



Union County

Multimodal

Transportation Plan

**Adopted
October 20, 2014**



Union County

Multimodal Transportation Plan 2014

Prepared for
Union County

Prepared by
Stantec

In association with
LandDesign

Acknowledgements

Thank you to all the organizations and individuals who committed their time, energy and resources to this effort. This Plan would not have been possible without the support of many throughout the process.

ADVISORY COMMITTEE

Bob Cook, Charlotte Regional Transportation Planning Organization
Chris Dugan, Union County Planning Board
Tim Gibbs, Charlotte Department of Transportation, Union County Resident
Mary Jo Gollnitz, Union County Resident
Wayne Hathcock, Union County Power
Liza Kravis, Union County Resident
Greg Mahar, Planning Director, Waxhaw
Dennis Moser, The Moser Group
Jess Perry, Walt Perry Realty
Chris Plate, Monroe Union Economic Development
Travis Starnes, Circle S Ranch
Jennifer Stewart, Union County Board of Adjustment
Phillip Tarte, Union County Health Department
Lisa Thompson, Town of Marvin Administrator

PROJECT TEAM

Joe Lesch (Client Project Manager - Union County Planning Department)
Dick Black (Union County Planning Department)
Brian Matthews (Union County Planning Department)
Lee Jensen (Union County Planning Department)
Roger Horton (Union County Planning Department)
Kate Pearce (Consultant Team Project Manager)
Margaret Nealon (Land Design)
Jake Petrosky (Land Design)
Mike Rutkowski (Transportation Plan Project Manager - Stantec)
Matt Noonkester (Stantec)
Scott Lane (Stantec)
Max Bushell (Stantec)
Todd Neoll (Noell Consulting)

Contents





01 INTRODUCTION & PLANNING PROCESS

- 1-2 | Location and Context
- 1-2 | Outreach – Vision - Goals
- 1-5 | Previous and On-going Planning Initiatives
- 1-6 | Travel Characteristics

02 LAND USE & COMPREHENSIVE PLAN INTEGRATION

- 2-2 | Vision for Union County/ Context

03 HIGHWAY MOBILITY RECOMMENDATIONS

- 3-2 | Roadway Recommendations Development Process
- 3-3 | Transportation Improvement Program (TIP)
- 3-3 | Roadway Deficiencies and Recommendations
- 3-10 | Recommended Cross-Sections
- 3-15 | Collector Street Improvements
- 3-15 | Detailed Corridor Recommendations
- 3-31 | Hot Spots & Concept Designs

04 MULTIMODAL RECOMMENDATIONS

- 4-2 | Pedestrian and Bicycle Planning Context
- 4-5 | Bicycle and Pedestrian Safety Analysis
- 4-6 | Public Transportation Planning Context
- 4-8 | Summary of Existing Multi-Modal Conditions
- 4-9 | Recommendations for Bicycle & Pedestrian
- 4-12 | Recommendations for Public Transportation

05 COMPLETE STREETS DESIGN

- 5-2 | Setting the Context
- 5-4 | Complete Street Design Elements
- 5-10 | Access Management Design Elements
- 5-13 | Public Transportation Design Elements

06 ACTION PLAN & INITIATIVES

- 6-2 | Introduction
- 6-4 | Funding Sources & Opportunities
- 6-5 | Priorities & Action Plan
- 6-9 | Conclusion

APPENDIX

Appendices: Transportation Plan Mapping

- A. Roadway Maps



Preface

The Union County 2025 Comprehensive Plan Update and associated Multimodal Transportation Plan was initiated by the Union County Commissioners to identify a sustainable land use and transportation strategy for the growing communities of Monroe, Waxhaw, Marvin, Weddington, Wesley Chapel, Mineral Springs, Indian Trail, Stallings, Unionville, Fairview, Marshville and Wingate. This region encompasses 639.5 square miles of a unique mix of a mid-sized metropolitan area, small towns/hamlets and farming communities painted across a broad expanse of rural tapestry in eastern Union County. Between 2000 and 2010, Union County was the fastest growing county in North Carolina, an attractive location for new residents due to resources and proximity to the Charlotte metropolitan area.

The Transportation Plan focused on an integrated approach that considered land use development initially, followed by transportation scenarios that took into account an array of factors to find the best, most cost-feasible set of recommendations. The hands and voices of the people in these communities brought their concerns, initiative, needs, and innovation to a comprehensive vision for Union County. One day you will be able to walk safely on a sidewalk to your bus stop; travel safely on the roadway without undue congestion; bicycle to school with your child; and experience the plan that was created through your efforts. From an Issues and Identification exercise to computerized transportation models to rendered visions of “hot spots,” this plan wove together these communities into a fabric that will bring health, vitality, and opportunity to all citizens and attract employers.

Several related documents and tools were developed as a part of the Transportation Plan planning process, including the following.

PROJECT WEBSITE

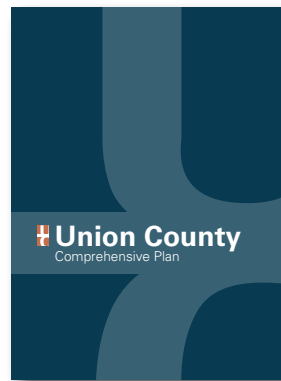
The project website was developed to keep all stakeholders informed on the planning process and schedule and serves as a repository for all information developed throughout the course of the planning process. All of the below documentation can be found on the project website.

www.unioncountyyonevoice.com



UNION COUNTY COMPREHENSIVE PLAN UPDATE 2014

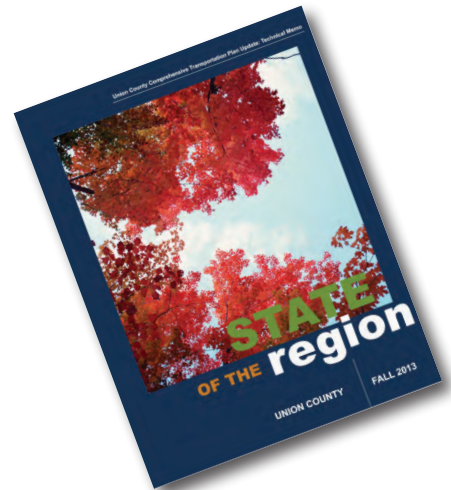
Recognizing the need to proactively address growth and development patterns and support economic development efforts, County leaders decided to revisit the 2025 Comprehensive Plan and update the Plan accordingly. This planning process addresses the issues and opportunities generated by Union County’s growth and provides proactive suggestions to ensure that Union remains a great place to live, work and visit.



STATE OF THE REGION -

State of the Region – CTP Existing Conditions Technical Memorandum.

This summary provides a snapshot of transportation infrastructure existing conditions and includes an inventory of facilities relative to vehicle, bicycle, pedestrian and public transportation mobility. Elements include quality level of services assessment, safety and operational analysis as well as an issues identification exercise expressed by key stakeholder groups.



PROJECT SHEET INVENTORY

This is a database of 50 roadway, transit, bicycle, and pedestrian projects identified during the planning process. They are summarized on single page project sheets that detail: project location, description, purpose and need, vicinity map, cost estimate, and funding strategy.





01

U

Introduction

From 2000 to 2010, Union County was the fastest growing county in North Carolina and one of the fastest in the country, increasing its population by 5.7 percent annually. A combination of a healthy regional economy, low taxes (particularly relative to Mecklenburg County) and high quality schools fueled this growth. Unfortunately, with this level of growth and prosperity comes the unwanted consequence of congestion. Many of the County's 2,525 miles of roadway have been constrained by the effects of continued urban sprawl and lack of infrastructure improvements. This section describes the context of the study area relative to growth, previous planning initiatives, mobility today and vision for tomorrow.

LOCATION AND CONTEXT

The growth rate in Union County from 2000 – 2010 was estimated at 5 percent per year for an overall increase in population of 62.8 percent. In comparison, North Carolina’s growth rate was estimated at 1.7 percent per year between the same time period, equating to an increase in population of 18.4 percent.

Historically, Union County was characterized by rural and agricultural development. In fact, many of the highways in the county were originally intended to be two-lane farm to market roads. New development, however, has transformed many of these once-country roads to major transportation corridors, creating problems with capacity and safety. Developing a transportation system that adequately serves the vehicular needs of the residents and workers without compromising the rural heritage and small-town atmosphere in the area is a major challenge for Union County.

OUTREACH/ VISION/ GOALS

As part of this Multimodal Transportation Plan/2025 Comprehensive Plan Update, the planning process included an **Advisory Committee** charged with guiding the planning process. This committee comprised of several stakeholders representing planning and engineering staff, residents, business owners, farming community, NCDOT, and the Charlotte Regional Transportation Planning Organization (CRTPO). This Transportation Plan was developed in conjunction with the communities of Marvin, Monroe, Stallings, Mineral Springs, Unionville, Waxhaw, Weddington, Wesley Chapel, Wingate, and Fairview as well as regional transit, and other transportation and land regulatory stakeholders. This planning effort focused not only on automobile transportation, but also on walking, bicycling, and transit, looking specifically at deficiencies while recognizing the inherent value of multimodal choices.



Slightly more than 80% of people in Union County drive alone to work every day.



Part of the planning process included a visioning process with the public, local staff, transportation agencies and regional decision-makers. Their collective vision provided a comprehensive background on local issues and needs relative to transportation. With this in mind, a set of issues and challenges were identified by local participants. The issues were then translated to transportation themes, ultimately, to help guide the project team throughout the planning process.

These Themes were then translated into focus areas or core issues to be addressed through the planning process. The following Focus Areas became the central to the development of the multimodal transportation plan for Union County.

FOCUS AREA:

We haven't been able to "keep up" with existing development. So, focus on existing facilities to bring them up to standards.

FOCUS AREA: Minimum safety improvements needed for rural "farm to market" roads.

FOCUS AREA: Small-scale improvements or "Hot Spots".

FOCUS AREA: Provide better choices through multimodal integration. Upgrade existing facilities as well as require bicycle and pedestrian provisions in the implementation of new streets and roadways.

FOCUS AREA: Improve connectivity through Collector Street design standards and connectivity requirements.

FOCUS AREA: Make good connections to the US 74 Bypass.

FOCUS AREA: Don't overpromise – concentrate on mobility carriers (traffic) and moving people (Complete Streets).

Overall, many issues were raised with regard to transportation within Union County. No issue is more important than the general theme of "doing more with less" and striving to maintain a quality level of service for ALL modes. With the profound influx and rapid growth on the western side of the county, the reality is that we (the County) did not keep up with development. So, there is a need to rebuild our infrastructure while playing catch up to existing development. At the same time, very little is being done for the rural parts of the County, in particular eastern Union County. There is still a need to improve the multitude of unsafe rural two-lane roads to NCDOT standards, including 12-foot lanes and adequate shoulders for large vehicles and farming equipment.



