic transportation corridors in the study area. Through data collection effort and creative input from these volunteers, it was possible to custom tailor the corridor vision statements to the needs in the community.

In the process of examining the transportation needs along the vision corridors, the volunteers from the Citizens' Advisory Committee performed field visits, assessed the current conditions and took pictures of perceived deficiencies.

Figures 2.12–2.22 represent the existing conditions for each of the strategic corridors. Issues specific to each corridor have been identified, in addition to relevant challenges and potential impacts. Each Figure shows a map outlining the corridor, existing cross-section, environmental features and intersection with high crash occurrence. The figures furthermore include some pictures and a summary of issues identified during field visits.



Figure 2.12
Community Strategic Corridor
Brawley School Road



Corridor Description and Issues Identified

- Only corridor in and out of the Brawley School Road peninsula
- Predominantly two-lane cross-section with turn lanes at intersections
- Heavy commercial and residential development activity along the corridor
- Two major bottlenecks: intersections with Williamson Road and Oak Tree Road
- High levels of traffic congestion and very long queues at signals

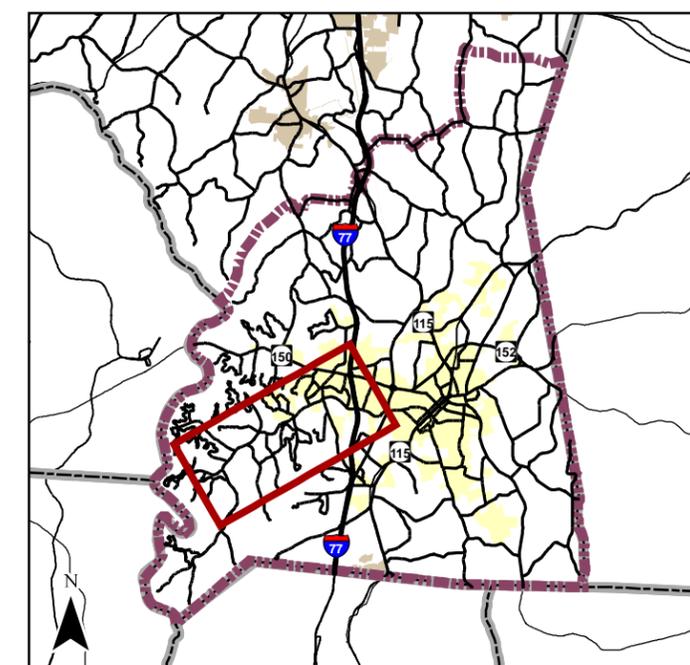
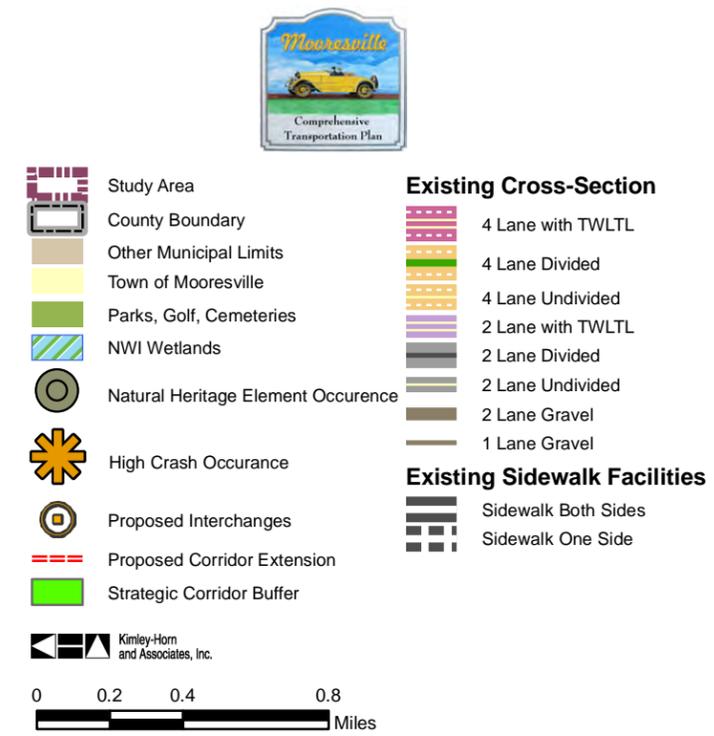
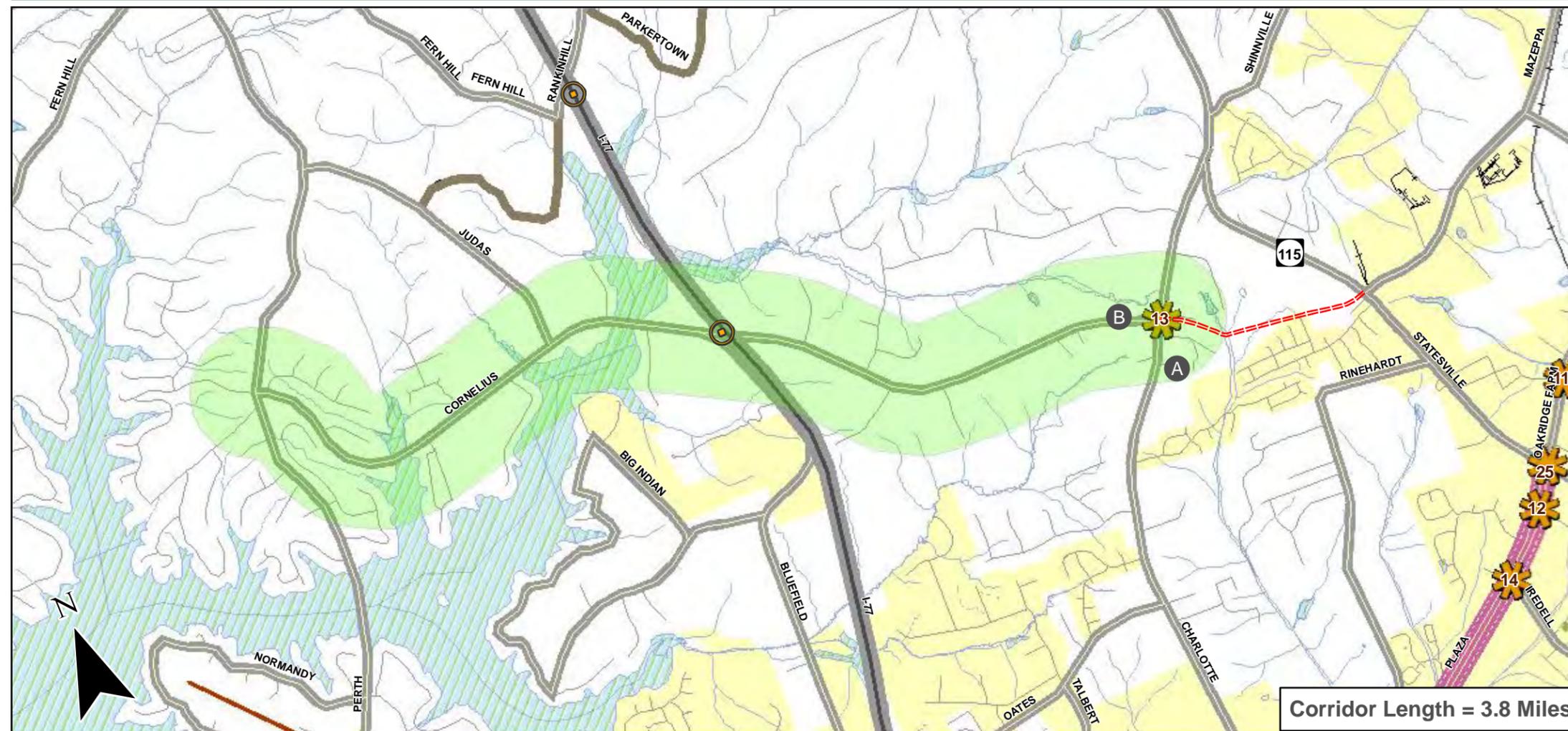


Figure 2.13
Community Strategic Corridor
Cornelius Road



Corridor Description and Issues Identified

- Two lane residential collector
- Industrial cluster east of I-77
- Proposed connection to Mazeppa Road
- Mooresville Chamber may develop this area
- Alternate route for trucks to NC Highway 150 west of Mooresville

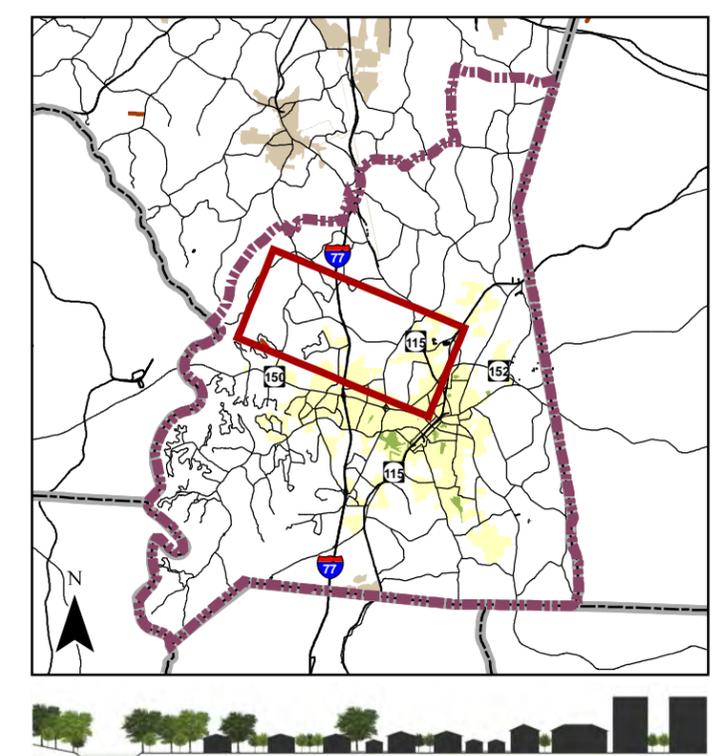
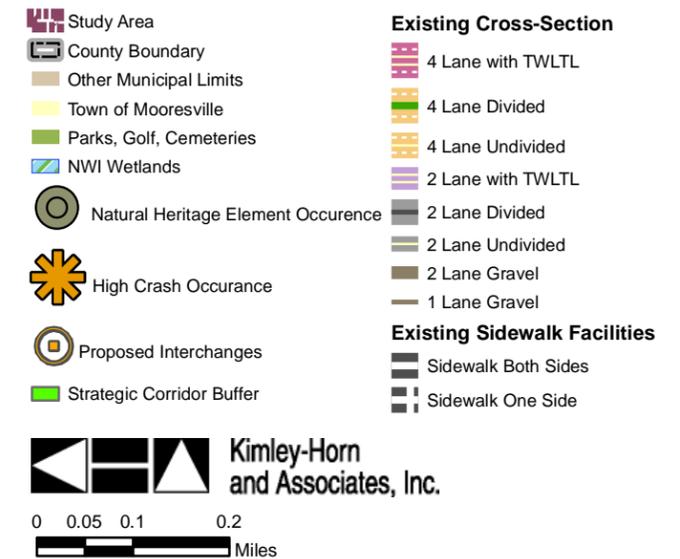
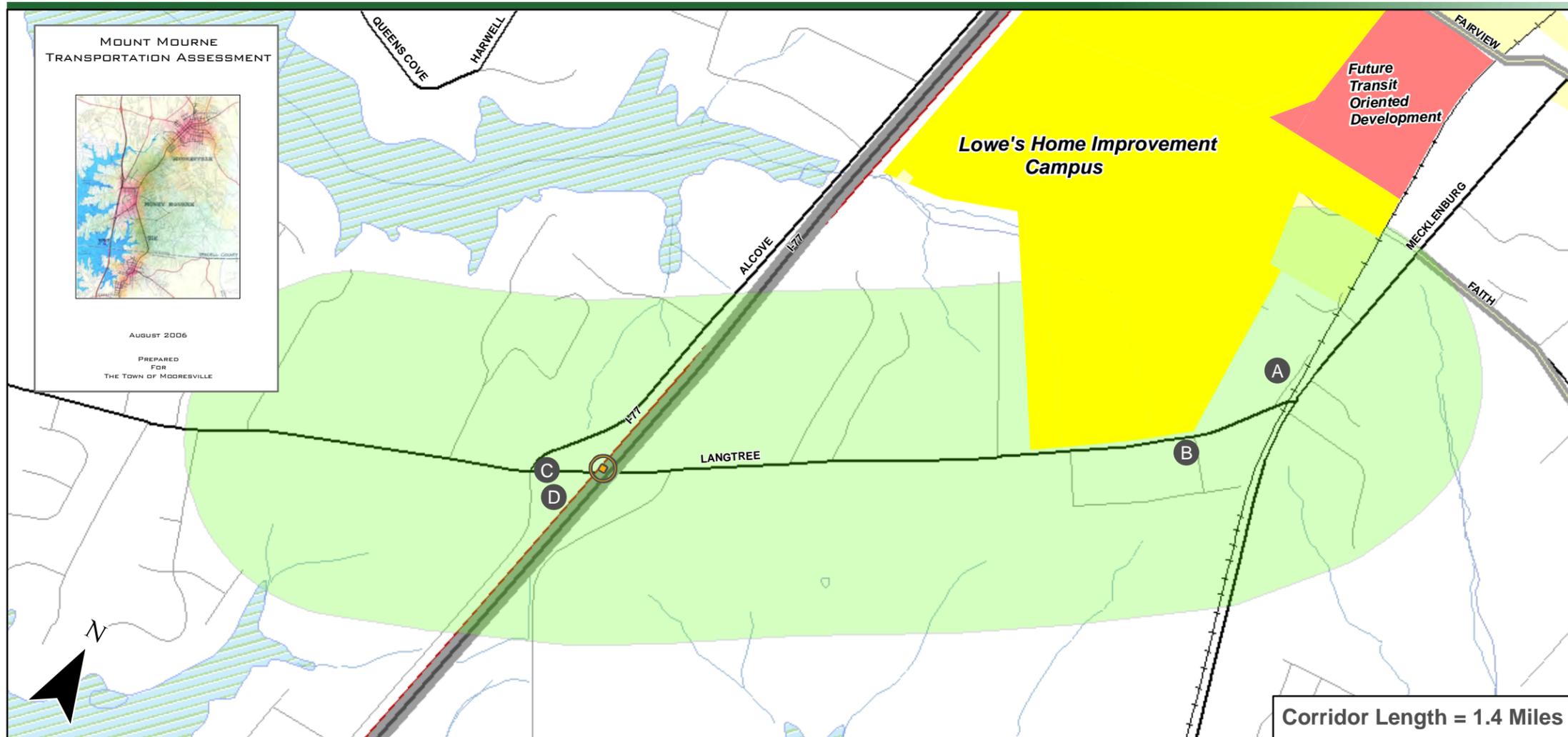


Figure 2.14
Community Strategic Corridor
Langtree Road



Corridor Description and Issues Identified

- Two-lane cross section
- New diamond interchange with I-77 (TIP I-4411) to be let on November 2006
- Signal constructed at NC Highway 115 and Langtree Road in Spring 2007
- Proposed development is expected to cause congestion on this corridor
- See Mt. Mourne area plan

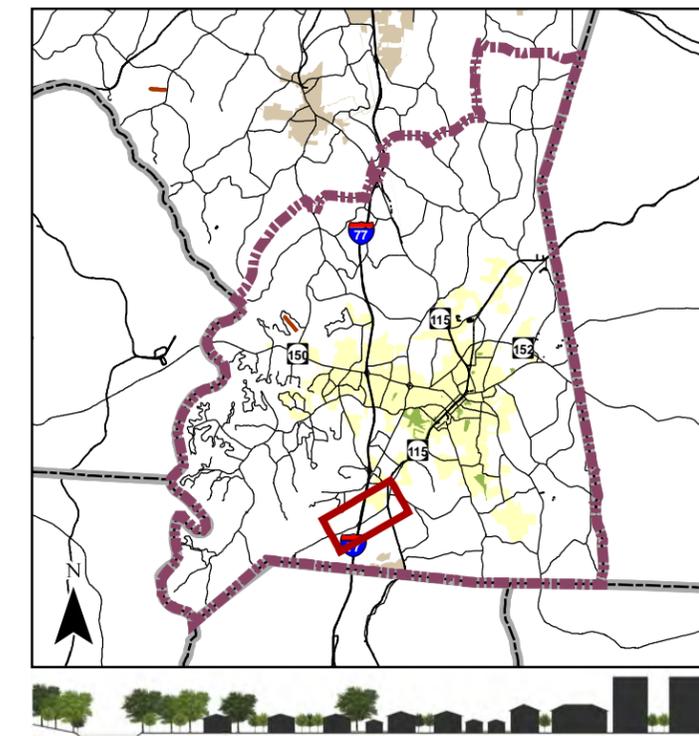
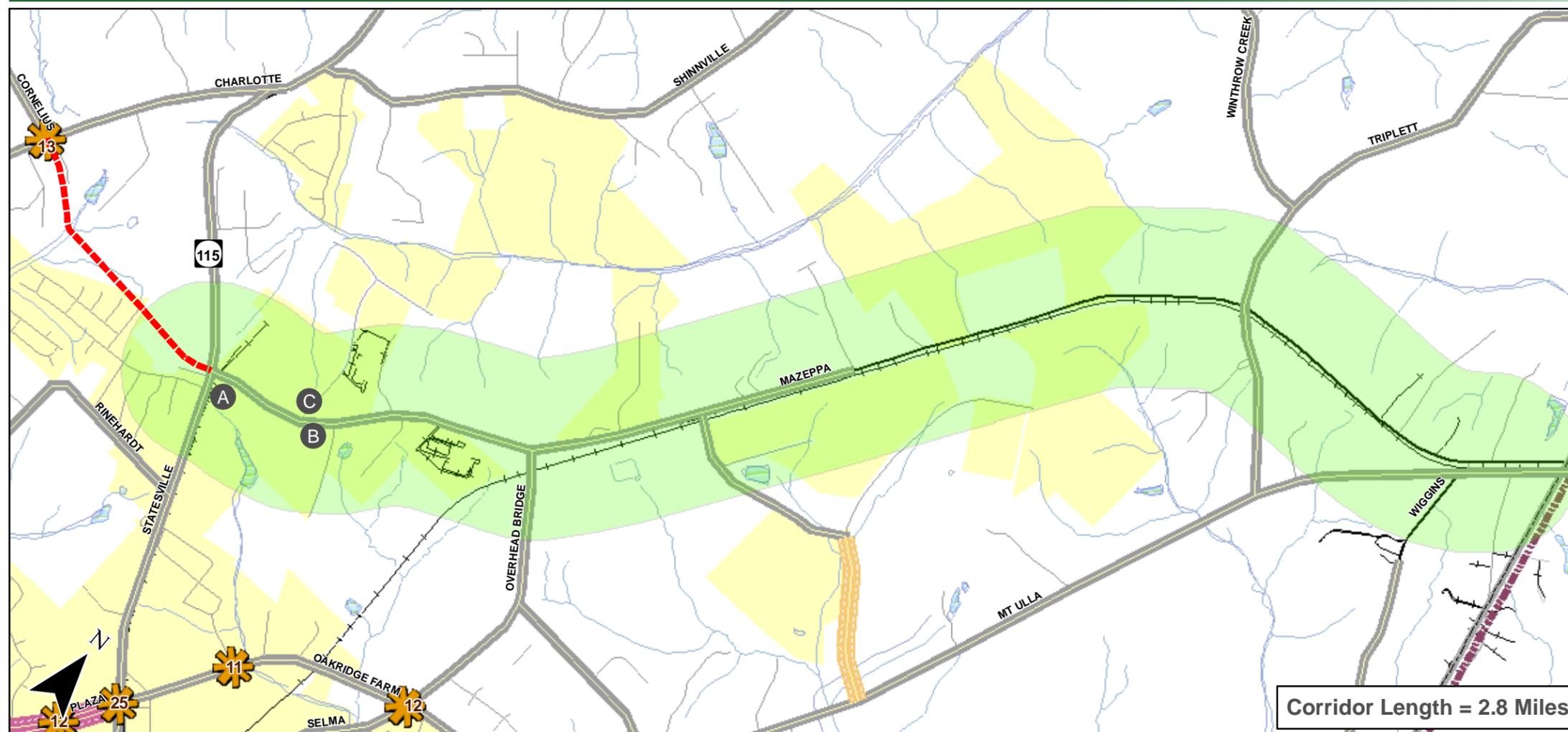
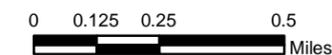


Figure 2.15
Community Strategic Corridor
Mazeppa Road



	Study Area		Existing Cross-Section
	County Boundary		4 Lane Divided
	Other Municipal Limits		4 Lane Undivided
	Town of Mooresville		2 Lane with TWLTL
	Parks, Golf, Cemeteries		2 Lane Divided
	NWI Wetlands		2 Lane Undivided
	Natural Heritage Element Occurrence		2 Lane Gravel
	High Crash Occurrence		1 Lane Gravel
	Strategic Corridor Buffer	Existing Sidewalk Facilities	
	Proposed Connector		Sidewalk Both Sides
			Sidewalk One Side

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Corridor Description and Issues Identified

- Mostly two lane cross - section
- Iredell County listed Cornelius-Mazeppa connector with new I-77 interchange as one of the top five potential TIP projects
- Railroad track constraint on south side of corridor
- Unsafe intersection at Mt. Ulla Road and Mazeppa Road
- Land use mix includes residential, industrial and small businesses.

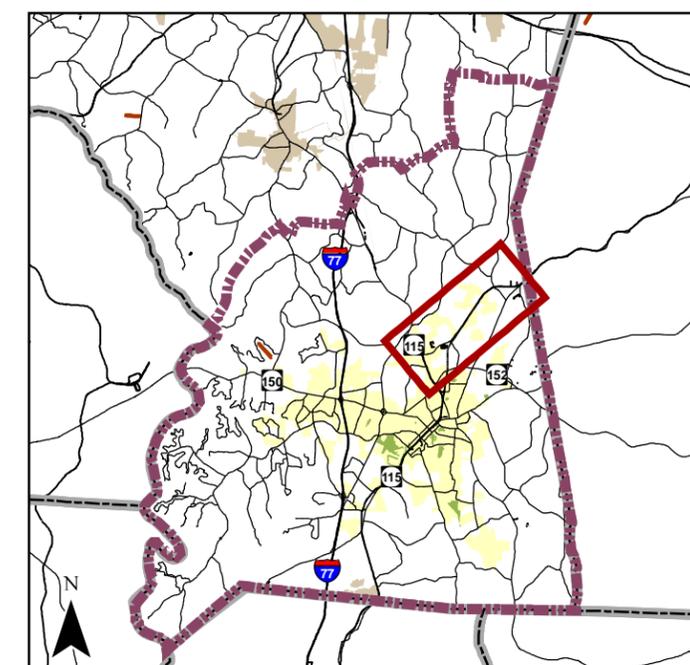
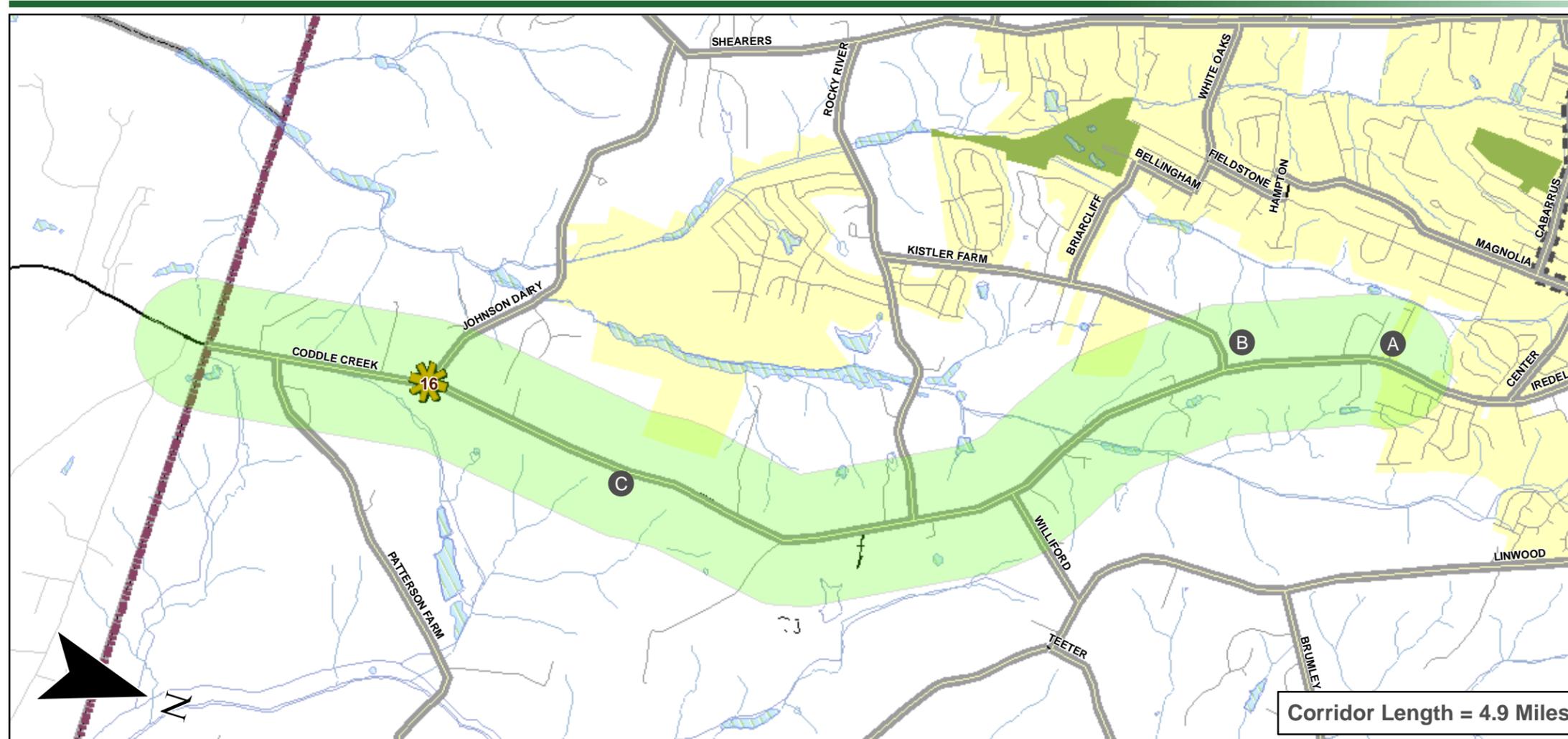
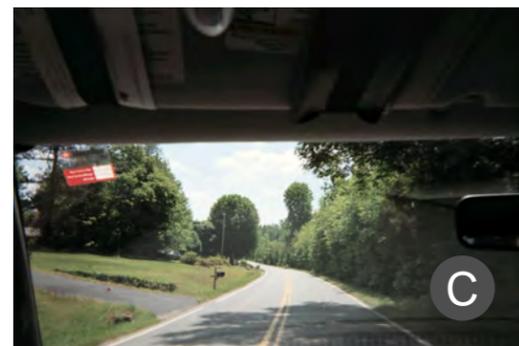
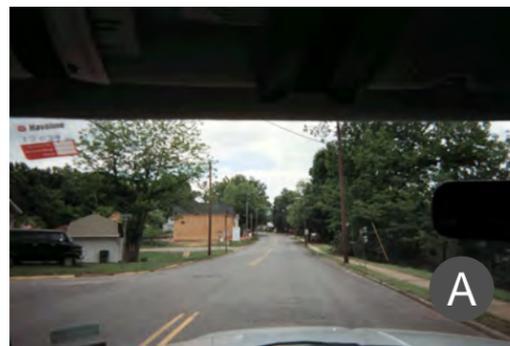
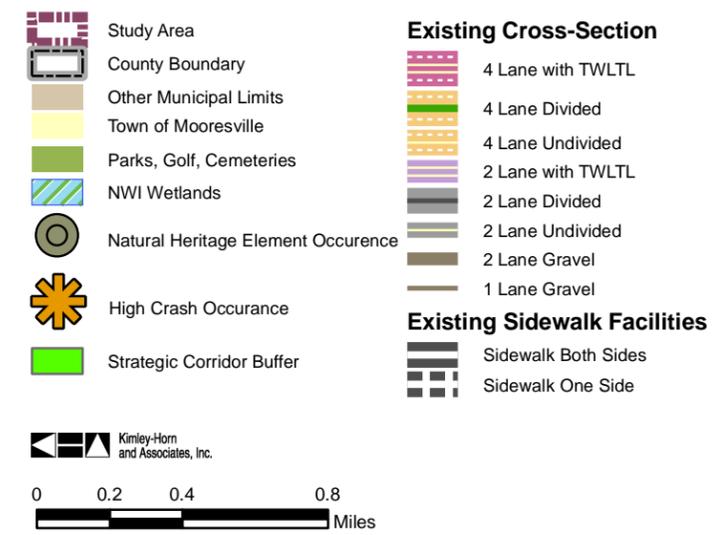


Figure 2.16
Community Strategic Corridor
NC Highway 3
Coddle Creek Highway



Corridor Length = 4.9 Miles



Corridor Description and Issues Identified

- Important travel route between Kannapolis and Mooresville
- Expected increase in daily vehicle volumes with continued growth
- Mostly 2-lane, rural corridor
- Some sidewalks along segment
- Varying levels of development
- Potential NC Strategic Corridor

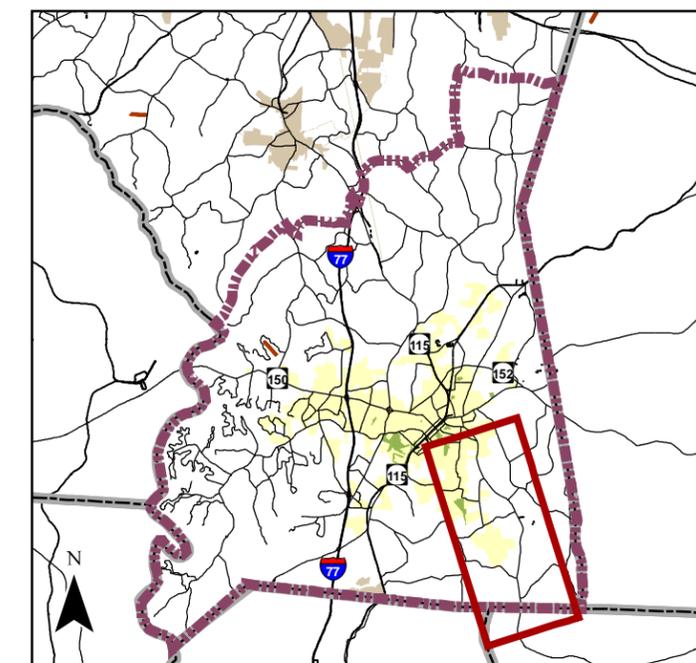
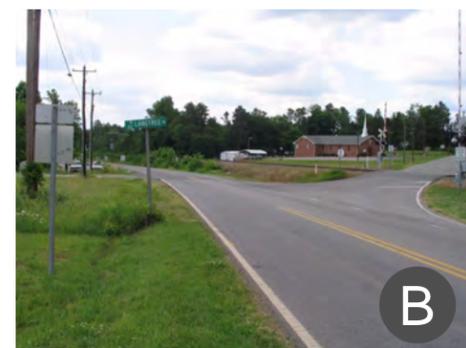
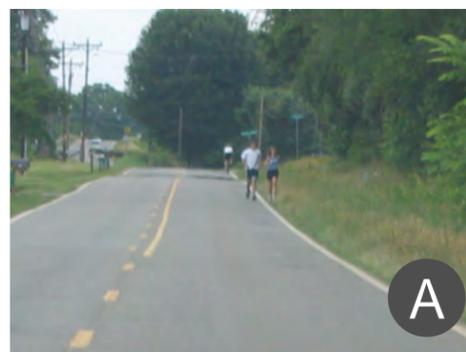
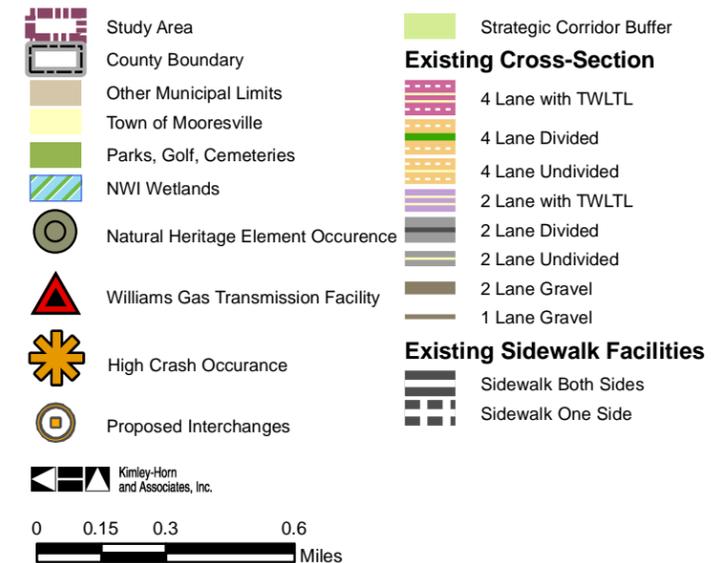
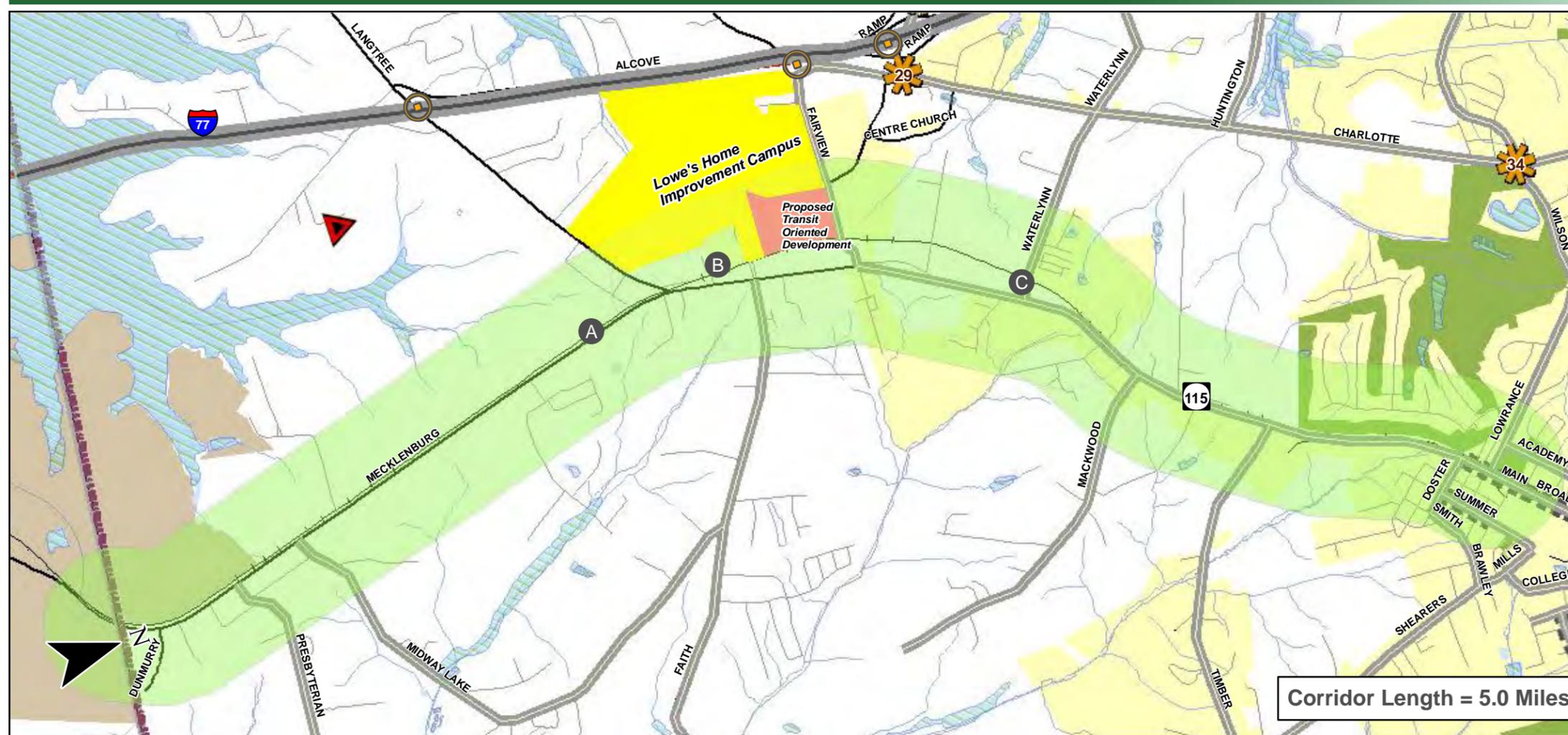


Figure 2.17
Community Strategic Corridor
NC Highway 115
Mecklenburg Highway



Corridor Description and Issues Identified

- Two-lane suburban, residential corridor
- Lack of turn-lanes at intersections
- Eroded shoulders in some sections
- Railroad track constraint on the west side of the corridor
- Excessive curb cuts