LOCAL PARTICIPATION
Push Button Polling at an Advisory Committee Meeting

SUMMARY OF ISSUES



real estate professionals

- Union County needs to allow higher densities (5+ units/acre or more) and cluster development styles
- Retirement communities may demand more attention to safer, walkable design patterns
- Increase densities along US 74 corridor and provide streetscape improvements to permit a more active, mixed-use environment



agricultural representatives

- Widening rural roads is good for agriculture (and for cyclists and pedestrians that don't have other options)
- More school-based education opportunities, which might translate into opportunities for cycling and walking safety
- Assess and prioritize rural bridges for priority improvements



economic development representatives

- US 74 and Old Monroe Road have "horrible" traffic conditions
- Parallel Road to US 74 is needed
- Increase residential density in urbanized areas



transportation professionals

- Need better connectivity, connectivity index
- US 74 Plan has been supported by each community
- Focus on mobility improvements to strategic corridors like Old Monroe Road, Weddington Road, Waxhaw Highway (NC 75), Providence Road (NC 16), US 601, NC 218, and NC 200
- Fixed guideway service planning commencing soon
- Focus on bicycle and pedestrian improvements in urban areas
- Support Carolina Thread Trail / activity centers
- Local governments should pay more for street construction and maintenance



planning professionals

- Identify and support the mobility needs of the entire County (east versus west)
- Aging in-place is an emerging issue (e.g., Marshville Plan)
- Provide more consistency across jurisdictions, county
- Require more from the development community – "pay their fair share"



community health / recreation

- Need to co-locate greenways on utility easements
- Need for more health-based decision-making during planning and design

PREVIOUS AND ON-GOING PLANNING INITIATIVES

here were a number of previous and on-going planning and design initiatives that were consider and integrated as a part of the Transportation Plan development.

- **2035 Long Range Transportation Plan (2010)** - Mecklenburg-Union Metropolitan Planning Organization. (now called the Charlotte Regional Transportation Planning Organization - CRTPO) - The Plan focused on highway needs for the western half of Union County
- **Indian Trail Park Design (2013)** - Town of Indian Trail Parks & Recreation
- **Western Union County Local Area Regional Transportation Plan (2009)**
- **Executive Summary: Parks & Recreation Comprehensive Master Plan Update (2006)** - Union County, North Carolina
- **Carolina Thread Trail (2011)** - Union County
- **Union County Comprehensive Transportation Plan (2012).**
- **2025 Comprehensive Plan, Union County (2010)** - The plan recommends expanding bus service and developing a framework for future transit
- **2035 Long Range Transportation Plan, MUMPO & RRRPO (2010)** - The plan recommends extensive expansions to the CATS service
- **US 74 Corridor Revitalization Study** - Recommendations include gateway centers, intersection improvements, driveway closures/consolidations, and parallel street connections were commonplace.





Of the 83,179 workers that live in Union County, 57,875 travel outside of the county to work, while 25,304 work in the county. Some 27,990 people commute to Union County to work.



ANNUAL VMT COST (WHITE = <\$3,200, BROWN = > \$4,500)



PERCENT OF INCOME SPENT ON TRANSPORTATION (LIGHT GREEN = < 15%, DARK BLUE = > 35%)

TRAVEL CHARACTERISTICS

Located in the Charlotte metropolitan statistical area, Union County and the US 74 corridor are quickly becoming magnets for residential growth and economic activity. Union County's economic engine is Monroe. However, with 30,000 of net out-commuters, this area still remains a bedroom community to the Charlotte metropolitan area. With growth comes the unwanted demands on transportation causing high levels congestion and increasing commuting travel delays.

As Union County continues to grow, providing more choices will become increasingly important. Using data from the Housing + Affordability Index, a service of the Center for Neighborhood Technology, generalized measures of transportation affordability were calculated for Union county. In terms of the dollars spent on transportation, those areas farther away from major commuting routes and those areas with fewer transportation options represent areas where transportation is expensive, costing a household more than \$4,500 per year. As indicated in this figure, much of Union County lacks transportation options, while areas closer to Charlotte spend substantially less money on transportation, likely due to the presence of more transportation options and shorter commute distances.

Looking at the percentage of income spent on transportation, a similar picture presents itself. Everyone in Union County spends more than 25% of their income on transportation. Some residents living outside the US 74/Monroe corridor spend, on average, more than \$100 per month more than most of the remainder of the County. Providing more options to residents of Union County can help reduce transportation costs and will increase prosperity in the community.

Some areas in Union County spend between 30% and 35% of their income on transportation.

Another travel metric often used by transportation professionals is the determination of Travel Bands. In this case, the Metrolina Regional Model was used to estimate the time it took to travel from downtown Monroe to downtown Charlotte during the AM peak period. Although this is not an exact science, the travel time increased by 29% from 2013 to 2035, assuming no further investment in roadway improvements. This equates to the average driver waiting two signal cycle lengths as opposed to one today.

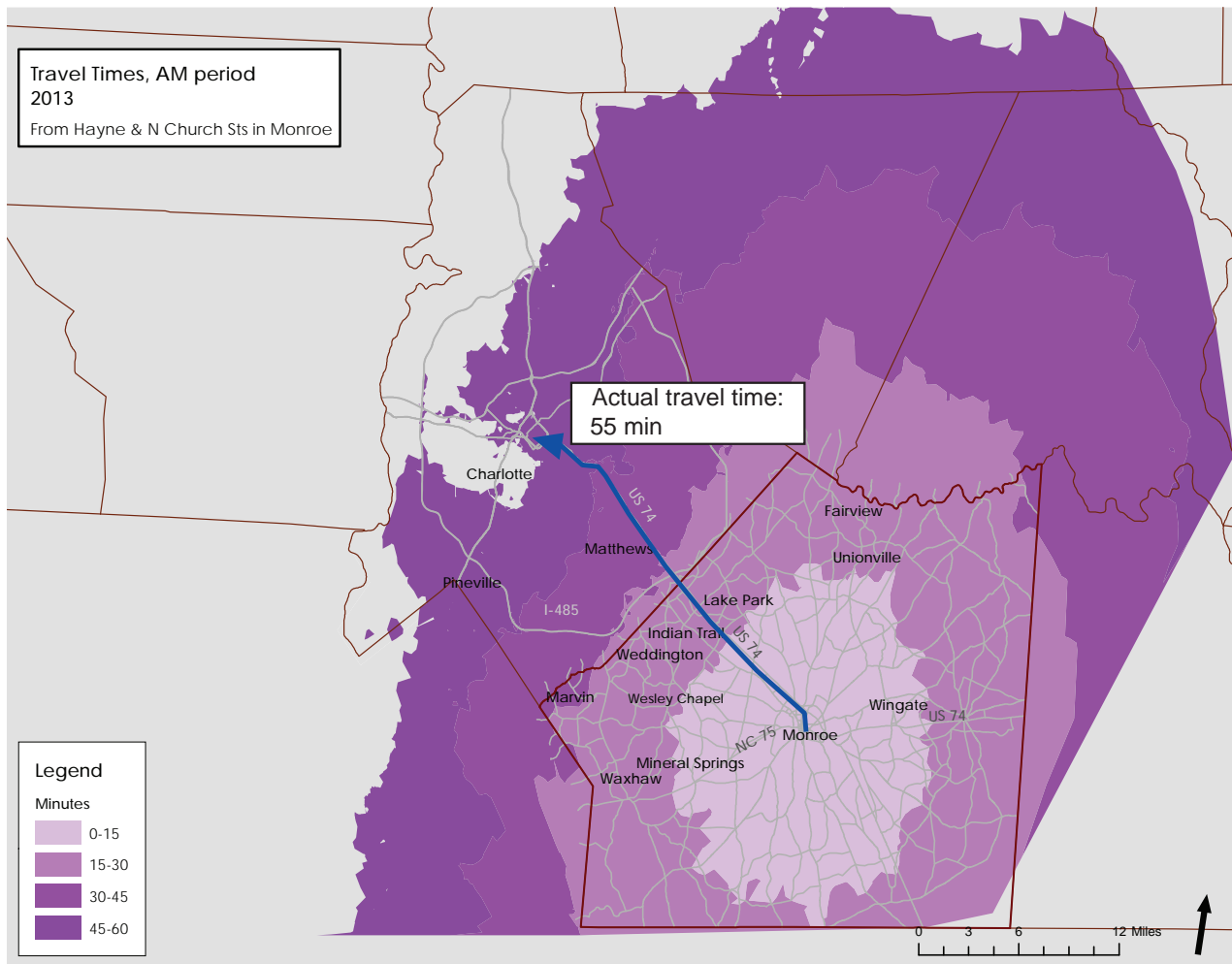


Figure 1-1



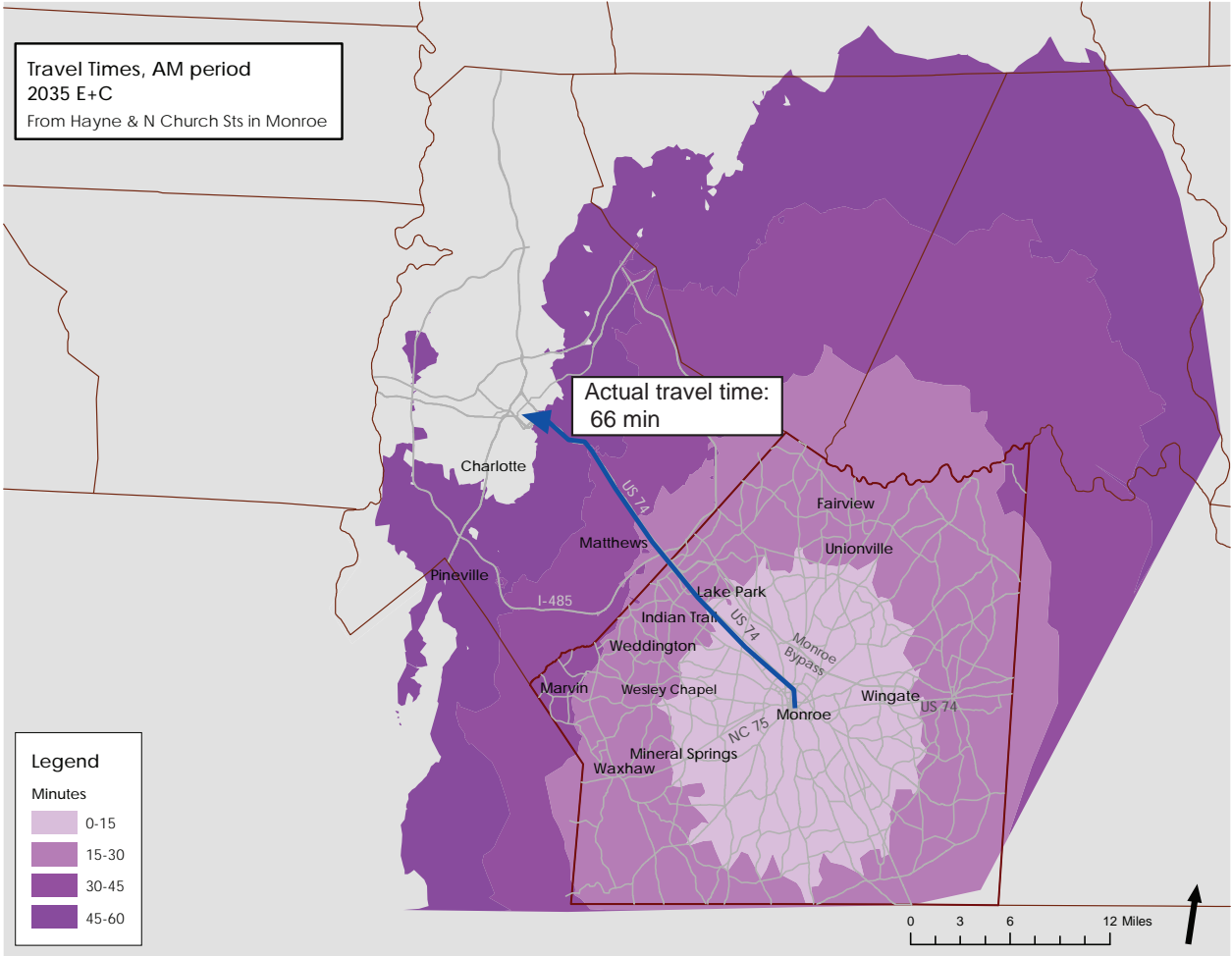


Figure 1-2



An assessment of vehicular crashes was completed using crash data from NCDOT's Transportation Mobility and Safety Division and analyzed in ArcGIS 10.1. Between August 1, 2010 and July 31, 2013 there were 11,959 crashes recorded in the county, of which 71 resulted in fatalities, 70 in disabling injuries, 772 in evident injuries, 2,583 in possible injuries, and 8,159 crashes incurring property damage only. The most prevalent crash types in Union County during this period were rear end crashes (3,770 instances), fixed object crashes (1,435 instances), and animal crashes (1,400 instances). On the whole, most crashes occurred in the more developed areas of the county, with particular crash clusters along US-74 and around the City of Monroe.



Union County Crash Analysis for Crashes Occurring between August 2010 and July 2013

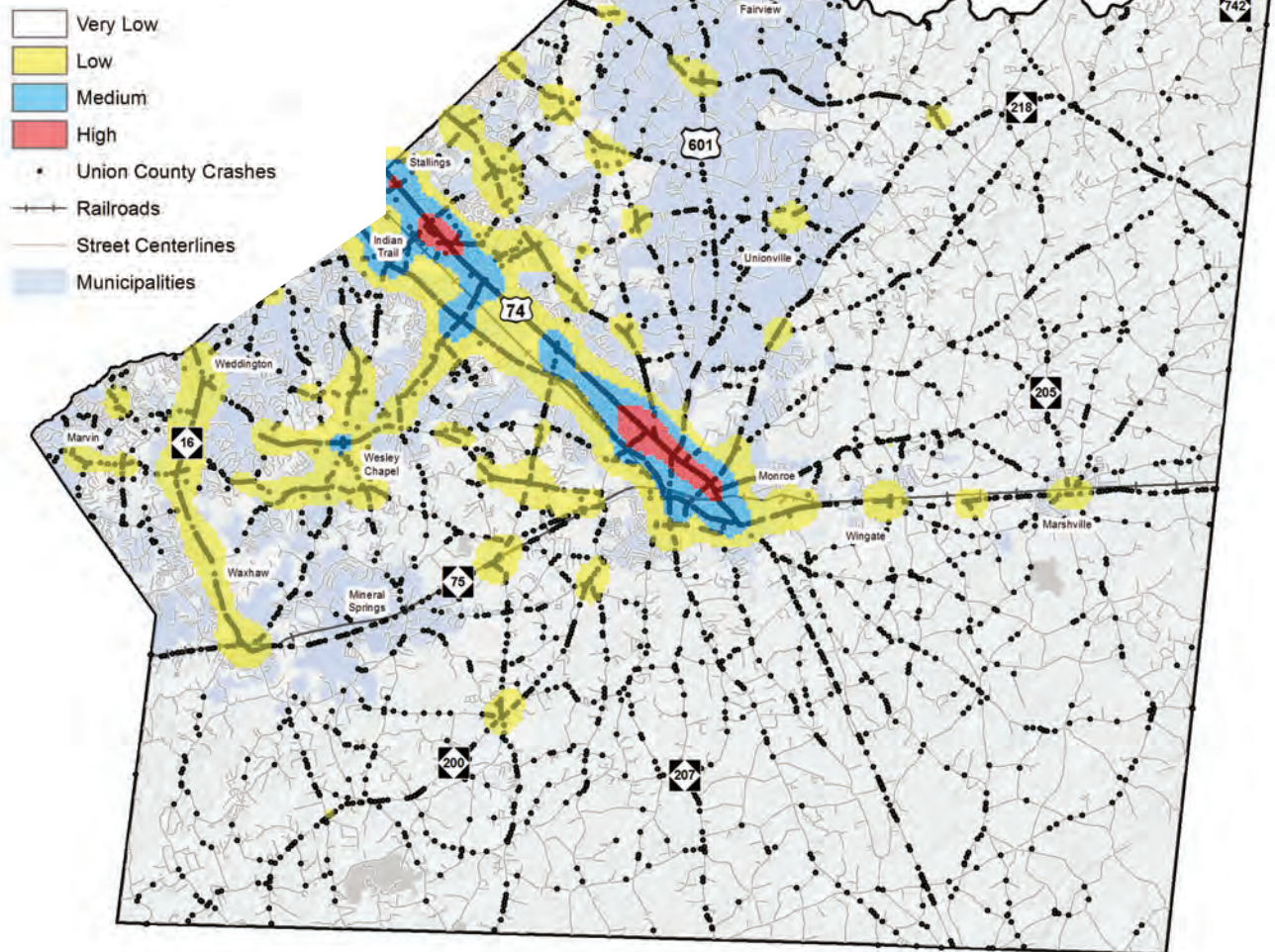


Figure 1-3



02

1

Land Use & Comprehensive Plan Integration

The inherent relationship between land use and transportation cannot be understated and can be best described by the law of Supply and Demand. That is, land use represents the demand side of the equation while transportation represents the supply side. Planners and engineers can agree that one often influences the other. For this reason, our planning process began with a detailed evaluation of historic develop trends, demographics and land use decision within Union County. The formation of a preferred Land Use Plan was the foundation used to influence transportation decisions through the development of this Multimodal Transportation Plan.



VISION FOR UNION COUNTY

The Future Land Use Plan outlines a framework of growth to achieve a more sustainable, balanced tax base in Union County. The following section provides a detailed description of the character and quality of place envisioned in the Plan.

In 2030, there are a number of mixed-use developments in the County that offer distinct living, working and shopping options. Land suitable for industrial and office development is preserved, especially around the Airport, which results in attracting employers that offer jobs to Union’s workforce. More industries take advantage of Union’s rail network. Fewer people commute to other places like Charlotte for work. In addition, there are a variety of housing options, including townhomes and apartments, to accommodate Union’s diverse population. Older residents are able to age-in-place in close proximity to existing downtown services and amenities. Existing neighborhoods are complemented by new single-family developments of similar character and scale. The agriculture areas in the County remain extremely productive and there are more agriculture-related businesses leveraging this asset.

The Bypass is complete and serves as a main thoroughfare from downtown Charlotte to points east. Mainly local traffic uses US 74, and key arterials have been widened to four lanes to decrease travel times at any point during the day. Pedestrian and bike facilities including sidewalks and greenways connect key locations throughout the County and serve as both recreational and transportation corridors for residents. Local and regional transit carries residents and visitors in and out of the County.

Infrastructure supports new development in appropriate areas throughout the County. All areas are adequately served by police, fire, and emergency services. All residents have convenient access to a park or recreational facility, and many schools are used afterhours as community centers. There are plenty of ball fields, community centers and programmed activities to serve Union’s growing population.

New development respects the agriculture areas. The public is keenly aware of the value of Union’s agriculture industry and actively supports farming and forestry operations. Rural farm-to-market roads and bridges are improved and farmers have access to the technology and infrastructure they need to be competitive.

Low-impact development techniques are commonly used in new projects. Many new neighborhoods outside of established urban areas have been design in a way that maintains the scenic quality of the County. Historic assets are identified and preserved. Property of historic significance is landmarked and added to the National Register. Greenways and sidewalks connect Union’s historic places to the greater community network of assets.

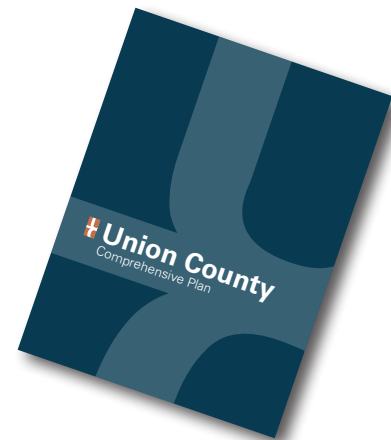
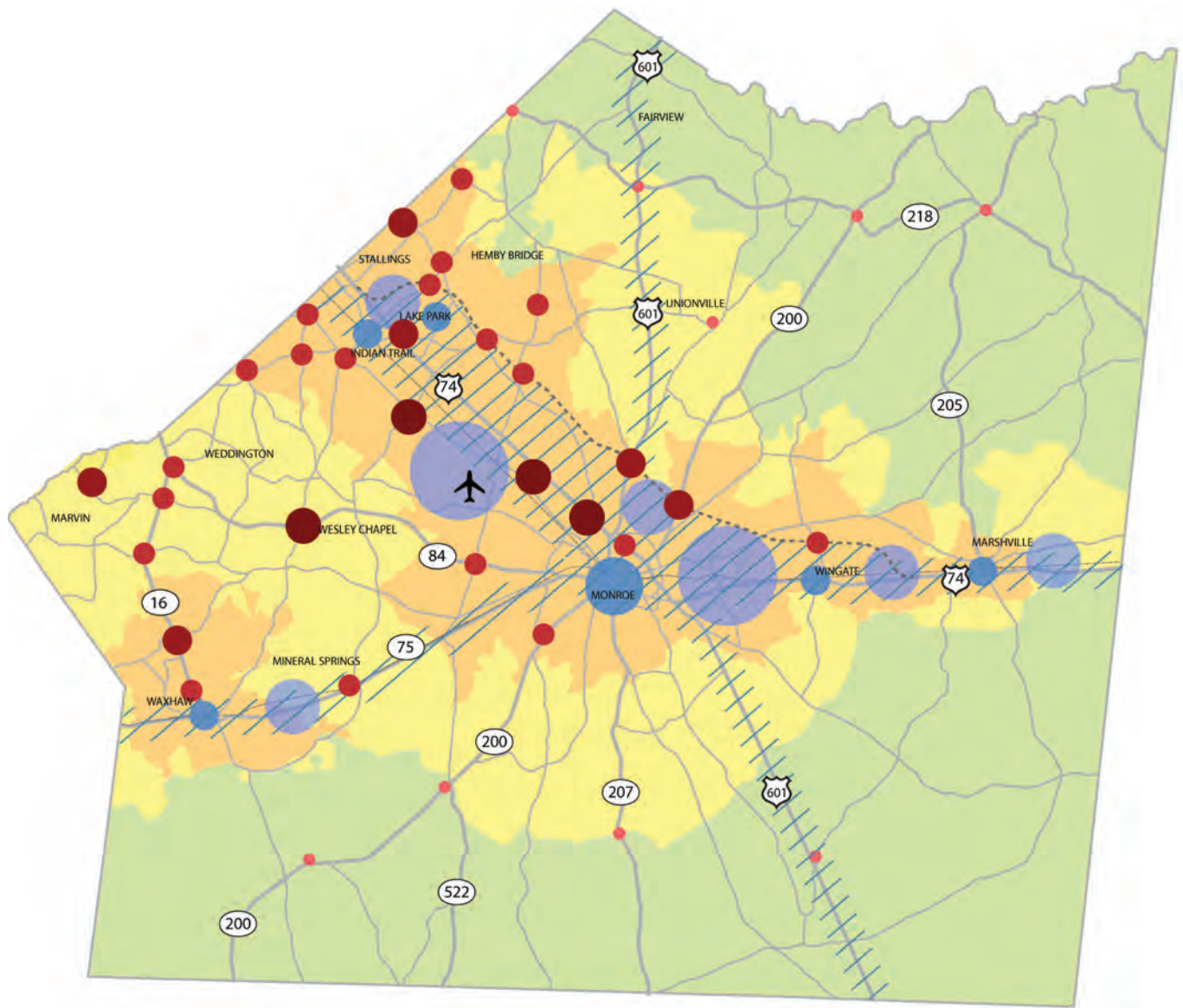


Figure 2-1

Future Land Use Concept

Union County Comprehensive Plan Update 2014

- Agricultural Area**
Farming, forestry and rural residential
- Strategic Agricultural Areas**
Contiguous Agricultural Areas that are larger than 200 acres and 50% prime farmland or farmland of statewide importance
- Single Family Residential**
Detached single family (~1unit/acre)
- Mixed Residential**
Mixed residential (detached single family, patio and cottage homes, town homes and multi-family)
- Rural Center**
Small scale commercial and civic uses
- Neighborhood Center**
Neighborhood-serving commercial uses (retail, restaurant and services)and mixed residential services)
- Community Center**
Community-serving commercial uses (retail, restaurant and services) including opportunities for office, civic, institutional and mixed residential uses
- Town Center / Downtown**
Existing Town Center or Downtown with a range of uses including commercial, office, civic, institutional and mixed residential uses
- Employment Center**
Industrial and office uses
- Employment Corridor**
Logistics, industrial and agri-business related uses





03

Highway Mobility Recommendations

The transportation challenges facing Union County decision-makers are daunting. To date, there are fewer than four capacity improvement projects that are funded through the NCDOT's Transportation Improvement Program (TIP) for the County. However, this reality did not deter the Advisory Committee and project leaders from devising a Plan built on previous efforts and defined by a set of Guiding Principles (See Comp Plan). These guiding principles helped to stitch together a series of local plans that did not necessarily align, blend a variety of transportation modes that competed for space and funding, and involved diverse stakeholders that held fast to competing interest.