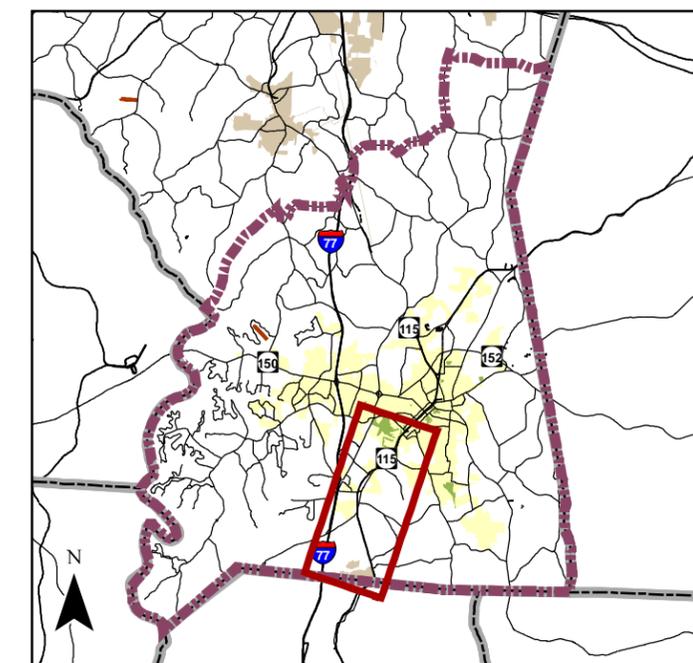
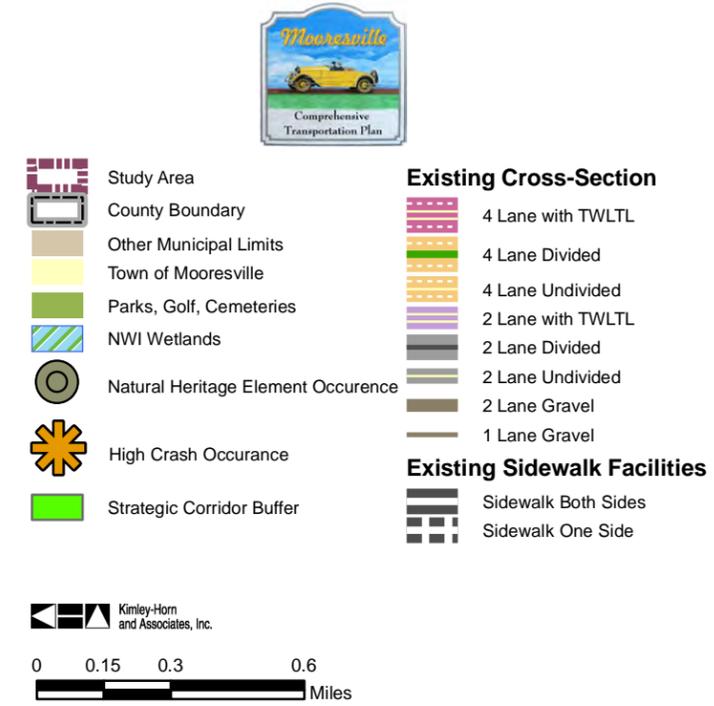
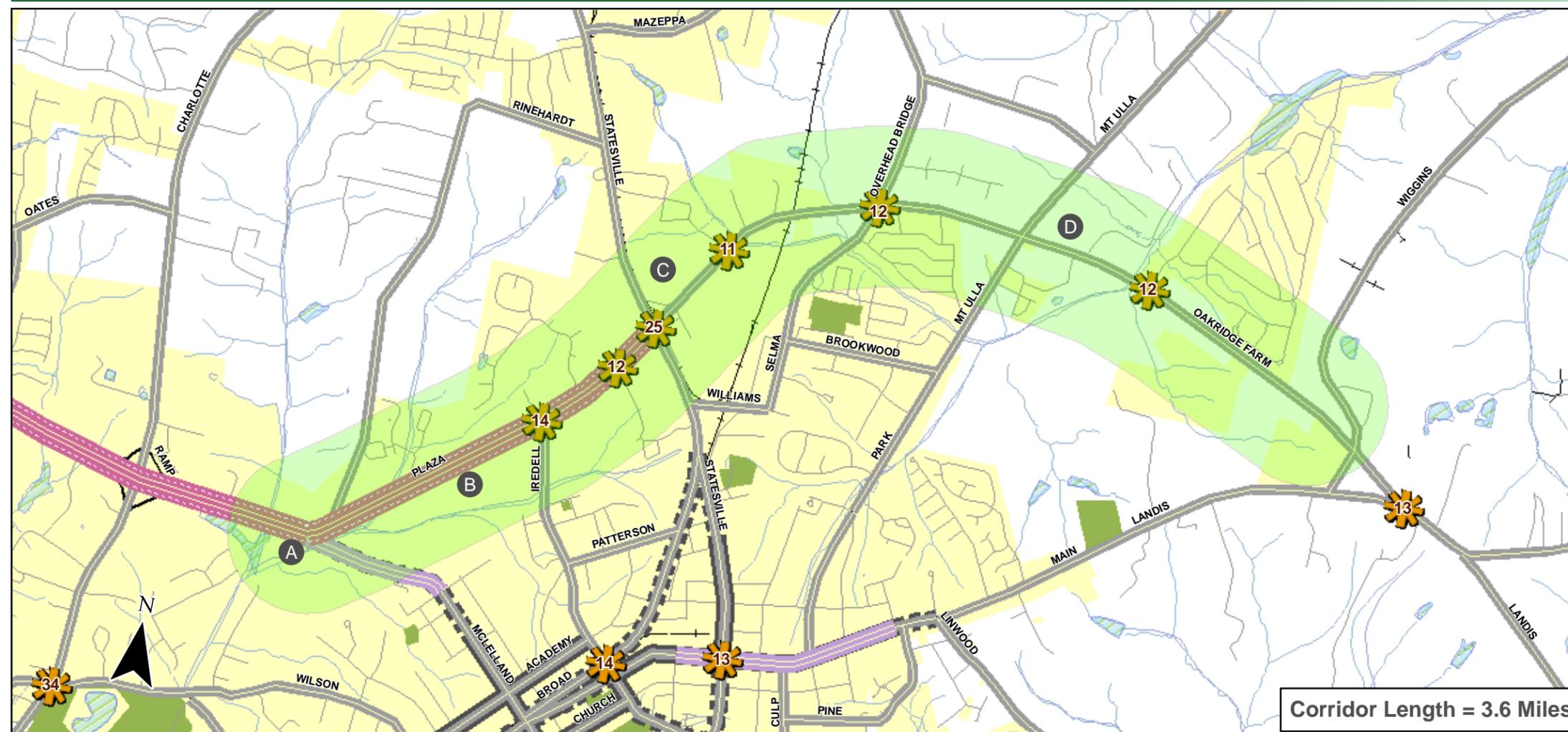


Figure 2.18
Community Strategic Corridor
NC Highway 150
Oakridge Farm Hwy



Corridor Description and Issues Identified

- Varying cross-section; two-lane to 5-lane
- Emerging Center at Landis Road intersection
- Potential center for commercial activity node
- At-grade railroad crossing at NC Highway 115/ Statesville Road intersection
- Heavy retail development along corridor

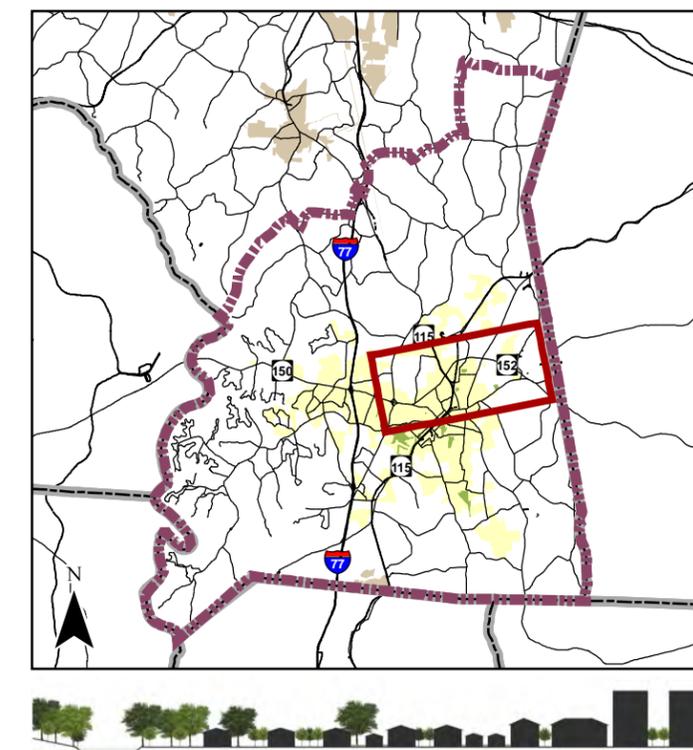
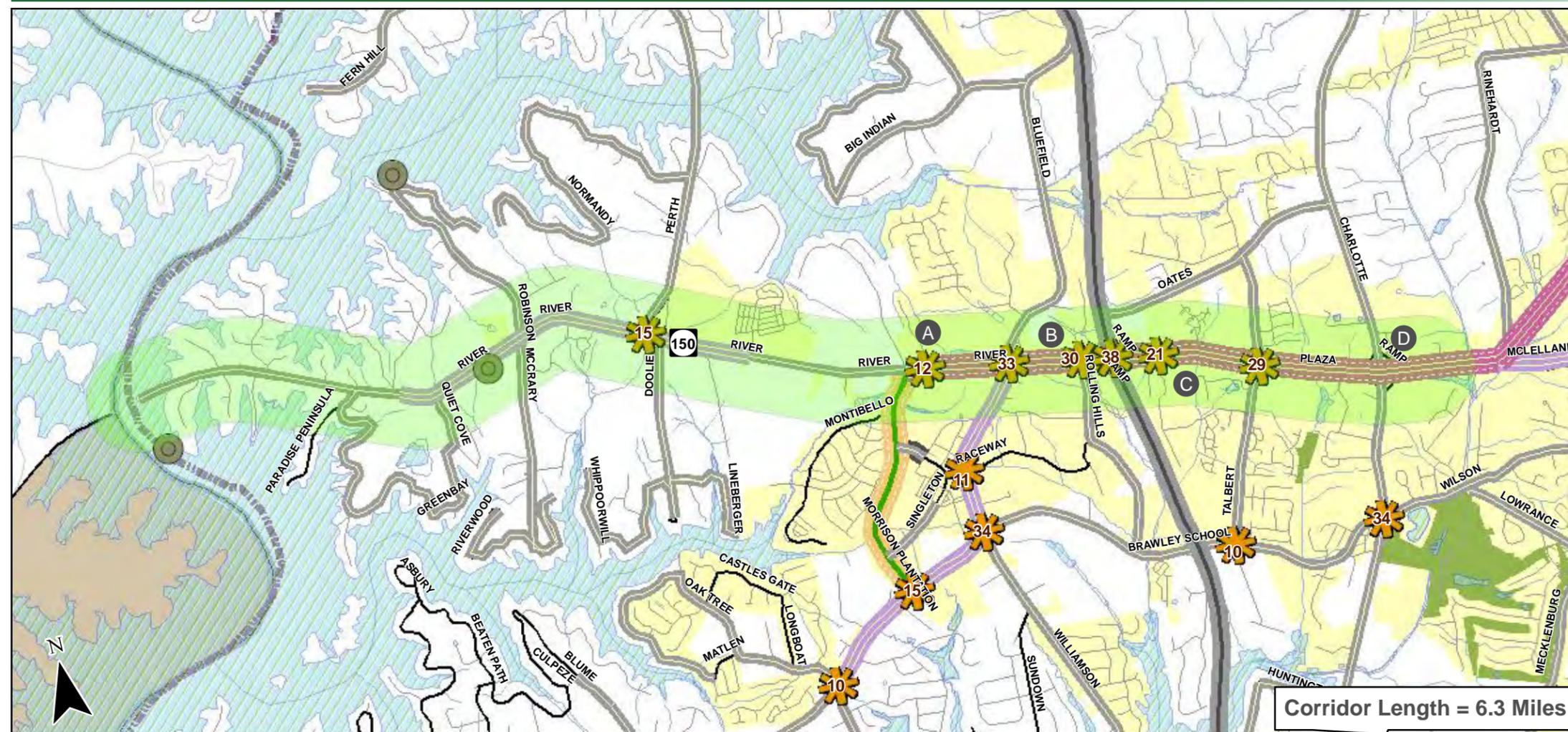


Figure 2.19
Community Strategic Corridor
NC Highway 150
River Highway



Corridor Description and Issues Identified

- Varying cross-section includes 2 to 5-lane segments
- Two-lane bridge across lake will not likely be widened
- Busy Perth/Doolie intersection with ongoing construction
- Critical section between Target Shopping Center and Statesville Road
- Significant congestion and crash history in vicinity of I-77 interchange

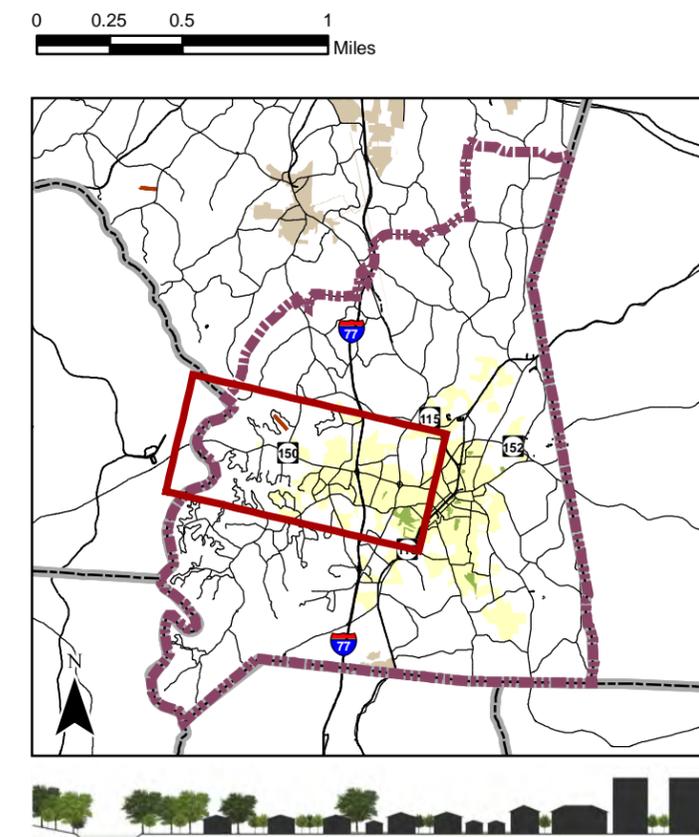
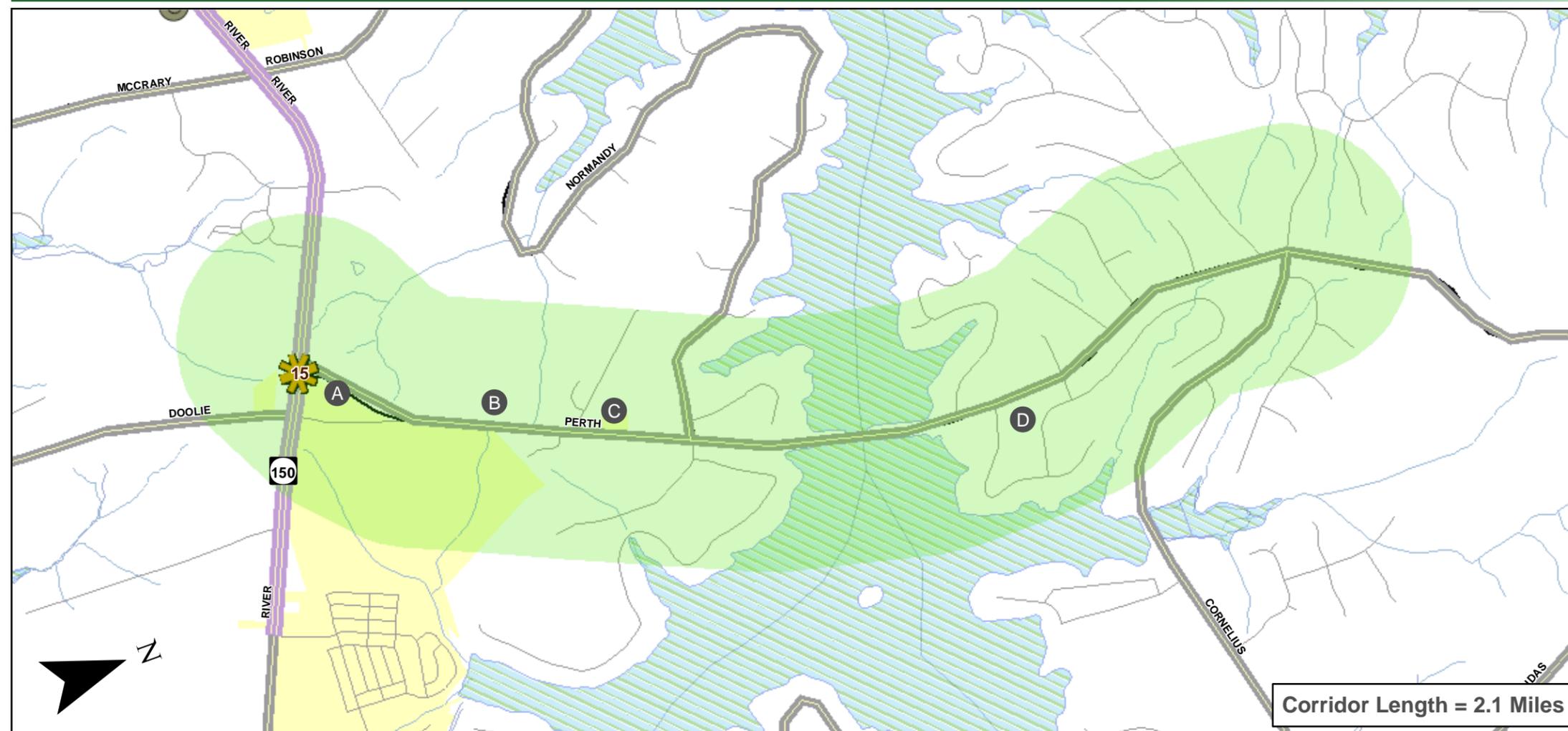
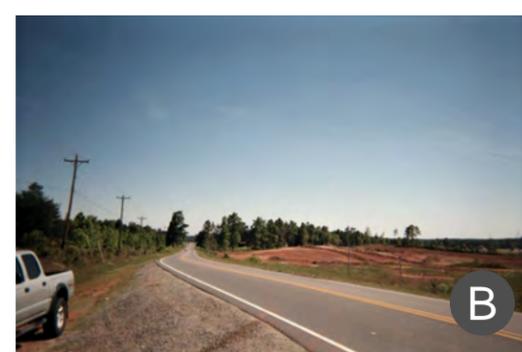
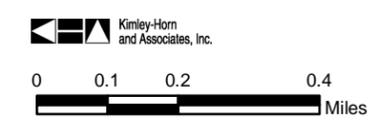


Figure 2.20
Strategic Corridor
Perth Road



	Study Area		4 Lane with TWLTL
	County Boundary		4 Lane Divided
	Other Municipal Limits		4 Lane Undivided
	Town of Mooresville		2 Lane with TWLTL
	Parks, Golf, Cemeteries		2 Lane Divided
	NWI Wetlands		2 Lane Undivided
	Natural Heritage Element Occurrence		2 Lane Gravel
	High Crash Occurrence		1 Lane Gravel
	Strategic Corridor Buffer		Sidewalk Both Sides
			Sidewalk One Side



Corridor Description and Issues Identified

- Major north-south route on the west side of the county
- Potential for becoming a high-growth area for residential and neighborhood commercial development
- County considering growth control measures
- Not yet identified as TIP project by any jurisdiction
- Existing land uses include two schools, a private airport, a large mixed-use development and some commercial development
- The intersection at NC Highway 150 is a busy commercial node
- Some eroded shoulders and pot holes
- Predominantly two-lane rural cross-section
- Two-lane bridge across the lake is a widening constraint

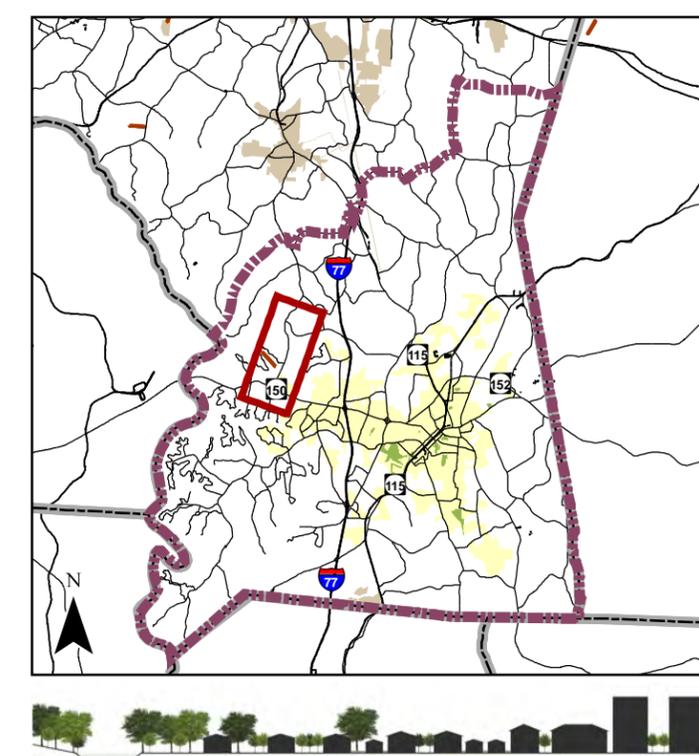
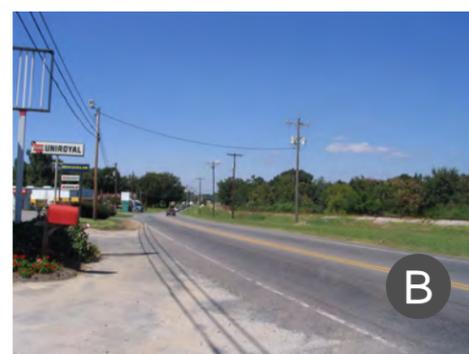
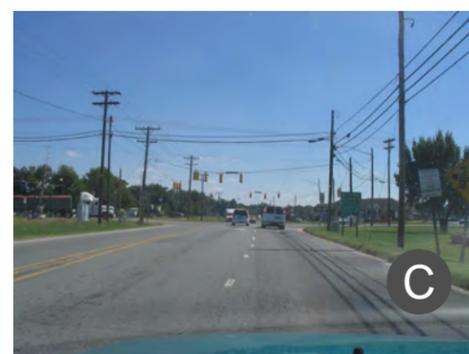
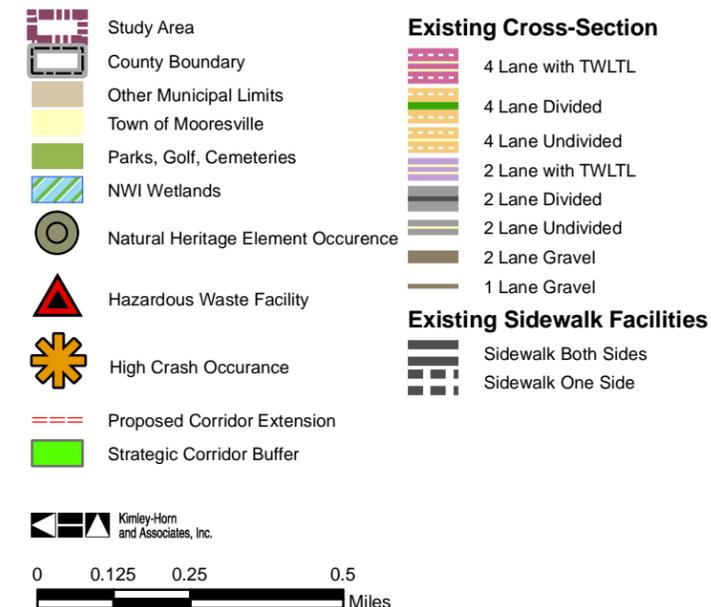
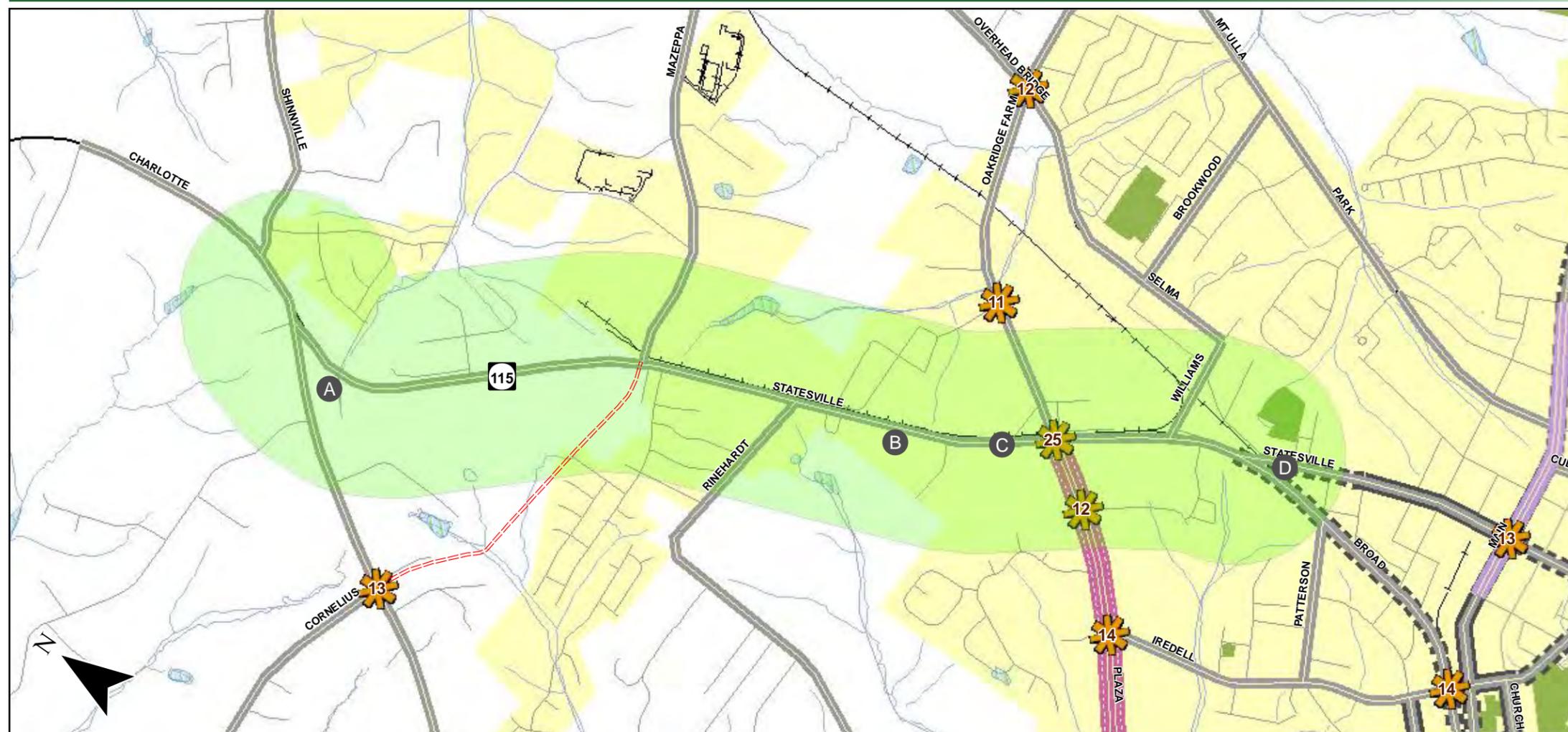


Figure 2.21
Community Strategic Corridor
Statesville Road



Issues Identified / Corridor Description

- Potential gateway to downtown
- Mostly single family homes
- Cut-thru road behind "One-Stop" gas station at US Highway 21 and NC Highway 115
- Limited sight visibility at US Highway 21 and NC Highway 115 intersection
- Potential need for a signal at NC Highway 115 and Rinehardt Road
- Railroad track constraint on the east side of the corridor

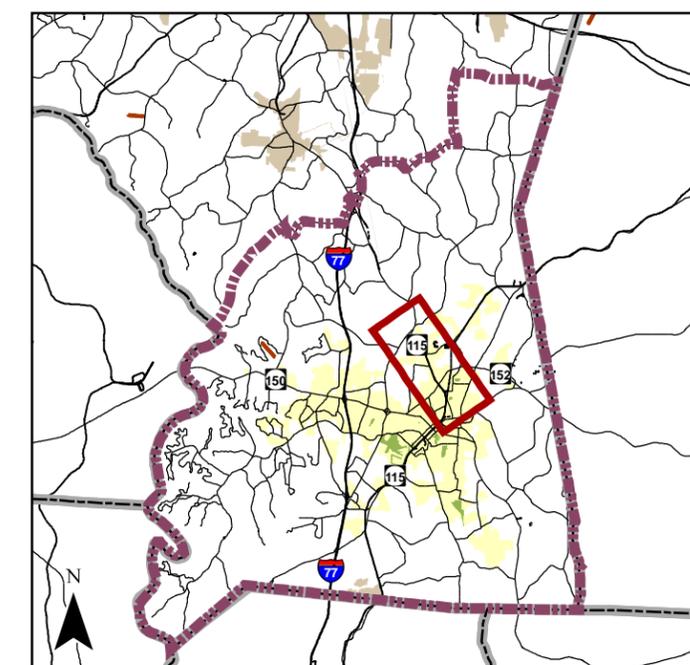
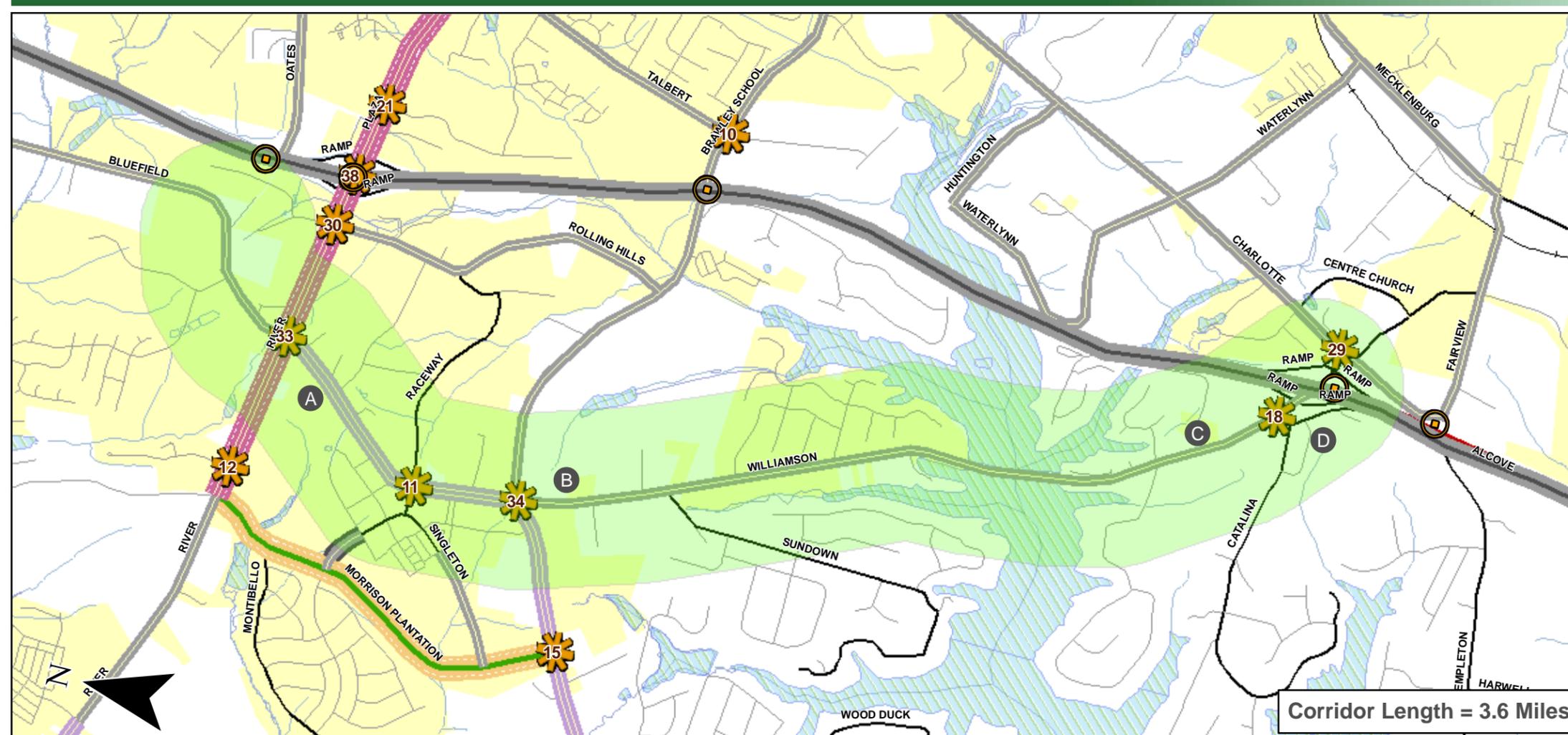
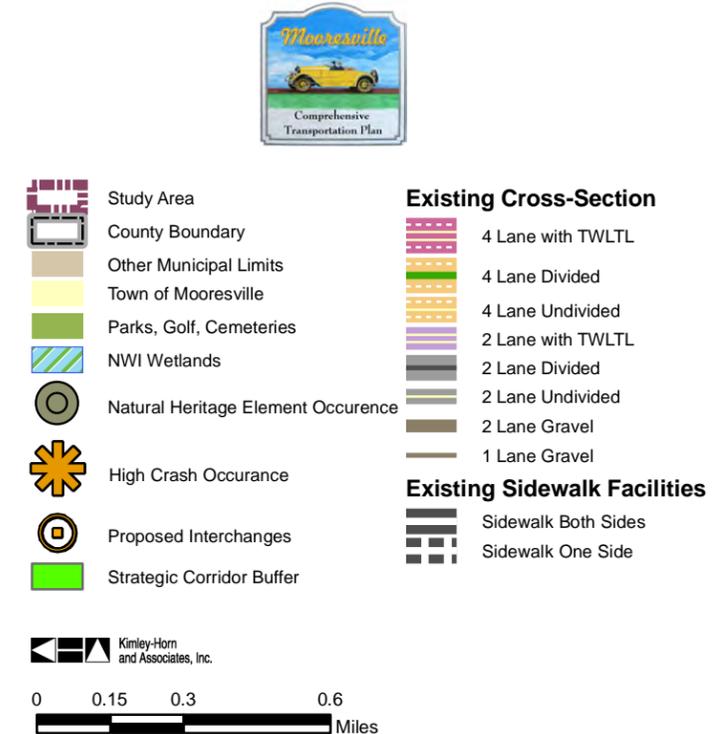


Figure 2.22
Community Strategic Corridor
Williamson Road

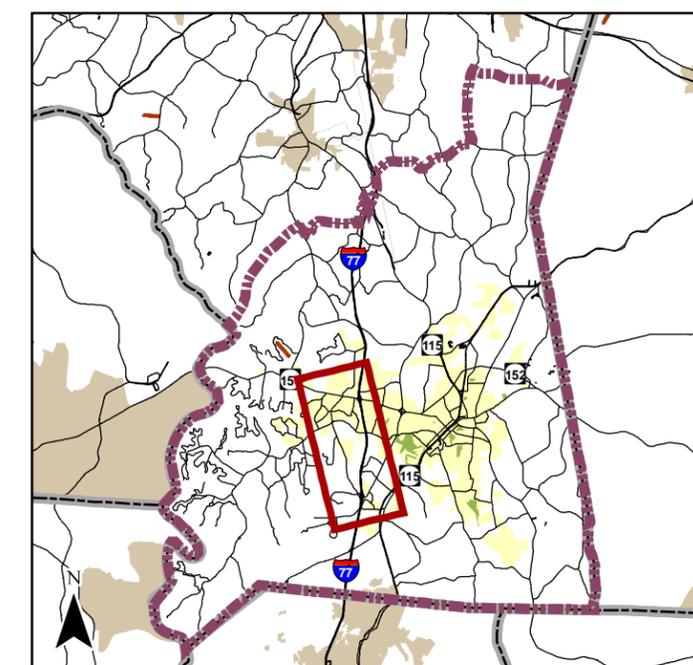


Corridor Length = 3.6 Miles



Corridor Description and Issues Identified

- Excessive driveway cuts along the corridor
- Two-lane bridge over the lake is a constraint to consider in future improvements
- Inconsistent use of curb and gutter between Brawley School Road and Exit 33
- Incremental road improvements from new developments
- Significant delays in the vicinity of intersections
- No access management policies currently being applied





Mooreville Comprehensive Transportation Plan

Chapter 3 – Vision

A critical component of any successful plan is engaging members of the public who live, work, and travel within the study area. These are the people who understand the transportation system as well as the shortcomings of the existing network. In addition to providing first-hand knowledge during the development of the plan and recommendations, it is ultimately these people who will live and work with the proposed future system. Therefore, they have a vested interest and responsibility to encourage their idea of the vision and function of their community for the future.

Public engagement for the transportation plan began early and was continuous throughout the planning process. A project website (www.moorevilletomorrow.com) was maintained to inform the public regarding plan progress and upcoming events. Two public workshops were held and public input was obtained, summarized, and used as a guide in the development of the transportation plan.



In addition, a Citizens' Advisory Committee was formed with local staff and citizens. This committee identified Town needs and interests during the plan's development. The committee contributed technical knowledge, institutional understanding, and community familiarity, and was heavily relied upon as the future transportation network and policy issues were discussed.

Members of the Citizens' Advisory Committee were further involved in identifying and evaluating strategic transportation corridors in the community. These *Strategic Vision Corridors* are a central component of the *Mooreville Comprehensive Transportation Plan* and the recommendations put forth in this document are a direct outcome of citizen input.



This extensive public involvement process was developed to gain valuable knowledge and input from the community as well as build awareness and support for the transportation plan. It is hoped that the *Mooreville Comprehensive Transportation Plan* will be supported and promoted by the public as a result of the input from knowledgeable members of the community.

Citizens' Advisory Committee

The Citizens' Advisory Committee consisted of volunteers who met on a regular basis to direct the development of the transportation plan. The Citizens' Advisory Committee's objective was to influence the plan so it would more completely represent the community's vision for Mooreville. The Citizens' Advisory Committee reviewed drafts and offered comments in order to make this plan something that they could support and promote in order to influence future implementation.

Issues Identified

This committee expressed the following concerns during the development of the *Mooreville Comprehensive Transportation Plan*

- Traffic will worsen with growth
- Planning for alternative modes must occur
- New interchanges will attract growth and change trip destinations
- Consider opportunities for walking within proximity to future rail services
- Money/financing will present challenges
- The new Lowe's corporate headquarters (10,000 – 12,000 employees) will have an impact on the Town
- The racing industry will continue to have a positive impact on the Town

Goals and Objectives

Based on the issues that were identified and the established vision for Mooreville as defined by the Citizens' Advisory Committee, the following objectives were developed to help maintain focus during the plan development.



Plan Objectives:

- Address Congestion – The existing and expected future traffic congestion must be reviewed and considered as the plan is developed and recommendations are identified
- Land Use/Transportation Integration (Land Use First, Transportation Second) – Land use and transportation should be integrated in the plan by completing a detailed look at land use first and then transportation
- Multimodal – Automobile, bike, transit, pedestrian, rail, and freight elements all need to be addressed
- Support Economic Development – Economic development should be supported by addressing existing aviation, multimodal, and congestion challenges
- Environmental Constraints, Good Stewards – Environmental constraints must be considered and projects should be recommended that are cognizant of sensitive areas
- Feasible Solution/Prioritize Recommendations (Financial Constraints) – Feasible recommendations need to be offered in this plan that are prioritized based on fiscal responsibilities
- Think Regionally, Act Locally – This plan needs to address regional challenges with local solutions wherever possible
- Collaborative Approach/Intergovernmental Coordination – In order to build a cohesive vision that can be implemented and supported by local decision-makers, this plan needs to involve appropriate levels of government
- Power to Enforce Context Based Solution – The context of issues specific to Mooreville needs to be considered in order to provide solutions based on the community vision
- Implementation – The recommendations from this plan must be able to be implemented





Mooreville

Comprehensive Transportation Plan

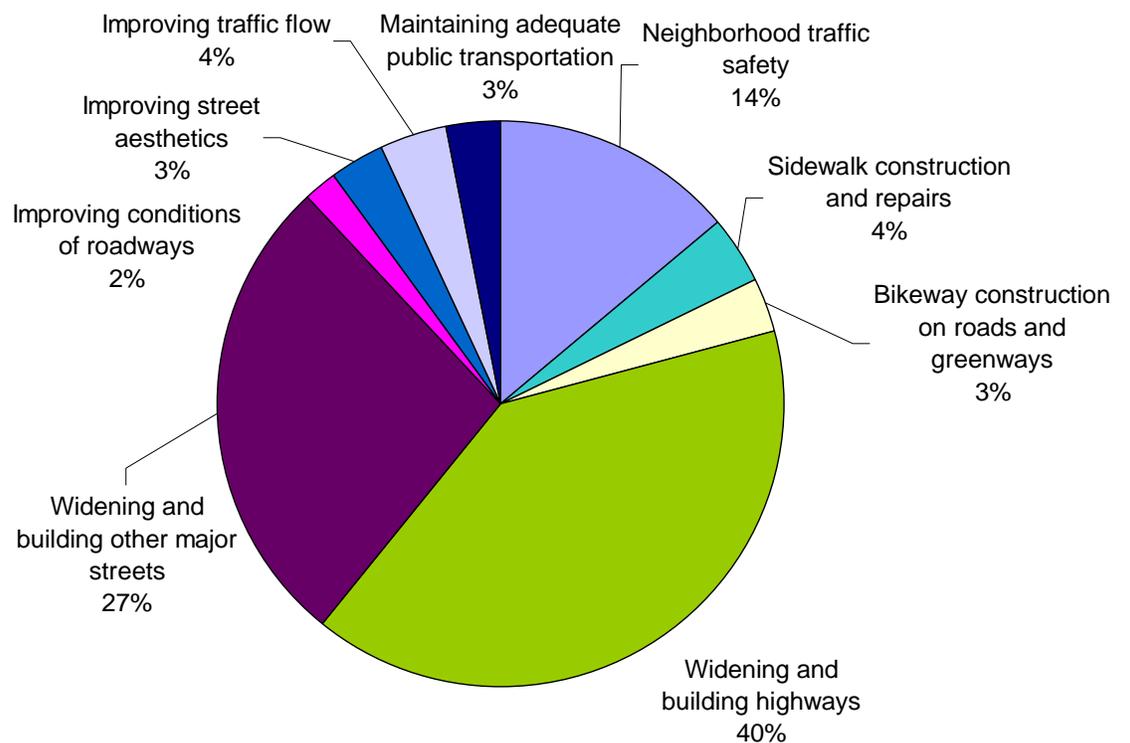
- Evacuation (e.g., Nuclear, Hurricane) – This plan should consider the possible problems that would be associated with a mass evacuation effort
- Education through an Informative Document – Finally, members of the community reviewing this plan should be educated and informed about the planning process and implementation recommendations relating to all modes of transportation for the short- and long-term horizons



Citizens' Advisory Committee Survey

To better identify the perceived needs in the community, a survey was presented to the Citizens' Advisory Committee at the beginning of this planning process.