ROADWAY RECOMMENDATIONS DEVELOPMENT PROCESS

In order to develop a set of roadway recommendations that reflects the wishes of the community for the Union County Multimodal Transportation Plan (MTP), it became clear that while congestion is an important driver of roadway improvements projects, it is far from the only important consideration. The robust public outreach effort undertaken as part of this project also provided some important input to our suggested improvements. In determining our final roadway and mobility recommendations, each of the following criteria were also considered.

- **Environmental/Cultural Features** – Union County has a rich history and cultural identity. In order to preserve historic downtowns and avoid significant impacts to buildings, recommendations in developed downtown areas called for access management and pedestrian and bicycle facility improvements in lieu of major roadway widenings. Additionally, care was taken to avoid crossing significant streams, floodplains, and wetland areas, though crucial collector street connections were recommended in these areas in certain instances.
- **Mobility/Safety** – While congestion was an important consideration in determining the project type on many of the roads in the Official Roadway Map, improving safety on corridors with high crash rates (and severity) per mile was another paramount consideration. Indeed, many of the proposed access management projects along major roads in Union County were a result of safety considerations.
- **Land Use/Development** – A thorough understanding of the projected land use changes and development patterns in Union County (see Comprehensive Plan) provided the basis for some of the recommended roadway improvements, especially in areas forecast to experience substantial suburban growth. Much of the area around Waxhaw, Weddington, Wesley Chapel, Indian Trail, Stallings, and Monroe will likely see a rapid increase in population in the next 30 years, growth that will put a strain on the existing roadway infrastructure. Many of the major arterials in these areas are also recommended to include pedestrian and bicycle facilities.
- **Constructability** – Early in the process, the consultant team made a point to understand the local funding context, estimated costs, and level of public support for roadway improvements. With this knowledge, these roadway recommendations reflect the public’s input as well as a reasonable estimation of constructability based on cost considerations and project timing.



TRANSPORTATION IMPROVEMENT PROGRAM (TIP)

Some of the projects identified in the Official Roadway Map are in fact already funded as part of the NCDOT's Transportation Improvement Program (TIP). These include the Monroe Bypass, a multi-lane freeway on new location divided into northern (R-3329) and southern (R-2559) sections; Idlewild Road (U-4913), a widening project from a 2-lane section to multi-lane from I-485 in Mecklenburg County to SR 1524 (Stevens Mill Road); and SR 1009 (John Street/Old Monroe Road), a widening project from a 2-lane section to multi-lane from SR 3448 (Trade Street) to SR 1377 (Wesley Chapel-Stoudts Road). With the exception of the Monroe Bypass, the remaining TIP projects are included as recommendations in the maps in this document.

ROADWAY DEFICIENCIES AND RECOMMENDATIONS

The 2010 base year highway network was compared with the 2040 E+C (Existing/underway projects as well as other, Committed projects) roadway network using the results from the Metrolina Regional Model (MRM) volume to capacity (V/C) analysis. Under the timeframe, we expect to see a 205.8% increase in regional congested corridors. This translates to a decrease of the average speed for all facilities in Union County from 40mph (2010) to 34mph (2040) if no other roadway projects are implemented.



Figure 3-1

Union County 2010 Daily V/C Map

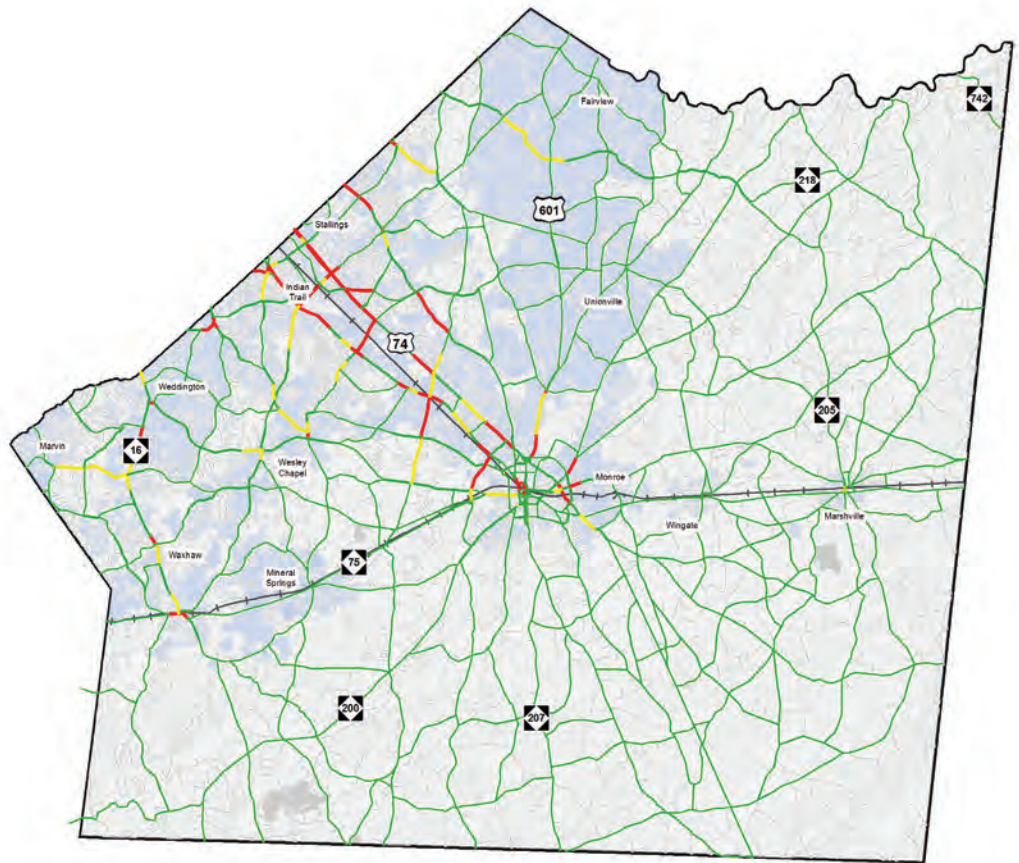
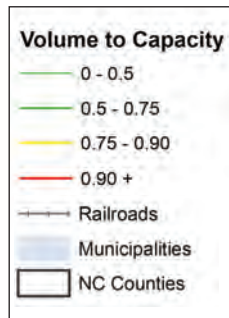


Figure 3-2

Union County 2040 Existing and Committed Projects V/C Map

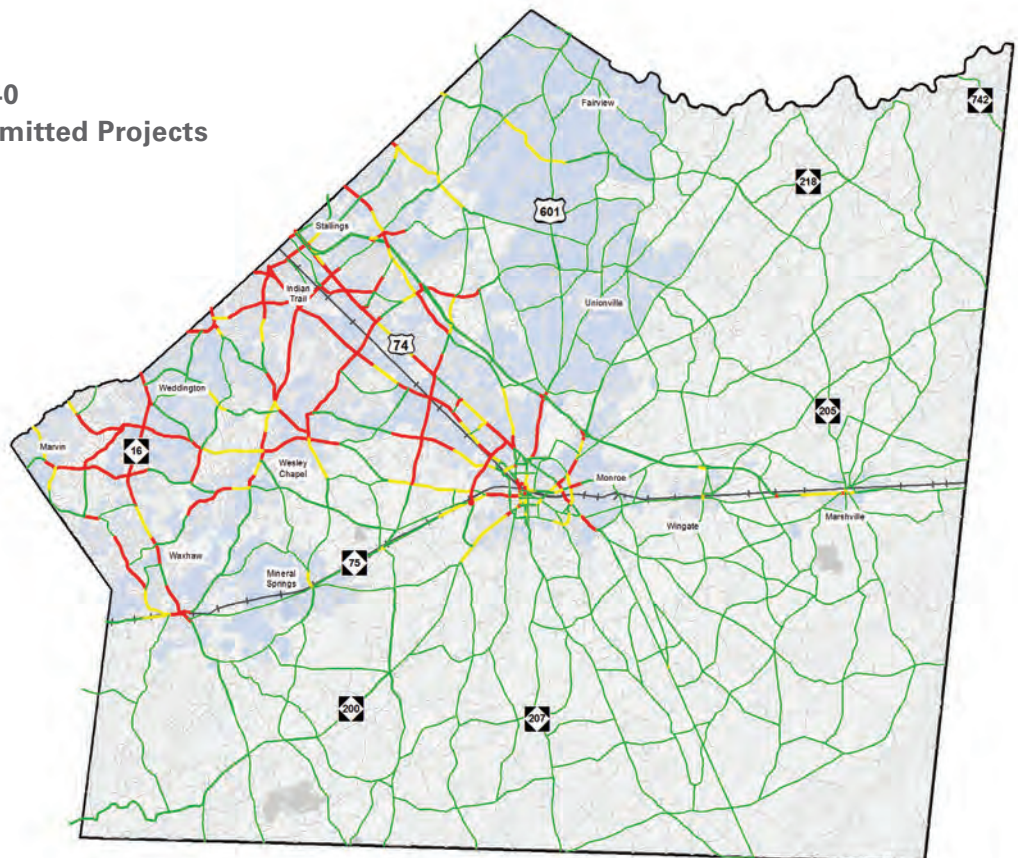
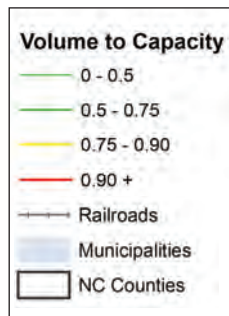
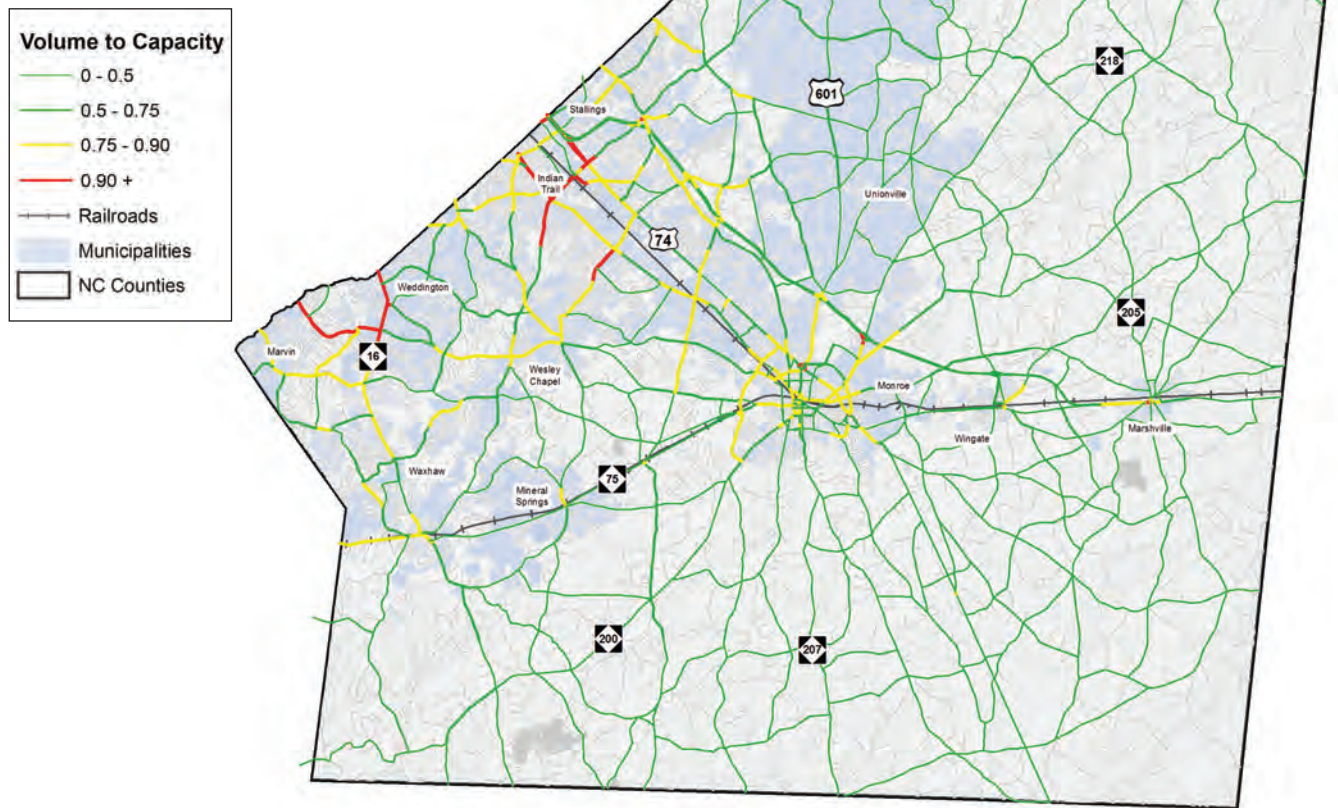


Figure 3-3

Union County 2040 Recommended Projects V/C Map



V/C MAPS

Most congestion issues shown in the 2040 E+C condition have been addressed through the recommended roadway projects. The only remaining segments above capacity in 2040 are small portions of US 74 and downtown urban areas, where community preference or barriers to construction result in a smaller preferred cross-section. Note that network assumptions for the 2040 V/C Recommended Project Improvements map reflect the socioeconomic data from the Preferred Growth scenario as described in the Union County 2025 Comprehensive Plan Update.



Table 3.1: Transportation Indicators

Indicator	Model Run	2010	2040 E + C	2040 Improvements
Vehicle Miles traveled		5,281,520	7,802,327	8,660,224
Vehicle Hours Traveled		155,221	242,042	278,558
Union County Population		201,275	319,159	371,086
Per Capita VMT		26.24	24.45	23.34
Per Capita VHT		0.77	0.76	0.75
VMT Under Congested Conditions (VOC.>0.9)		492,850	947,056	1,162,900
Mode Split (AM HBW Tranist Share)		approximately 0.4%		

Table 3.2: Difference between 2040 E+C and 2040 Improvements to 2010 Baseline (Not Shown)

2010	2040 E + C	Percent	2040 Improvements	Percent
Vehicle Miles traveled	2,520,807	48%	3,378,704	64%
Vehicle Hours Traveled	86,921	56%	123,337	79%
Union County Population	117,884	59%	169,811	84%
Per Capita VMT	1.79	-7%	2.90	-11%
Per Capita VHT	0.01	-1%	0.02	-3%
VMT Under Congested Conditions (VOC.>0.9)	454,206	92%	670,050	136%

NOTES:

- Vehicle Miles Traveled = roadway segment volume * roadway segment length
- Vehicle Hours Traveled = roadway segment volume * roadway segment travel time (hours)
- Per Capita VMT = Vehicle Miles Traveled (within Union County)/Population within Union County
- Per Capita VHT = Vehicle Hours Traveled (within Union County)/Population within Union County
- Mode Split = Share of Transit for AM Period Home Based Work Trips Originating in Union County

As indicated in Table 3.1 above, the Vehicle Miles Traveled (VMT) metric, which describes the total vehicle miles traveled in Union County, increased substantially in the 2040 Improvements scenario. The 2040 Improvements Transportation Demand Model run, however, includes an increase in population of approximately 25 percent from the 2040 Existing and Committed Project Travel Demand Model run, a considerable amount. Despite the larger population figure used in this analysis, per capita VMT, a measure of how many miles are traveled per person, decreased in the 2040 Improvements Travel Demand Model run by 11 percent as opposed to a decrease of 7 percent in the 2040 Existing and Committed Project Travel Demand Model run. While the VMT under Congested Conditions metric increased, the Per Capita Vehicle Hours Traveled (VHT) has decreased.

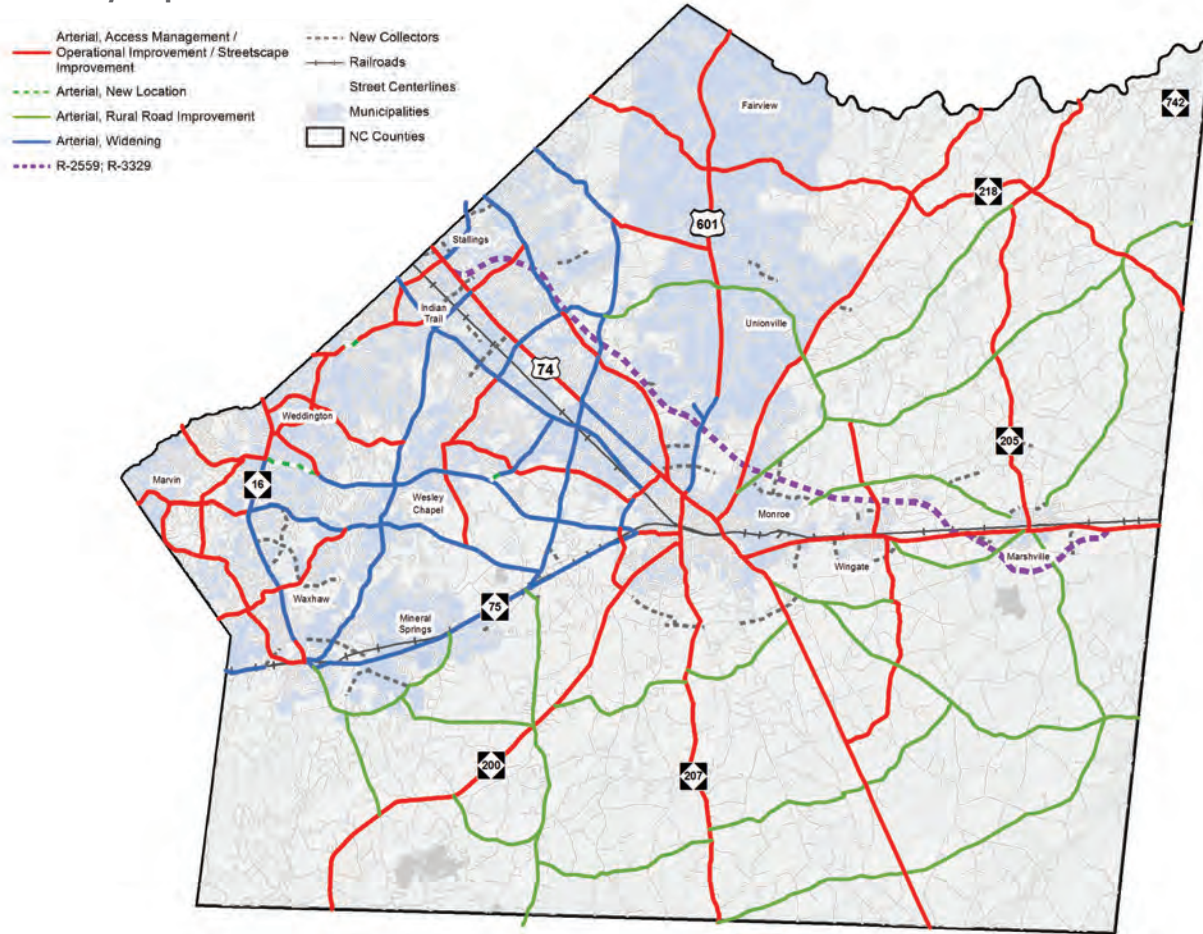
Overall, the 2040 Improvements Model Run indicates that while more vehicle miles are being driven in Union County, people are in fact driving fewer miles and spending less time behind the wheel. As expected, congestion is getting worse with the forecasted increase in population, but this is understandable based on the volume of people driving during peak hours.

Two separate maps are presented in this document, the Roadway Improvement Map (Figure 3-4) and the Roadway Laneage Map (Figure 3-5). The Roadway Improvement Map presents the specific type of project recommended for each roadway. Overall, five types of roadway recommendations are suggested for Union County, including Arterial Widening, Arterial New Location projects, Arterial Access Management and Streetscape projects, Rural Road Improvements, and Collector Street New Location projects. The Official Roadway Laneage Map presents the proposed future laneage for all projects in the County, while the Corridor Design Treatments map indicates the specific laneage as well as the improvement type for each recommended project.

As collector streets are anticipated to be constructed with new development on an as-needed basis, specific collector street projects will not be discussed in detail. However, some considerations with regard to constructing collector roads are presented on the following page.