They were presented with the question: "If you had \$100 to spend on transportation improvements, how would you spend it?" Members allocated 67% of the money to widening and building major streets and highways, 14% to neighborhood traffic safety, 10% to alternative modes of transportation, and 9% to improving traffic conditions, flow, and street aesthetics.

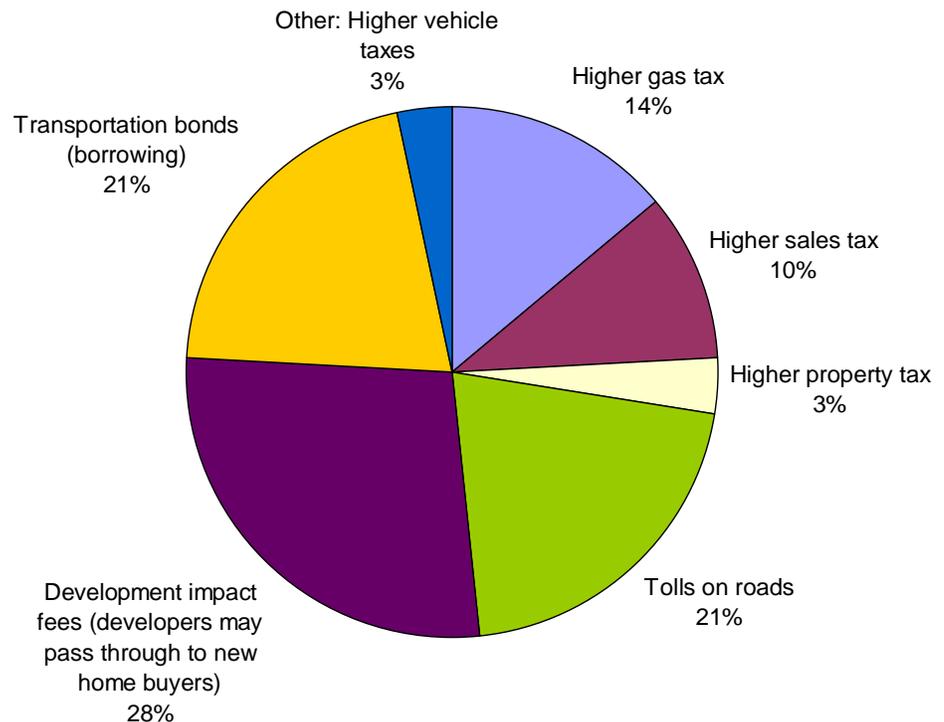


Mooresville

Comprehensive Transportation Plan

The funding situation in North Carolina today means that traditional transportation funding is inadequate. As a result, alternative funding sources need to be carefully considered in order to determine how implementation will be funded.

To gauge the Town's support for alternate funding sources, they were asked to identify what additional funding mechanisms they would support. As shown in the chart below, the committee indicated the most support for developer impact fees with 28% of the total votes. Transportation bonds and tolls on roads both received 21% of the votes, while 14% of the votes indicated support for higher gas tax, 10% for higher sales tax, and 3% each for higher vehicle and property taxes. Although transportation bonds received 21% of the total votes, it should be noted that this method of funding would not create new revenue, but rather would create debt that would need to be paid in the future by an unidentified source.

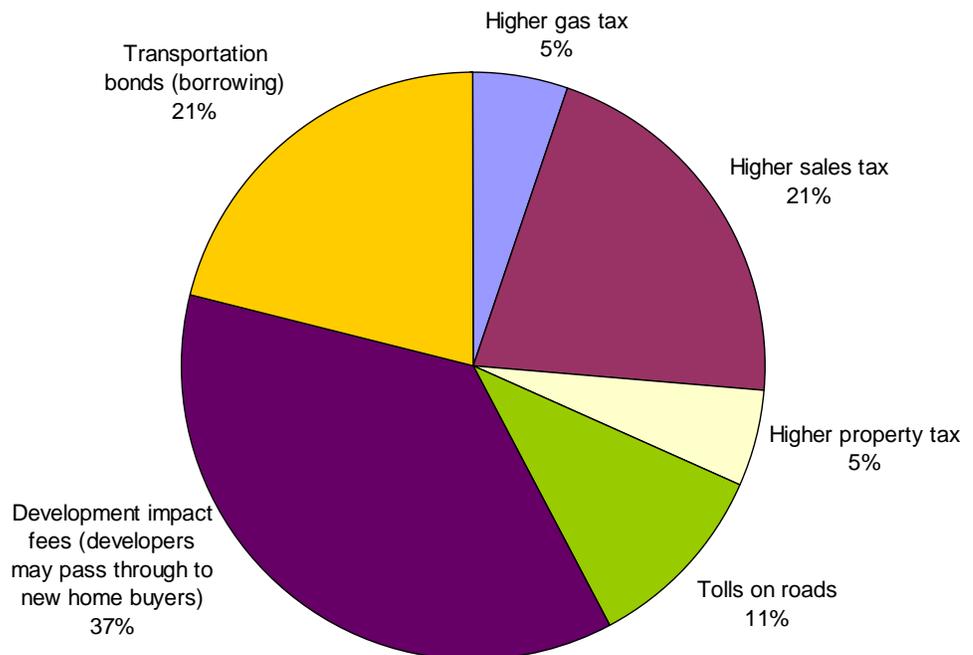


Public Workshop #1

The first public workshop was held on November 1, 2007 from 7:00 to 9:00 PM at the Charles Mack Citizen Center. During this workshop citizens offered their input on land use and transportation projects, identified issues, and brainstormed about possible solutions.

Upon arrival to the workshop, each participant was asked to complete a survey similar to the Citizens' Advisory Committee survey. It was later found that both the survey results correlated closely. This is a good indication that the Citizens' Advisory Committee is accurately representing the community.

The workshop participants were asked to identify what additional funding mechanisms they would support and given the same categories presented to the Citizens' Advisory Committee. As shown in the chart below, the public indicated the most support for developer impact fees with 37% of the total votes. Transportation bonds and higher sales tax both received 21% of the votes, while 11% of the votes indicated support for tolls on roads, and 5% each for higher vehicle and property taxes.



Mooresville

Comprehensive Transportation Plan



Following the survey, an introductory presentation was presented to orient the public to the project and process. Then participants were presented with resource maps that identified existing conditions. Finally, participants were broken in groups to list transportation and land use issues that effected Mooresville on a regular basis. Some of the responses are listed below.



- “Ensure that congestion on NC Highway 150/Williamson Road/Interstate I-77 corridors does NOT worsen.”
- Significant congested areas
 - Brawley School Road
 - Interstate I-77
 - NC Highway 150 / River Highway
 - Williamson Road
- “Future growth will require a need for a citywide bus system.”
 - New commercial development should have plans to accommodate bus stops
 - Park and Ride facility for commuters
- “Better connectivity is needed.”
 - Geographic constraints with Lake Norman
 - Insufficient collector street system
 - Need better connectivity with the pedestrian network
- “Maintain rural character in the hinterlands.”
- “Improve appearance of gateway corridors.”
 - Include aesthetic improvements at new intersections



Mooresville

Comprehensive Transportation Plan

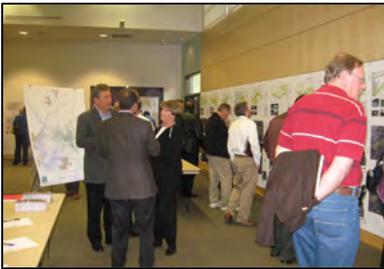


Public Workshop #2

The second public workshop was held on April 5, 2007 from 6:00 to 9:00 PM at the Charles Mack Citizen Center to present the Draft Mooresville Comprehensive Transportation Plan. A formal presentation was given to present the process of the plan and share the draft recommendations. Workshop participants were given the opportunity to review the recommendations and ask questions. Participants were overall pleased with the progress and recommendations presented. However, participants indicated concern with the recommendations located within the following corridors:



- Langtree Road
- NC Highway 115 south of downtown
- NC Highway 3 / Coddle Creek Highway
- Brawley School Road



Each of these corridors were reassessed and revisions to the draft recommendations were made and are reflected in this plan.



Strategic Corridors

As mentioned in the previous chapter, eleven strategic corridors were identified as requiring closer consideration and study. The strategic corridors analyzed for potential improvements include:

- Brawley School Road, Bay Harbour Road to Talbert Road
- Cornelius Road, Perth Road to US Highway 21
- Langtree Road, Pin Oak Lane to NC Highway 115.
- Mazzeppa Road, Overhead Bridge Road to Wiggins Road
- NC Highway 3/Coddle Creek Highway, Study Area Boundary to Eucalyptus Street
- NC Highway 115/Mecklenburg Highway, Study Area Boundary to Lowrance Avenue
- NC Highway 150/River Highway, Study Area Boundary to Charlotte Highway
- NC Highway 150/Oakridge Farm Highway, McLelland Avenue to Wiggins Road
- Perth Road, NC Highway 150/River Highway to Cornelius Road
- NC Highway 115, Charlotte Highway to Broad St
- Williamson Road, Carriage Club Drive to Interstate I-77

Corridor Visions

Based on the existing conditions in the strategic corridors and with key input from members of the Citizens' Advisory Committee, the project team developed visions for each of the eleven corridors. Figures 3.1 – 3.11 again outline the corridor and highlight a proposed future vision for the corridor including geometric and operational modifications.

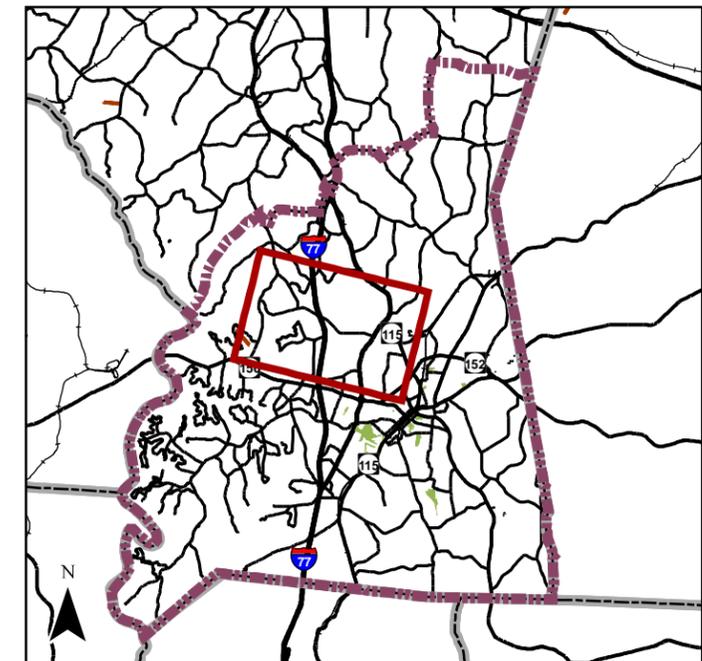




Figure 3.1
Community Strategic Corridor
Cornelius Road

-  Study Area
-  County Boundary
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Strategic Corridor Buffer
-  Proposed Corridor Extension
-  Proposed Interchanges

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Corridor Vision

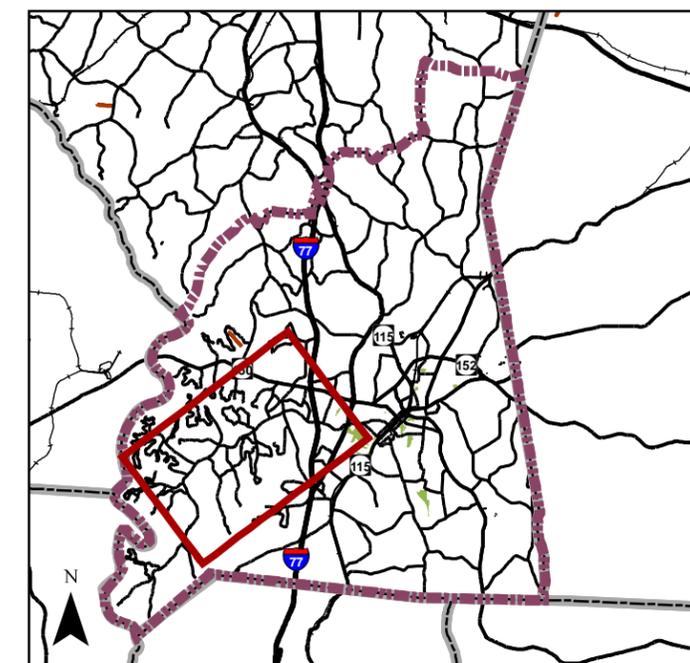
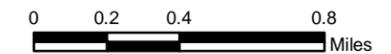
- Proposed interchange with I-77
- Connect to Mazeppa Road
- Relieve congestion from NC Highway 150 corridor
- Industrial corridor east of I-77 that must accommodate large trucks
- Residential corridor west of I-77

Figure 3.2
Community Strategic Corridor
Brawley School Road



- Study Area
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Strategic Corridor Buffer
- Proposed Interchange

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Corridor Vision

- Create suburban ambience with landscaping and traffic control per adopted plans
- Discourage commercial development west and south of Oak Tree intersection
- Modify commercial permitting and strengthen Iredell County zoning practices to protect residential areas and foster better architectural standards
- Retain residential land use east of Williamson Road intersection

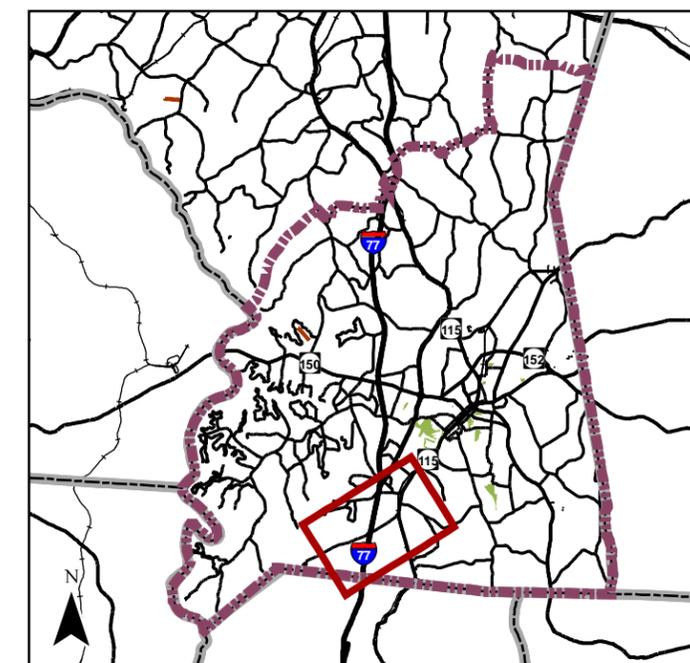
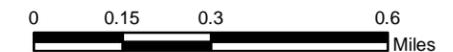


Figure 3.3
Community Strategic Corridor
Langtree Road



- Study Area
- Study Corridor
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Proposed Extension
- Proposed Interchanges
- Proposed Grade Separation

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Corridor Vision

- Gateway to Mount Mourne
- Signalization improvements to be coordinated with roadway redesign
- East-west connector to intersect with Langtree Road
- Limit the number of full movement access locations
- Right-of-way should be obtained to secure space for future capacity improvements
- Future six lane alignment
- Mitigate congestion caused by new interchange and Lowe's Campus expansion



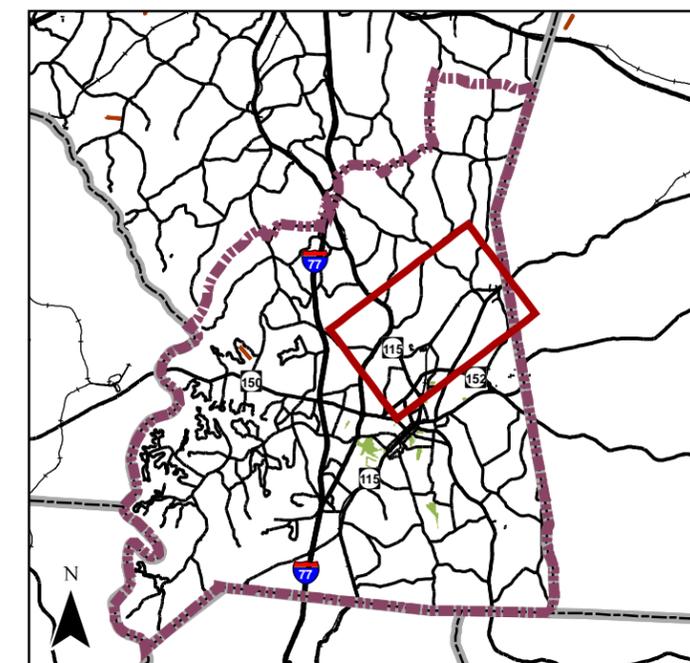
Figure 3.4
Community Strategic Corridor
Mazeppa Road



- Study Area
- County Boundary
- Study Corridor
- Bodies of Water
- Parks, Golf, Cemeteries
- Proposed Corridor Extensions

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0 0.2 0.4 0.8 Miles



Corridor Vision

- Serve as industrial and residential access road
- Widen to accommodate traffic generated by industrial land uses
- Improve the maneuverability of large vehicles
- Improvements to accommodate bikes and pedestrians per approved plans
- Proximity of railroad on south side of alignment causes difficulty constructing turn lanes

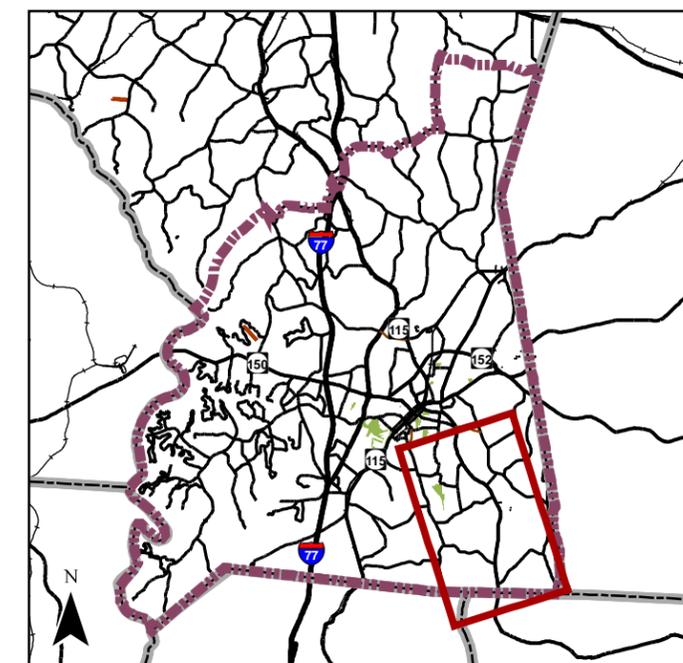
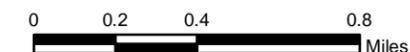


Figure 3.5
Community Strategic Corridor
NC Highway 3
Coddle Creek Road



-  Study Area
-  Study Corridor
-  County Boundary
-  Bodies of Water
-  Parks, Golf, Cemeteries

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Corridor Vision

- Preserve rural, residential character
- Restrict commercial and industrial land uses
- Potential parkway corridor with increased setbacks and tree preservation
- Roadway design should be compatible with land use



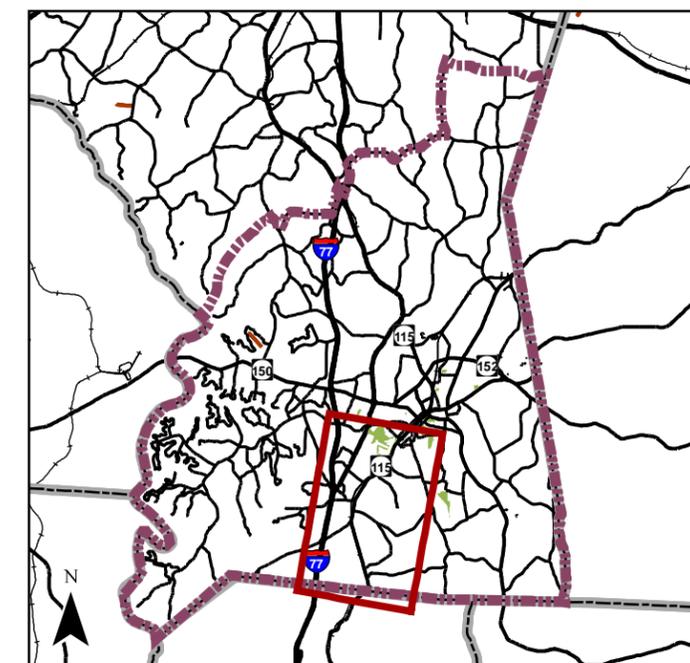
Figure 3.6
Community Strategic Corridor
NC Highway 115 South



- Study Area
- Study Corridor
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Proposed Extension
- Proposed Interchanges
- Proposed Grade Separation

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0 0.15 0.3 0.6 Miles



Corridor Vision

- "A safe multi-modal corridor with rural character"
- Future Lake Norman Bike Loop Corridor
- Discourage widening to multiple lanes
- Add paved shoulder and additional turn lanes at major intersections
- Include sidewalks where appropriate

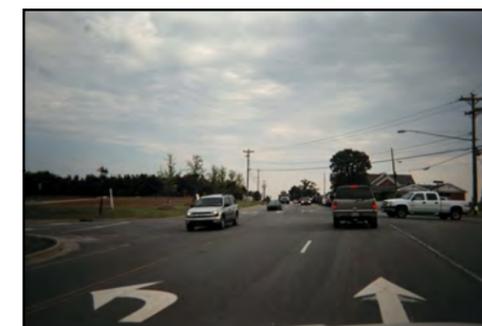
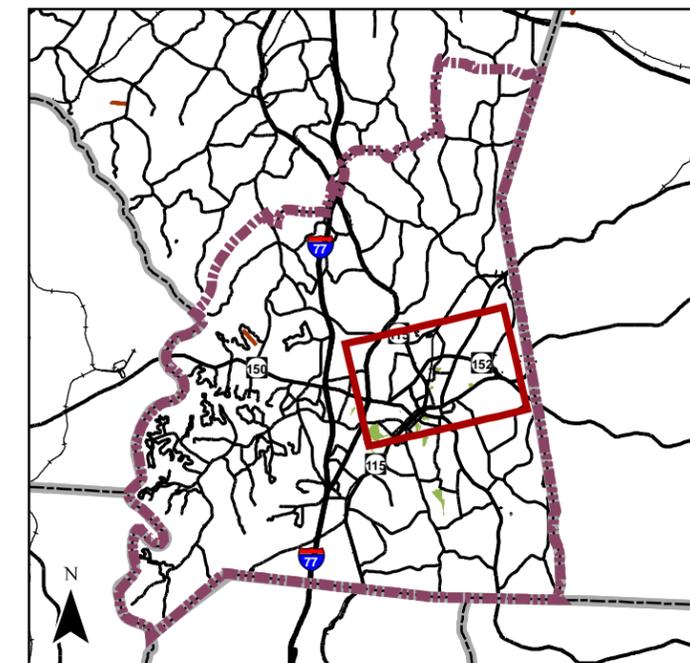
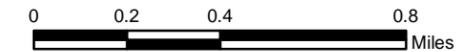


Figure 3.7
Community Strategic Corridor
NC Highway 150 East



-  Study Area
-  County Boundary
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Strategic Corridor Buffer

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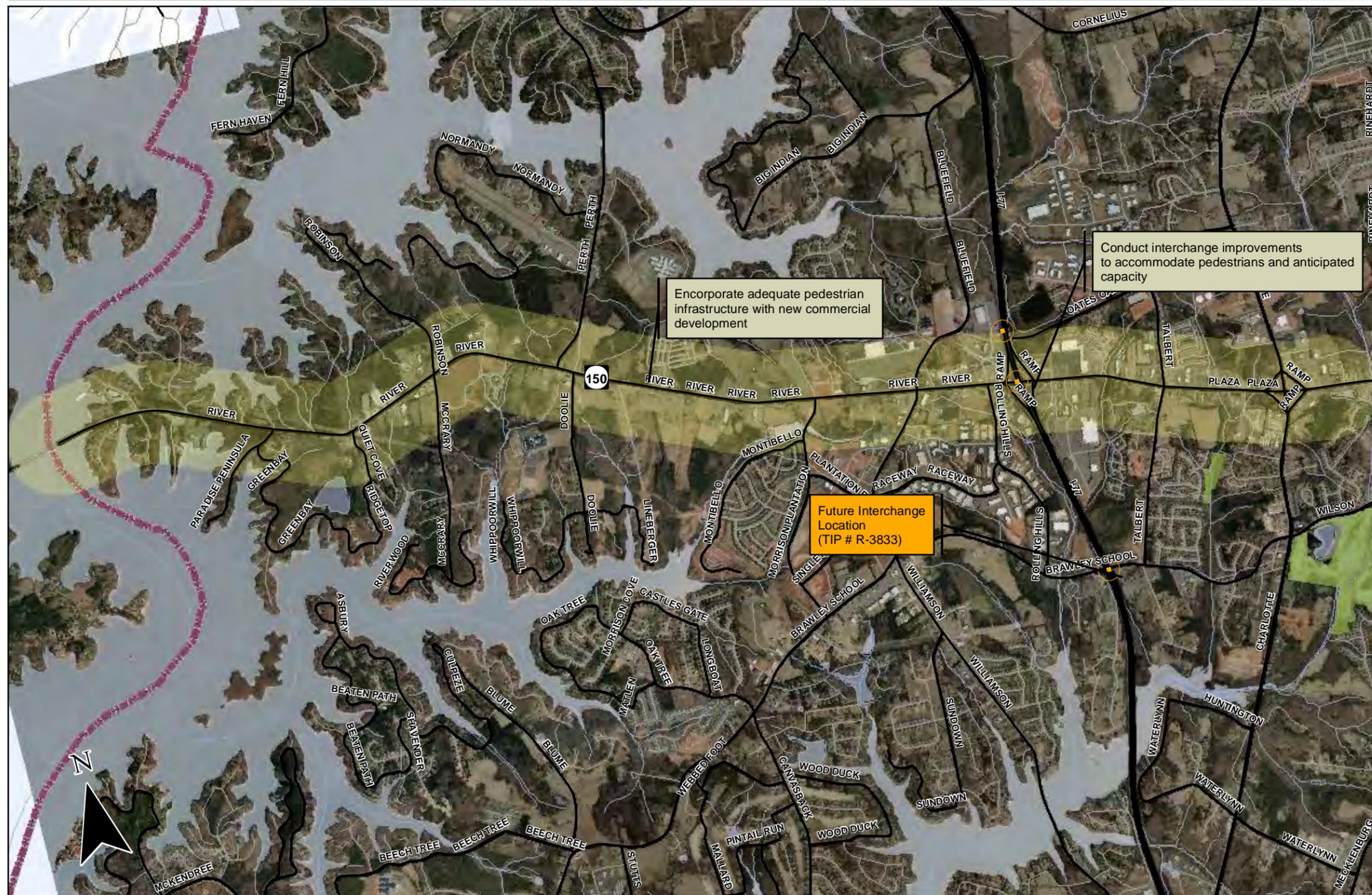


Corridor Vision

- Gateway to downtown
- A transitional area between suburban and rural areas
- Application of access management principles per approved plans
- Consider dedicated turn lanes where warranted
- Provide sidewalks in the vicinity of East Mooresville Intermediate School

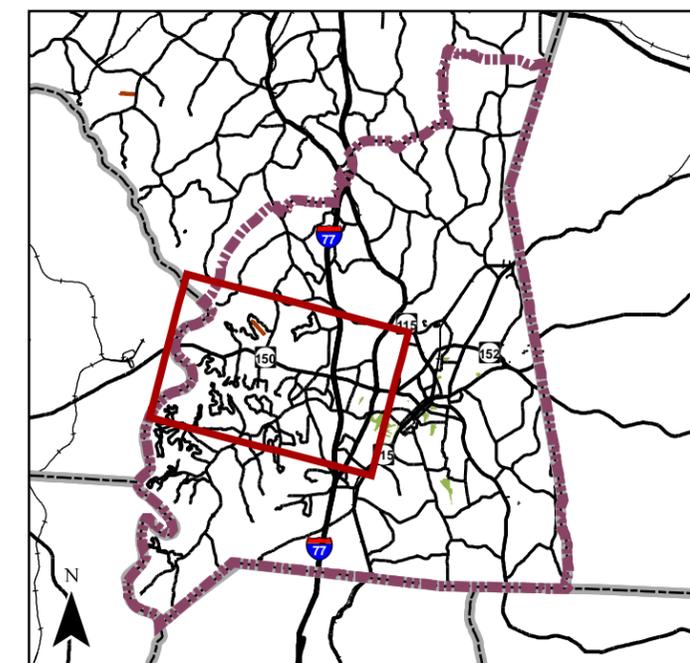
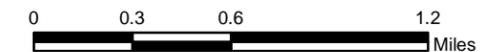


Figure 3.8
Community Strategic Corridor
NC Highway 150 West



- Study Area
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Strategic Corridor Buffer
- Proposed Interchange

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Corridor Vision

- Economic development gateway
- Construct medians with turn lanes
- Consolidate driveway access
- Improve interchange with I-77 to accommodate pedestrians and anticipated vehicular capacity
- Provide sidewalks to enhance pedestrian access to commercial development



Figure 3.9
Community Strategic Corridor
Perth Road



-  Study Area
-  County Boundary
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Airport Runways
-  Strategic Corridor Buffer

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Corridor Vision

- An arterial for north-south traffic in Iredell County
- Limit/consolidate driveway access
- Construct turn lanes per approved plans
- Bridge constrains widening possibilities

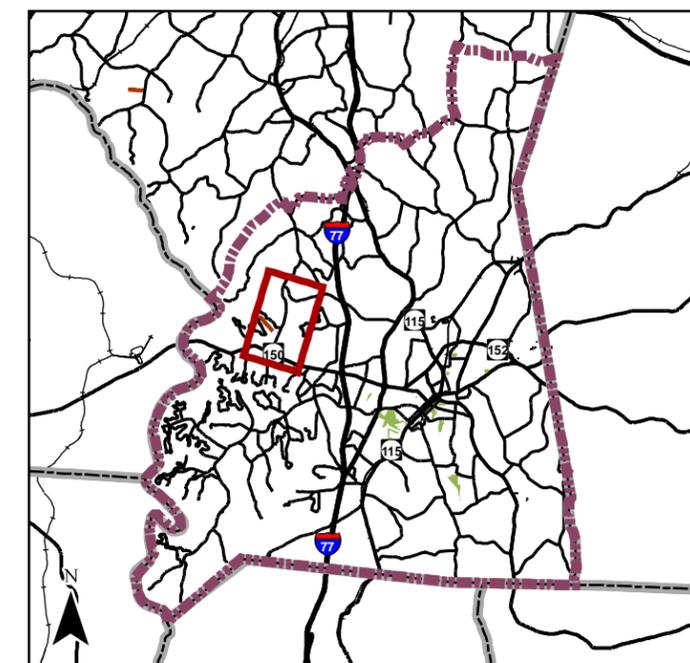
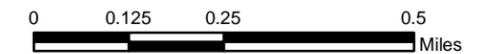


Figure 3.10
Community Strategic Corridor
NC Highway 115
Statesville Rd



- Study Area
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Strategic Corridor Buffer
- Proposed Corridor Extension

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Corridor Vision

- Gateway to downtown
- Provides access to residential development along Statesville Road
- Reconstruct as a multi-lane facility north of NC Highway 150
- Downtown to NC Highway 150 shall retain urban character

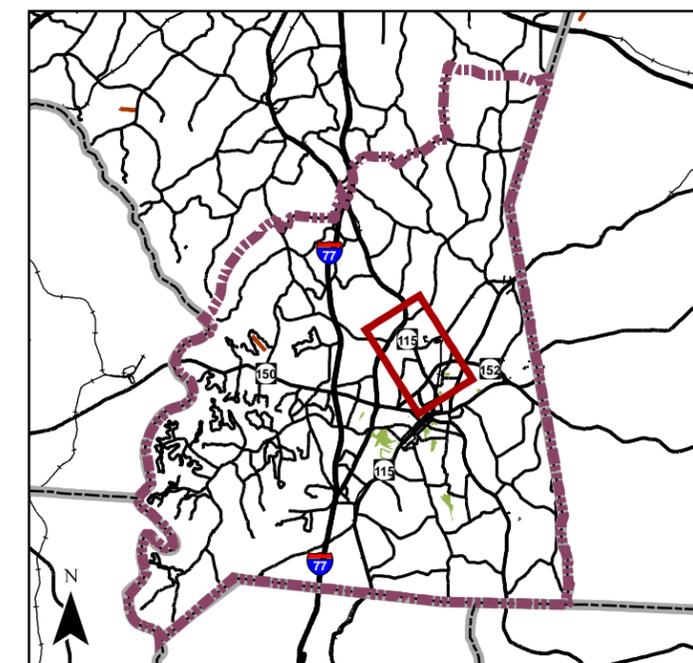
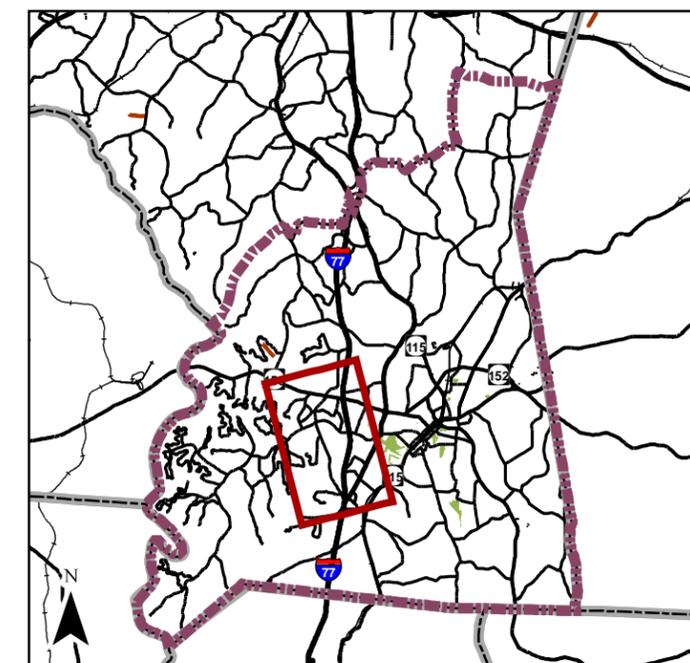
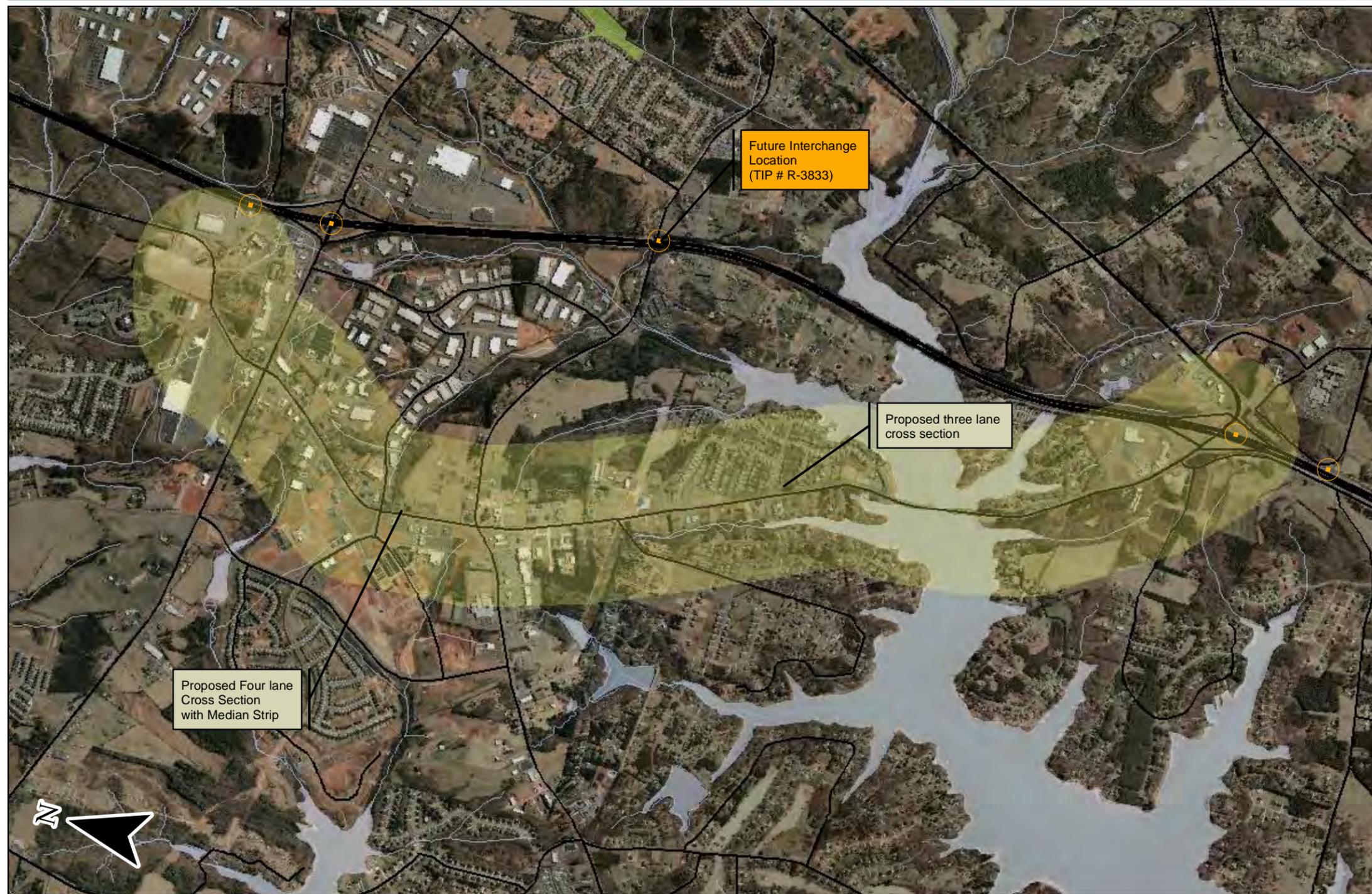
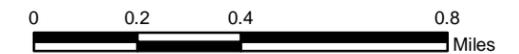


Figure 3.11
Community Strategic Corridor
Williamson Road



-  Study Area
-  County Boundary
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Strategic Corridor Buffer
-  Proposed Interchange

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Corridor Vision

- Reconstruct as a three lane cross section from I-77 to Brawley School Road
- Reconstruct as a four lane cross section from Brawley School Road to NC Highway 150
- Construct a sidewalk on the side of the road with the commercial development
- Promote consistent use of curb and gutter along corridor
- Eliminate/consolidate driveways by applying principles of access management
- Protect traffic operations

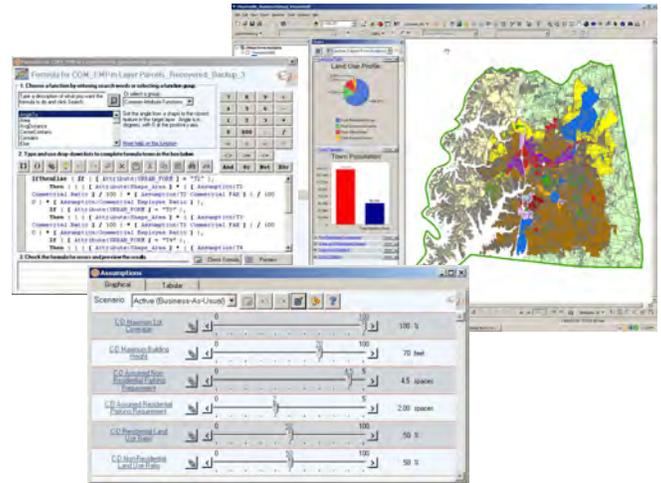




Mooresville Comprehensive Transportation Plan

Chapter 4 – Scenario Planning

Scenario planning represents the next generation of analytical processes created to evaluate the influence of development intensities and land use patterns on the efficiency of a proposed transportation system. Visualization of the interaction between land use and transportation decisions, as well as causal factors that



explain the push-pull relationship between them, provide community leaders with the information they need to evaluate the consequences of potential actions. Building on this momentum, the Federal Highway Administration, Environmental Protection Agency, and other federal agencies are actively promoting the use of scenario planning models by state agencies, metropolitan planning organizations, and local governments to better integrate transportation and land use decisions.