Figure 3-4

Union County 2040 Roadway Improvement Plan



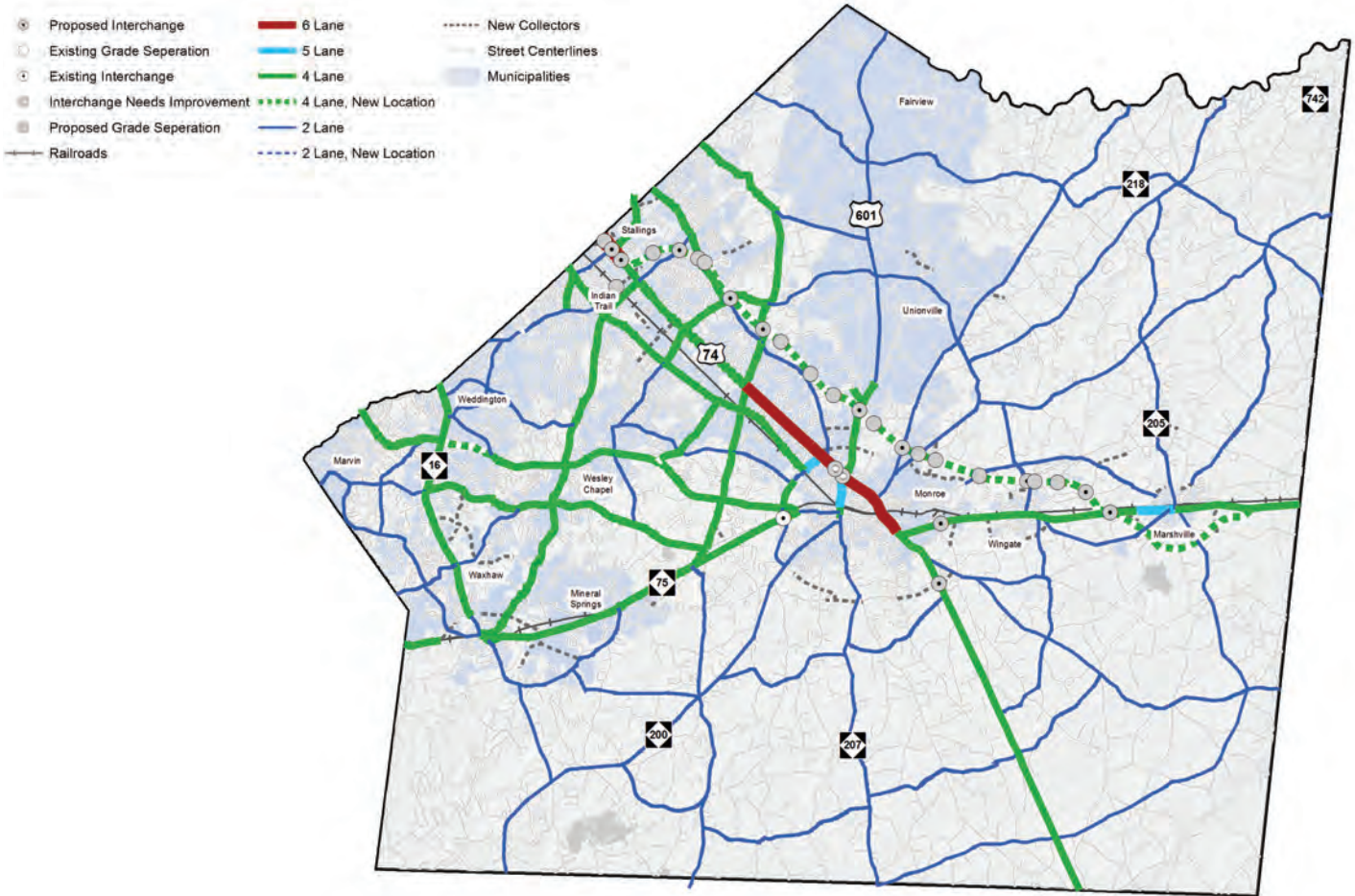
Arterial Improvements

As indicated, recommendations for arterials are grouped into four categories: Existing Road Widening, New Location Construction, Access Management and Streetscape projects, and Rural Road Improvement projects. On roadways where capacity improvements are warranted, widening may not always be the answer; in many cases, roadways with capacity issues are recommended to be improved through the use of landscaped medians and better access management design. Access management strategies will be discussed in Chapter V. These types of strategies help improve safety, provide easier and safer ingress and egress to neighboring land uses, and create better corridor aesthetics in addition to improving capacity. Many of these access management and streetscape improvement projects include provisions for bicyclists and pedestrians; these recommendations are given further consideration in the multimodal improvements section of this document.



Figure 3-5

Union County 2040 Roadway Laneage Map



Recommended Road Widening

In examining current as well as future capacity on Union County roadways, it becomes clear that improvements will be necessary to accommodate the growth forecast to occur in the county over the coming decades. As a primarily rural county for much of its history, many of the roadways in Union County can be categorized as “farm to market” roads. That is, these are roads that primarily serve to bring goods from the agricultural areas of the County to the towns and cities. They are typically narrow two-lane roads with no shoulders. Union County has already seen substantial suburban development occur in the northwestern area of the county, which has led to the need for improvements as the “farm to market” roads become primary commuting routes between Union County and Charlotte in neighboring Mecklenburg County. In order to improve traffic flows and support not only the current growth, but also future growth, it will be vital to upgrade many of the existing roadways to NCDOT two-lane standards (with proper shoulders) as well as four-lane cross-sections.

With the development trends in Union County in mind, many of the widening projects recommended as part of this Transportation Plan are located in the western portion of the county, while many of the access management and streetscape improvement and rural road improvement projects are focused on the northern, southern, and eastern portions of Union County. These projects will be examined in subsequent sections of this document.

The corridors listed on the following page are recommended for widening projects, based mostly on current and forecasted future congestion. However, many of these roads were also identified during the public and stakeholder outreach process as important pedestrian and bicycle corridors. As such, it is expected that any widening project construction will also include provisions for pedestrian and bicycle. These facilities are grouped by the future ultimate cross-section. See Chapter 6 for short-term, middle-term and long-term priorities.

4 Lane Median Divided

- **Airport Road** – Old Charlotte Highway to Propel Way
- **Airport Road** – Propel way to Hampton Meadows Road
- **Austin Chaney Road** – Olive Branch Road to approximately Camden Street
- **Idlewild Road** – Mill Grove Road to the Union/Mecklenburg County Border.
- **Indian Trail Road** – US 74/Independence Boulevard to Old Monroe Road
- **Lawyers Road** – Rocky River Road to Union/Mecklenburg County Border
- **Martin Luther King Junior Boulevard** – Goldmine Road to Weddington Road
- **NC 601** – East Avenue to Fowler Road to Sikes Mill
- **New Town Road** – Rocky River Road to Potter Road
- **New Town Road** – Potter Road to Waxhaw – Indian Trail Road
- **New Town Road** – Waxhaw – Indian Trail Road to Providence Road
- **North Rocky River Road** – Goldmine Road to Old Charlotte Highway
- **North Rocky River Road** – Old Charlotte Highway to US 74/Independence Boulevard
- **North Rocky River Road** – US 74/Independence Boulevard to Secret Short Cut Road
- **Old Charlotte Highway** – North Rocky River Road to Wesley Chapel – Stouts Road
- **Old Charlotte Highway** – Rocky River to Dickerson Boulevard and Martin Luther King Junior Boulevard
- **Old Monroe Road** – Waxhaw – Indian Trail Road to Union/Mecklenburg County Border
- **Old Monroe Road** – Wesley Chapel – Stouts Road to Indian Trail Road
- **Providence Road** – New Town Road to Rea Road
- **Rocky River Road** – Secret Short Cut Road to Lawyers Road
- **Rocky River Road** – Waxhaw Highway to Weddington Road
- **Rocky River Road** – Weddington Road to Goldmine Road
- **Secret Short Cut Road** – Mill Grove to Unionville –

Indian Trail Road

- **South Providence Road** – Cuthbertson Road and Kensington Drive to New Town Road
- **South Providence Road** – Cuthbertson Road and Kensington Drive to Waxhaw Parkway
- **Stallings Road** – US 74/Independence Boulevard to Union/Mecklenburg County Border
- **Unionville – Indian Trail Road** – Rocky River Road to Secret Short Cut Road
- **Unionville – Indian Trail Road** – US 74/Independence Boulevard to Secret Short Cut Road
- **Waxhaw Highway** – Broome Street to Weddington Road
- **Waxhaw – Indian Trail Road** – New Town Road to Broome Street
- **Waxhaw – Indian Trail Road** – New Town Road to Weddington Road
- **Waxhaw – Indian Trail Road** – Weddington Road to Old Monroe Road
- **Weddington Road** – Martin Luther King Junior Boulevard to Rocky River Road
- **Weddington Road** – Rocky River Road to Embassy Court
- **Weddington Road** – Waxhaw – Indian Trail Road to Potter Road
- **Weddington Road** – Waxhaw – Indian Trail Road to Rea Road Extension
- **Weddington Road** – Waxhaw Highway and West Franklin Street to Martin Luther Kind Junior Boulevard

In addition to the recommendations to widen whole sections of roadway, some spot widening will likely be part of select access management projects. These smaller widening sections may be needed to accommodate passing lanes or turn pockets. This needed improvement was specifically expressed by our Advisory Committee to address large tractor trailers as well as large farm equipment. Additionally, as the rate of development in Union County continues to increase and right-of-way continues to become more constrained, it may behoove decision-makers to acquire right-of-way in advance of any proposed widening projects as the opportunity arises. Union County will work with local governments and the CRTPO to preserve roadway corridors to ensure right-of-way is obtained when available.

New Location Construction

In the current funding climate, obtaining funding for the construction of large-scale infrastructure projects can be very difficult. While costs associated with new construction including right-of-way acquisition, materials, and labor continue to increase, the available funding for new location projects has decreased. This trend is likely to continue. With this in mind, justifying the expense of adding a new location project can be difficult and usually only occurs when significant congestion relief, safety improvement, or growth opportunities are anticipated as a result of the project.

Apart from the Monroe Bypass project (TIP # R-2559, R-3329), which is already programmed and funded, the majority of the new location projects recommended in this document provide crucial short connections between major roadways. In every case, these short projects provide a linkage between two roadways that are recommended for improvement. These projects are presented below.

4 Lane New Location Projects

- Rea Road Extension** (TIP #U-3467) – The proposed extension to Rea Road would create an important 4-lane divided cross connection between Providence Road and Weddington Road in an area likely to continue to develop at a rapid pace. Located within the town of Weddington, this proposed section would open a large parcel for development and reduce congestion along Providence Road as well as in downtown Weddington.

2 Lane New Location Projects

- Chestnut Lane Relocation** – This short project would straighten the alignment of Chestnut Lane to Matthews Weddington Road in order to reduce conflicts at the existing intersection and improve traffic flows from the southwest to northeast.

Project Type	Total
Access Management / Operational Improvement / Streetscape Improvement	180.531
New Location	2.502
Rural Road Improvement	137.805
Widening	96.962

RECOMMENDED CROSS-SECTIONS

Figure 3-6 presents the typical cross sections as well as the laneage for the roadways proposed for improvements in Union County. In determining the recommended cross-sections for each roadway, not only roadway recommendations, but also pedestrian and bicycle recommendations were considered. The recommended cross-sections are color-coded to correspond directly to the laneage indicated on the Official Laneage Map (Figure 3-5), with red indicating the 6-lane sections, light blue the 5-lane sections, green the 4-lane section, and dark blue the 2-lane section. For the 2- and 4-lane sections, multiple cross-sections are presented to indicate possible pedestrian and bicycle improvements that may accompany the roadway. Final design will determine the ultimate cross-section of the roadway. The total right-of-way widths along with an example facility are listed with each cross-section.