The Town of Mooresville is leading the movement in North Carolina to incorporate scenario planning in the process of developing local Comprehensive Transportation Plans (CTP). Town officials initially hosted a scenario planning peer workshop sponsored by the Federal Highway Administration on July 20, 2005 to link the development of the CTP with scenario planning. Since then, they created a spatial data planning model using Community Viz software that evaluates the impacts of land use decisions on surrounding public facilities and services. An enhanced spatial data planning model was developed by the consultant preparing the *Mooresville Comprehensive Transportation Plan* to measure the influence of urban form on regional travel behavior.

Evaluating the relationship between urban form and regional travel behavior in a scenario planning analysis produces several benefits. When considered together, decisions and investments regarding both elements can have a significant bearing on the Town of Mooresville:



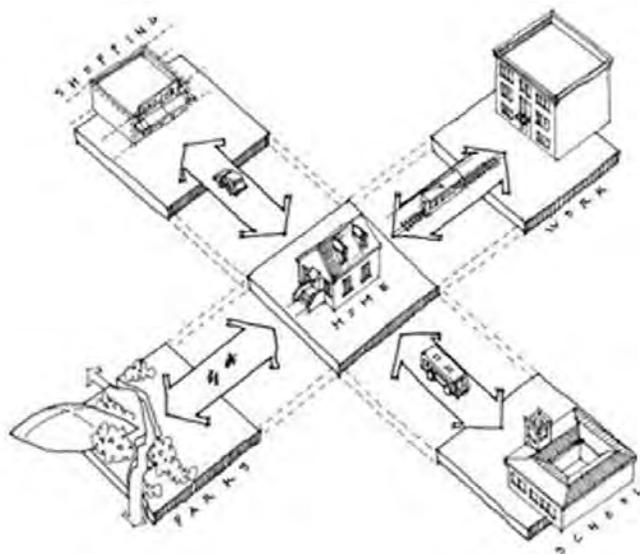
Mooresville

Comprehensive Transportation Plan

- The impacts to sensitive land uses can be minimized when facilities identified for transportation investments are located *after* considering appropriate land use patterns and development intensities for the area.
- Prime locations for development can be stimulated if transportation investments consider available capacity or appropriate mobility options.
- Complementary activities can be placed next to existing or planned transportation infrastructure, making the most of land use opportunities and dedicated transportation investments.
- The quantity and location of travel demand can be influenced by land use decisions, making the possibility of real choices for various modes of travel both accessible and attractive.

Urban Form & Travel Behavior

Scholars explain urban form as the spatial footprint of our cities; it is measured by street patterns, block length, mix of land uses, maximum building height, average residential density, and non-residential intensity. Categorization of these design elements measures the town's coherence, and follows a natural progression from rural to suburban to urban. Urban form categories and the surrounding transportation system often influence each other in a cyclical pattern.

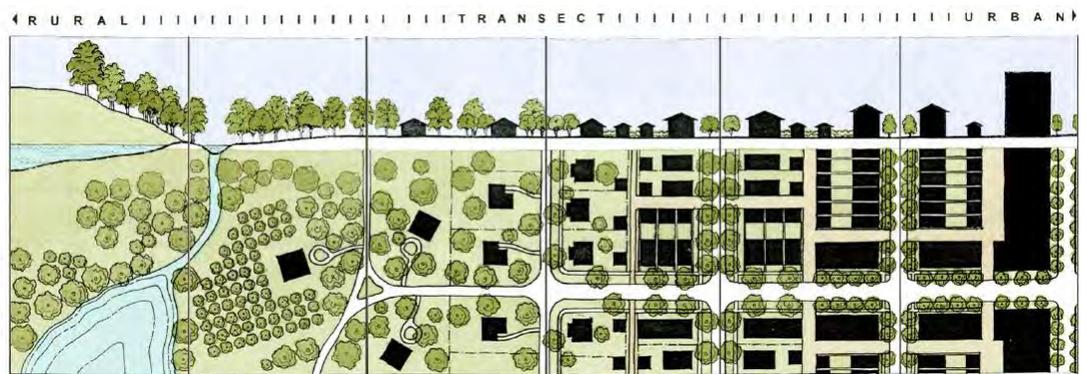


Elements of transportation — including roads and pedestrian, bicycle, and transit facilities — impact how land is developed in terms of density and even types of land use. Further, where land uses fall and how they are distributed inevitably impacts decisions regarding where people travel and how transportation facilities are prioritized. If low-density development is spread out, the residents of such areas must rely almost entirely on automobiles to get from one location or land use to another. On the other hand, denser urban centers that combine complementary land uses near each other enable greater choice in transportation.

Reorganization of urban form in the Town of Mooresville for a more efficient transportation system requires that community leaders evaluate the four Ds commonly associated with the relationship between land use, urban design and transportation – density, diversity, design and destinations. By doing so, Mooresville will be able to shorten the commuting distance between complementary land uses, provide more travel choices, and create a more efficient transportation system.

The Transect 1

The transect, developed by Andres Duany, provides a framework for organizing the components of urban form within the human environment. It follows a continuum from natural environment to urban center, with discrete categories established for specific urban form categories that vary by level of intensity and urban character (see diagram below).



The plan above illustrates how the transect classifies elements of the human environment from rural to urban, in a left-to-right sequence. (Source: Duany, Plater-Zyberk, 2007)





Mooresville

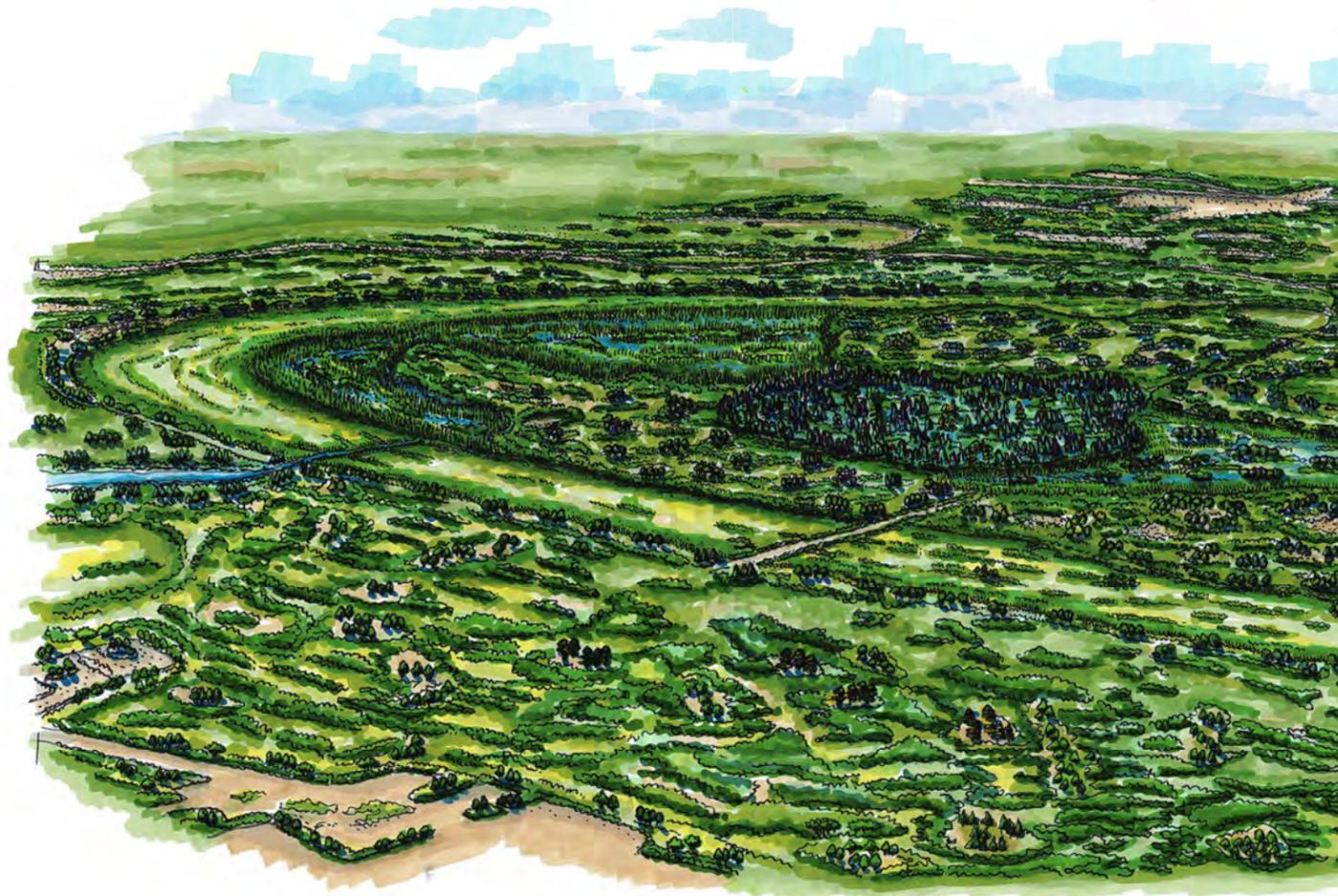
Comprehensive Transportation Plan

These discrete categories become the basis for organizing components of the built environment: densities/intensities, street patterns, land use and other physical elements. In planning for new development and redevelopment, purposeful combination of the components that define specific urban form categories creates immersive environments – places that have an integrity and coherence about them to reinforce an intended sense of place. At the boundaries between urban form categories, an overlap of defining elements allows them to fit together smoothly.

The transect applied to the Mooresville study area was divided into seven discrete urban form categories: environmentally sensitive areas, rural, lakeside living, suburban, general urban, urban center, and a special district created to represent the *Mount Mourne and South Iredell Master Plan*. As defined by the mix of land uses, average residential density and non-residential intensity, typical street pattern and block lengths, and maximum building height, each urban form category represents a unique development pattern in Mooresville. The illustrations that follow in Figures 4.1 through 4.7 describe in detail the physical elements used to define the seven urban form categories.

¹ Description of the transect developed from various publications of Andres Duany and Emily Talen: *Transect Planning*, 2002; *Making the Good Easy: The Smart Code Alternative*, 2002; and *A New Theory of Urbanism*, 2000.



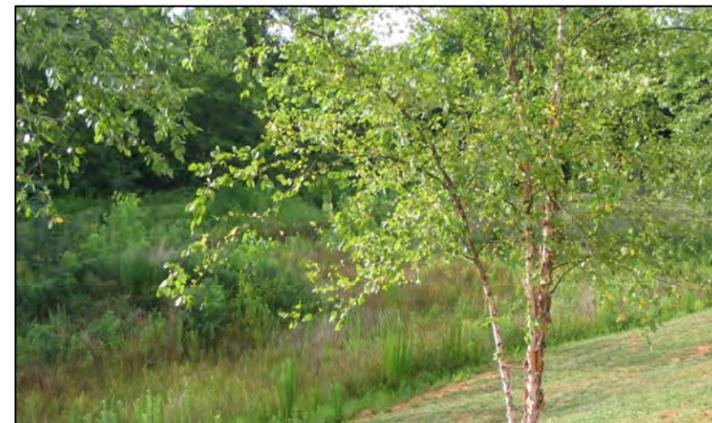


Environmentally sensitive areas remain generally undeveloped to protect the integrity of these natural areas as a critical component of the regional water supply watershed.

Local Examples:



Cherry Grove Development near NC 15

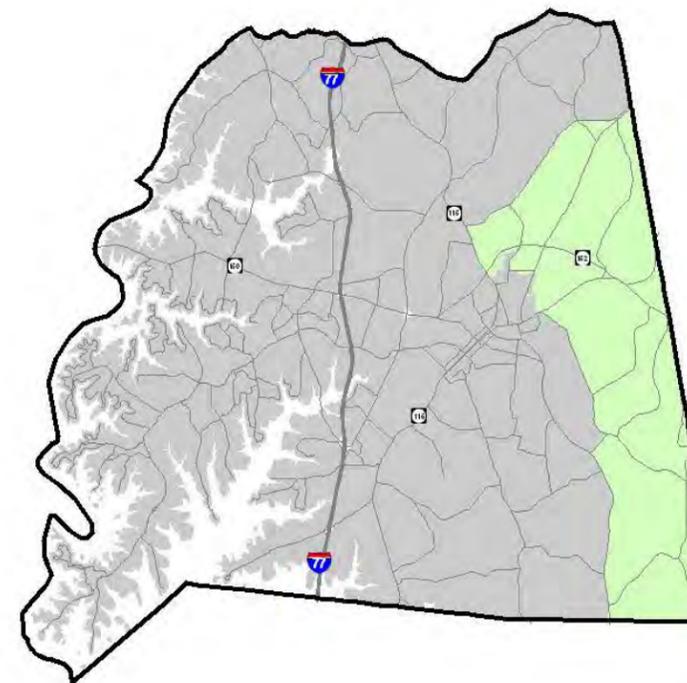


Flowering Grove Lane near NC 15

General Development Characteristics

Average Base Residential Density	1.0 d.u. / acre
Typical Street Pattern	Curvilinear
Typical Block Length	N/A
General Land Use Pattern	Isolated Uses
Maximum Building Height (stories)	2 stories
Mix of Land Uses	
Residential Ratio	20%
Commercial Ratio	0%
Office Ratio	0%
Industrial Ratio	2%
Open Space Ratio	78%
Non-Residential Intensities	
Commercial FAR	0.10
Office FAR	0.10
Industrial FAR	0.10
Persons per Household	2.55

This table summarizes general development characteristics for environmentally sensitive areas that were incorporated into the scenario planning analysis. Generally, this urban form category isolates different land use types in low-density development patterns. The predominate land use type is single-family residential, subject to the limitations set forth in the Yadkin-Back Creek and Yadkin-Caddle Creek Watershed (WS-II-BW) Zoning Overlay Districts.



Environmentally sensitive areas include the Yadkin-Back Creek and Yadkin-Caddle Creek Watershed (WS-II-BW) Zoning Overlay Districts described in Section 14.4 of the Town of Mooresville Zoning Ordinance.

Figure 4.1
Urban Form
Category Descriptions



T1 – Environmentally Sensitive





Rural areas support primarily low-density, residential development on the outskirts of the urbanized area.

Local Examples:



US 115 south of intersection with US 21

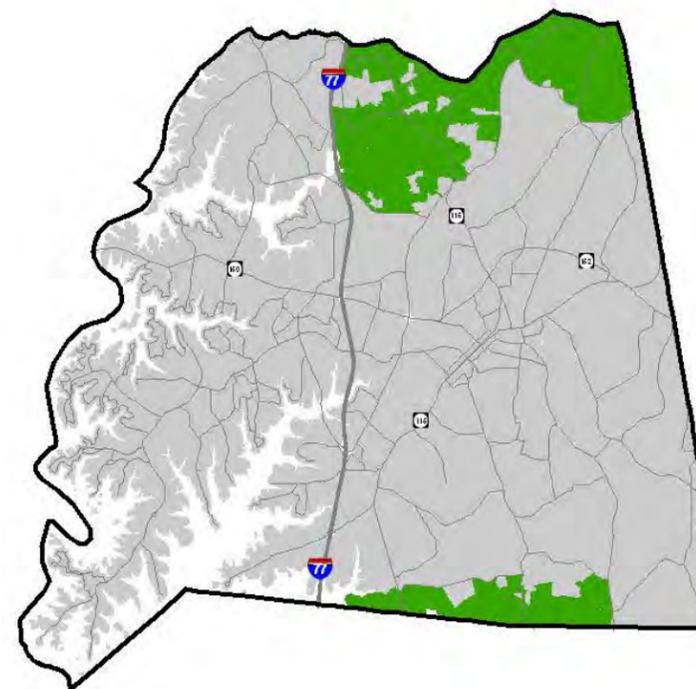


US 21 south of Parkertown Road

General Development Characteristics

Average Base Residential Density	1.0 d.u. / 5 acre
Typical Street Pattern	Curvilinear
Typical Block Length	N/A
General Land Use Pattern	Isolated Uses
Maximum Building Height (stories)	2 stories
Mix of Land Uses	
Residential Ratio	20%
Commercial Ratio	1%
Office Ratio	0%
Industrial Ratio	6%
Open Space Ratio	73%
Non-Residential Intensities	
Commercial FAR	0.15
Office FAR	0.15
Industrial FAR	0.10
Persons per Household	2.55

This table summarizes general development characteristics for rural areas that were incorporated into the scenario planning analysis. Generally, this urban form category isolates different land use types in low-density development patterns. The predominate land use type is single-family residential; however, small pockets of commercial and industrial uses are spread throughout the landscape to serve rural residents.



Rural areas include land at the northern and southern extremes of the study area that are generally located east of Interstate 77.

Figure 4.2
Urban Form
Category Descriptions



T2 – Rural





Lakeside living areas support primarily single-family, residential development on large lots along Lake Norman.

Local Examples:



McCrary Road near NC 150

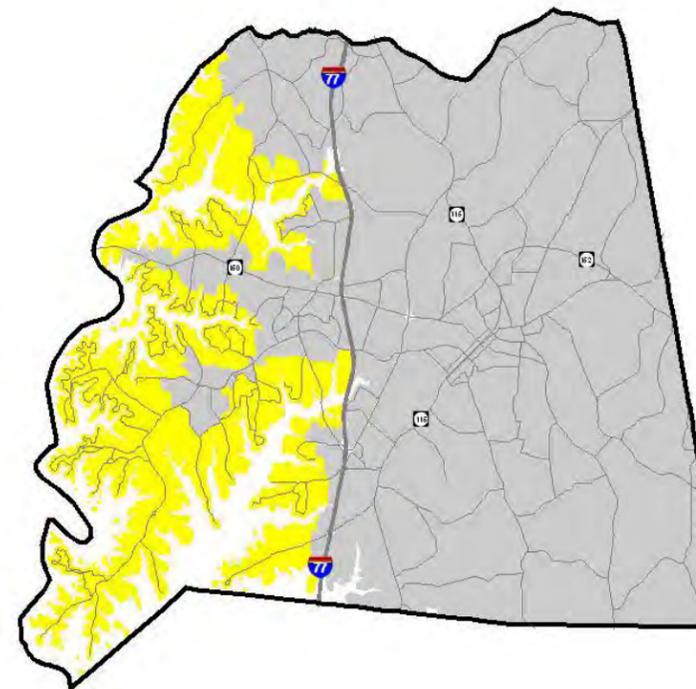


Pinnacle Shores near NC 150

General Development Characteristics

Average Base Residential Density	1.65 d.u. / acre
Typical Street Pattern	Curvilinear
Typical Block Length	800 - 1000 feet
General Land Use Pattern	Isolated Uses
Maximum Building Height (stories)	2 stories
Mix of Land Uses	
Residential Ratio	25%
Commercial Ratio	1%
Office Ratio	0%
Industrial Ratio	0%
Open Space Ratio	74%
Non-Residential Intensities	
Commercial FAR	0.20
Office FAR	0.20
Industrial FAR	0.10
Persons per Household	2.55

This table summarizes general development characteristics for lakeside living areas that were incorporated into the scenario planning analysis. Generally, this urban form category isolates different land use types in low-density development patterns. The predominate land use type is single-family residential; however, small pockets of commercial uses are spread throughout the landscape to serve lakeside residents.



Lakeside living areas include land in close proximity to Lake Norman.

Figure 4.3
Urban Form
Category Descriptions



T3 – Lakeside Living





General Development Characteristics

Average Base Residential Density	3.0 d.u. / acre
Typical Street Pattern	Curvilinear
Typical Block Length	400 - 800 feet
General Land Use Pattern	Isolated Uses
Maximum Building Height (stories)	2 stories
Mix of Land Uses	
Residential Ratio	45%
Commercial Ratio	3%
Office Ratio	1%
Industrial Ratio	4%
Open Space Ratio	47%
Non-Residential Intensities	
Commercial FAR	0.20
Office FAR	0.20
Industrial FAR	0.10
Persons per Household	2.55

This table summarizes general development characteristics for suburban areas that were incorporated into the scenario planning analysis. Generally, this urban form category isolates different land use types in relatively low-density development patterns. Residential, commercial, office, and industrial uses are prevalent in the suburban landscape; however, the separation between complementary land uses often necessitates travel by automobile to satisfy daily needs.

Suburban areas support low-density residential and non-residential development typical of most U.S. cities.

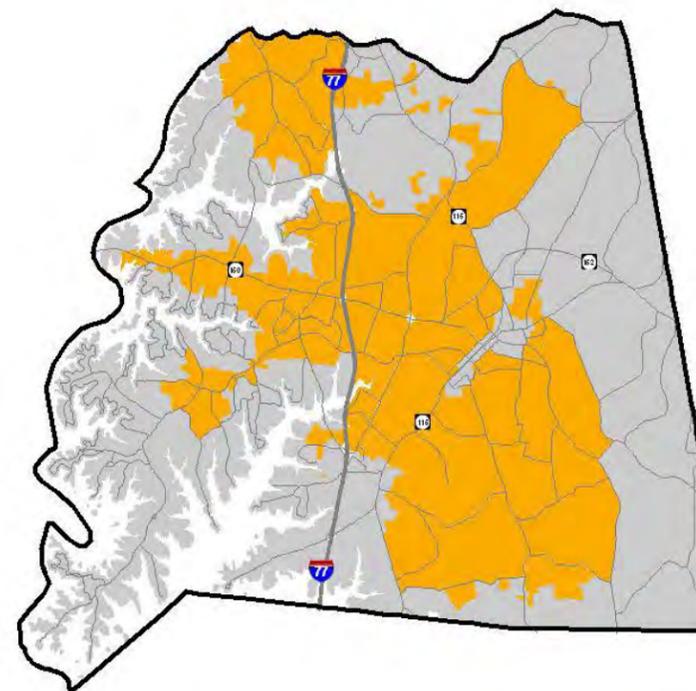
Local Examples:



Intersection of NC 150 and Plantation Ridge Drive



Morrison Plantation near NC 150



Suburban areas include land with generally low-density, expansive development patterns along most major thoroughfares and the newer residential subdivisions inside town limits.

Figure 4.4
Urban Form
Category Descriptions



T4 - Suburban





General urban areas represent the first tier of expansion from the traditional downtown center of Mooresville. It extends the short blocks and grid street pattern originated in the downtown to relatively dense single-family neighborhoods.

Local Examples:



East Park Avenue at Main Street

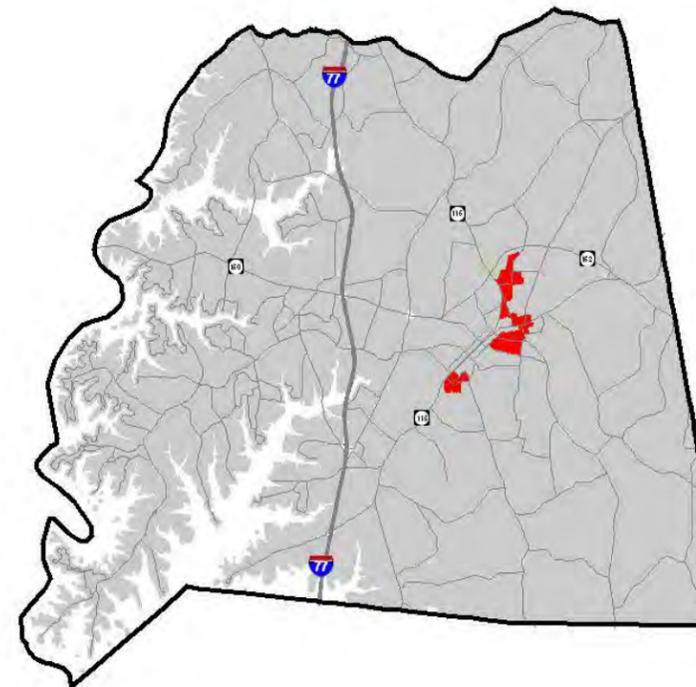


Main Street near Culp Street

General Development Characteristics

Average Base Residential Density	4.0 d.u. / acre
Typical Street Pattern	Grid
Typical Block Length	400 - 800 feet
General Land Use Pattern	Isolated Uses
Maximum Building Height (stories)	3 - 4 stories
Mix of Land Uses	
Residential Ratio	50%
Commercial Ratio	3%
Office Ratio	3%
Industrial Ratio	4%
Open Space Ratio	40%
Non-Residential Intensities	
Commercial FAR	0.35
Office FAR	0.35
Industrial FAR	0.10
Persons per Household	2.55

This table summarizes general development characteristics for general urban areas that were incorporated into the scenario planning analysis. Generally, this urban form category isolates different land use types, but supports more dense development patterns compared to previous urban form categories. Residential, commercial, office, and industrial uses are prevalent in the general urban landscape, and the grid street pattern and shorter block lengths support travel mode choices between complementary land uses.



General urban areas include land that surrounds the historical downtown for Mooresville.

Figure 4.5
Urban Form
Category Descriptions



T5 – General Urban





General Development Characteristics

Average Base Residential Density	8.0 d.u. / acre
Typical Street Pattern	Grid
Typical Block Length	300 - 600 feet
General Land Use Pattern	Mix of Uses
Maximum Building Height (stories)	4 - 6 stories
Mix of Land Uses	
Residential Ratio	25%
Commercial Ratio	30%
Office Ratio	5%
Industrial Ratio	5%
Open Space Ratio	35%
Non-Residential Intensities	
Commercial FAR	0.30
Office FAR	0.30
Industrial FAR	0.15
Persons per Household	2.55

This table summarizes general development characteristics for the town center that were incorporated into the scenario planning analysis. Generally, this urban form category mixes different land use types by block and by building; and supports more dense development patterns compared to previous urban form categories. Residential, commercial, office, and industrial uses are prevalent in the general urban landscape, and the grid street pattern and shorter block lengths support travel mode choices between complementary land uses.

Figure 4.6
Urban Form
Category Descriptions



T6 – Town Center

The town center area represents the historical center of Mooresville, and continues to be the civic and government hub for the community. A fine mix of residential and non-residential land uses occurs block-by-block and vertically within certain buildings.

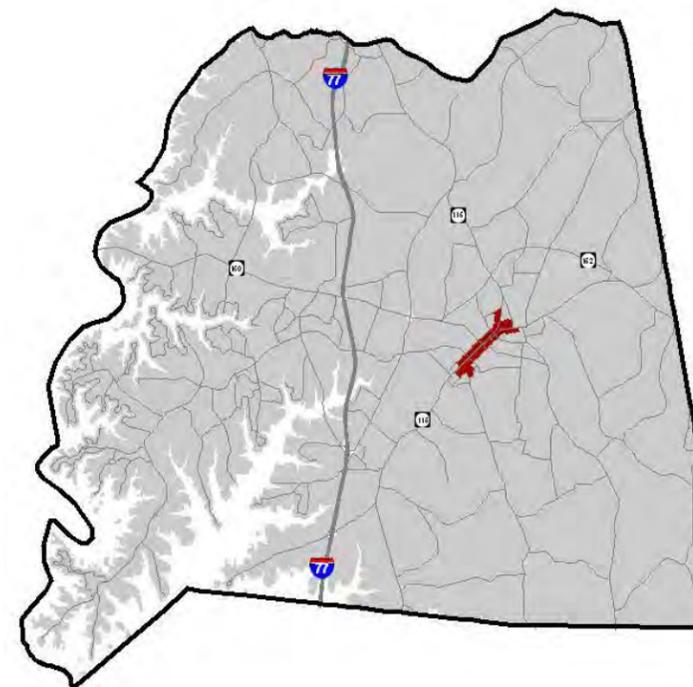
Local Examples:



Main Street near Center Street



Main Street at East Moore Street



The town center area includes land that lies within the historical limits for downtown Mooresville.





General Development Characteristics

Average Base Residential Density	8.0 d.u. / acre
Typical Street Pattern	Curvilinear/Grid
Typical Block Length	400 - 800 feet
General Land Use Pattern	Mix of Uses
Maximum Building Height (stories)	4 - 6 stories
Mix of Land Uses	
Residential Ratio	5%
Commercial Ratio	3%
Office Ratio	38%
Industrial Ratio	0%
Open Space Ratio	54%
Non-Residential Intensities	
Commercial FAR	0.25
Office FAR	0.35
Industrial FAR	0.10
Persons per Household	2.55

This table summarizes general development characteristics for the Mount Mourne area that were incorporated into the scenario planning analysis. Generally, this urban form category mixes different land use types by block and by building; and supports more dense development patterns compared to previous urban form categories. Residential, commercial, and office uses are prevalent in the general urban landscape, and the grid street pattern and shorter block lengths support travel mode choices between complementary land uses.

This special district incorporates the conclusions and recommendations from the Mount Mourne and South Iredell Master Plan completed in 2006. It accommodates rapidly-growing employment centers within a more sustainable development pattern that is characterized by mixed-use centers and pristine natural areas, served by a truly multi-modal transportation system.

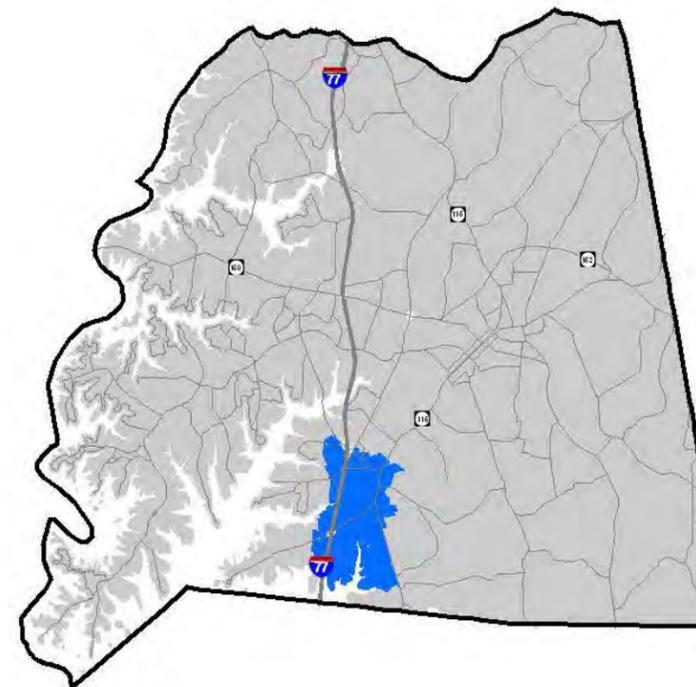
Local Examples:



Proposed Mount Mourne Village Center



Proposed Mount Mourne Transit Center



The Mount Mourne Special District includes all land within the limits of the Mount Mourne and South Iredell Master Plan completed in 2006.

Figure 4.7
Urban Form
Category Descriptions



T7 – Mount Mourne



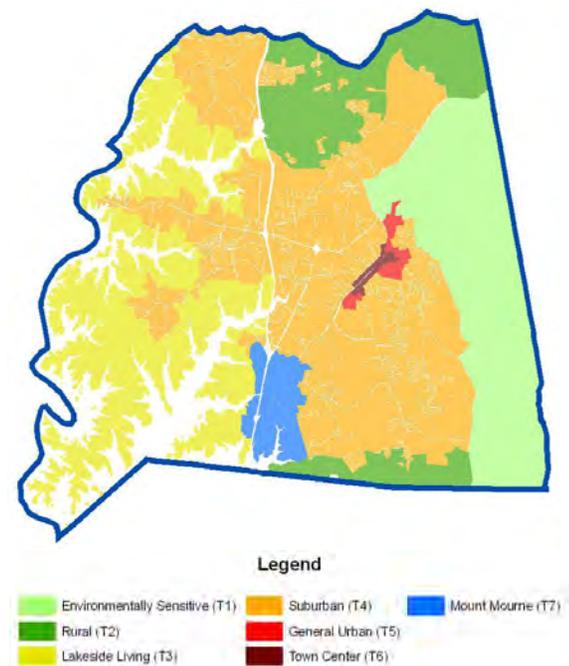
Development Scenarios

Two extreme future year development scenarios were created for the Comprehensive Transportation Plan that measure the impact urban form may have on the demand factors (i.e., trip generation, trip length, and travel mode choice) that influence the efficiency of the transportation system. Both development scenarios represent the same study area, planning horizon year (2030), and control totals for population, number of households, and number of employees by commercial, office, and industrial categories maintained in the 2030 Metrolina Regional Travel Demand Model (maintained by Charlotte Department of Transportation). Differences between the two development scenarios were limited to the 4 Ds commonly associated with the relationship between land use, urban design, and transportation – density, diversity, design, and destinations.

For the purposes of land use scenario planning, a study area similar to the CTP study area was used. Areas beyond the rural fringe were excluded in an effort to maintain a compact urban form analysis. A detailed description of the two future year development scenarios is provided below.

Sprawl Development

The sprawl development scenario represents a continuation of adopted plans, programs, and policies administered in the Town of Mooresville Comprehensive Land Use Plan (currently under update) and Zoning Ordinance (also currently under update) to accommodate future year growth anticipated in 2030. The historical central business district, bisected by Main Street, and the Mount Mourne area represent two locations for concentrated, mixed-use development. Surrounding these designated activity centers, low-density



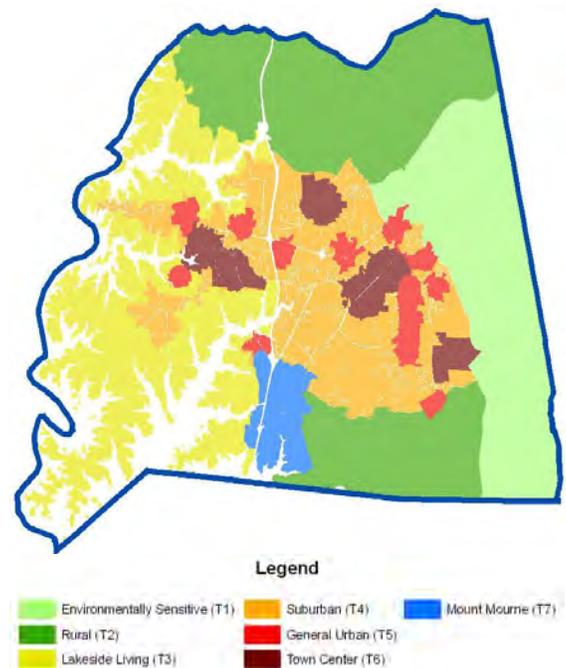
Mooresville

Comprehensive Transportation Plan

development and the physical distance between complementary land uses tend to promote automobile travel, particularly since safe, convenient facilities are not easily available for pedestrians and bicyclists. Increased traffic means less mobility for Mooresville citizens and others traveling through the region.

Compact Development

The compact development scenario represents a paradigm shift in planning philosophy for the Town of Mooresville toward more sustainable development – measured by environmental stewardship and equitable distribution of community resources – that reflects the community’s unique character and local values. Under this planning scenario, future year growth anticipated for 2030 was directed to one of seven urban or fifteen neighborhood activity centers – matching those identified in the adopted Mooresville



Comprehensive Pedestrian Plan. The diversity of close-by, complementary land uses and local travel options within the designated activity centers encourages better distribution of trips and shorter trip lengths, thereby reducing the number of vehicles region-wide vying for similar routes. This scenario also assumes a safe environment for pedestrians and bicyclists to travel from one land use to another.

Scenario Planning Results

The Town of Mooresville is committed to fostering a more efficient, multimodal transportation system, supportive of an overarching community goal to implement a more sustainable land use plan that reflects the unique character and local values celebrated by its citizens.



Comparative statistics for the two development scenarios confirm that reorganization of urban form throughout the study area into a more compact, nodal development pattern significantly improves the efficiency of the transportation system, while preserving unspoiled natural areas immediately surrounding town limits.

Summary statistics for evaluating the impacts of sprawl development and compact development scenarios were reported using Community Viz software and the 2030 Metrolina Regional Travel Demand Model maintained by the Charlotte Department of Transportation. Measures of Effectiveness (MOEs) generated by the two software programs articulate the significance of reorganizing development densities/intensities and land use patterns to improve efficiency of the regional transportation system.

Compared to a sprawling development pattern, the alternative development scenario emphasizes compact, walkable urban and neighborhood centers, and supports future opportunities for bus and rail transit for higher order trips. Higher order trips typically represent trip lengths over one-half mile in length, whereby walking or bicycling would not be the primary means of travel between two destinations. Non-motorized modes of transportation could provide connections to transit stops and/or close-by land uses that make alternatives to single-occupant automobile travel more viable. MOEs from the 2030 Metrolina Regional Travel Demand Model indicate nearly a 10% increase for walking and biking trips associated with compact development patterns included in the alternate scenario.

Viable travel alternatives and more compact, mixed-use centers also reduce travel distance between complementary land uses and reliance on the automobile for day-to-day activities. This leads to less vehicle miles traveled, less vehicle hours traveled, and higher average automobile travel speeds (system-wide) compared to a more sprawling development pattern. Further, vehicle miles traveled and vehicle hours traveled at times of highest demand on the transportation system are reduced by nearly 12%, resulting in a more efficient transportation system. Table 4-1 summarizes the MOEs from the 2030 Metrolina Regional Travel Demand Model for the two development scenarios.



Table 4-1
Comparison of Daily Travel Characteristics

Measure of Effectiveness (MOE)	Sprawl Development Scenario	Compact Development Scenario	Percent Change
Total Person Trips (1,000s)	511	521	1.96%
Total Population	110,269	110,204	-0.06%
Person Trips per Person	4.64	4.73	1.94%
Walk/Bike Trips	7,303	8,100	10.91%
Vehicle Miles Traveled (1,000s)	4,020	3,928	-2.29%
Vehicle Miles Traveled per Person	36.46	35.64	-2.25%
Vehicle Hours Traveled (1,000s)	108	104	-3.70%
Vehicles Hours Traveled per Person	0.98	0.94	-4.08%
Average Vehicle Speed (mph)	37.2	37.8	1.61%
Vehicle Miles Traveled @ LOS E (1,000s)	942	835	-11.36%
% Vehicle Miles Traveled Over Capacity	0.23	0.21	-8.70%

A compact development scenario also reduces the spatial footprint of urban development on surrounding hinterlands. Urban and neighborhood centers identified in the hypothetical scenario would limit creeping low-density, sprawl development patterns and reduce accompanying public infrastructure costs. Output data from Community Viz indicates that up to 29% of the total land area included in the study area could be maintained in a rural context compared to 14% in the sprawl development scenario – while accommodating the same growth projections for 2030. Beyond environmental stewardship, the compact development scenario supports prudent fiscal responsibility for capital improvements planning and room for purposeful growth beyond the 25-year planning horizon. Table 4-2 summarizes the land use profile, by urban form category, for both sprawl and compact development scenarios.



Table 4-2
Comparison of Development Scenario Land Use Profiles

Urban Form Category	Sprawl Development Scenario		Compact Development Scenario		Change Acres
	Acres	Percentage	Acres	Percentage	
Environmentally Sensitive Area	11,919	20%	11,857	20%	62
Rural	8,247	14%	17,622	29%	-9,375
Lakeside Living	12,234	20%	11,877	20%	357
Suburban	25,287	42%	11,590	19%	13,697
General Urban	387	1%	2,453	4%	-2,066
Urban Center	195	0%	2,870	5%	-2,675
Mount Mourne Special District	1,829	3%	1,829	3%	0
Total	60,098	100%	60,098	100%	0

Detailed study and public outreach for reaffirming the Town’s long-term vision toward a sustainable land use plan is being prepared independent of this document. Plans, programs, and policies recommended during this concurrent planning process will be included in the *Mooreville Comprehensive Land Use Plan*. The resulting document will serve as the official adopted statement on land use by the Board of Commissioners and will serve as the blueprint for long-term sustainable growth in the community. The Comprehensive Transportation Plan serves as a companion document to the Town’s Comprehensive Land Use Plan.

Recommendations

The scenario planning analysis confirms that reorganization of urban form throughout the study area into a more compact, nodal development pattern significantly improves the efficiency of the transportation system, while preserving unspoiled natural areas immediately surrounding town limits. Successful implementation of a compact, nodal development pattern will require fundamental changes to certain land use plans, programs, and policies administered by Iredell County and the Town of Mooreville. Purposeful coordination among private landowners, officials for the Town and Iredell County, and the North Carolina Department of Transportation to combine land use and transportation planning





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processes traditionally completed in isolation will ensure a more efficient and fiscally responsible regional transportation system.

The Town of Mooreville should consider including the guiding principles for compact development in the *Mooreville Comprehensive Land Use Plan* (currently under development) for implementing a more efficient transportation system.





Chapter 5 — Transportation Recommendations

Introduction

Chapter 3 explained the role of the Citizens' Advisory Committee to help identify transportation and land use issues in Mooreville, as well as to recognize and implement the community's vision for 2030. The following transportation recommendations were developed based on public input, future land use recommendations, and engineering principles.

The Citizens' Advisory Committee and general public expressed a desire for a more defined "sense of place," increased mobility, and better bicycle and pedestrian connectivity during this planning process. The *Comprehensive Land Use Plan* that was developed concurrently with this transportation plan identifies several focus areas for sustainable development and redevelopment, and a future land use plan. Together, these sources guided the development of the following transportation recommendations, which recognize the future urban form and establish a street hierarchy that incorporates bicycle and pedestrian needs. By taking advantage of the relationship between land use and transportation, Mooreville will benefit from a comprehensive and sustainable transportation system.

The following recommendations are segmented into transportation elements which represent different travel modes and hierarchies of roadways. The roadway recommendations are presented first and are organized by NCDOT standardized classifications which are described in Chapter 2; general congestion management policies and strategies are presented to be used in conjunction with the roadway recommendations as well. The roadway recommendations are followed by the collector street element (not standardized by NCDOT) which identifies specific connections and general policy recommendations to improve connectivity and ease traffic congestion. Next, the pedestrian and bicycle elements present recommendations from the recently completed *Comprehensive Pedestrian Plan*. Finally, the transit and freight elements provide specific route and general policy recommendations to improve the convenience and efficiencies in each respective network. In addition, the adopted NCDOT CTP maps can be found in the Appendix of this plan and represent the roadway, bicycle, and public transportation and rail recommendations in NCDOT format. Recommendations are consistent with those represented in the following sections of Chapter 5.



Roadway Recommendations

The recommended Highway Plan for the Mooresville study area shown in Figure 5.1 represents the results of an integrated planning process that considers the 1997 Thoroughfare Plan, existing and planned land uses and development, environmental constraints, projected future travel demand, and public input. The plan shows new roadway facilities, existing roadway widening, roadway realignment, intersection improvements, and corridor enhancements. Each segment is identified by NCDOT classifications and determined to be existing (no capacity improvements needed), needs improvement (capacity improvements recommended), or recommended (new location). The following recommendations are anticipated to address the future capacity and system deficiencies in 2030 and should be implemented incrementally as growth occurs. The NCDOT adopted Highway Map can be found in the Appendix and represents the adopted recommendations for the highway element per NCDOT standards.

Future Corridor Deficiencies

According to the *Highway Capacity Manual*, level of service (LOS) is a measure used to describe the operation conditions that drivers experience in a traffic stream. Level of service is designated by letter, similar to grades in school, with A representing the best conditions and F the worst. LOS A is generally free-flow with few delays, while LOS F constitutes highly congested, stop-and-go conditions. LOS D or better is generally considered acceptable. At level of service D, the roadway is busy, but traffic is still flowing at a reasonable speed.

A traffic model was developed for Mooresville study area based upon the Metrolina Regional Travel Demand Model (sub-area model documentation can be found in the Appendix). The socio-economic data used for this traffic model also came from the Metrolina Regional Travel Demand Model. In an effort to depict an accurate picture of the





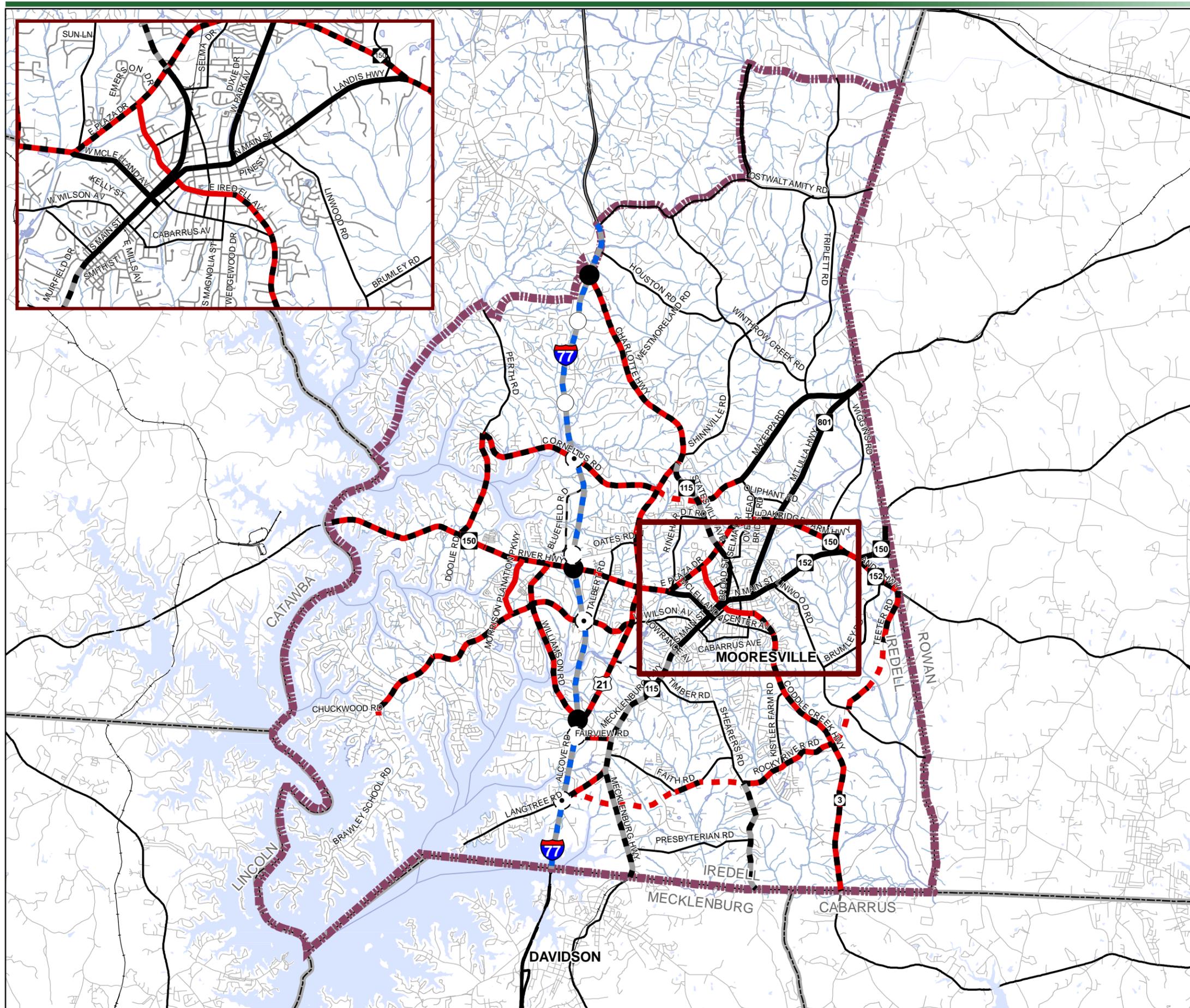
Mooreville

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future “no-build” and future “build” deficiencies, each scenario was modeled and is represented in the following figures. Figure 5.2 represents the projected traffic for the future (2030) with the “no-build” or existing roadway network that currently exists. Figure 5.3 represents the projected traffic for the future (2030), incorporating the “build” or recommended roadway network with new location projects and facility widenings. Even with the recommended capacity improvements, major arterials such as River Highway/NC Highway 150, Brawley School Road, and Charlotte Highway are still expected to operate at unacceptable levels of service, proving that capacity improvements alone will not solve Mooreville’s congestion problems. A holistic approach, however, considering all modes of transportation and all classifications of roadway facilities was performed to accommodate the anticipated growth and development in the Town of Mooreville. Recommendations were updated following the future “build” model run and are not reflected in Figure 5.3.



Figure 5.1
Highway Map



-  Study Area
-  County Boundary
-  Bodies of Water
-  Local Streets
- Freeways**
-  Existing
-  Needs Improvement
-  Recommended
- Expressways**
-  Existing
-  Needs Improvement
-  Recommended
- Boulevards**
-  Existing
-  Needs Improvement
-  Recommended
- Other Major Thoroughfares**
-  Existing
-  Needs Improvement
-  Recommended
- Minor Thoroughfares**
-  Existing
-  Needs Improvement
-  Recommended
-  Existing Interchange
-  Proposed Interchange
-  Existing Grade Separation
-  Proposed Grade Separation

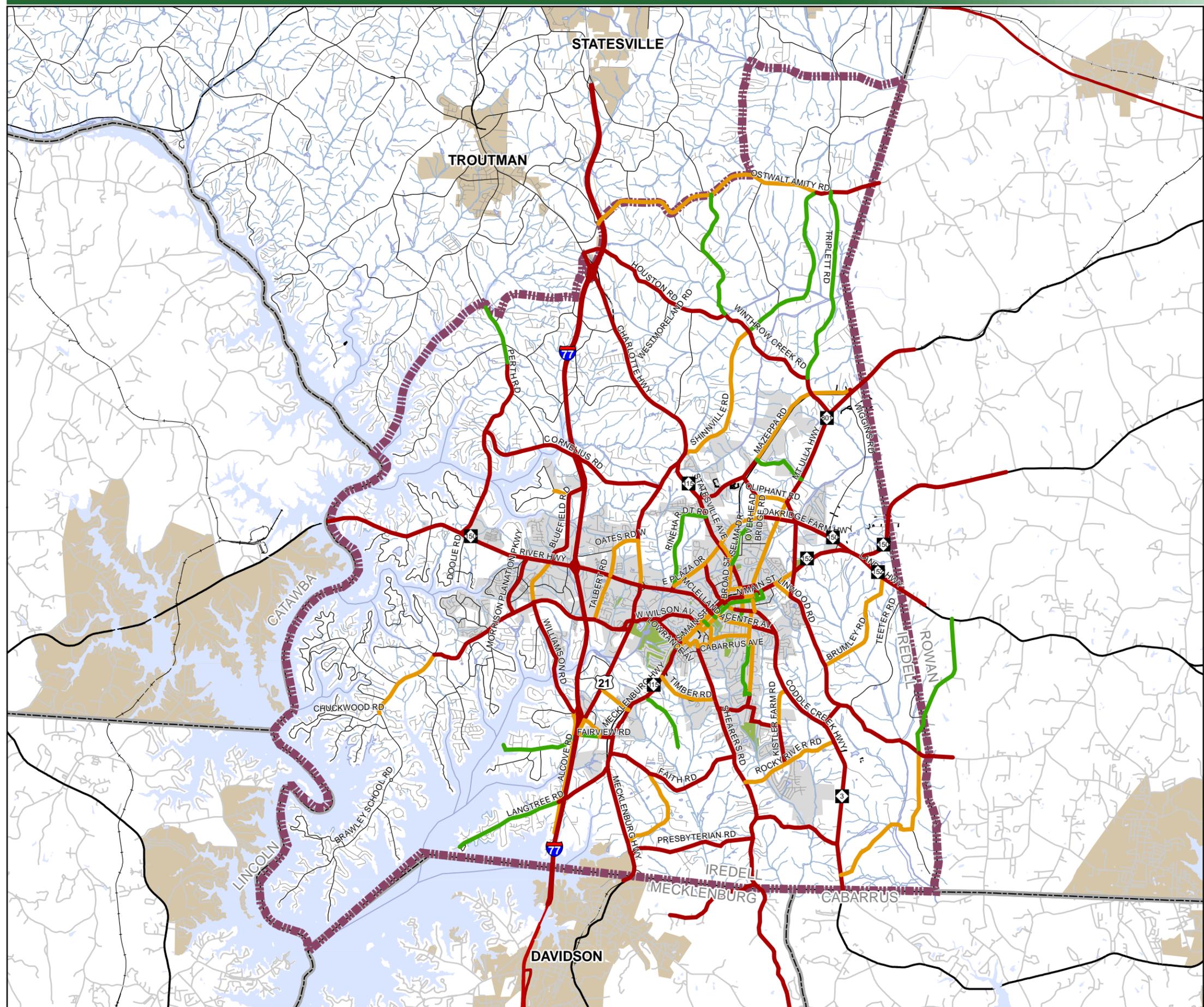
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Figure 5.2
2030 "No Build"
Level of Service



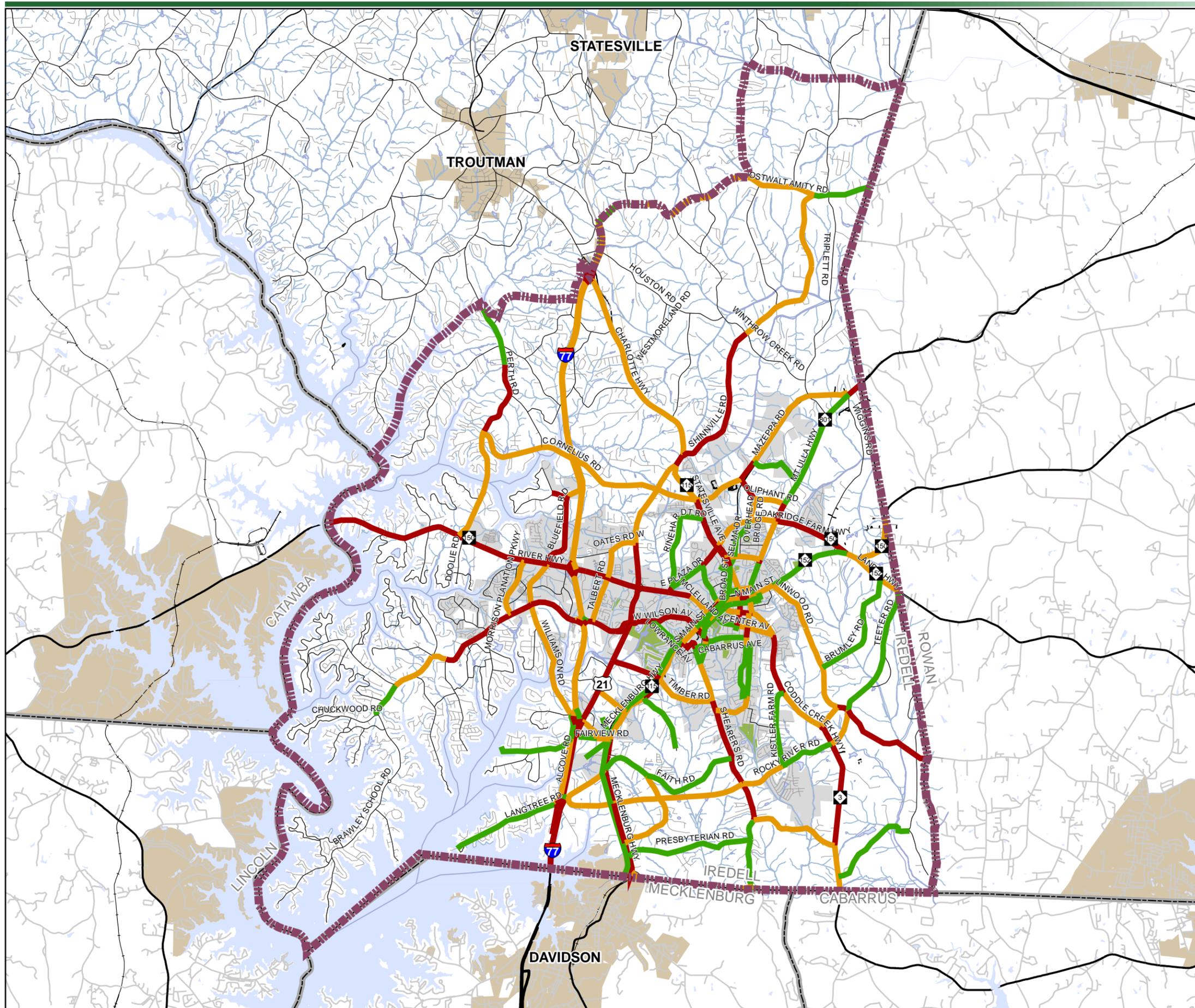
- Study Area
- County Boundary
- Other Municipal Limits
- Town of Mooresville
- Parks, Golf, Cemeteries
- Bodies of Water
- Railroads
- 2030 "No Build" LOS**
- LOS A - B
- LOS C - D
- LOS E - F



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Figure 5.3
2030 "Build" Deficiencies



- County Boundary
- Other Municipal Limits
- Town of Mooresville
- Parks, Golf, Cemeteries
- Bodies of Water
- Study Area
- Railroads
- 2030 Highway Map LOS
- LOS A - B
- LOS C - D
- LOS E - F

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Miles



Community Strategic Corridor Recommendations

The following corridor descriptions identify potential roadway recommendations for those corridors identified as community strategic corridors. These corridors were considered closely by the public, Citizens' Advisory Committee, and staff and reflect the vision and goals identified by the community. These recommendations are shown collectively on the highway map in Figure 5.1. More detailed information for each of the community strategic corridors can be found in Figures 5.4 – 5.14.

Cornelius Road is identified as a proposed *boulevard* in need of improvements. It is recommended that this corridor be widened to a four lane divided facility from Perth Road to US Highway 21. The area north of the downtown within the industrial region of Mooresville provides employment, goods, and services for Mooresville and the surrounding region. It is expected and encouraged that these areas grow for the economic development of Mooresville. In addition, it is recommended that an interchange located at Interstate I-77 be further studied. The recommended improvements will allow for needed capacity and access to Interstate I-77 and provide a consistent corridor for freight movement in this area.

Brawley School Road is identified as a *boulevard* in need of improvement. This corridor experiences significant congestion due to the lack of connectivity, resulting from Lake Norman. It is recommended that access management strategies (described following) be implemented and that development density be limited. It is recommended that this corridor be widened to a four lane divided facility from Chuckwood Road to US Highway 21. This is consistent with the current NCDOT Transportation Improvement Program (TIP) project R-3833. Funding has been identified in the fiscal years 2008 and 2009 from Chuckwood Road to Interstate I-77 and post years for the section between Interstate I-77 and US Highway 21.

Langtree Road is identified as a proposed *boulevard* in need of improvements. This area is expected to experience significant growth in the near future as a result of the expansion at the Lowe's Corp Campus. The Mt. Mourne plan should be consulted regarding specific recommendations for this corridor. Generally, it is recommended that Langtree Road be widened to a six lane median divided facility to the Lowe's Corp Campus and to a four lane median divided facility from the



Lowe's Corp Campus to NC Highway 115 / Mecklenburg Highway. In addition, it is recommended that Langtree Road be realigned to provide better access for the anticipated dominate movements into the Lowe's Corp Campus site from Langtree Road and the future East - West Connector. Careful consideration should be taken to account for the future East - West Connector.

Mazeppa Road is identified as a *boulevard* in need of improvements. As described above in the Cornelius Road description, this corridor is located in an area of industrial growth and is expected to flourish. Therefore, it is recommended that Mazeppa Road be widened to a four lane divided facility from Overhead Bridge Road to Statesville Highway/NC Highway 115.

Coddle Creek Highway/NC Highway 3 is identified as a proposed *boulevard* needing improvements. This corridor is a vital link between Mooresville and Kannapolis. With the anticipated growth associated with the North Carolina Research Campus in downtown Kannapolis and future Lowe's Corp Campus expansion in Mooresville, it is expected that the traffic along this corridor will grow significantly. Therefore, it is recommended that a corridor study be performed to further evaluate anticipated growth and recommend specific improvements. In the absence of a more detailed study, however, it is recommended that this corridor be widened to a two lane divided facility between the town center and Rocky River Road and be widened to a four lane divided facility between Rocky River Road and the Cabarrus county line. In addition it is recommended that a multi-use path be constructed the entire length of the corridor.

NC Highway 115 / Mecklenburg Highway from Lowrance Avenue to the Mecklenburg county line is identified as *other major thoroughfare* needs improvement. This corridor is located south of the town in an area that anticipates significant growth with the development of the Lowe's Corp Campus expansion. This facility parallels Interstate I-77 and NC Highway 3 / Coddle Creek Highway. Due to the community vision for this corridor and the proximity of the active railroad, it is recommended that this facility remain two lanes and that a multi-use path be constructed. In addition, it is recommended that turn lanes be constructed at key intersections to help relieve congestion.



NC Highway 150 / River Highway / Plaza Drive is identified as a proposed *boulevard* needing improvements. Currently, River Highway is a heavily traveled facility often congested at an unacceptable level throughout the day. It serves as a local route for those living in this area and for those who live on the Brawley School peninsula. It also serves regional traffic because it is the only east/west facility connecting Mooresville with Catawba County due to Lake Norman. It is recommended that congestion management strategies, such as consolidating driveways, limiting access, and improving on-site circulation, be implemented to ease congestion and improve safety throughout the entire corridor. A consistent four lane median divided facility should be built from the Catawba County line to McLelland Avenue. In addition, it is important to note that NC Highway 150 was designated as a NCDOT Strategic Highway Corridor (SHC) in 2007 which creates additional opportunities to further the long-term vision for this corridor.

NC Highway 150 / Plaza Drive / Oakridge Farm Highway from McLelland Avenue to NC Highway 152 / N Main Street is identified as a proposed *boulevard* needing improvements. This corridor is located directly north of downtown Mooresville and is heavily traveled. It is recommended that a four lane median divided facility be constructed for the entire length of this corridor. In addition, it is recommended that striped bike lanes be constructed from N. Broad Street to N. Main Street to accommodate bicycle traffic in the vicinity of downtown Mooresville.

Perth Road is identified a *boulevard* in need of improvements. This roadway provides connectivity and an alternative route to Interstate I-77 on the west side of Mooresville. It is recommended that an interchange be constructed at Cornelius Road and Interstate I-77. It is expected that this corridor will attract more traffic due to the potential interchange. Therefore, it is recommended that this corridor be considered for future maintenance, congestion management strategies, and capacity improvements at key intersections. In addition, it is recommended that this corridor be widened to a four lane median divided facility from Cornelius Road to NC Highway 150 / River Highway.





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NC Highway 115 / Statesville Highway / Broad Street from US Highway 21 / Charlotte Highway to Williams Street is identified as *other major thoroughfare* needing improvements. This corridor is located north of the town in where industrial development is anticipated. It is recommended that this corridor be widened to a four lane undivided roadway.

Williamson Road is identified as a *boulevard* needing improvements. This thoroughfare is heavily congested during peak hours of the day due to the access it provides to Interstate I-77. It is expected that congestion will worsen with anticipated growth and development in this area. Therefore, it is recommended that this corridor be widened to a four lane median divided facility from River Highway/NC Highway 150 to Interstate I-77.

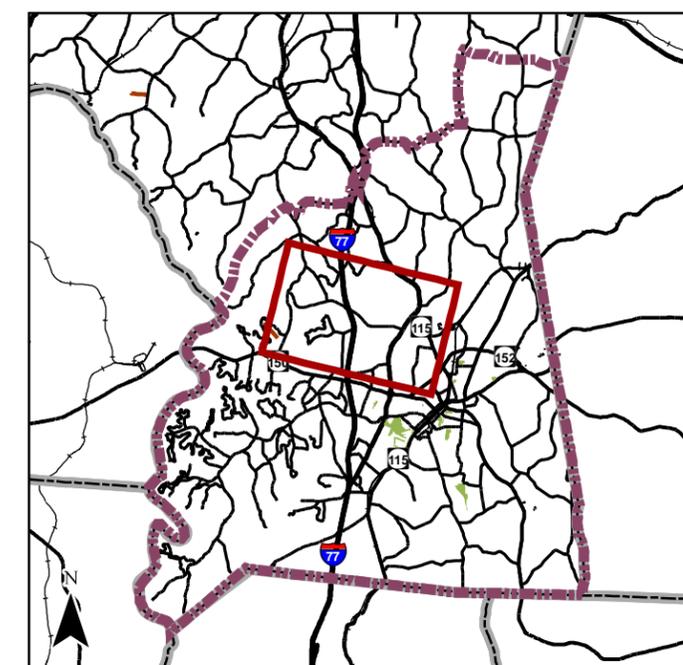


Figure 5.4
Community Strategic Corridor
Cornelius Road



- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Strategic Corridor Buffer
- Proposed Corridor Extension
- Proposed Interchanges

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Corridor Recommendations

Number of Lanes	4
Median	Divided
2030 Daily Volume	29,500
2030 Daily Capacity	41,000

Proposed Cross Section

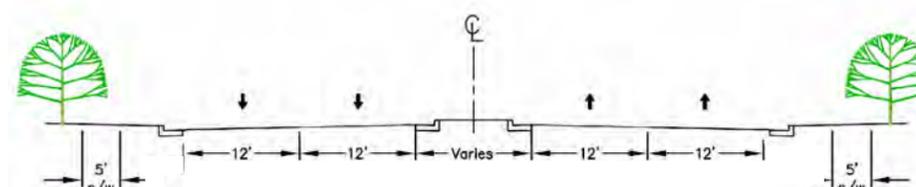
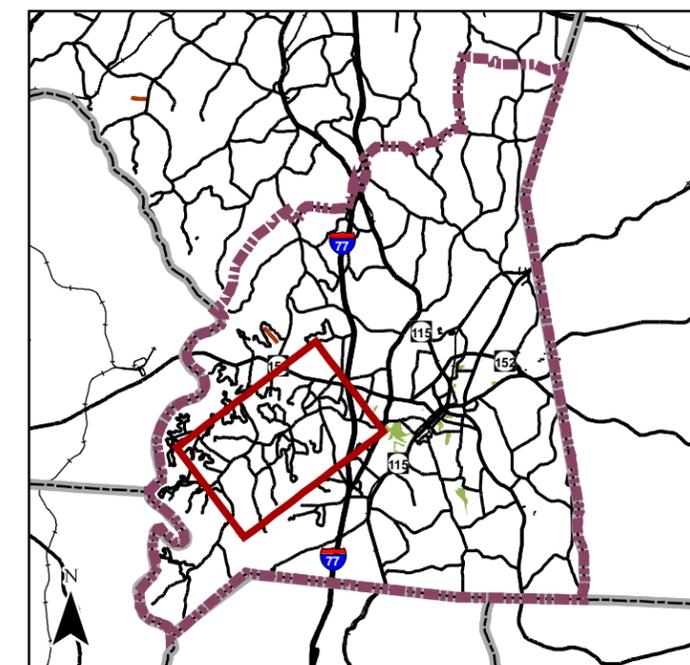
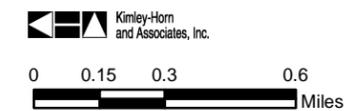


Figure 5.5
Community Strategic Corridor
Brawley School Road



- Study Area
- County Boundary
- Parks, Golf, Cemeteries
- Strategic Corridor Buffer
- Proposed Interchanges



Corridor Recommendations

Number of Lanes	4
Median	Divided
2030 Daily Volume	37,000
2030 Daily Capacity	23,000

Proposed Cross Section

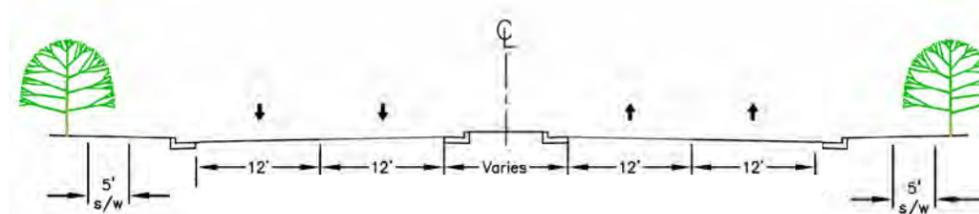
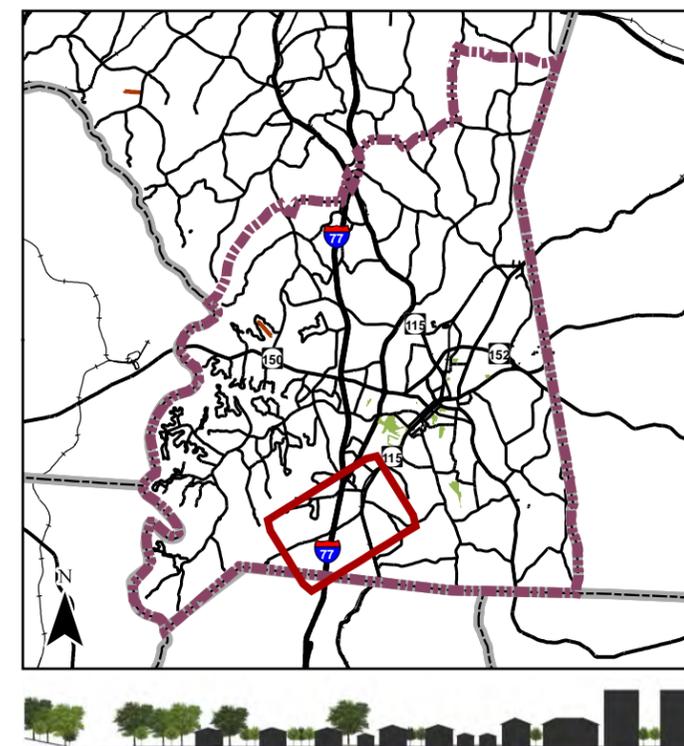
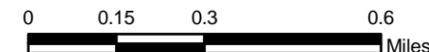


Figure 5.6
Community Strategic Corridor
Langtree Road



- Study Area
- Study Corridor
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Proposed Interchanges
- Proposed Grade Separation

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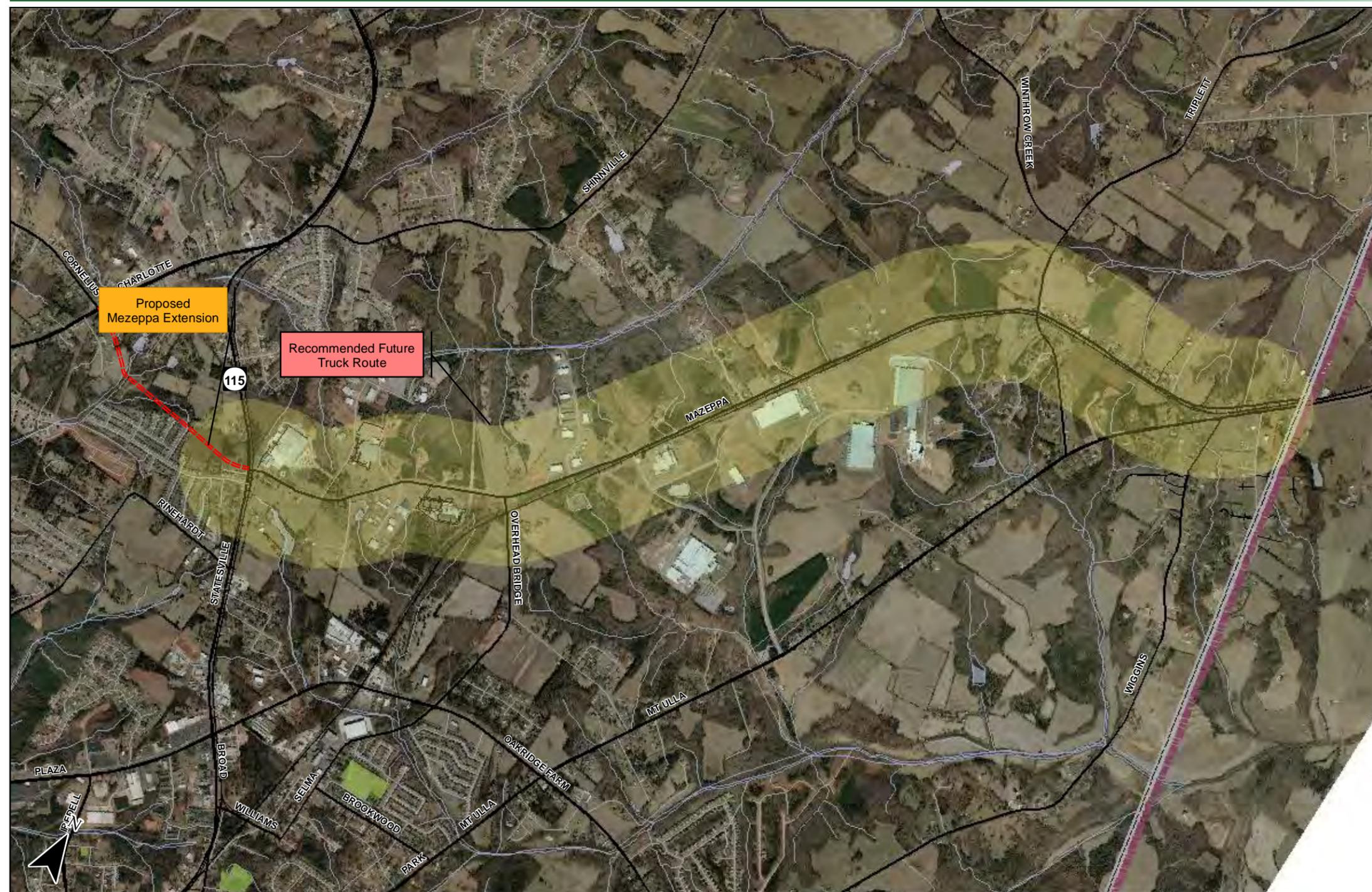
Corridor Recommendations

	West of Lowe's Corp Campus	East of Lowe's Corp Campus
Number of lanes	6	4
Median	Divided	Divided
2030 Daily Volume	13,000	8,000
2030 Daily Capacity	32,000	21,000

Proposed Cross Section (West of Lowe's Corp Campus)

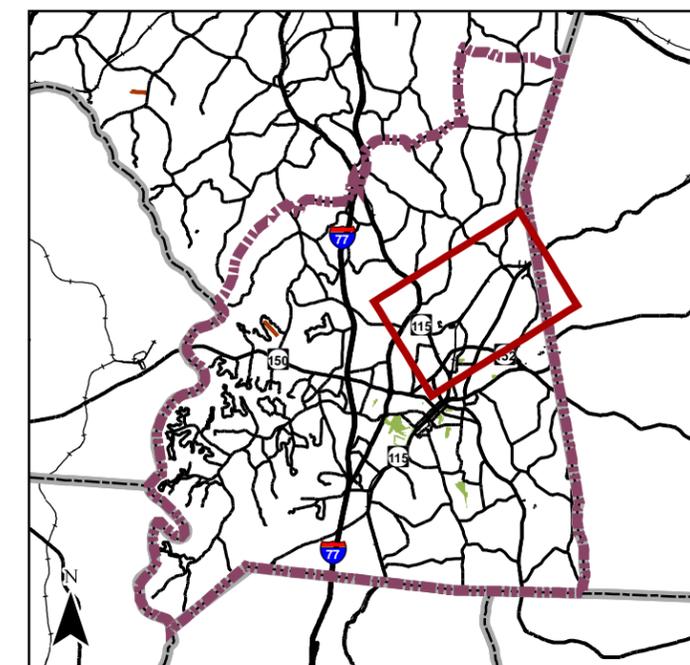
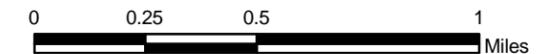


Figure 5.7
Community Strategic Corridor
Mazeppa Road



- Study Area
- Study Corridor
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Proposed Interchanges

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Corridor Recommendations

	West of Overhead Bridge
Number of lanes	4
Median	Divided
2030 Daily Volume	14,800
2030 Daily Capacity	43,700

Proposed Cross Section (West of Overhead Bridge Road)

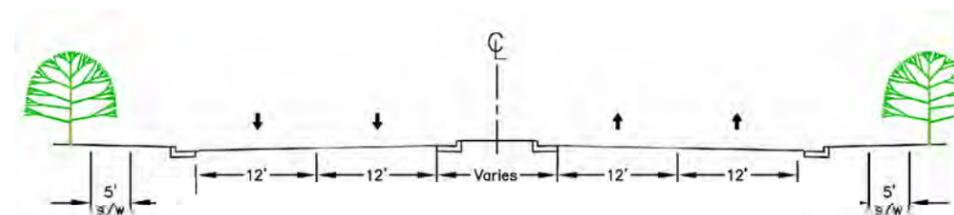
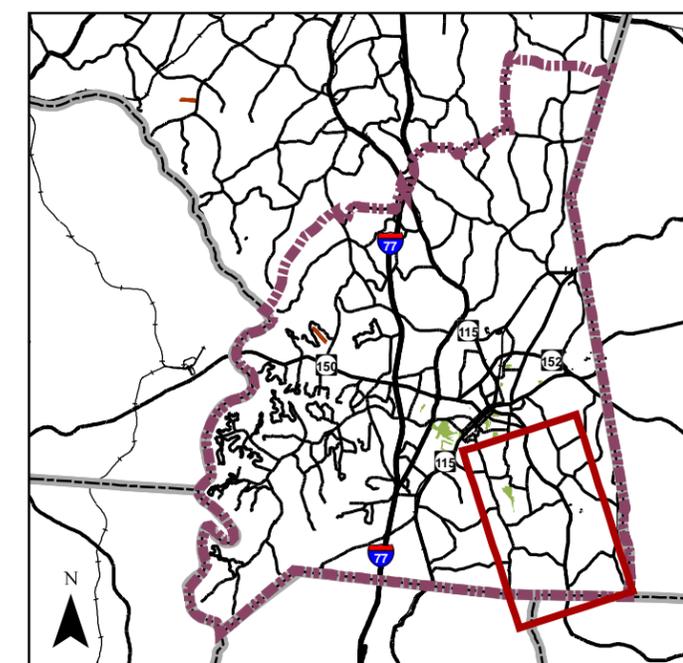
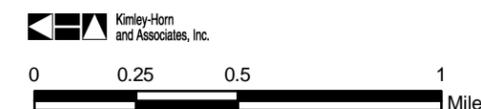


Figure 5.8
Community Strategic Corridor
NC Highway 3
Coddle Creek Road



-  Study Area
-  Study Corridor
-  County Boundary
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Proposed Interchanges



Corridor Recommendations

(south of Rocky River Road)

Number of lanes	4
Median	Divided
2030 Daily Volume	30,000
2030 Daily Capacity	23,000

Proposed Cross Section

(south of Rocky River Road)

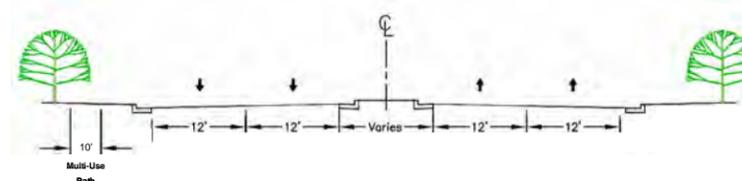
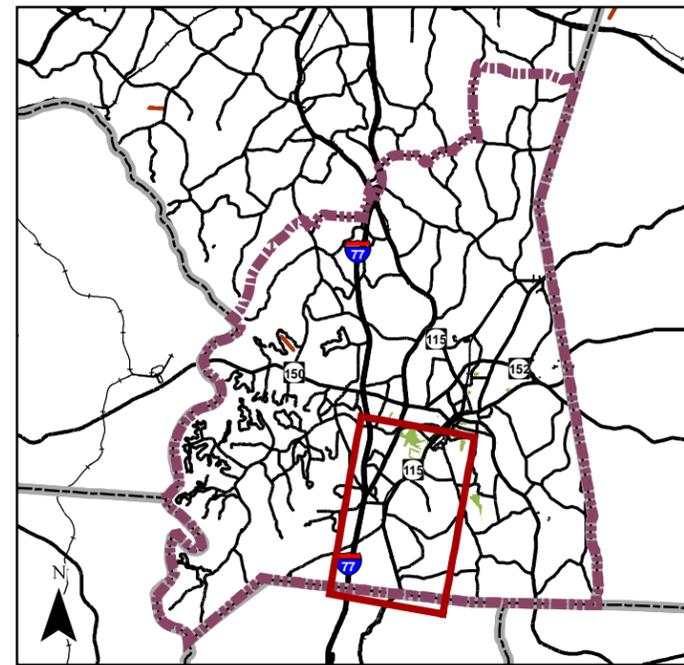
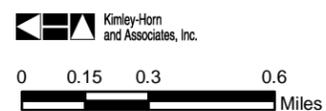


Figure 5.9
Community Strategic Corridor
NC Highway 115
Mecklenburg Highway



- Study Area
- Study Corridor
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Proposed Interchanges
- Proposed Grade Separation