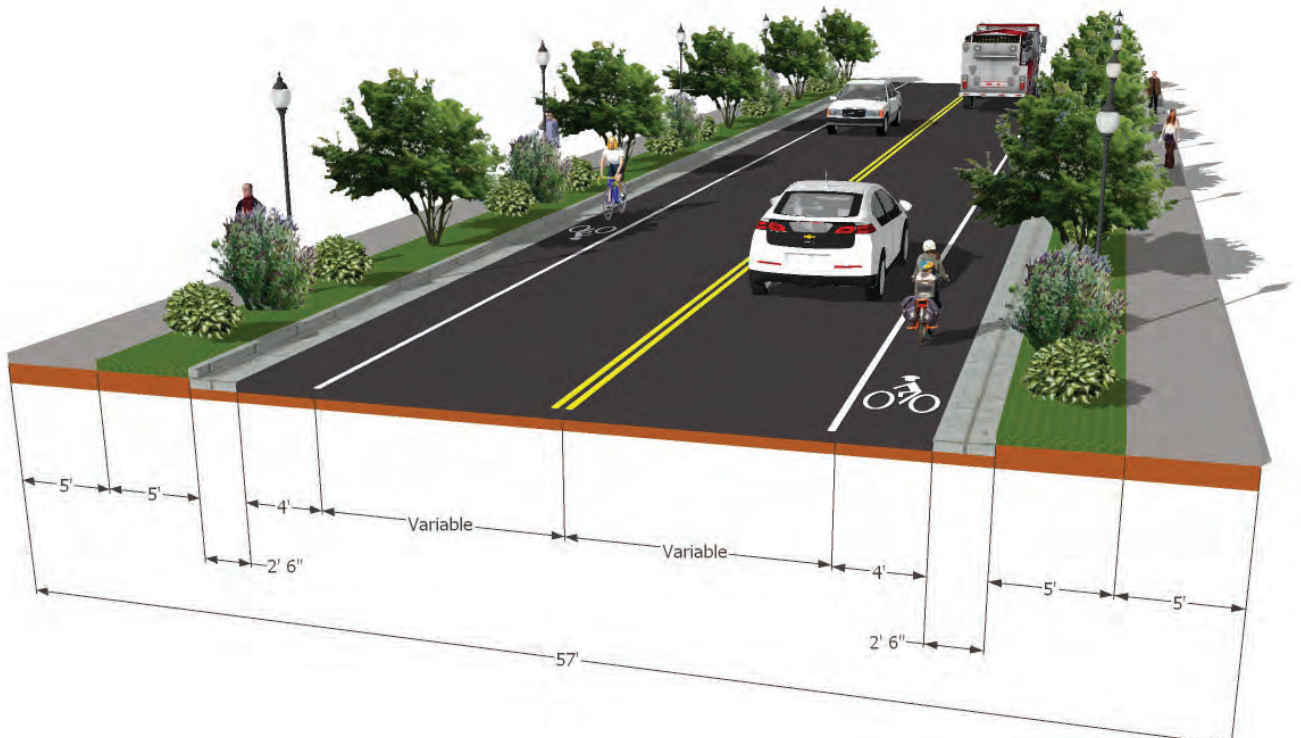
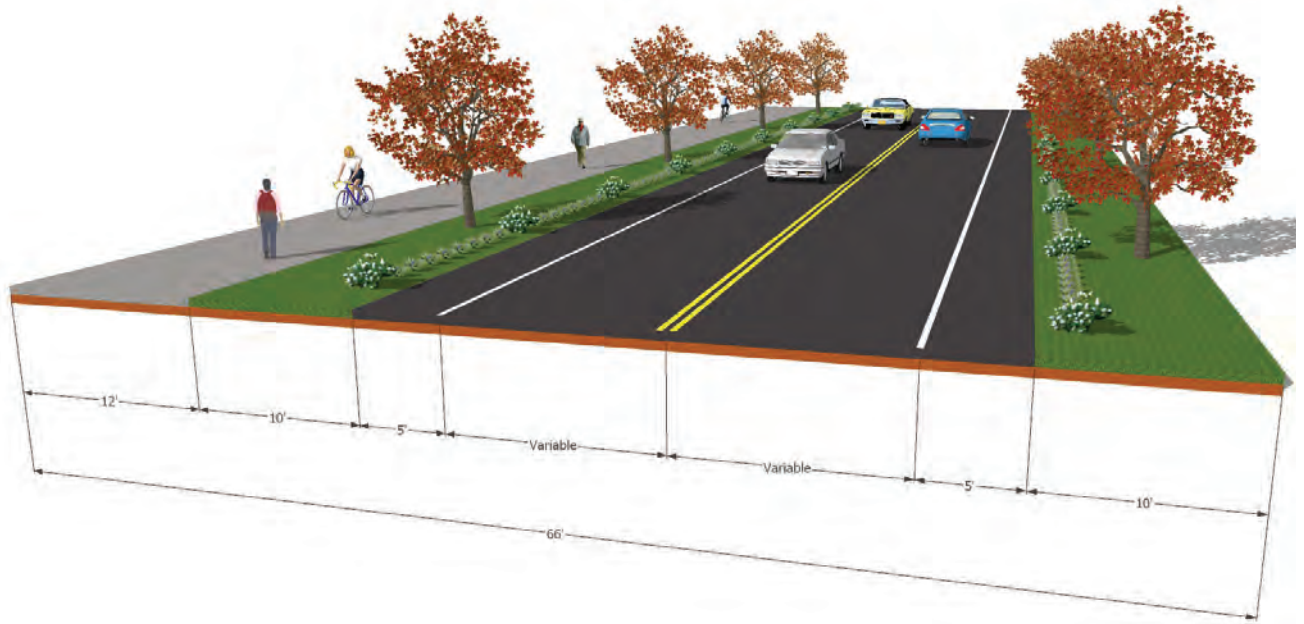


Figure 3-6

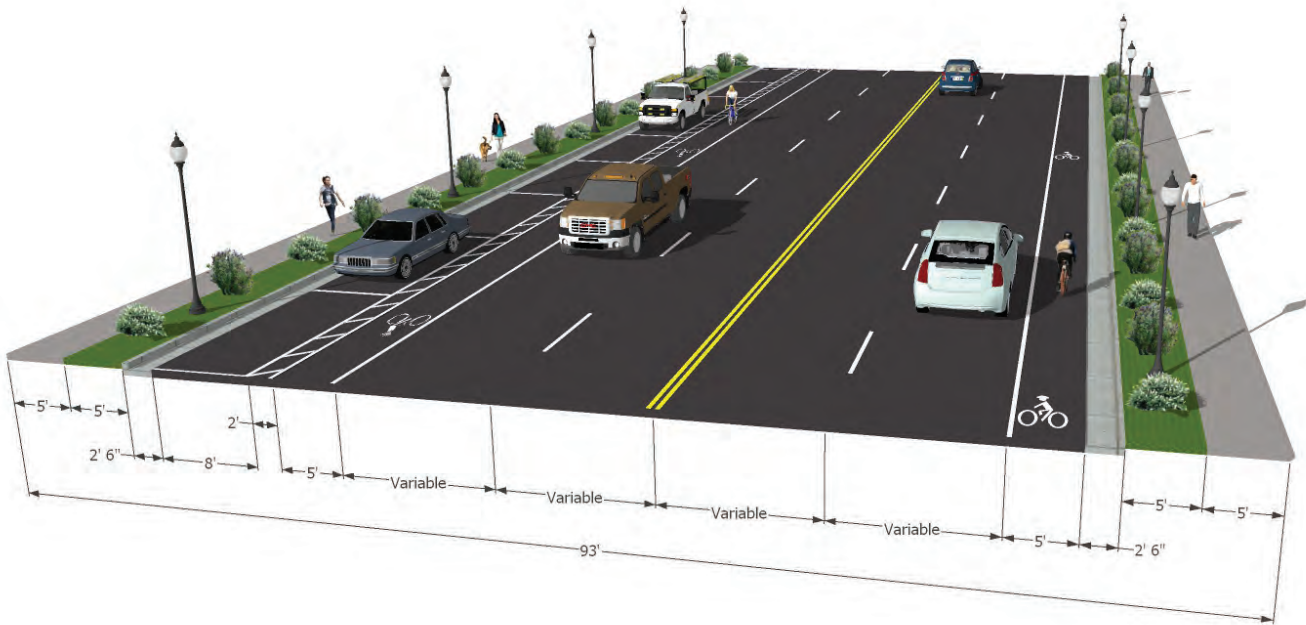
2-lane sections



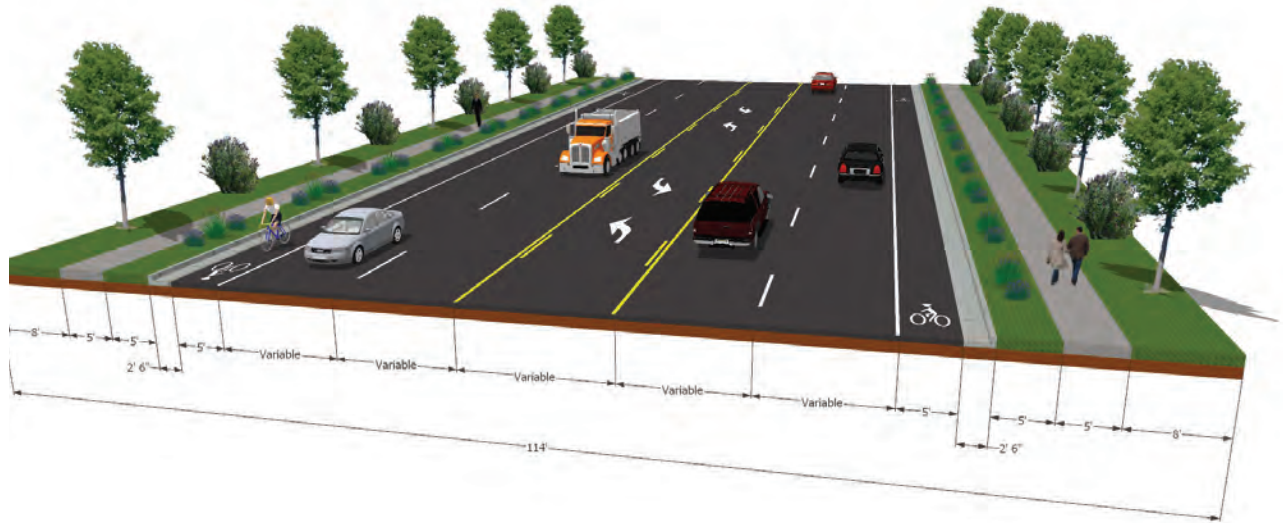
2-lane sections



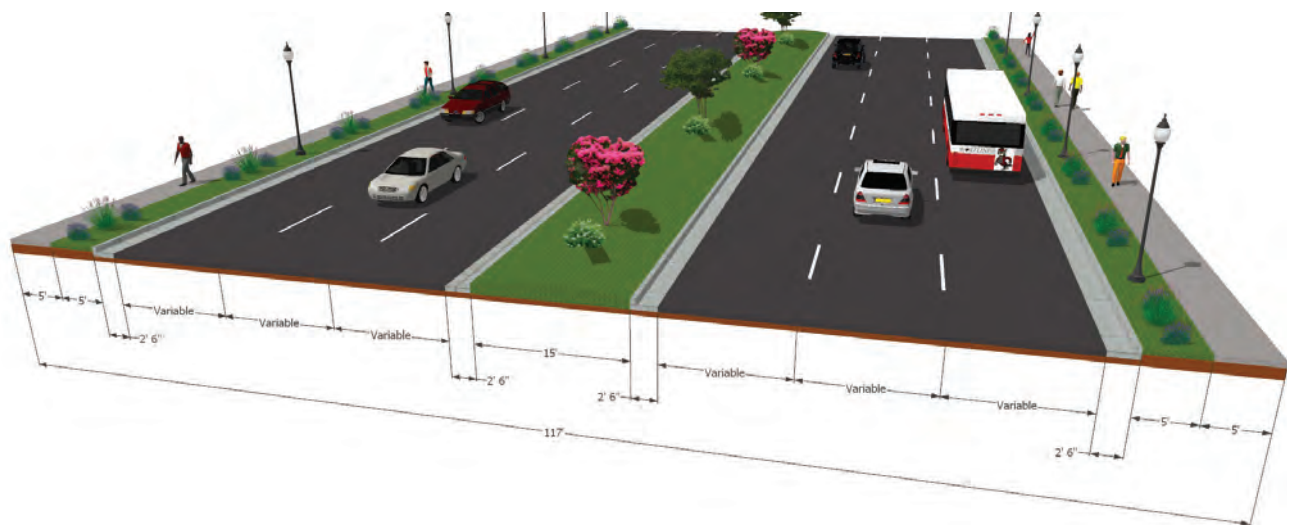
4-lane sections



5-lane section



6-lane section



COLLECTOR STREET IMPROVEMENTS

According to the latest edition of AASHTO's A Policy on Geometric Design of Highways and Streets (2011)¹, commonly known as the "Green Book," collector streets are defined differently depending on the context of the roadway. For more rural areas, collector streets serve to provide intracounty travel, as opposed to intrastate, and typically serve travel over shorter distances than on arterial roads. In a more urban/suburban context, collector streets provide access between arterials and local roads, serving both land access and traffic circulation purposes. Collector streets are typically lower speed than arterial roads and can penetrate neighborhoods with the intention of helping to distribute trips from arterials to local roads and vice versa (AASHTO 2011).