Corridor Recommendations

Number of lanes	2
Median	Undivided
2030 Daily Volume	26,000
2030 Daily Capacity	18,000

Proposed Cross Section

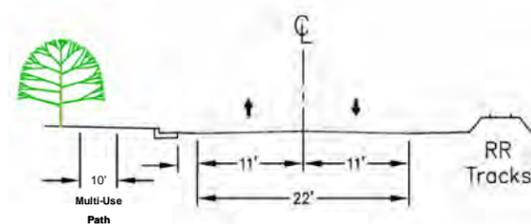
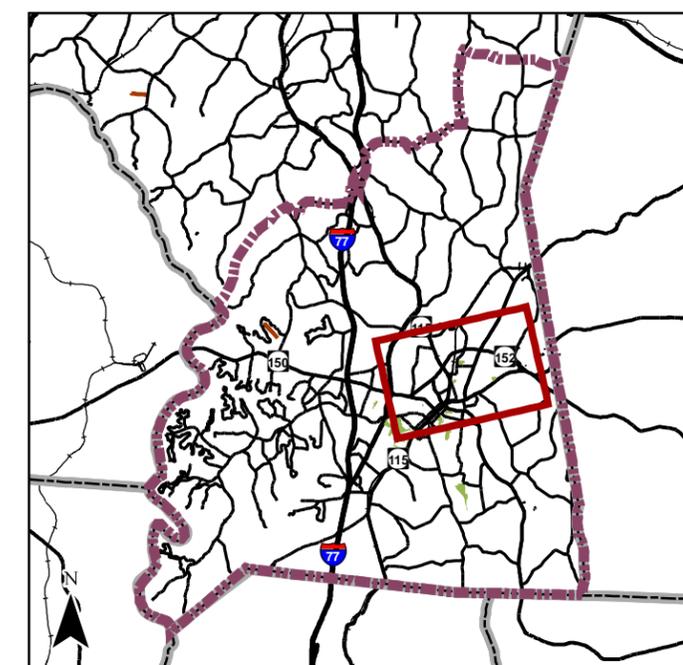
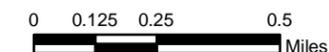


Figure 5.10
Community Strategic Corridor
NC Highway 150
Oakridge Farm Highway



-  Study Area
-  Study Corridor
-  County Boundary
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Proposed Interchanges

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Corridor Recommendations

Number of lanes	4
Median	Divided
2030 Daily Volume	24,000
2030 Daily Capacity	31,000

Proposed Cross Section

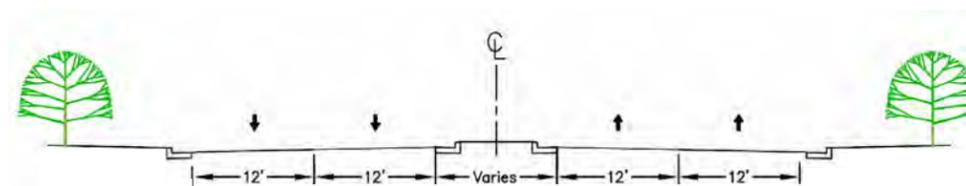
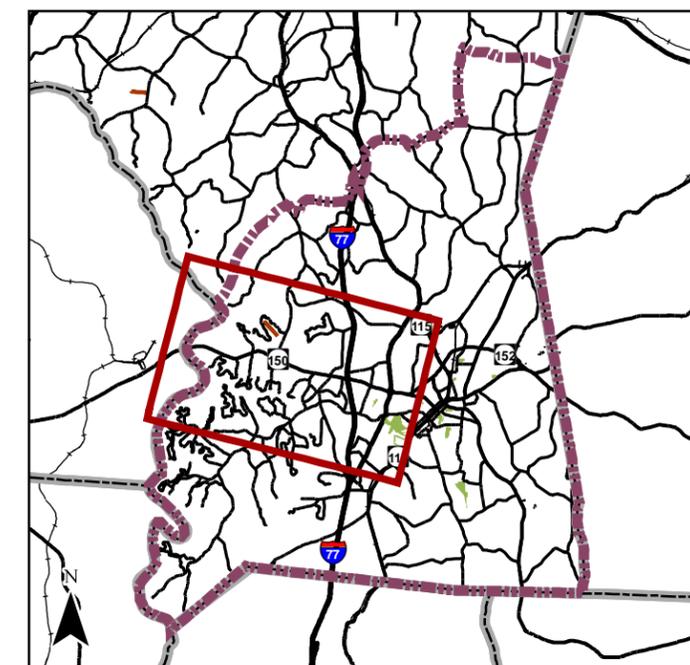
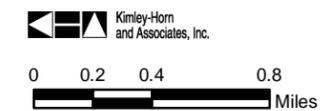


Figure 5.11
Community Strategic Corridor
NC Highway 150
River Highway



- Study Area
- Study Corridor
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Proposed Interchanges



Corridor Recommendations

Number of lanes	4
Median	Divided
2030 Daily Volume	52,000
2030 Daily Capacity	34,000

Proposed Cross Section Varies

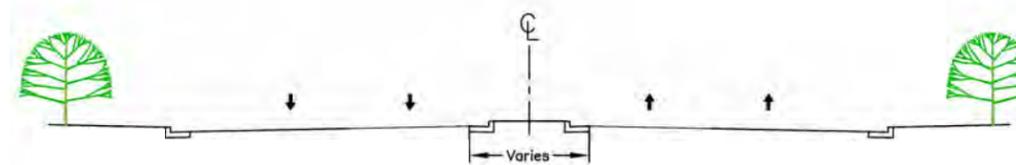
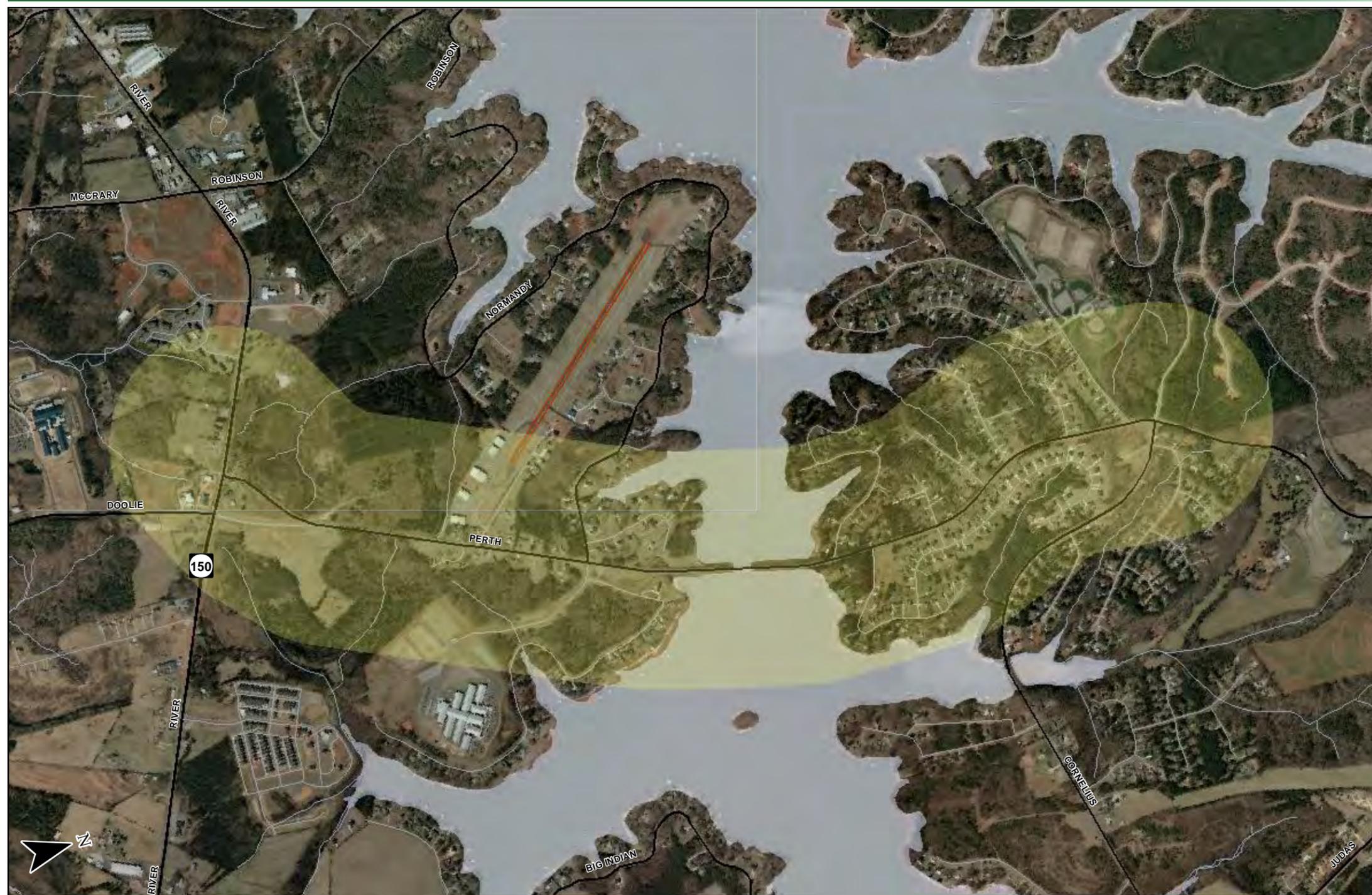
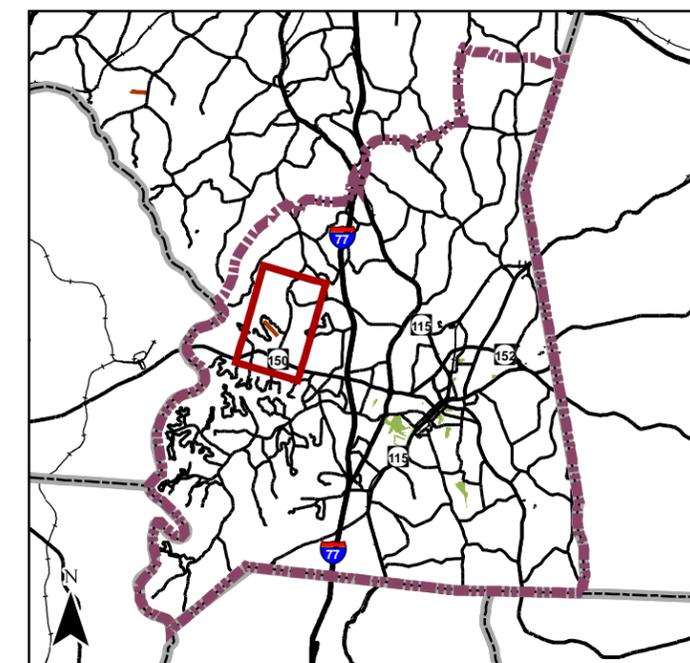


Figure 5.12
Community Strategic Corridor
Perth Road



- Study Area
- Study Corridor
- County Boundary
- Bodies of Water
- Parks, Golf, Cemeteries
- Proposed Interchanges

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Corridor Recommendations

Number of lanes	4
Median	Divided
2030 Daily Volume	17,500
2030 Daily Capacity	31,000

Proposed Cross Section

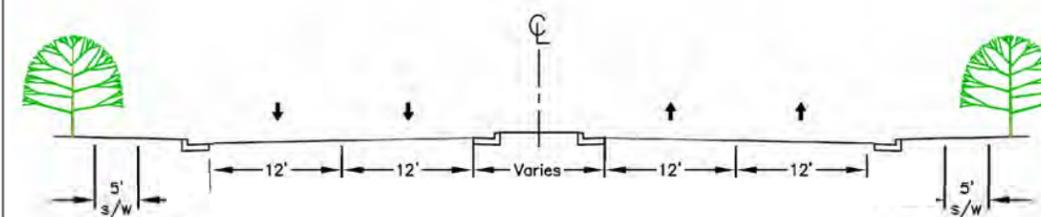
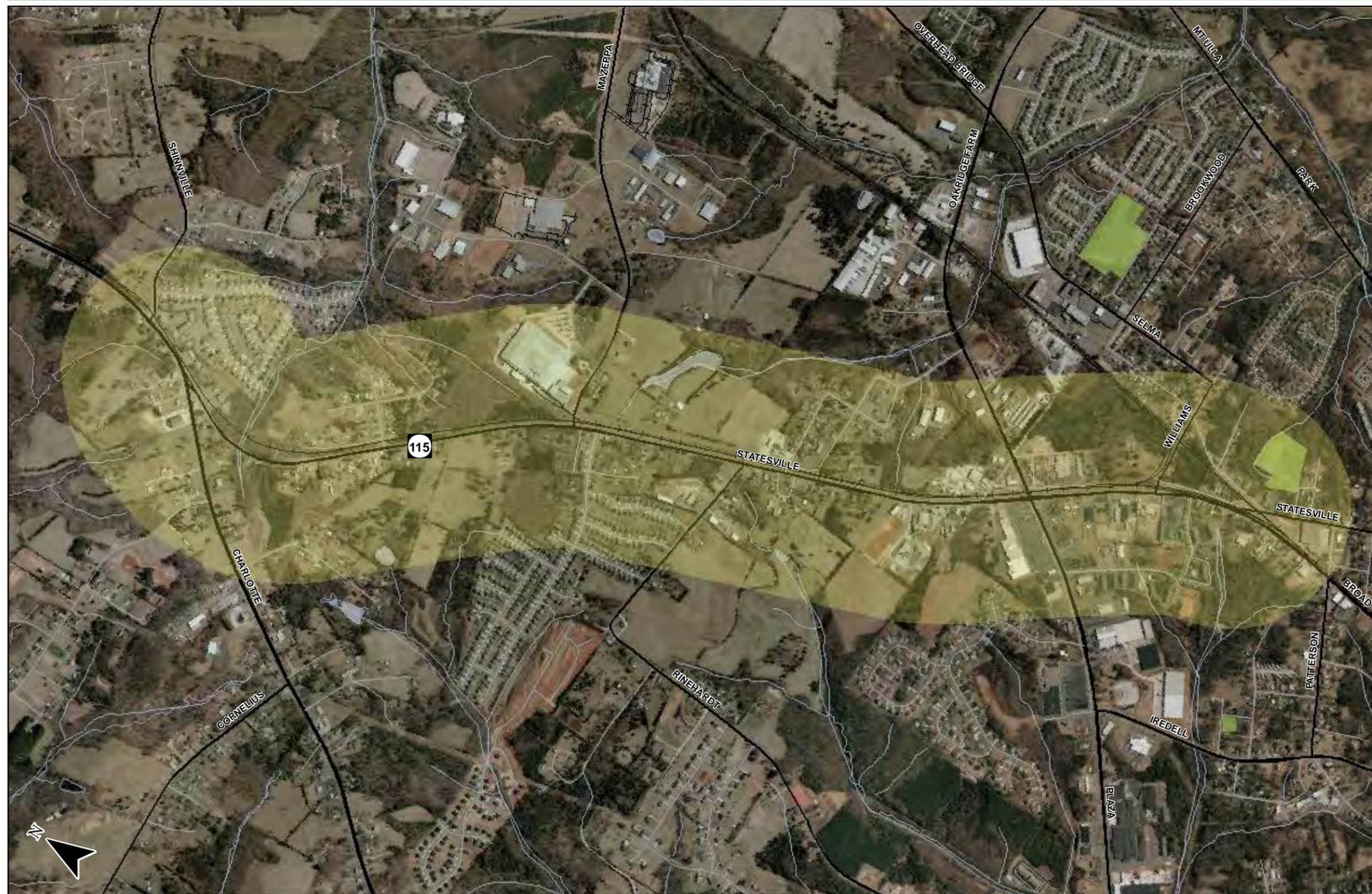
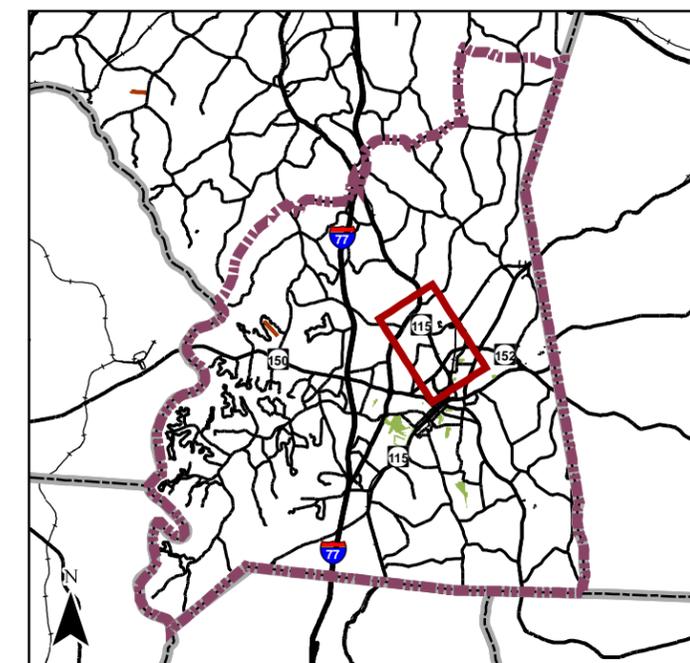
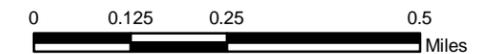


Figure 5.13
Community Strategic Corridor
NC Highway 115
Statesville Road



-  Study Area
-  Study Corridor
-  County Boundary
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Proposed Interchanges

Kimley-Horn and Associates, Inc.



Corridor Recommendations

Number of lanes	4
Median	Undivided
2030 Daily Volume	19,500
2030 Daily Capacity	38,000

Proposed Cross Section

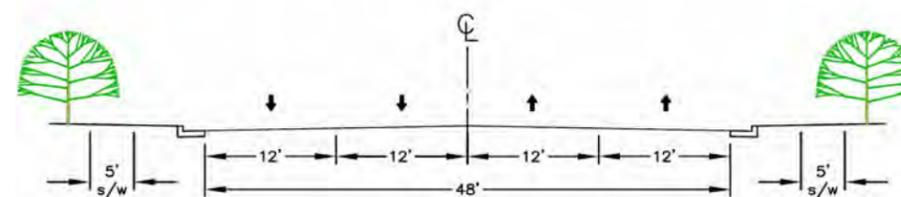
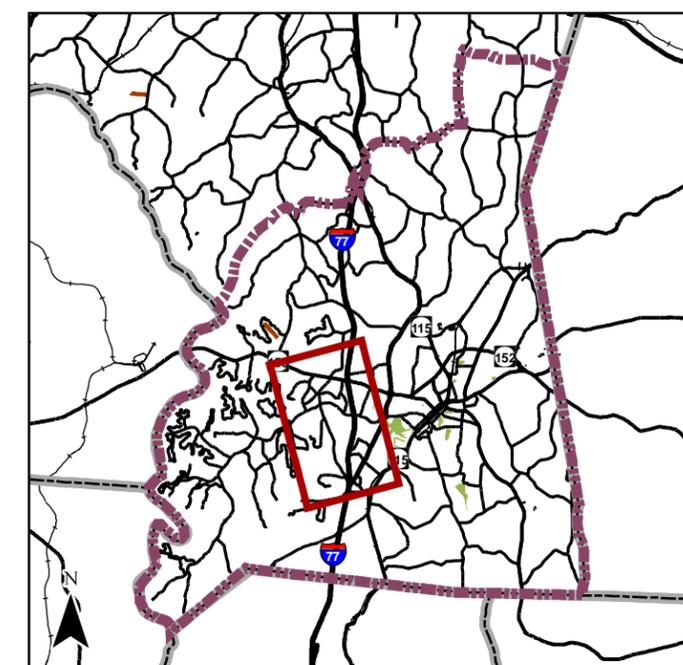
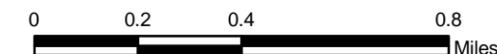


Figure 5.14
Community Strategic Corridor
Williamson Road



-  Study Area
-  Study Corridor
-  County Boundary
-  Bodies of Water
-  Parks, Golf, Cemeteries
-  Proposed Interchanges

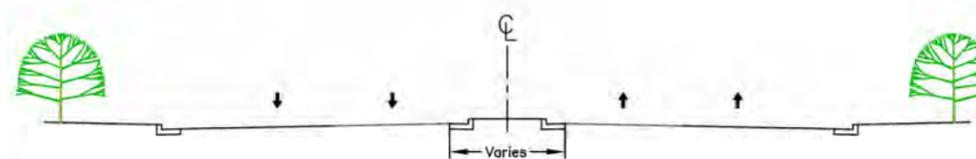
Kimley-Horn and Associates, Inc.



Corridor Recommendations

Number of lanes	4
Median	Divided
2030 Daily Volume	15,000
2030 Daily Capacity	34,000

Proposed Cross Section



Other Corridor Recommendations

The following corridor descriptions identify specific roadway recommendations for those corridors not identified as community strategic corridors. These recommendations are shown on the highway map in Figure 5.1 and represent ideas that were presented throughout this planning process as potential solutions to ease congestion and increase safety. The classifications identified follow NCDOT's current Comprehensive Transportation Plan (CTP) criteria, discussed in Chapter 2.

Freeway

Interstate I-77/Interstate I-4750 is identified as a *freeway* facility needing improvement. This facility is included in the current Transportation Improvement Program (TIP) project list and is designated as an NCDOT Strategic Highway Corridor; it is recommended that this corridor be widened to an eight lane median divided facility. Right-of-way acquisition and construction for this project are currently unfunded. The widening of Interstate I-77 from NC Highway 73 to Interstate I-40 is estimated to cost \$526 million. Even with the widening of this roadway, congestion is still projected to occur in 2030 as shown in the future deficiencies section, Figure 5.3.

Boulevards

Charlotte Highway/US Highway 21 is identified as a proposed *boulevard* needing improvements. It is recommended that this corridor be widened to a four lane divided facility from Interstate I-77 (exit 42) to Interstate I-77 (exit 33). This corridor offers a much needed parallel facility to Interstate I-77 and is used by regional and local traffic. Significant growth is anticipated in the southern portion of the corridor at Alcove Road and Fairview Road.

Landis Highway / NC Highway 152 is identified as a *boulevard* needing improvements. It is recommended that this corridor be widened to a four lane divided facility from NC Highway 150 / Oakridge Farm Highway to the Rowan County line.

Fairview Road is identified as a proposed *boulevard* needing improvements. Mooresville is anticipating significant growth with the development of the Lowe's Corp Campus and growth in the Mt. Mourne



area. This CTP includes a recommendation to provide a connection between Fairview Road and Alcove Road by constructing a grade separation at Interstate I-77. Further, it is recommended that a more detailed study be performed to consider a connection between Fairview and Alcove Roads with shared interchange ramps at Interstate I-77 and Exit 33. This improvement plays a vital role in the economic development and congestion management for the Mt. Mourne area. Figure 5.15 represents a general concept of this recommended improvement.

East-West Connector is identified as a four lane divided proposed *boulevard*, part on new location and part on an existing facility in need of improvements. The proposed facility is located on new location between Langtree Road and Faith Road, between Faith Road and Shearers Road, between NC Highway 3 and Linwood Drive, and between sections of Teeter Road. The proposed facility is expected to utilize section of existing Faith Road, Rocky River Road, and Teeter Road. It is anticipated that future growth and development will be spurred by the Lowe's Corp Campus and Langtree area and could potentially spur additional infill development south of Langtree Road. As such, it is likely that the segment from NC Highway 115 to Langtree Road will be constructed incrementally as development occurs in this area. It is recommended that the corridor from Linwood Road to Langtree Road be studied further to determine an appropriate alignment and feasibility of the recommended improvements.

Mazeppa Road Extension is identified as a proposed *boulevard* extension on new location. To provide safer and more efficient access for freight and vehicular traffic, it is recommended that Mazeppa Road be extended to align with Cornelius Road. This alignment should be studied further for feasibility and specific design considerations, however, it is recommended at this time that the future cross-section be a four lane divided facility which is consistent with recommendations for Mazeppa and Cornelius Roads in this vicinity.

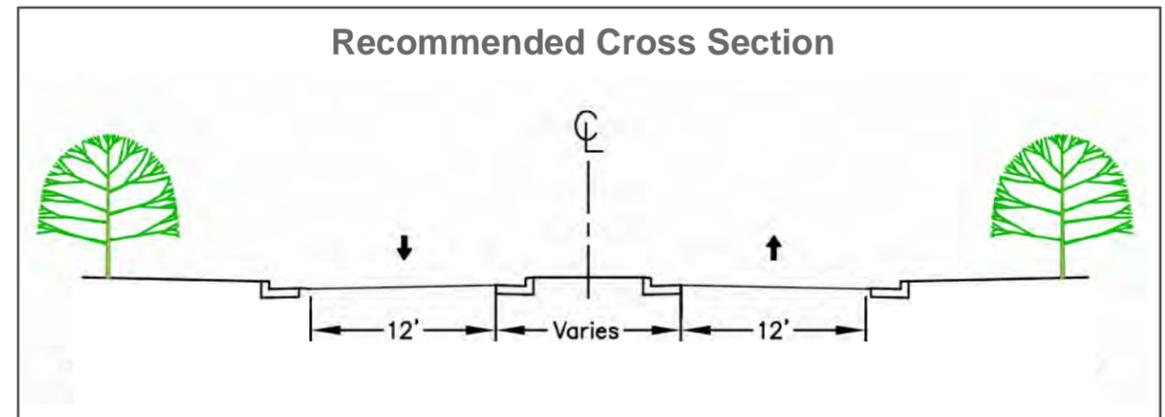
Other Major Thoroughfares

Shearers Road is identified as a proposed *other major thoroughfare* in need of improvements. This facility is located south of the town center and parallels Interstate I-77, NC Highway 115/Mecklenburg Highway, and NC Highway 3/Coddle Creek Highway. It is recommended that this roadway be widened to a four lane undivided facility between Rocky River Road and the Mecklenburg county line.





Mooresville is experiencing significant growth in and around Interstate I-77 and Exit 33 with the development of the Lowe's Corp Campus and the Mt. Mourne area. It is recommended that a potential connection between Fairview and Alcove Roads with shared interchange ramps at Interstate I-77 and Exit 33 be studied. This connection would provide additional connectivity and better east/west access for those traveling in the area. This connection would help relieve existing and potential future congestion at Exit 33.



Legend

- Potential Grade Separation
- Fairview Road/Alcove Road Corridors
- Bodies of Water



Minor Thoroughfare

Bluefield Road is identified as *minor thoroughfare* needing improvements. It is recommended that this roadway be improved to accommodate more traffic and provide an alternate route to Interstate I-77 on the west side of Mooresville. These improvements may include further maintenance, congestion management strategies, and capacity improvements at key intersections. This corridor is expected to remain a two lane facility.

Timber Road Extension is identified as a proposed *minor thoroughfare* on new location from US Highway 21 to Existing Timber Road. It is recommended that a two lane undivided facility be constructed.

Other Studies

Interchange Justification Study for Cornelius Road – The industrial area north of the Town Center discussed in the previous study would also benefit from more efficient access to Interstate I-77. Therefore, it is recommended that an interchange justification study be performed for Cornelius Road at Interstate I-77.

Oats Road/Midnight Lane Overpass Connection – During the Comprehensive Transportation Plan process, River Highway/NC Highway 150 was identified by the public and staff as being an area of concern. The corridor is currently operating at a poor level of service and expected to worsen with future growth. It is recommended that an alternative route be considered to alleviate traffic congestion and provide alternative access. The Oats Road/Midnight Lane Overpass Connection is recommended for further study to provide this alternative route. Figure 5.16 shows this area and presents general considerations that would be pertinent to this project.





INTRODUCTION

The rapid growth of the western sections of Mooresville has brought congestion to the thoroughfares in the area. In particular, the NC 150 corridor (River Highway) has experienced heightened levels of congestion in recent years because of increased commercial development along the corridor, an inefficient interchange with Interstate 77, and the limited availability of other roadways to provide east-west connectivity in Mooresville. An overpass over Interstate 77 that would link Oates Road to Midnight Lane has been discussed as a possible option to relieve congestion near the NC 150/Interstate 77 interchange while increasing connectivity in the western half of Mooresville. This connection would allow motorists to travel between US 21 and Bluefield Road while avoiding the interchange with Interstate 77 and NC 150. A pre-existing overpass was demolished at this location to provide adequate spacing for the NC 150 interchange, therefore grading costs would be minimal. The following represents information regarding the potential bridge connection. This summary is based on known information and is not a substitute for a more detailed overpass feasibility study.

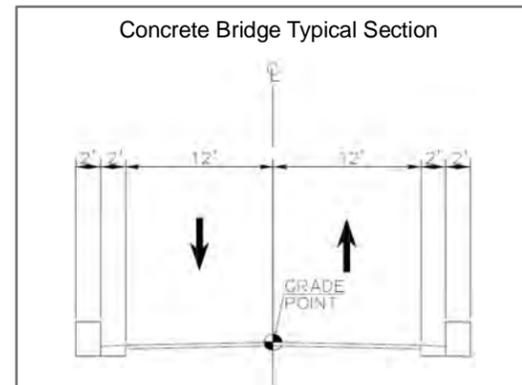
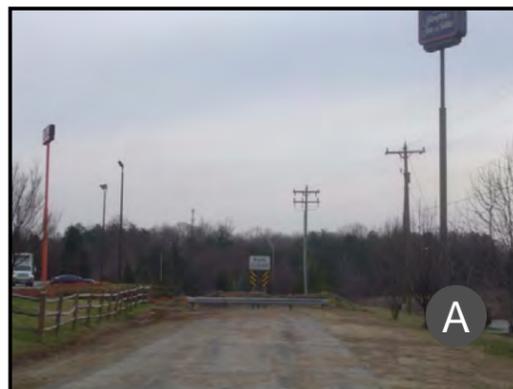
COST ESTIMATE

A cost estimate has been prepared that approximates the cost of constructing an overpass spanning Interstate 77 between the western end of Oates Road to the eastern end of Midnight Lane. The pavement bases of existing approaches would need to be reconstructed from Bluefield Road to the intersection with Talbert Road. The cost estimate has been based upon the following assumptions:

- Bridge Type: NCDOT Standard Concrete
- Length: 260'
- Width: 32'
- TOTAL ESTIMATED COST: \$ 3,000,000
- The following assumptions were used in calculating the approximate cost of constructing a bridge:
 - Two lane typical section with 12' travel lanes
 - 2' Shoulders in each direction
 - 2' curb and gutter in each direction
 - Average cost per ft²: \$125
 - The cost of right of way acquisition was excluded from the analysis
- The following assumptions were used in calculating the approximate cost of constructing the approach roadway:
 - Two lane typical section with 12' travel lanes
 - 2' paved shoulders
 - 1 mile of new two-lane alignment
 - Average cost per mile of new 2 lane alignment: \$1,700,000
 - The cost of right of way acquisition was excluded from the analysis

PERMITTING PROCESS

1. Identify sources of funding.
 - If the overpass were to be funded by NCDOT, it would need to be added to the State Transportation Improvement Program.
 - Construction of an overpass at this location could be a candidate for a local construction bond.
2. Identify all long term improvements for the Interstate 77 corridor and design accordingly so the overpass would not encroach upon future right of way.
3. Obtain an encroachment agreement from NCDOT
 - Final approval through FHWA
4. Obtain the required environmental permits.
 - Water Quality Permit (North Carolina Division of Water Quality)
 - Erosion Control Permit (North Carolina Department of Environment and Natural Resources)
 - If the construction of the overpass was funded by NCDOT, they would assume responsibility for the procuring the environmental permits.
5. Other potential issues
 - Public Hearing to obtain Town or County for approval to construct
 - Permit to widen approaches of Oates Road
 - Lake Norman water runoff issues



— Existing Oates Road
 — Major Thoroughfare
 Potential Bridge Location
- - - Proposed Extension
 — Local Roads
 Bodies of Water



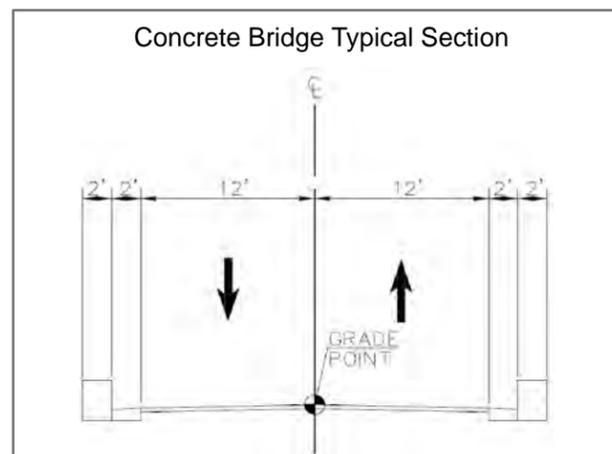
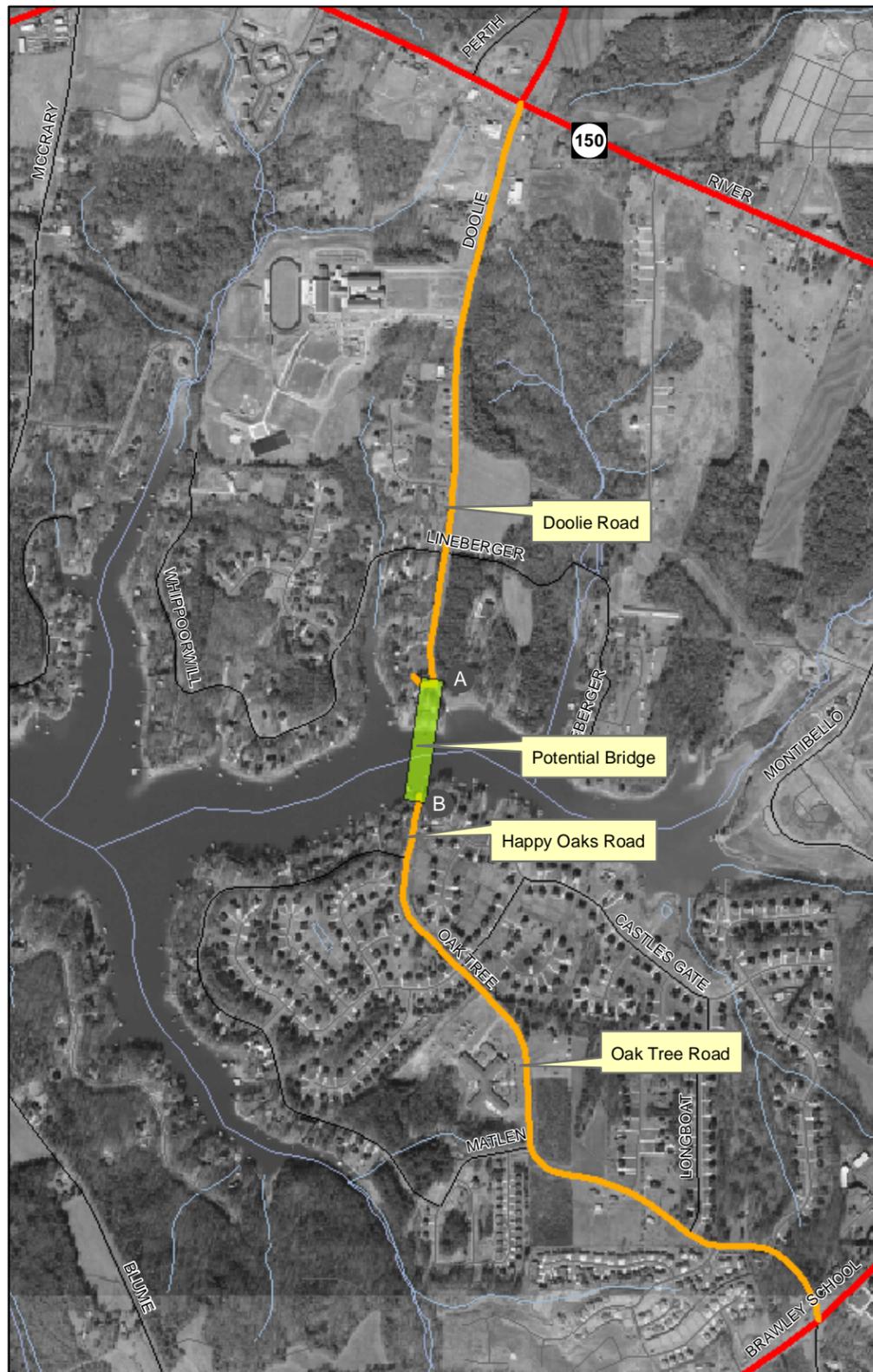
Doolie Road/Happy Oaks Road Bridge Connection – The rapid growth of the western sections of Mooreville has brought congestion to the thoroughfares in the area. The majority of the roadways are constrained by Lake Norman and capacity improvements are difficult, if not impossible. A bridge that would link Doolie Road to Happy Oaks Road has been discussed as a possible option to address congestion while increasing connectivity in the western half of Mooreville. It is recommended that a more detailed bridge feasibility study be performed to consider this connection. Figure 5.17 shows this area and presents general considerations that would be pertinent to this project.

Downtown Mooreville Signal Removal/Traffic Progression Study – Downtown Mooreville has recently encouraged commerce, activity, and residential infill development and redevelopment, which has proven to be successful. As such, traffic congestion is expected to worsen with further development. Therefore, it is recommended that a signal removal/traffic progression study be conducted to determine which signals, if any, would ease congestion if removed.

The earlier Thoroughfare Plan recommended study of potential one way pairs in downtown. However, given the urban design objectives associated with the Downtown Master Plan, consideration of one way pairs is no longer considered an appropriate option for downtown. Completion of a downtown signal removal/progression study is recommended prior to any significant changes in street configuration.

In addition to the specific recommendations above, it is suggested that general congestion management strategies be implemented as opportunities arise. The following section describes strategies that may be implemented to improve the flow of traffic, easing congestion and improving safety.





INTRODUCTION

The rapid growth of the western sections of Mooresville has brought congestion to the thoroughfares in the area. The majority of the roadways are constrained by Lake Norman and capacity improvements are difficult, if not impossible. A bridge that would link Doolie Road to Happy Oaks Road has been discussed as a possible option to address congestion while increasing connectivity in the western half of Mooresville. The following represents information regarding the potential bridge connection. This summary is based on known information and is not a substitute for a more detailed bridge feasibility study.

COST ESTIMATE

A cost estimate has been prepared that approximates the cost of constructing a bridge spanning Lake Norman between the southern end of Doolie Road to the northern end of Happy Oaks Road. The cost estimate has been based upon the following assumptions:

- Bridge Type: NCDOT Standard Concrete
- Length: 1000'
- Width: 40'
- TOTAL ESTIMATED COST: \$8,000,000
- The following assumptions were used in calculating the approximate cost of constructing a bridge:
 - 40' of approach in each direction
 - Two lane typical section with 12' travel lanes
 - 4' Shoulders in each direction
 - 4' curb and gutter in each direction
 - Average cost per ft2: \$175
 - The cost of right of way acquisition was excluded from the analysis

ENVIRONMENTAL IMPACTS OF PERMITTING

The impact to the surrounding environment and Lake Norman needs to be clearly identified to determine the magnitude of permitting that will be required for this project. A source of funding for the implementation and construction of a bridge will need to be established. Since Duke Power owns Lake Norman and possesses the Federal Energy Regulatory Commission (FERC) license, they will have significant involvement in the permitting process. Depending on the funding sources as well as the nature and amount of environmental impacts, the approval process could involve the need for coordination with a number of state and federal agencies in order to obtain the necessary approvals and/or provide the necessary documentation. The following is a list of potential permits, approvals and documentation that could be required. The agencies or entities involved for each are in parenthesis.

- Nationwide or Individual Section 404/401 Permit (USACE, NCDWQ, USEPA, USFWS, NCWRC, NCDOT, SHPO)
- Environmental Impact Statement or Environmental Assessment as part of the SEPA process (NCDENR including NCDWQ, NCDWR, and NCWRC as well as SHPO)
- National Environmental Policy Act or NEPA FONSI or ROD (USACE, NCDWQ, USEPA, USFWS, NCWRC, NCDOT, FERC, FEMA, SHPO)
- Federal Energy Regulatory Commission or FERC approvals under the existing FERC license (Duke Power Company)
- Encroachment Agreement (Duke Power Company)
- FEMA approval (FEMA)

Some of the required documentation for the above could include Indirect and cumulative Impact Analyses, endangered species surveys, and a complete alternative sites analysis. Federal permitting will be required even if the Town of Mooresville does not solely fund the construction for this project. Depending on magnitude, the permitting process can range from several months to 1-3 years. The cost of completing the above processes can vary drastically depending upon which of the above is required. The cost could range from the tens to the hundreds of thousands of dollars.



General Congestion Management Strategies

Aside from the inconvenience of added travel delay, traffic congestion can have many negative impacts on a community. As levels of service worsen, congestion causes traffic to divert onto nearby neighborhood roads, which are not designed to handle large volumes of traffic. Excessive speeds and high traffic volumes on local streets may impede travel safety and “cut-through” traffic. Roadways that operate near capacity generally lead to a hazardous environment for drivers, bicyclists, and pedestrians.

Congestion also can hinder economic growth. The proximity of an area to a safe and efficient roadway network is crucial for local companies considering an expansion of their business and the attraction of new industries to the region. Congestion slows the movement of goods and services, which hinders economic development and productivity.

Additionally, congestion is often associated with the deteriorating vitality of an area. Many people who move into the suburbs do so in order to escape the congestion of an urban region. As the congestion moves into the suburbs, it brings with it a declining quality of life. The excessive pollution created by stop-and-go traffic is detrimental to air quality and increases noise levels.

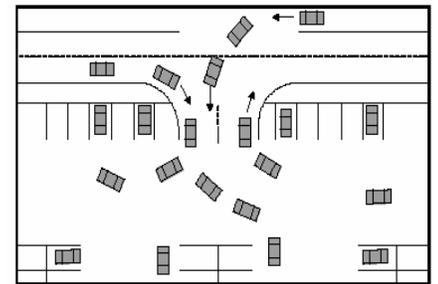
Congestion has a negative impact on highway safety, noise, and air quality. NC Highway 150 / River Highway is an example of what happens in the absence of coordinated access management. However, numerous cost effective strategies (e.g., congestion management, access management, intelligent transportation systems (ITS), and signal systems) are available to assist communities in reducing congestion and its effects. Depending on the causes of congestion, various strategies are available to mitigate it and its effects.

Municipalities have the option of using NCDOT’s *Policy on Street and Driveway Access to North Carolina Highways* for guidance and reference. However, it is recommended that the Town of Mooresville develop a specific access management policy to appropriately accommodate the vision and goals of the community.



Traffic Signal Coordination

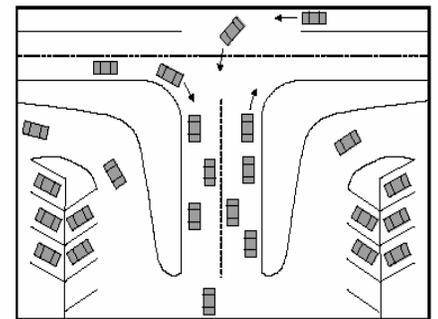
Coordination involves synchronizing traffic signals on a corridor to minimize through traffic delay. Signal coordination can be accomplished either using time-based signal plans or by interconnecting the signals in a system. Coordination can improve both the operations and safety of a corridor. (Approximate cost: \$4,000,000-\$4,700,000 per 100 signals in system)



Before traffic signal circulation improvements

On-Site Traffic Signal Circulation

One way to reduce traffic congestion is to promote on-site traffic circulation. Pushing back the throat of an entrance, as shown in the figures to the right, helps to avoid spillback onto the arterial. This measure improves both the safety and efficiency of the roadway. Another aspect of on-site traffic circulation involves limiting access points into a development by considering developments with multiple lots and land uses as one property for the purposes of access regulation.



After traffic signal circulation improvements

Only the minimum number of connections necessary to provide reasonable access should be permitted. For those situations where outparcels are under separate ownership, easements for shared access can be used to reduce the number of necessary connections. Reducing the number of access points also decreases the number of conflict points, making the arterial safer and more efficient. (Approximate cost: \$150,000 per application)

Non-Traversable Median Treatment

One of the recurring suggestions for improving Town roads expressed by the public was the need for medians. A non-traversable median treatment is a raised or depressed barrier that physically separates opposing traffic flows. Advantages include increased safety due to separation of opposing flows, pedestrian refuge, and restricting left turns

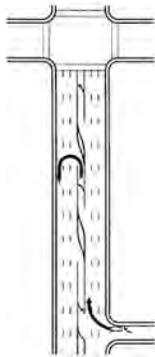


to designated locations. Where sufficient storage bays are provided, the removal of left-turning vehicles from through lanes can increase safety and reduce delay to through vehicles. Disadvantages include slowed response time for emergency vehicles, increased travel distance for left turns, and public opposition due to the possibility of detrimental effects on the business community.



A non-traversable median

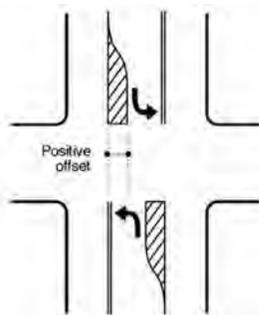
Non-traversable median treatments should be considered for multi-lane urban arterials with average daily traffic (ADT) volumes greater than 20,000 and all multi-lane roadways with high pedestrian volumes, high collision rates, or where aesthetics are a priority. Consideration should be given to providing sufficient space for u-turning vehicles at median openings when non-traversable median treatments are used. Divided roadway facilities are generally safer than undivided facilities or roadways with a two way left-turn lane (TWLTL). (Approximate cost: \$600,000 per mile)



Median U-turn treatment

Median U-Turn Treatment

Median u-turn treatments involve the prohibition of minor street direct left turns at signalized intersections in favor of right turns followed by median u-turns, as shown in the figure to the left. Advantages of this treatment include reduced delay, improved progression, and fewer stops for through traffic as well as fewer and more separated conflict points for vehicles and pedestrians along the arterial. Disadvantages include increased delay, travel distances, and stops for left-turning traffic as well as the potential for driver confusion. These treatments can increase the safety and efficiency of arterials with high through volumes. However, they should only be used where sufficient space is available for u-turning maneuvers at median openings.



Advanced left-turn treatment

Installing median u-turn treatments at multiple locations along a corridor can help to alleviate driver confusion. Much consideration should be given to locations of median openings in order to provide adequate weaving space without creating excessive travel distances for left-turning vehicles. (Approximate cost: \$50,000 per median opening)

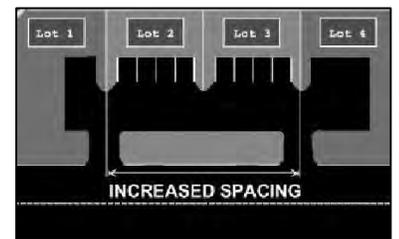


Advanced Left-Turn Treatment

Traditional exclusive left-turn lanes at signalized intersections are usually aligned to the left of one another, so the vision of a left-turning vehicle is obstructed by vehicles in the opposing left-turn lane. Advanced left-turn treatment, also known as positive offset left-turn treatment, involves shifting exclusive left-turn lanes toward the center of the intersection and past the opposing left-turn lane to provide better sight lines. Where permissive left-turn phasing is used, this treatment can improve the efficiency of an intersection by reducing the crossing time for left-turning vehicles and allowing them to see and take advantage of all adequate gaps in the opposing traffic stream. The disadvantage of this treatment is that, where existing median widths are not sufficient, the roadway may need to be widened and additional right-of-way may need to be acquired. (Approximate cost: \$250,000 per mile)

Consolidated Driveways

Consolidating adjacent driveways using shared access easements can increase safety and efficiency of corridors by reducing the number of access points and thus conflict points. Additionally, trips between adjacent land uses are then possible without using the arterial.



Relocated Driveways

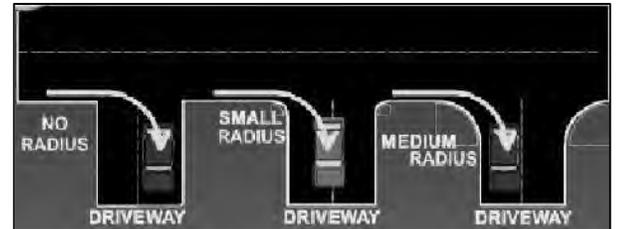
Driveways that are located too close to an intersection can cause operational, safety, and capacity problems resulting from traffic backing up across the driveway entrance or into the intersection from the driveway. Additionally, the distance between the driveway and the intersection may not provide a sufficient weaving distance. Relocating driveways that are too close to intersections can improve safety and efficiency of the intersection by separating conflict points and lengthening weaving distances.



Improved Intersection Turning Radii at Intersection/Driveways

Driveways with short turning radii force vehicles to encroach on adjacent lanes when

entering or exiting the driveway. Intersections with short radii also force vehicles onto the roadside, causing potential damage to curb and gutter and sidewalks. Long turning radii allow drivers to make turning maneuvers more easily, which enhances the operations and safety of the roadway.



Signalize Retail Driveway Leg at Existing Signalized T-Intersection

For high volume retail driveways, a signal head may improve operations and safety of the minor street turning maneuvers. There may be some increase in delay to major street through traffic as well as an increase in rear-end collisions. However, it is likely that a signal would greatly reduce minor street delay as well as angle collisions. (Approximate Cost: \$10,000)

Left Turn Storage Bays at Major Driveways

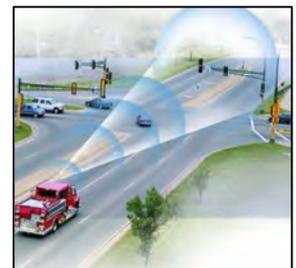
Left turn storage bays can be used at high volume retail driveways in order to remove left-turning vehicles from the through lanes. Adequate storage bays enhance the safety of a corridor and decrease delay to through vehicles. Additional right-of-way and roadway widening may be needed in order to provide storage bays.

Exclusive Left-Turn Lane on Minor Approach

At signalized intersections where left turns from a minor approach are significant, an exclusive left-turn lane can promote optimal signal phasing.

Emergency Vehicle Preemption

Emergency vehicle preemption involves changing the indication at traffic signals to favor the direction of detected emergency vehicles. Preemption improves emergency vehicle response time and the safety of the responders by stopping conflicting movements. (Approximate Cost: \$10,000 per application)



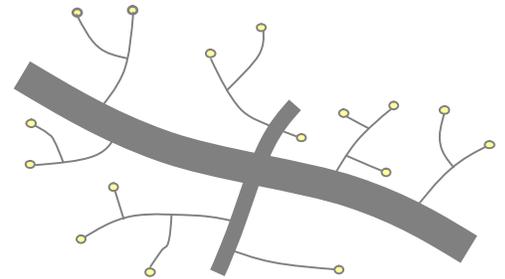
Collector Street Recommendations

Introduction

Expanding Mooresville's transportation system with an increased number of collector streets will enhance travel between local streets and arterials. As discussed in Chapter 2, the primary purpose of the collector street system is to collect traffic from neighborhoods and distribute it to the system of major and minor thoroughfares throughout an area. In general, collector streets have two lanes and often have exclusive left-turn lanes at intersections with major and minor thoroughfares and less frequently at intersections with other collectors. Collector streets rarely are constructed and funded by the state. Responsibility for collector streets usually falls to the local government and developers for funding, design, and construction. A properly implemented system improves accessibility to higher intensity residential areas and activity centers, while minimizing impacts to sensitive natural areas. As a result, local and through traffic will benefit from the reduced reliance on the town's major roadways: Interstate I-77, NC Highway 150, and US Highway 21.



Connected Street Network



Fragmented Street Network

Natural Environment

Located to the east of Lake Norman, Mooresville faces challenges related to the natural environment. The geography of Lake Norman has created a series of peninsulas where extensive residential development has occurred. These peninsulas are constrained by Lake Norman and access to the regional roadway network is limited to a single connector street. The Catawba River floodplain and wetlands all impact Mooresville. These features affect how the community develops, where streets can be



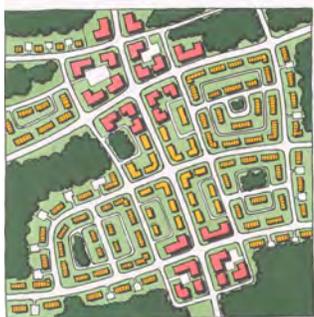
Collector Street Spacing



Low Intensity Land Use
Street Spacing
3,000' to 6,000'



Medium Intensity Land Use
Street Spacing
1,500' to 3,000'



High Intensity Land Use
Street Spacing
750' to 1,500'

constructed and maintained, and where connections between streets can be made. Other features of the natural environment that can be found around Mooresville include historic properties, endangered and threatened species, and superfund sites.

Assessment of Collector Street Spacing Needs

It is important to determine an appropriate set of collector street spacing guidelines for this plan. It has been theorized that 1,500 to 3,000 feet is an appropriate spacing for collector streets in a suburban setting; unincorporated and incorporated areas tend to have different development potential. This difference is mostly due to environmental constraints and the availability of municipal water and sewer service.

Different spacing standards are necessary for different development types and intensities. Understanding this principle, Kimley-Horn developed a theoretical model largely influenced by land use intensity ranges that shows the desired collector street spacing for different intensities.

Land Use/Type of Collector Street	Intensity	Access Function	Approximate Street Spacing
Very Low Intensity Residential	Less than 2 dwelling units per acre	High	3,000 to 6,000 ft
Low Intensity Residential	2 to 4 dwelling units per acre	High	1,500 to 3,000 ft
Medium and High Intensity Residential	More than 4 dwelling units per acre	High	750 to 1,500 ft
Activity Center	Mixed-use residential/commercial	Medium	750 to 1,500 ft

Recommendations — For local and collector streets, recommendations include:

- Local Streets — One connection along a collector should be in place every 750 to 1,500 feet. There are cases that will necessitate a variation in this guideline. Approval for these cases will be the responsibility of the Town Engineer and State Division Engineer who will consider traffic impacts, land access, property rights, and environmental conditions.



- Collector Streets — One public street intersection along a collector or an arterial should be in place every 1,200 to 2,000 feet in a suburban context and every 500 to 1,000 feet in the context of heavily developed areas or the central business district. As determined by the Town Engineer, variations in spacing requirements will depend on traffic impacts, land access, property rights, and environmental conditions.

Identifying Future Collector Street Connectors

The following guidelines were used to develop the Mooresville collector street network:

- Avoid steep slopes and otherwise unsuitable topography
- Minimize impact to the built environment
- Avoid FEMA designated floodplains
- Minimize the number of wetland (National Wetland Inventory) impacts
- Minimize the amount of each wetland impact (e.g., don't cross a wide wetland when a narrower one can be crossed)
- Minimize the frequency of stream crossings
- Minimize the number of high-quality (larger) stream crossings
- Minimize the length of stream crossings
- Minimize school impacts
- Minimize the number and size of each impact to other environmental features, such as historic features and districts, threatened and endangered species, hazardous waste sites, and superfund sites
- Avoid impacts to parks and designated open spaces
- Minimize the number of new facilities in critical watershed areas
- Be responsive to existing and planned development patterns
- To extent possible utilize existing stub streets
- Develop feasible connections (A to B)
- Consider Land Use Plan goals for area development
- Consider land use potential and plan collectors according to established spacing guidelines



Design Guidelines

Designing a street with appropriate horizontal and vertical alignment is important. The following horizontal and vertical design features — based on standards published in *A Policy on Geometric Design of Highways and Streets, 2001*, by American Association of State Highway and Transportation Officials (AASHTO) — are recommended for the design of future collector streets. Design speed should be 35 miles per hour, and the maximum recommended grade is 8%. The maximum degree of horizontal curvature is 10 degrees ($R_{\min} = 573$ feet).

Future Collector Street Network

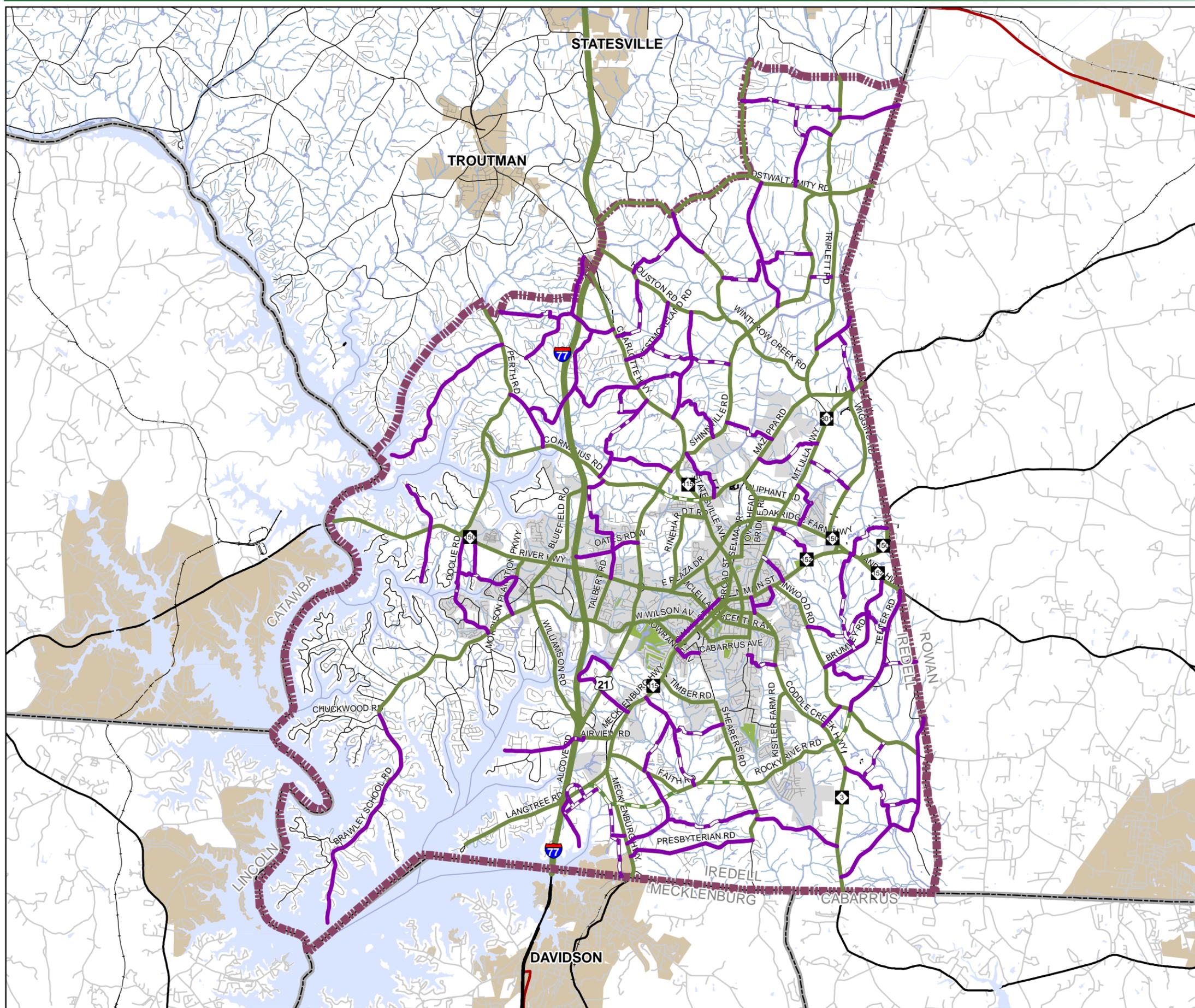
A future collector street network (Figure 5.18) was developed using the guidelines discussed above. Key goals of this network included improving accessibility to higher intensity residential areas and activity centers, and avoiding or minimizing impacts to sensitive areas for the preservation of the natural environment. Although environmental and built constraints (such as Lake Norman and Interstate-77) limited the number of collector streets that could be identified, the general policy recommendations will provide local staff with the ability to encourage connectivity as future development occurs. Ultimately, the future collector street network will provide a greater level of connectivity and mobility to the residents of Mooresville by reducing the travel time between local streets and arterial streets.



Figure 5.18
Future Collector
Street Network



-  Study Area
-  County Boundary
-  Other Municipal Limits
-  Town of Mooresville
-  Parks, Golf, Cemeteries
-  Bodies of Water
-  Railroads
- Higher Facility Type**
-  Existing
-  New Location
- Collector Streets**
-  Proposed
-  Existing



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General Policy Recommendations

The following general policy recommendations are offered for consideration in an effort to increase the number of collector streets to better facilitate travel between local streets and arterials:

- Use the future collector street network as a tool to review proposed development projects and plans as they locate and design future collector streets
- Amend the collector street network to include new streets as they are identified during the development review process
- Work with the development and real estate community to increase public awareness of future collector street connections through enhanced signage
- Provide temporary turnaround accommodations for collector street stub-outs to allow access by maintenance and emergency vehicles; right-of-way needed for these turnarounds would revert back to property owners once the connection is made
- Require that new developments reserve right-of-way for, and in some cases construct, future collector streets
- Consider adopting policies and dedicating funding to help construct traffic calming measures on existing collector streets that become connected to new collector streets
- Require all new development to provide connections or stub-out streets in each of the four cardinal directions (where applicable)

Example Cross Sections

Figure 5.19 shows plan and section views of a typical residential collector street. This collector is designed to limit automobile travel speeds to 25-35 miles per hour. It provides two travel lanes with on-street bicycle lanes and trees along both sides of the street. Sidewalks are preferred for both sides of the street in more urban areas; however, a 10-foot, multi-use path on one side of the street is acceptable in less dense areas. A natural buffer extends from the back of the sidewalk to the private property line along the entire corridor. Context-sensitive design considerations should include:

- Striped crosswalks
- Drainage (curb and gutter)
- Street trees (formal or random plantings)
- Pedestrian circulation (sidewalk or multi-use path)
- Street lighting (pedestrian scale)



Mooresville

Comprehensive Transportation Plan

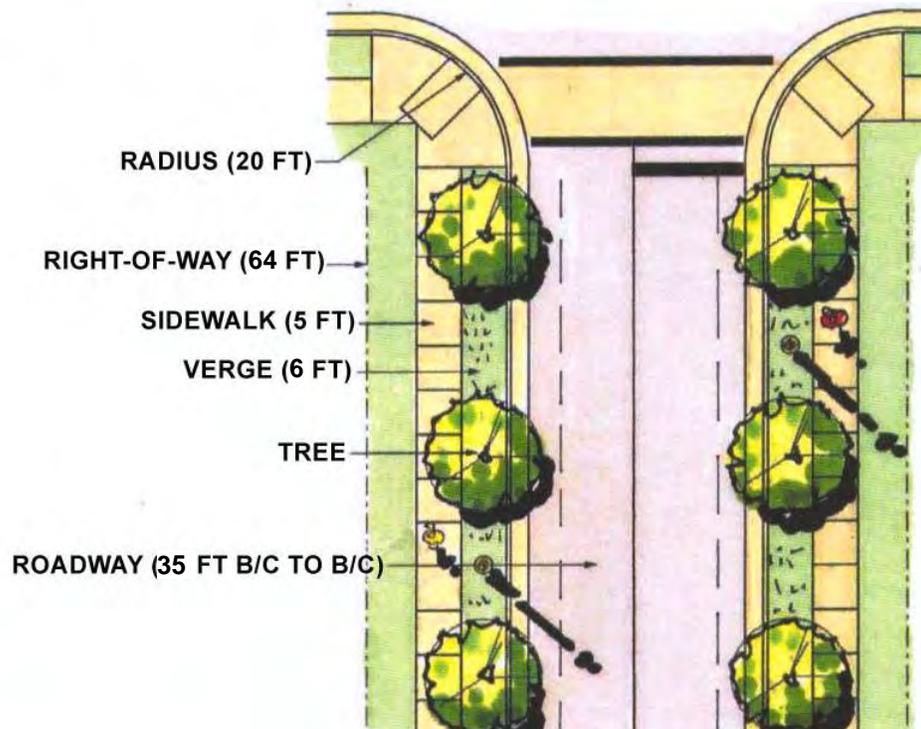
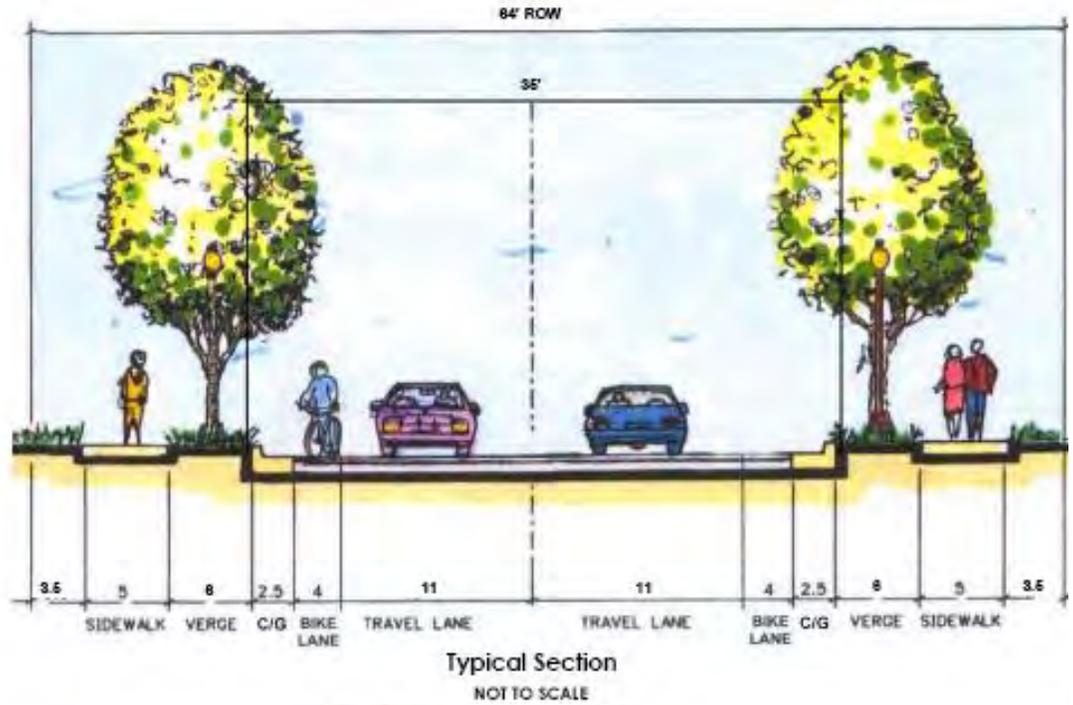


Figure 5.19 Typical Cross-Section



Bicycle and Pedestrian Recommendations

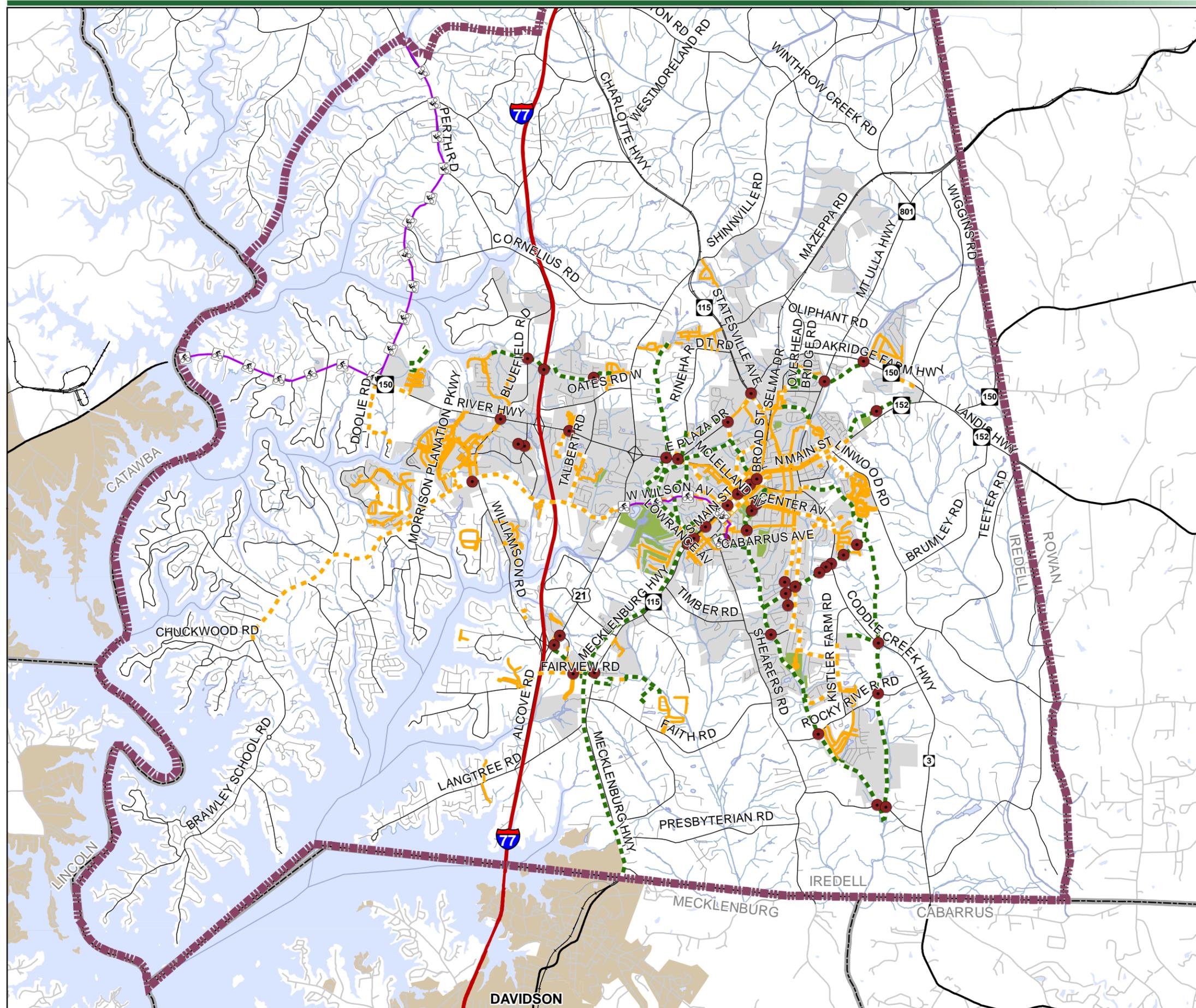
The Town of Mooresville's growth requires the implementation of a transportation plan that extends beyond the vehicular realm and enhances the non-vehicular transportation network. This plan's bicycle and pedestrian facilities can be constructed as stand-alone enhancement projects. These facilities are often more effectively implemented, however, as components of public and private infrastructure projects, such as roadway widenings, regular street maintenance, utility line replacements, and new road construction.



The Town of Mooresville has recently completed the *Comprehensive Pedestrian Plan* and has received a grant to complete a *Comprehensive Bicycle Plan*. North Carolina Department of Transportation (NCDOT) awarded Mooresville a grant for each of these projects with the purpose of identifying and planning safe amenities that encourage a pedestrian and bicycle-friendly environment. Through the pedestrian plan development process, the public was encouraged to communicate their vision for the non-vehicular environment. The following bicycle and pedestrian recommendations reflect the efforts of the *Comprehensive Pedestrian Plan* and suggest that the *Comprehensive Bicycle Plan* be referenced, after completion, for more specific action items. Figure 5.20 shows the *Comprehensive Pedestrian Plan* proposed pedestrian projects which include sidewalks, multi-use trails, and road crossing amenities.



Figure 5.20
Proposed Bicycle and Pedestrian Improvements



- Study Area
- County Boundary
- Bodies of Water
- Other Municipal Limits
- Town of Mooresville
- Parks, Golf, Cemeteries
- Local Streets
- Existing Sidewalks
- Proposed Sidewalks
- 10' Wide Paved Multi-Use Trail
- Striped Bike Lanes
- Crosswalks

Sources:
Town of Mooresville Pedestrian Plan
Lake Norman Bike Trail Report
Adopted CTP Maps



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Miles



Bicycle Facilities

The Lake Norman Bicycle Route is a regional route that is currently under consideration by NCDOT and the Centralina Council of Governments. This facility is proposed as a 125-mile comprehensive system of arterial, collector, and local roads that collectively offer various skill levels of bicyclists the opportunity to travel safely and enjoyably around Lake Norman.

A number of secondary arterials located to the west of Interstate I-77 have been designated as proposed long distance bicycle routes in the Lake Norman Bicycle Route. Several major arterials bypassing or linking downtown Mooresville to the network have been identified as “vehicle substitution routes,” where riding a bicycle may be considered a feasible alternative to using a motor vehicle. Some of the vehicle substitution routes identified in the plan include NC Highway 150, Brawley School Road, and Williamson Road (*Lake Norman Bike Trail Report, Centralina Council of Governments*).

The *Mooresville Comprehensive Pedestrian Plan* identifies several new greenways and multi-use paths throughout the Mooresville area for pedestrian and bicycle use. The adopted *Comprehensive Pedestrian Plan* has identified an interconnected network of seven greenways and four multi-use trails within the Town limits of Mooresville. These facilities will be linked through an interconnected network of signed bicycle and pedestrian routes. In order to maximize the benefits of the ultimate transportation network, the proposed pedestrian and bicycle facilities network should be implemented with other planned facilities in mind.

The following descriptions represent locations that were specifically referenced by previous plans or public input during the Mooresville Comprehensive Transportation Plan process. These recommendations should be updated upon completion of the Mooresville Comprehensive Bicycle Plan.

- Wilson Avenue is identified as an existing *other major thoroughfare*. It is recommended that this corridor remain a two lane undivided facility and that bike lanes be constructed from US Highway 21 to Shearers Road.
- Perth Road is identified as *boulevard* in need of improvements from NC Highway 150/River Highway to Cornelius Road and is



identified as an existing minor thoroughfare from Cornelius Road to the northern study area boundary. It is recommended that bike lanes be constructed along the length of this corridor.

- NC Highway 150 / River Highway is identified as *boulevard* in need of improvements from Perth Road to the Catawba County boundary. It is recommended that bike lanes be constructed along the length of this section of corridor.

In general, bikeways in Mooresville should have the following characteristics:

- Shared lane facilities on roadways without curb-and-gutter should consist of a paved shoulder approximately 4 feet in width. On two-lane roadways with curb-and-gutter, shared lane facilities should require a travel lane width of 15 feet, excluding curb-and-gutter. On multi-lane roadways with curb-and-gutter, these facilities should require a total outside lane of 14 feet (excluding curb-and-gutter), with an adjacent lane width of 12 feet.
- Designated bike lanes on roadways with curb-and-gutter should be striped 4 feet wide. On roadways with shoulder only should be 5 feet wide.
- Greenways/multi-use paths should have a 10-foot wide off-street network.

The NCDOT adopted Bicycle Map can be found in the Appendix and represents the adopted recommendations for the bicycle element per NCDOT standards.

Pedestrian Facilities



Figure 5.20 illustrates the existing and proposed sidewalks for the Town of Mooresville. The network of proposed sidewalks includes two types of facilities: those that have been added to existing roadways and those constructed as part of new roadways. The Citizens' Advisory Committee and the general public expressed an interest in "closing the gaps" in the sidewalk network and improving connections to existing activity nodes, such as shopping centers, schools, and the Town's recreational center. Multi-use trails also are shown in the figure to fully illustrate potential network connections. These facilities supplement the sidewalk network by providing additional connectivity to destinations.



In general, sidewalks in Mooresville should adhere to the following guidelines:

- Width — Sidewalks should be a minimum of 5 feet in width in suburban locations, and sized appropriately to complement/support the streetscape in urban areas.
- Set-back — In areas where curb-and-gutter exists, sidewalks should be set back from the street by a minimum of 5 feet (using planted or “hardscaped” land). In areas where curb-and-gutter does not exist, sidewalks should be located with the open drainage channel between the roadway and the sidewalk.
- Material — Generally, sidewalks should be concrete. Other decorative materials, however, should be permitted in areas as dictated by streetscape designs. These decorative materials must be level and smooth.
- Location — Sidewalks should be located in accordance with Mooresville’s ordinances. Sidewalks also should be constructed on both sides of major/minor thoroughfares and collector streets. In instances where a greenway is shown for a corridor, the greenway takes the place of a sidewalk on one side of the street and a sidewalk may or may not be required on the opposite side of the street.

In addition to the sidewalks shown in Figure 5.20, the *Mooresville Comprehensive Pedestrian Plan* has identified several pedestrian development zones where improvements would enable residents to walk and bike to attractions within their neighborhoods. The zones have been developed to include housing, shopping, businesses, and schools, and the recommendations were intended to improve connectivity between all land uses.

Some of the proposed facilities and the associated pedestrian improvements include:

- Encourage compact commercial development along NC Highway 150 with greenways and sidewalks that connect to residential areas.
- Connect neighborhoods, commercial developments, parks, and downtown Mooresville with a pedestrian path that would follow Caldwell, Academy, and Goodnight Streets and terminate at Academy Park.
- Restrict commercial development for greater than ¼ mile from the corner of McClelland Avenue and NC Highway 150 to provide a



compact community center which would promote pedestrian activity.

- Develop wider sidewalks with planting strips and on-street parking along Main Street from McClelland Avenue to Wilson Avenue to extend the “pedestrian-friendly” atmosphere that is evident throughout downtown Mooresville.
- Relax off-street parking requirement ordinances that require large parking lots to be constructed in front of large commercial developments. Promoting infill and increasing building density should be the alternative to allowing commercial development to spread farther on NC Highway 150 or Williamson Road.

Pedestrian Plan Policy Recommendations

A series of suggested policy guidelines to create a unified network of pedestrian facilities in concert with new pedestrian development throughout the Town of Mooresville are listed below:

- Orient new commercial development to the pedestrian with accessible pedestrian walkways.
- Construct new residential development to be pedestrian friendly, with interconnected, grid-like street patterns, and block lengths that are less than 660 feet in distance.
- Provide adequate pedestrian connectivity between new and existing developments.
- New residential, commercial, and mixed-use developments should provide sidewalks on both sides of the street, plant trees that will shade sidewalks, and ensure an adequate buffer distance between traffic and off-street parking lots.
- Establish an adequate detour route when an existing pedestrian path is closed for construction or maintenance.
- Enact a policy to create pedestrian-friendly parking lots by encouraging shared parking between businesses and constructing sidewalks that provide safe routes from the parking lot to the commercial development.
- Mandate that adequate bicycle racks and pedestrian walkways be included in any ordinance, and that the developer may substitute these facilities for vehicular parking spaces.
- Identify opportunities for the town to reach agreements with property owners to construct a sidewalk or path as necessary without acquiring right-of-way.



- Create pedestrian linkages to future transit operations, including the proposed commuter rail station.

NCDOT currently does not specify a standard for a pedestrian element map, however, should a standard be released, the Appendix should be updated to include an adopted NCDOT Pedestrian Map.

General Bicycle and Pedestrian Recommendations

In general, three steps can be taken to provide an improved pedestrian and bicycle environment:

1. Integrate land use and transportation to create communities and neighborhoods that are designed for walking and bicycling.
2. Adopt pedestrian- and bicycle-friendly development standards, policies, and guidelines.
3. Develop a proactive attitude toward change.

Step 3 is a critical step. *Bicycling & Walking in North Carolina, A Long-Range Transportation Plan* conceives the following vision for the future:

“All citizens of North Carolina and visitors to the state will be able to walk and bicycle safely and conveniently to their desired destinations, with reasonable access to all roadways.”

The fulfillment of this vision of pedestrian- and bicycle-accessible communities requires a “can-do” attitude. Mooresville can build on current successes, such as the bike lanes on Wilson Avenue as well as the bicycle and pedestrian plans already undertaken through the NCDOT grant initiatives. Capitalizing on this willingness to accommodate multimodal facilities can ensure that as Mooresville experiences growth, pedestrian and bicyclist issues will be given appropriate consideration. Below are four important components that contribute to the success of non-motorized transportation systems and programs:



1. Engineering — Before the Town can have facilities for walking and riding bicycles, a network of pathways must be planned and designed. Good design and route choices are essential parts of a successful pathway network, and are underway in Mooresville as a result of the development of the comprehensive bicycle and pedestrian plans. In addition, ancillary facilities such as bike racks, crosswalks, curb ramps, and pedestrian signals should be planned and designed in order to create a more user-friendly system.



2. Education — Once pathway systems are developed, new and experienced cyclists should be made aware of where these systems are and what destinations can be accessed. Motorists, pedestrians, and cyclists must understand the “rules of the road” to keep themselves safe while operating on and near these facilities. School programs are an excellent medium to expose children to bicycle and pedestrian safety. Public service messages using local media are an effective tool to educate adult pedestrians, bicyclists, and motorists about their responsibilities and safety techniques.

Mooresville should participate in the Safe Routes to School program to encourage and provide a safe environment for children and educators to walk or bike to school. More information on this program can be found at safety.fhwa.dot.gov/saferoutes. Furthermore, a workshop should be conducted to educate Town officials on safe practices and laws regarding bicyclists, walkers, and drivers.

3. Encouragement — The more desirable Mooresville becomes for pedestrians and bicyclists (by providing more destinations oriented for them), the more successful these modes of transportation will become. Setting a Town goal to be widely recognized as bicycle friendly is a worthy idea.

Mooresville should publicize and participate in National Walk to School Day in October each year. This program encourages children, parents, faculty, and staff to walk to school, and provides an opportunity to educate students about safe practices and the benefits of walking.

The Town could initiate annual community events such as rideabouts and bike rodeos to help children and adults learn the “Rules of the Road” and helmet safety laws, as well as encourage healthy lifestyles.

4. Enforcement — To ensure safety, everyone should heed laws that pertain to the interaction between motorists, pedestrians, and cyclists. Local enforcement agencies should monitor driving speeds on local roads and actively ticket speeders.

Also, Mooresville should participate in the North Carolina School Crossing Guard Training Program to properly train law enforcement officers.



Transit Recommendations

As the Town's population continues to increase, it is important to look beyond the passenger vehicle when planning future transportation services. While the private vehicle will remain the predominant means of transportation for the majority of citizens, the need for quality alternative modes of transportation will increase with community growth. The recommendations presented in this section aim to provide improved alternatives for both commuters traveling to and from the Town and travelers whose origin and destination is within Town limits.

Chapter 2 of this document inventoried the existing transit facilities within the study area and summarized issues important to the community. The existing transit services include taxi, rideshare, and limited fixed-route through the Charlotte Area Transit System (CATS). The following recommendations build on the existing services to provide a greater level of mobility for transit riders.

Fixed-Route Service

Charlotte Area Transit System (CATS) currently operates a single route between the Town of Mooreville and uptown Charlotte. The Mooreville Express route operates Monday through Friday from 4:45 a.m. to 7:11 p.m. (from uptown) and from 5:40 a.m. to 7:06 p.m. (to uptown). The primary service stop for this route is a park-and-ride lot located at the Williamson Chapel Church. Within the past year, three park-and-ride lots have closed, leaving Mooreville with a single location for transit access to and from Charlotte.

Ridership for the Mooreville Express route for fiscal year 2005-2006 was more than 50,000 riders, up over 38% from the previous year. The current fixed route is more than likely sufficient to handle commuter traffic to and from downtown Charlotte. However with the recent loss of park-and-ride lots in the Mooreville area, ridership on the Mooreville Express has significantly decreased. From November 2006 to March 2007 the ridership has decreased anywhere from 11% to 25% on the Mooreville Express. As Mooreville continues to grow, it may be necessary to create dedicated park-and-ride lots along the route to encourage and handle additional riders.





Mooresville

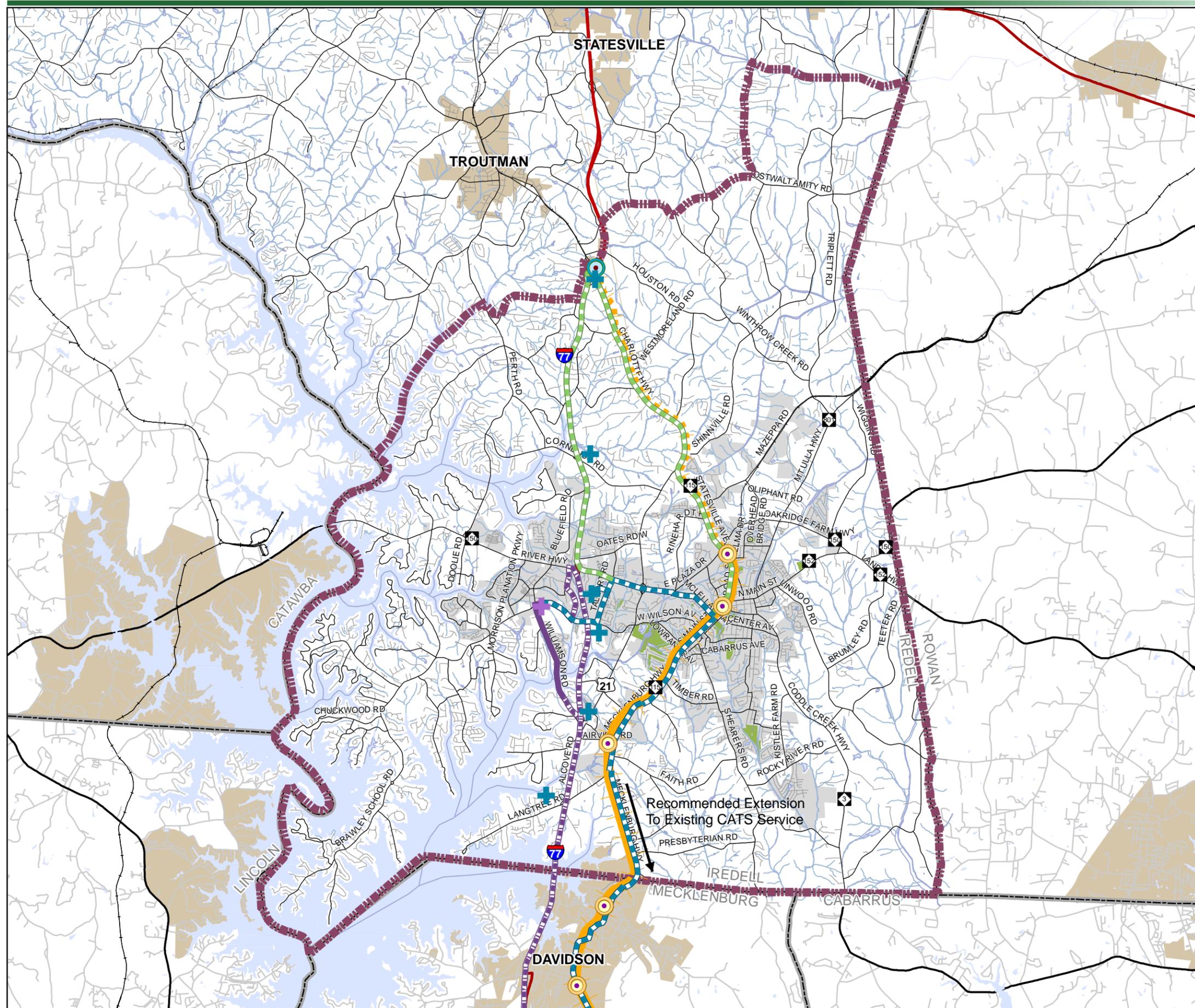
Comprehensive Transportation Plan

Figure 5.21 shows the recommended interim and long-term fixed route services. It is recommended that in the interim CATS service be extended from the existing Mooresville Express service to downtown Mooresville and connected to existing CATS service south. It is recommended that this service be extended north over the long-term to accommodate anticipated growth and to link Mooresville to neighboring communities.

The NCDOT adopted Public Transportation and Rail Map can be found in the Appendix and represents the adopted recommendations for the transit element per NCDOT standards.

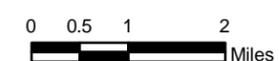


Figure 5.21
Future Public Transit and Rail Map



- Study Area
- County Boundary
- Bodies of Water
- Other Municipal Limits
- Town of Mooresville
- Parks, Golf, Cemeteries
- CATS Proposed Station
- Mooresville Proposed Station
- Proposed Mooresville Extension
- CATS North Corridor
- Proposed Troutman Extension
- Existing CATS Fixed Route Service
- Existing CATS Express Fixed Route Service
- Proposed Interior Fixed Route Service
- Proposed Interior*
- Proposed Long-Term Fixed Route Service
- Proposed Long*
- P61 Williamson Chapel Park and Ride Location
- Proposed Park and Ride Location

Recommended Extension
To Existing CATS Service



Commuter Rail

Commuter rail is a passenger rail service that operates on existing freight railroad tracks, connecting city centers to the community's outer fringes, typically 3 to 5 miles apart. This system differs from commuter rail, which is primarily located in urbanized city centers with station spacing of a mile or less. While commuter rail may appear to primarily benefit the passenger traveling from a suburban area to the urban core, it is also used by reverse commuters traveling from the city to the suburbs for employment, recreational, and commercial purposes. Commuter rail systems are often integrated with buses to encourage transfers to other areas throughout the region.



CATS Commuter Rail
Line

Several studies (including the *2025 Integrated Transit/Land-Use Plan*, the *2025 Corridor System Plan*, and a Major Investment Study (MIS) conducted by both CATS and the City of Charlotte) outline strategies to construct commuter rail between downtown Charlotte and several outlying communities, including Mooresville. The North Corridor rail line is intended to provide an alternative to the congested Interstate I-77 corridor for commuters from the northern section of Mecklenburg County to uptown Charlotte.

The North Corridor rail line is approximately 30 miles long, operating on the "O" line of the existing Norfolk-Southern rail line. The route is proposed to run from uptown Charlotte to Mooresville, with 12 proposed stations between Williams Street and the Gateway Station. The proposed alignment will follow Graham Street within the City of Charlotte, and parallel Old Statesville Road (NC Highway 115) to the north. Figure 5.21 shows the proposed North Corridor alignment in the vicinity of Mooresville.

The North Corridor is expected to have 4,500 daily riders following the first phase of construction. The initial service is projected to have 16 daily commuter trains operating in one direction at a time. The North Corridor rail line could open for operation between Charlotte and Mooresville as early as 2012.



Park-and-Ride

Park-and-ride services were addressed in relation to fixed-route transit, and should be studied further to determine if additional stations would benefit the commuters in the Town of Mooresville. In addition, with the construction of commuter rail, it will be important to make sure that adequate park-and-ride facilities are available to those citizens who wish to use the service. It is recommended that a number of potential park-and-ride locations be studied to accommodate future transit riders. Figure 5.21 identifies potential interim and long-term park-and-ride locations that would be appropriate for further study.

Telecommuting

Telecommuting is a work arrangement between an employee and an employer in which the daily commute is replaced by use of telecommunication links. In short, it is the process of working from home in lieu of commuting to and from the office on a daily basis. This arrangement requires some flexibility between the employee and the employer, and the management style has to be tempered to be based on results instead of close scrutiny of the employee. If this arrangement can be successfully incorporated into several employer work programs, congestion levels along major corridors could be affected.



Freight Recommendations

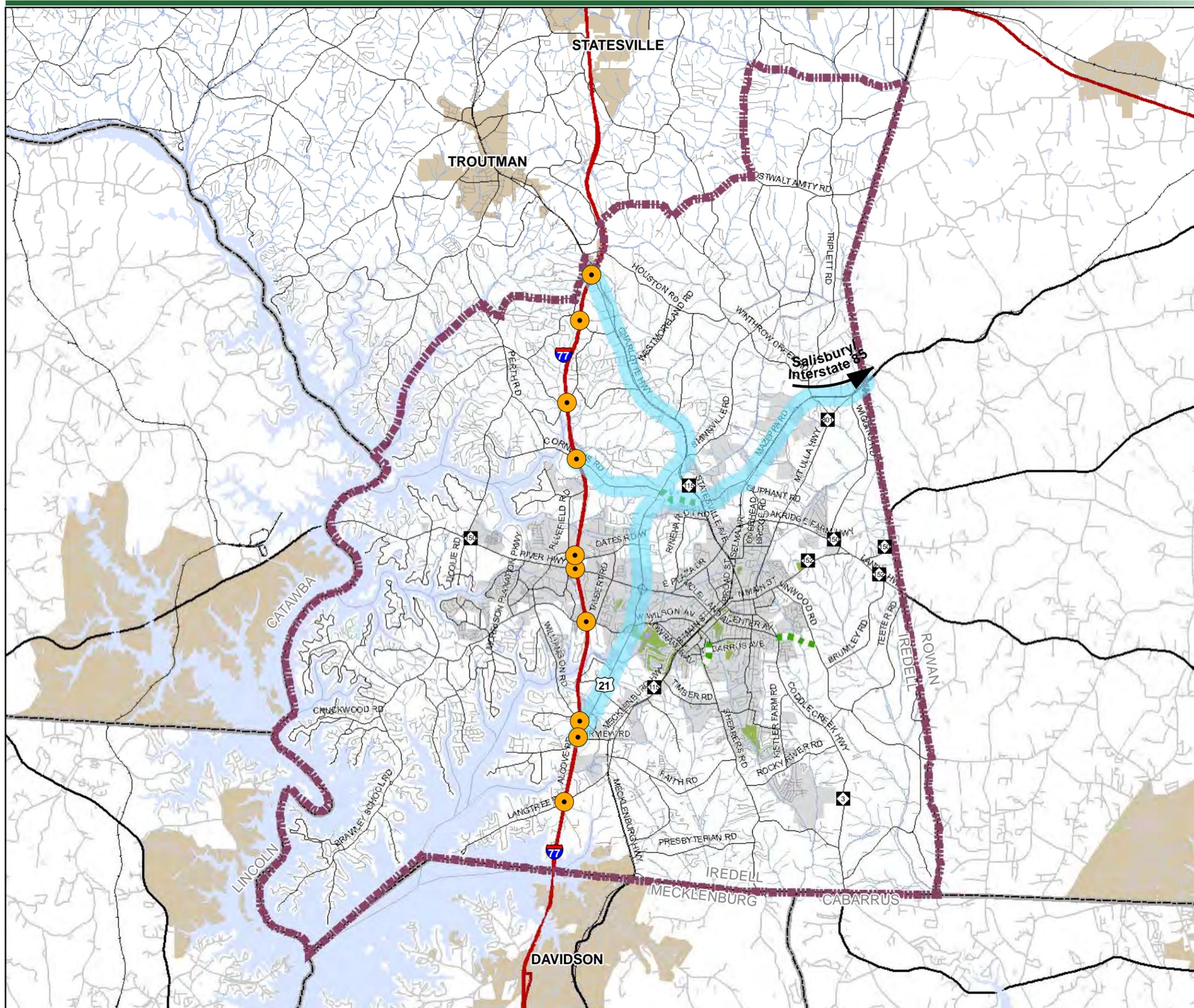
The Town's freight movements will likely increase with the completion of the industrial area on the northeast side of Mooresville near Mazeppa Road. Several roadway improvements are proposed that will likely lead to the introduction of a designated truck route between this area and Interstate I-77. These projects include:

- A proposed interchange located at Cornelius Road and Interstate I-77
- Widening of Cornelius Road from two to four lanes
- Widening of Mazeppa Road from two to four lanes
- Extending Mazeppa Road from Statesville Highway to Charlotte Highway, in order to connect with Cornelius Road
- Proposed improvements to US Highway 21 / Charlotte Highway

These improvements should lead to the introduction of this facility as a designated truck route, primarily because of its proximity to the future industrial area and the interstate. While this corridor is the main focus of this study's recommendations, the Town should implement the truck route recommendations presented in this section where the designation is needed to restrict or promote truck access. Figure 5.22 identifies these truck route recommendations. Special attention should be given to the downtown core, where truck traffic should be restricted only to those vehicles making local deliveries. The following recommendations apply to those facilities designated as truck routes.



Figure 5.22
Proposed Freight Routes



- Study Area
- County Boundary
- Bodies of Water
- Other Municipal Limits
- Town of Mooresville
- Parks, Golf, Cemeteries
- Local Streets
- Proposed Freight Route
- Proposed Corridor Extensions
- Proposed Interchanges

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Truck Route Recommendations

As Mooresville and surrounding areas continue to grow and more businesses locate to the community, the volume of truck traffic is likely to increase. Before this type of traffic becomes a source of citizen outcry, Mooresville should work with NCDOT to designate local and through truck routes. During this process, the following recommendations should be considered.



Typical no through trucks sign



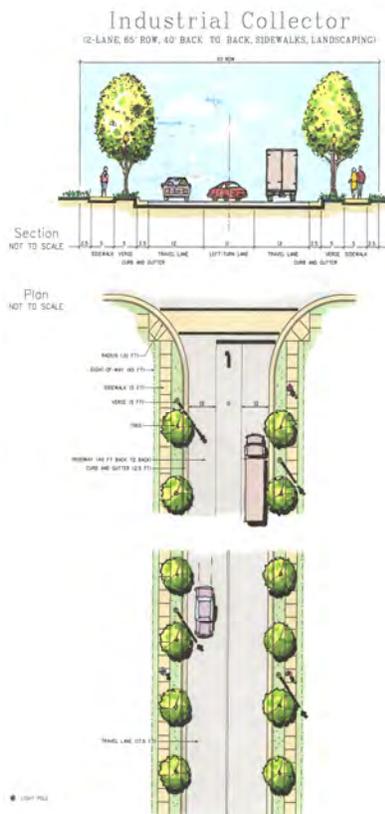
Designated truck route sign

- **Truck definition** — Currently, trucks are defined as vehicles with a manufacturer's gross vehicle weight of 33,000 pounds or more. This definition excludes most single-unit, panel and delivery trucks, and public service vehicles, such as garbage collection trucks. It includes trucks with more than two axles, such as tractor-trailers and tandem axle dump trucks. The Town should review its truck definition to determine if changes might restrict more heavy vehicles, thereby protecting and maintaining the integrity of its streets.
- **Signage** — Designated truck routes should be clearly marked at and within (as appropriate) Town limits, as well as major highway intersections, interchanges, and other appropriate locations directing heavy vehicle operators to permitted routes. This may include limiting travel to US and NC routes and other designated routes throughout the Town. Within the Town limits, consideration should be given to amending the local ordinance to specifically prohibit through trucks on local streets. Prohibition of trucks on any segment of state-maintained roadways, however, requires approval from NCDOT.
- **Routes** — Truck route designations should be sought for major routes and industrial streets. The previously mentioned Cornelius Road/Mazeppa Road corridor between the future industrial park and Interstate I-77 should be considered for this designation. In addition, US Highway 21, NC Highway 150, and NC Highway 152 could be examined for truck route designation eligibility.
- **Industrial use areas** — In the industrial use areas along Mazeppa Road, efficient truck access should be planned and provided to allow unimpeded movement of freight without creating unwanted cut-through traffic.



Additional tasks associated with establishing truck routes through the urban area include:

- Working with NCDOT to prioritize resurfacing on designated routes to reduce noise and vibration from trucks.
- Adjusting signal timing (coordination) along high priority routes to reduce vehicle delay and maintain vehicle speeds within an acceptable range of the posted speed limit. Impacts of the adjusted timing could include travel time (and reliability), reduced noise (from accelerating and braking vehicles), and air pollution.
- Publishing and distributing educational materials to businesses and industries concerning truck routes.
- Working with NCDOT to make improvements to critical intersections on truck routes to more easily facilitate large vehicle movements and encourage their use by truckers. Improvements include providing adequate curb radii, lane width, and exclusive turn lanes.



Sample industrial collector street cross section

Street Design Considerations

The design of all roadways should be consistent with their intended function and be responsive to the environments and land uses through which they pass. Streets serving as truck routes are not an exception. Common high priority design elements include adequate lane width, turning radii, horizontal and vertical transitions, and adequate space between the edge of the traveled way and adjacent pedestrian facilities. A general set of design considerations for truck routes and industrial streets include:

- Edge Treatment — Curb and gutter preferred in incorporated areas and a ditch or swale in unincorporated areas
- Median — Paved, flush with travel lanes
- Lane Widths — 12 feet
- Bike/Pedestrian Accommodations — 5-foot sidewalks (minimum) and 5-foot verge (minimum)
- Design/Posted Speed — 30-55 mph
- Curb Radius — 40 feet (minimum)
- On-Street Parking — Prohibited





Mooreville

Comprehensive Transportation Plan

Chapter 6 – Implementation Plan

Introduction

Planning, design, and implementation are all critical components of a successful plan. The citizens of Mooreville have expressed a desire to implement a comprehensive transportation plan that will add to the quality of life and unique character of the Town. However, with limited funding, implementation can be challenging and time-consuming. With this in mind, policy recommendations and an action plan have been developed to help local staff focus their efforts and seek strategic opportunities to expedite the implementation of this plan.

Completion of the Town's Comprehensive Transportation Plan represents an important step toward implementing multimodal improvements that affect travel safety, mobility, development patterns, and the aesthetics of Mooreville. Some of the recommended improvements will be implemented through the development review process. Major infrastructure improvements most likely will be a product of state and federal funding; however, transportation improvement funds are limited and competition for them is great.

This chapter provides general policy recommendations, reviews funding opportunities, and presents an action plan to assist local decision-makers and planning staff in the implementation of the *Mooreville Comprehensive Transportation Plan*.

Responsible Agencies

To successfully implement this plan, responsible agencies have been identified that can influence and authorize recommendations. Policy and program initiatives will, for the most part, occur at the local level. Some improvements will occur as a result of development and redevelopment opportunities. The majority of responsibility for implementing these recommendations, will be a coordinated effort between NCDOT, the Lake Norman Rural Planning Organization, and the Town of Mooreville.



Funding Opportunities

The construction of a comprehensive and connected transportation network can occur through adoption of local policies and programs and state programs, as well as through the receipt of private contributions. With this in mind, it will be important for the Town of Mooresville to identify funding sources to implement the recommendations of this plan. While some projects and programs will be funded by the Town, alternatives are available to provide financial support for improving the local transportation network.

Local Programs

Local funds should be used for strategic projects identified by the community as being necessary to improve the transportation network in Mooresville. Usually these projects are most successful when additional funding can be secured to help lessen the burden to the Town. Local funding sources tend to be flexible and include general revenue expenditures, and in some communities local bond programs as well as proceeds from bond programs. An exception to this policy may include high priority connections along roads unlikely to be developed.

Powell Bill

Powell Bill funds are collected by the state in the form of a gasoline tax. The amount of these funds distributed to a municipality is based on the number of street miles to be maintained and the Town's population.

Transportation Bonds

Transportation bonds have been instrumental in the strategic implementation of local roadways, transit, and non-motorized travel throughout North Carolina. Voters in communities both large and small regularly approve the use of bonds in order to improve their transportation system. Some improvements identified in this plan could be candidates funding for a future transportation bond program.

Lake Norman Rural Planning Organization (RPO)

Mooresville is a member of the Lake Norman RPO, which is one of 20 RPOs designated by NCDOT. The RPO aids local planning efforts and provides services and guidance in coordinating with NCDOT.



State and Federal Programs

In comparison with local funds, state and federal funds are not as flexible in terms of their use. Projects funded by these programs usually focus on the needs required by vehicles, either in terms of capacity or safety — for example, widening projects. It can be difficult to secure these funds for alternative transportation projects.

The 1998 Transportation Equity Act for the Twenty-First Century (TEA-21) required NCDOT to set aside federal funds from eligible categories for the construction of bicycle and pedestrian transportation facilities. On August 10, 2005, the President signed into law the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). With guaranteed funding for highways, highway safety, and public transportation totaling \$244.1 billion, SAFETEA-LU represents the largest surface transportation investment in our nation's history. Provisions address specific safety issues, including pedestrian and bicycle safety.

Funds for pedestrian and bicycle projects come from several different sources that are described in this section; however, allocation of those funds depends on the type of project or program and other criteria. The information provided in this section presents a basic overview of the process.

Transportation Improvement Program (TIP)

The state's Transportation Improvement Program (TIP) supports communities through an array of funding resources including Federal Aid Construction Funds and State Construction Funds. As part of the application process, strict criteria must be met before project selection. Criteria include providing right-of-way information, meeting a set of design standards, showing a need for a project, local support of the project, and the inclusion of the project in the community's planning processes. Chapter 5 discussed Mooresville's current TIP projects in detail. See www.ncdot.org/transit/bicycle/funding/funding_TIP.html for more information.

Hazard Elimination and Railway-Highway Crossing Programs

These funds are a subset of the State Transportation Improvement Program (STIP) funding, constituting 10% of a state's funds. This program is intended to inventory and correct the safety concerns of all travel modes.



NCDOT Division Funds

NCDOT separates the state into 14 divisions. Iredell County is in Division 12. Division funds are another resource that provides allocations or discretionary funding for special projects within each division.

North Carolina's Clean Water Management Trust Fund (CWMTF)

At the end of each fiscal year, 6.5% (or a minimum of \$30 million) of the unreserved credit balance in North Carolina's General Fund is placed in the CWMTF. The revenue of this fund is allocated as grants to local governments, state agencies, and conservation non-profits to help finance projects that specifically address water pollution problems. CWMTF funds may be used to establish a network of riparian buffers and greenways for environmental, educational, and recreational benefits.

Governor's Highway Safety Program (GHSP)

The Governor's Highway Safety Program is committed to enhancing the safety of North Carolina roadways. To achieve this, GHSP funding is provided through an annual program, upon approval of specific project requests, to undertake a variety of safety initiatives. Communities may apply for a GHSP grant to be used as seed money to start a program to enhance highway safety. Once a grant is awarded, funding is provided on a reimbursement basis and evidence of reductions in crashes, injuries, and fatalities is required. More information about the program can be found at www.ncdot.org/secretary/GHSP.

Public/Private Initiatives

Developer Contributions

Through diligent planning and early project identification, regulations, policies, and procedures could be developed to protect future transportation corridors and require contributions from developers when property is subdivided and/or developed. To accomplish this goal, it will take a cooperative effort between local planning staff, NCDOT planning staff, and the development community.

Impact Fees

Developer impact fees and system development charges are another funding option for communities looking for ways to pay for transportation



infrastructure. They are used most commonly for water and wastewater system connections or police and fire protection services, but they have been used recently to fund school systems and pay for the impacts of increased traffic on existing roads. Impact fees place the costs of new development directly on developers and indirectly on those who buy property in the new developments. Impact fees free other taxpayers from the obligation to fund costly new public services that do not directly benefit them. Although other states in the country use impact fees, they have been controversial in North Carolina and only a handful of communities have approved the use of impact fees. The use of impact fees requires special authorization by the North Carolina General Assembly.

Active Living by Design (ALbD)

Active Living by Design is a program sponsored by the Robert Wood Johnson Foundation. ALbD seeks to bring together the health care and transportation communities to create an environment that encourages residents to pursue active forms of transportation such as walking and bicycling. Grants are awarded each year to a selected number of communities that are then required to produce a local match. These grants can be used to create plans, change land use policies, institute education policies, and develop pilot projects. For more information, visit www.activelivingbydesign.org.

Fit Together

Fit Together is a partnership of the North Carolina Health and Wellness Trust Fund and Blue Cross and Blue Shield of North Carolina. The grant initiative “recognizes and rewards North Carolina communities’ efforts to support physical activity and healthy eating initiatives in the community, schools, and workplaces, as well as tobacco-free school environments.” This program awards as many as nine partnerships with up to \$30,000 annually for a two-year period. For more information on the Fit Together grant initiative, visit www.healthwellNC.com.

The Trust for Public Land (TPL)

Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land to enhance the health and quality of life in American communities. TPL works with landowners, government agencies, and community groups to create urban parks and greenways,



as well as to conserve land for watershed protection. For more information on the Trust for Public Land, visit www.tpl.org.

Action Plan

This section discusses the appropriate steps for local leaders to implement the recommendations of this plan and key agencies that should be involved with the task. It is not expected that all of the listed items would be completed over the next several years; however, the process should be initiated to best take advantage of the momentum gained with the development of this plan. Table 6.1 identifies a summary of the short and long-term action items that should be considered to implement this plan.

Beyond the tasks listed below, it is vital to the success of this plan that the Town continue to work with and educate local citizens and businesses. While public support can encourage implementation, opposition can significantly delay a project.

Safety

The Town and NCDOT should secure funding to implement safety countermeasures at the high-crash locations in the study area. Chapter 2 describes crash analysis that was performed for the heaviest traveled segments and for the 10 worst intersections over the three-year period from January 1, 2003 to December 31, 2005.

Comprehensive Transportation Plan

The Highway Element of this Comprehensive Transportation Plan, as shown in Figure 5.1 replaces the 1997 Thoroughfare Plan. As proposals are implemented, the Town should note the changes in this CTP in terms of alignments and cross-section recommendations. The *Mooreville Comprehensive Transportation Plan* reflects several changes to the 1997 Thoroughfare Plan for one of the following reasons: either the connection/alignment is no longer feasible due to new development and no other alternative exists, the project has been downgraded from a thoroughfare to collector street status, or a lack of clearly defined transportation benefits has resulted in reduced support for the project. Most of the changes result from informal environmental review, feasibility study and phase one environmental scans, and new development that has occurred since the last update to the plan. As projects continue to be



constructed after the adoption of this plan, the CTP Highway Element should be updated to reflect current conditions.

Policy Measures

The Town should work with the RPO and the County to ensure that roadway corridors are preserved as development applications are considered. During the last 10 years, a number of projects were impacted by development that was not responsive to the adopted Plan. The Town should work cooperatively with the RPO and County by providing review and comment on proposed development applications. Where corridor preservation isn't feasible, reasonable alternatives should be sought. In an effort to improve corridor protection, copies of the adopted plan also should be forwarded to the RPO, County, Board of Realtors, Chamber of Commerce, and Economic Development Departments. Additional copies should be made available for public review in the Town of Mooresville Planning Department, local library, and on the RPO and County web pages.

Highway Improvements

The Town and NCDOT should conduct necessary studies and secure funding to implement the recommended Highway Map for the Mooresville area shown in Figure 5.1. The plan shows new roadway facilities, roadway widenings, roadway realignments, intersection improvements, and corridor enhancements. Future corridors shown on the map do not represent specific alignments, but rather a series of connections. See Chapter 5 for detailed roadway recommendations.

Collector Streets

The collector street plan discussed in Chapter 5 should be used by local staff and developers to ensure adequate connectivity as development and redevelopment occurs. By expanding Mooresville's transportation system through increasing the number of collector streets, traveling between local streets and arterials is enhanced. Key outcome goals of the plan include improved accessibility to higher intensity residential areas and activity centers while avoiding or minimizing impacts to sensitive areas for the preservation of the natural environment.

It is recommended to use the guidelines in Chapter 5 when requiring collector street network improvements. Research indicates that a 3,000-foot grid is typically the most appropriate for the mixed suburban and rural



development pattern that prevails throughout most of Iredell County. For more intense development, a 750-foot grid proves optimal, but this is independent of the costs that would be incurred to build a network of such intensity. The draft collector street plan is shown in Figure 5.18.

Collector Street Implementation Policies

- Seek to incorporate the *Collector Street Plan* and associated roadway design standards and policy requirements within development ordinances of the County and the Town
- Use the plan as a tool to communicate desired roadway connectivity as development projects are proposed
- Review all development proposals for consistency with the approved collector street plan and place an emphasis on connections rather than alignments
- Require that new developments reserve right-of-way for and construct future collector streets
- Integrate future bikeway, greenway, and trail networks with the *Collector Street Plan* to improve access and enhance connectivity between systems
- Amend the *Collector Street Plan* as necessary to include new streets as they are identified during the development review process

Sidewalks, Bikeways and Greenways

The adopted *Mooresville Comprehensive Pedestrian Plan* as shown in Figure 5.20 should be implemented. Likewise, this plan should be updated, following the completion of the *Comprehensive Bicycle Plan*, to include the policy and network recommendations. Non-vehicular facilities can be constructed as stand-alone enhancement projects; however, they often are implemented more effectively when incorporated into public and private infrastructure projects such as roadway widenings, regular street maintenance, utility line replacements, and new road construction. The networks represented in each of these plans should not be implemented alone, but in conjunction so as to realize the maximum benefit of the network that currently exists, will exist in interim periods, and will ultimately result.



In general, sidewalks in the Mooresville area are recommended to have the following characteristics:

- Width — 5 feet minimum in suburban locations and sized to complement/support the streetscape in urban areas.
- Set-back — In areas where curb and gutter exists, sidewalks should be set back from the street by a minimum of 5 feet (planted or hardscaped). In areas where there is not curb and gutter, sidewalks should be located with the open drainage channel between the traveled way and the sidewalk.
- Material — Generally, sidewalks should be concrete; however, other decorative materials (if level and smooth) should be permitted in areas where streetscape designs designate other materials.
- Location — Sidewalks should be located in accordance with Mooresville ordinances and generally on both sides of all collector streets, minor thoroughfares, and major thoroughfares. In the case that a greenway is shown for a corridor, the greenway takes the place of a sidewalk on one side of the street and a sidewalk may or may not be required on the opposite side of the street (at the Town's discretion).

Transit

The existing transit services in the Mooresville area include taxicab, rideshare, and limited fixed-route through the Charlotte Area Transit System (CATS).

The existing fixed route service provides transportation to people traveling to uptown Charlotte, but is not extensive enough to serve the greater community. Several studies conducted by CATS and City of Charlotte suggest that a commuter rail line between uptown Charlotte and Mooresville may be in place as early as 2012. This proposed commuter rail corridor will provide excellent service to the Town of Mooresville.

CATS riders in the Mooresville area currently are served by a single park-and-ride lot. With the rapid growth in Mooresville and the introduction of a commuter rail service, the need for additional park-and-ride lots might arise. Telecommuting is a promising arrangement that could affect congestion levels along major corridors in the area.



Freight

With the completion of the industrial area on the northeast side of Mooresville near Mazeppa Road, truck traffic is likely to increase. Prior to this type of traffic becoming a source of citizen concern, Mooresville should work with NCDOT to designate local and through truck routes. During this process, the following recommendations should be considered.

- **Truck Definition** — Currently, trucks are defined as vehicles with a manufacturer's gross vehicle weight of 33,000 pounds or more. This definition excludes most single-unit trucks, panel trucks, and delivery trucks, as well as public service vehicles like garbage collection trucks. It includes larger trucks — trucks with more than two axles — such as tractor-trailers and tandem axle dump trucks. The town should review its truck definition to determine if changes might restrict more heavy vehicles, thereby protecting and maintaining the integrity of its streets.
- **Signage** — Designated routes should be marked clearly at and within (as appropriate) town limits, major highway intersections, interchanges, and other appropriate locations directing truck drivers to permitted routes. This may include limiting travel to US and NC routes and other designated routes through the town. Within the town limits, consideration could be given to amending the local ordinance to specifically prohibit through trucks on local streets. Prohibition of trucks on any segment of state maintained roadways requires approval from NCDOT.
- **Routes** — Truck route designations should be sought for major routes and industrial streets. The Cornelius Road/Mazeppa Road corridor between the future industrial park and Interstate I-77, US Highway 21, NC Highway 150, and NC Highway 152 could be examined for truck route designation eligibility.
- **Industrial Use Areas** — In the industrial use areas along Mazeppa Road, efficient truck access should be planned and provided to allow unimpeded movement of freight without creating unwanted cut-through traffic.

Additional tasks associated with the establishment of truck routes through the urban area include:

- Working with NCDOT to prioritize resurfacing on designated routes in an effort to reduce noise and vibration from trucks.
- Adjusting signal timing (coordination) along high priority routes to reduce vehicle delay and maintain vehicle speeds within an



acceptable range of the posted speed limit. Impacts of the adjusted timing could include travel time (and reliability), reduced noise (from accelerating and braking vehicles), and air pollution.

- Publishing and distributing educational materials to businesses and industries concerning truck routes.
- Working with NCDOT to make improvements to critical intersections on truck routes to more easily facilitate large vehicle movements and encourage their use by truckers. Improvements include providing adequate curb radii, lane width, and exclusive turn lanes.

Truck Route Design Standards

The design of all roadways should be consistent with their intended function and be responsive to the environment through which they pass. Streets serving as truck routes are not an exception. Common high priority design elements include adequate lane width, turning radii, horizontal and vertical transitions, and adequate space between the edge of the traveled way and adjacent pedestrian facilities.

Environmental Issues

When considering new roadway alignments and extensions, planners and engineers should use a guiding set of principles to make sure the following environmental considerations are adhered to:

- Avoid steep slopes and otherwise unsuitable topography
- Minimize impacts to the built environment
- Stay away from FEMA designated floodplains
- Minimize the number of wetland (NWI) impacts
- Minimize the amount of each wetland impact (e.g., don't cross a wide wetland when a narrower one can be crossed)
- Minimize the number of stream crossings
- Minimize the length of stream crossings
- Minimize impacts to school sites
- Minimize the number and size of impacts to historic features and districts
- Minimize the number and size of impacts to threatened and endangered species
- Minimize the number and size of impacts to hazardous waste sites
- Minimize the number and size of impacts to superfund sites
- Minimize/avoid impacts to neighborhoods
- Avoid unnecessary or disproportionate impacts to minority communities



- Do not impact parks and designated open spaces
- Minimize gameland impacts
- Minimize the number of new facilities in critical watershed areas
- Be aware of existing development patterns
- Look for existing stub streets

Congestion Management

Consider each of the strategies described in *Chapter 5* to manage traffic congestion in the Mooresville area. These strategies should be used as a guide while considering roadway improvements and development.

Projects for Further Study

The following projects should be considered for further study to assess the feasibility and reasonability of each project. For detailed descriptions, see *Chapter 5*.

- Fairview/Alcove Road Connection and interchange study
- NC Highway 3/Coddle Creek Road Corridor Study
- East-West Connector Corridor
- Mezeppa Road Extension
- Interchange Justification Study for Cornelius Road
- Oats Road/Midnight Lane Overpass Connection
- Doolie Road/Happy Oaks Road Bridge Connection
- Downtown Mooresville Signal Removal/Traffic Progression Study
- CATS Extension
- Park-and-Ride Stations

Action Plan Matrix

The action plan was developed in an effort to consolidate recommendations and provide direction and focus to key stakeholders. By implementing this action plan, the established vision and goals for the *Mooresville Comprehensive Transportation Plan* will in-turn be accomplished.

The action plan matrix shown in *Table 6.1* clearly defines action items to be accomplished and identifies key stakeholders as well as the lead party for each action item. The Town of Mooresville should use this action plan matrix as a guide in implementing the *Mooresville Comprehensive Transportation Plan*.



Mooresville
Comprehensive Transportation Plan

Table 6.1 — Action Plan Matrix

Priority	Action Items	Town	County	NCDOT	RPO	CATS	Developers
Short-Term	Adopt the <i>Mooresville Comprehensive Transportation Plan</i>	★		★			
Short-Term	Coordinate to secure spot safety funding to implement safety countermeasures	★		★			
Short-Term	Develop revised street design standards to adequately accommodate the surrounding land use context	★					
Short-Term	Coordinate to ensure roadway corridors are preserved as development applications are considered	★	★				
Mid-Term	Implement Cornelius Road recommendations	★		★			
Short-Term	Implement Brawley School Road recommendations			★			
Short-Term	Implement Langtree Road / Mt. Mourne transportation recommendations			★			
Mid-Term	Implement Mazeppa Road / Mazeppa Road Extension recommendations	★		★			
Short-Term	Implement NC 3 / Coddle Creek Highway recommendations	★		★			
Short-Term	Implement NC 115 / Mecklenburg Highway recommendations	★		★			
Short-Term	Implement NC 150 / River Road recommendations	★		★			
Short-Term	Implement NC 150 / Oakridge Farm Highway recommendations	★		★			
Mid-Term	Implement Perth Road recommendations			★			
Mid-Term	Implement Statesville Highway / NC 115 recommendations	★		★			
Short-Term	Implement Williamson Road recommendations	★		★			
Short-Term	Conduct Fairview / Alcove Road study	★					
Mid-Term	Construct East - West Connector	★					
Long-Term	Implement the long-term projects identified in Figure 5.1 as opportunities arise	★					
Mid-Term	Increase transportation connectivity by implementing the recommended collector street network incrementally as development occurs						★
Short-Term	Coordinate multi-modal planning between NCDOT, Iredell County, RPO, CATS and nearby communities	★					
Mid-Term	Enhance existing sidewalk policy to ensure consistent implementation of pedestrian facilities	★					
Short-Term	Update this plan to reflect recommendations provided from the upcoming Comprehensive Bicycle Plan	★					
Short-Term	Coordinate with CATS to extend existing fixed-route service to downtown Mooresville and South of Mooresville					★	
Long-Term	Coordinate with CATS to extend fixed-route service to Troutman from downtown Mooresville					★	
Short-Term	Coordinate with CATS to provide additional park-and-ride facilities					★	
Mid-Term	Coordinate with NCDOT to designate Mazeppa Road and Cornelius Road as a truck route	★					
Short-Term	Initiate those projects identified for further study	★					

Lead	★
Joint Lead	
Affected parties	