Designing collectors in locations that link neighborhoods to arterials and ensuring that they are built to applicable standards is a critical component to the transportation future of Union County.

- **Policy Considerations**

The collector street network should reflect the community's vision for transportation in the County as well as the balance between connectivity, access, mobility, and safety. As the collector street network also impacts congestion, any future construction should reflect both the current and future condition and operation of the roadway.

- **Natural Environment**

Natural features such as wetlands, lakes, and streams will often have a large impact on where new location roadway construction occurs. The collector street recommendations presented in this Transportation Plan were developed with the intention of avoiding major stream crossings as well as any major impacts to wetlands.

- **Design Elements**

Collector streets in Union County are expected to be constructed to the latest roadway standards, as determined by the County. As it is anticipated that majority of collector streets will be constructed by private developers, these proposed collector street alignments can serve as base recommendations, but may be altered as future land use plans crystallize. Additionally, collector street design should consider pedestrians, bicyclists,

and transit users and incorporate Complete Streets (see Chapter V) design elements to ensure that all modes of transportation are accommodated safely and comfortably for all users.

DETAILED CORRIDOR RECOMMENDATIONS

Corridor Based Planning

Each transportation corridor within Union County has its particular characteristics. Right-of-way constraints, land use service, and relationship to major job centers, residential areas, schools, and shopping districts shape the demand for travel. Every trip has a reason; even recreational trips that have the same beginning and ending point have a clear purpose.

The following section helps describe the major corridors within Union County, and what trip purposes are being served. Each corridor has been assessed using a multi-modal evaluation technique called a **Quality / Level-of-Service (Q/LOS) rating**. The Q/LOS method is a planning-level assessment of roadway/automobile, public transportation, pedestrian and bicycling modes of travel; lower scores indicate better conditions. Each description in the following pages describes the typical conditions along the travel corridor (which may include more than one street in a corridor), key intersections, and how the corridor functions currently. Recommendations for these corridors will utilize these descriptions as a baseline for comparison.



Recurring Congestion: Traffic delays caused by exceedances of volume beyond the normal operating capacity of the roadway, typically happening in peak period, weekday conditions.



Non-Recurring Congestion: Traffic delays due to weather, accidents, special events, or construction.

¹American Association of State Highway and Transportation Officials. (2011). A Policy on Geometric Design of Highways and Streets. Washington, D.C., AASHTO.

How the Q/LOS Evaluation Works. Each roadway was divided into segments that had fairly similar characteristics: number of travel lanes, volumes, and median/access control. For each segment, information about travel lane widths, posted speeds, sidewalks, bicycle facilities, traffic volumes (2012), and intersections were input into the model. The Q/LOS software outputs a letter level-of-service as well as average speeds (automobile mode), and a unique score for each segment and alternative mode of travel (bus, bicycle, and pedestrian) as well as average values for the entire roadway. The Highway Capacity Manual and Transit Capacity & Quality of Service Manual provide the basis for the scoring systems. The sample chart below provides an overview of how to interpret each Q/LOS table.

	Mode	Q/LOS Score	6 Volume per Day
1	Auto (avg. speed)	17.9mph	35k – 57k
2	Transit	1.5	1 to 25
3	Pedestrian	7.0	26 to 100
4	Bicycle	4.9	26 to 100
Existing Cross-Section (E. Independence/Andrew Jackson):			
			
5	Existing Cross-Section (Old Monroe Rd/Old Charlotte Hwy):		
			

1. The average speed of automobile traffic, in mph
2. The average Q/LOS transit score/modified bus frequency; a lower score is better
3. The average pedestrian score, typically between 0.5 and 7.0 (lower is better)
4. The average bicycle Q/LOS score, typically between 0.5 and 7.0 (lower is better)
5. Sample cross-section(s) and / or images
6. Estimated volume by mode (vehicles per day for auto, categories for other modes):
 0 = none or very few;
 1 to 25 per day (transit=peak period only);
 26 to 100 per day;
 Greater than 100 per day

US 74 West (East Independence Boulevard/Andrew Jackson Boulevard/W. Roosevelt Boulevard) / Old Monroe Road-Old Charlotte Highway Corridor

This corridor is the most complex and heavily traveled corridor in Union County, and includes the CSX Railroad line as well. The corridor provides the most direct route into Charlotte from the center of the County, but also is an important destination in its own right, providing the location of a considerable fraction of the retail, employment, and commercial energy of the County (about 30% of the 2011 employment in Union County falls within one mile of US 74). The corridor is comprised mainly of two streets: Independence Boulevard from Monroe to the Mecklenburg County line, and Old Monroe Road to the south. Independence Boulevard is a combination of four-lane and six-lane median-divided highway. While the median greatly aids in the control of access from adjoining land uses, frequent driveways have been permitted throughout its length, contributing to both recurring and non-recurring (e.g., from accidents) traffic congestion. Old Monroe Road roughly parallels Independence Boulevard to the south, with the CSX single-track rail line in-between the two roads

north of Rocky River Road. This road is typically two-three lanes, and with little to no control of access to adjacent residential and industrial properties. For both roads, land access is almost entirely limited to private automobile, with only sporadic sections of sidewalk, including along the side streets. There are almost no provisions for pedestrian crossings or for cycling along or across either major street in the corridor. The

ultimate provision of two-way multi-use paths set back well behind the ditch line is demonstrated only along the frontage of a few relatively recent private developments. Given the traffic levels, density of destinations, and residential uses nearby, isn't surprising that this corridor also experiences the highest number of crashes in the County. Transit service is provided to Mecklenburg and downtown Charlotte via the CATS 74X Union County regional express route. This service is provided during weekdays only, however, and has four morning and four evening peak period runs approximately 20 to 30 minutes apart, with pickups restricted to two shopping center locations in this corridor.

US 74 West

This corridor is the most complex and heavily traveled corridor in Union County, and includes the CSX Railroad line as well. The corridor provides the most direct route into Charlotte from the center of the County, but also is an important destination in its own right, providing the location of a considerable fraction of the retail, employment, and commercial energy of the County (approximately 63% of the total employment of Union County in 2011 falls within one mile of US 74 corridor²). The corridor is comprised of one street: Independence Boulevard from Monroe to the Mecklenburg County line. Independence Boulevard is a combination of four-lane and six-lane median-divided highway. While the median greatly aids in the control of access from adjoining land uses, frequent driveways have been permitted throughout its length, contributing to both recurring and non-recurring (e.g., from accidents) traffic congestion. Land access is almost entirely limited to private automobile, with only sporadic sections of sidewalk, including along the side streets. There are almost no provisions for pedestrian crossings or for cycling along or across US 74 in the corridor. The ultimate provision of two-way multi-use paths set back well behind the ditch line is demonstrated only along the frontage of a few relatively recent private developments. Given the traffic levels, density of destinations, and residential uses nearby, it isn't surprising that this corridor also experiences the highest number of crashes in the County. Transit service is provided to Mecklenburg and downtown Charlotte via the CATS 74X Union County regional express route. This service is provided during weekdays only, however, and has four morning and four evening peak period runs approximately 20 to 30 minutes apart, with pickups restricted to two shopping center locations in this corridor.



Building rooftops (red) northwest of Monroe.



30% of the 2011 employment in Union County falls within one mile of US 74

Recommended Cross Sections: US 74/Independence Boulevard is proposed to be improved through access management strategies including applications for Super Streets and include the implementation of sidepaths.

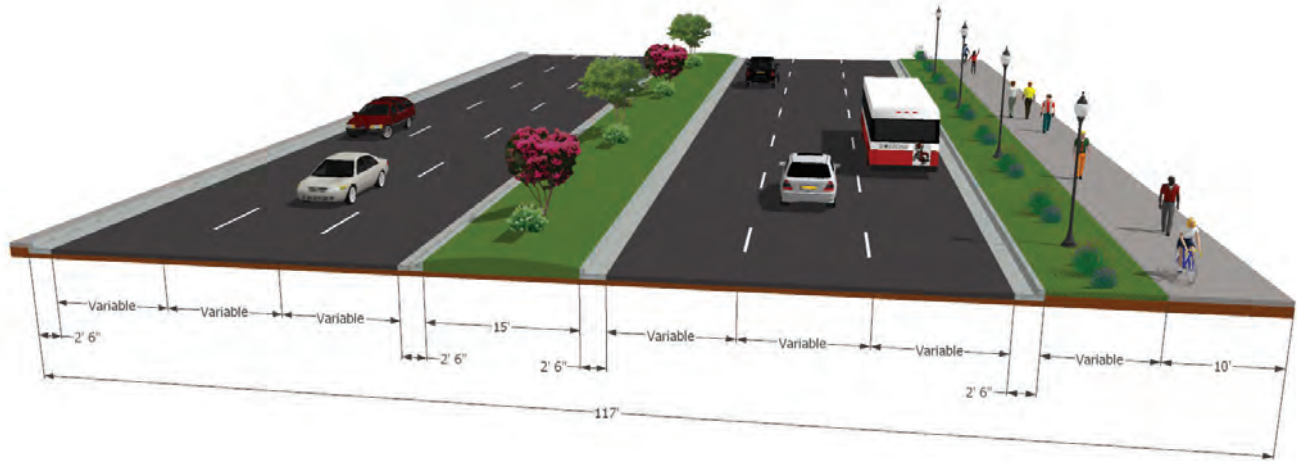
Mode	Q/LOS Score	Volume Per Day
Auto (avg. speed)	17.9mph	35k – 57k
Transit	1.5	1 to 25
Pedestrian	7.0	26 to 100
Bicycle	4.9	26 to 100

Existing Cross-Section (E. Independence/Andrew Jackson):

Existing Cross-Section (Old Monroe Rd/Old Charlotte Hwy):

² U.S. Census Bureau. 2011. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. <http://onthemap.ces.census.gov/>

US 74 West



Old Monroe Road-Old Charlotte Highway Corridor

Running parallel to US 74/Independence Boulevard, this corridor is another heavily traveled roadway providing both local access to businesses, but also serving as a commuting route from Union County into Charlotte. A number of local businesses are located directly in the vicinity of this area, while residential areas can be accessed from this corridor. This road is typically two-three lanes and has little to no control of access to adjacent residential and industrial properties. Sidewalks can be found only sporadically along this roadway and pedestrian crossing facilities and bicycle infrastructure is almost non-existent. Based on the high crash rate in this area of Union County, the ultimate provision of sidepaths and sidewalks along this corridor will have a hugely beneficial effect on non-motorized user safety and will likely encourage pedestrian and bicycle traffic. Transit service is not recommended on Old Monroe Road-Old Charlotte Highway at this time, though transit is recommended on nearby US 74.

Old Monroe Road is proposed to be widened to a 4-lane with plantable median. See Chapter 5 for more details.



US 74 East

East of Comfort Lane, US 74 reverts back to a four-lane, median-divided cross-section. “Superstreet” control measures, which primarily restrict left-turn maneuvers in the median, are prolific in this section of roadway until it reaches Edgewood Drive. At this point, the roadway turns back into a five-lane cross-section, and access controls become more lax until it reaches nearly to Country Lane, where the median picks back up again, sometimes reaching 35’ in width. Bicycling provisions (and automobile run-off recovery area) are provided through 14’ outside lanes in the sections where two-way, left-turns are permitted. The five-lane design reappears as the road traverses through Marshville and driveways, residential development, and highway retail land uses all increase in this brief stretch. The roadway handles drainage through a ditching system. No public transportation services in terms of fixed routes are provided; the CSX rail line stays to the north of the roadway alignment, and well out of the road right-of-way.



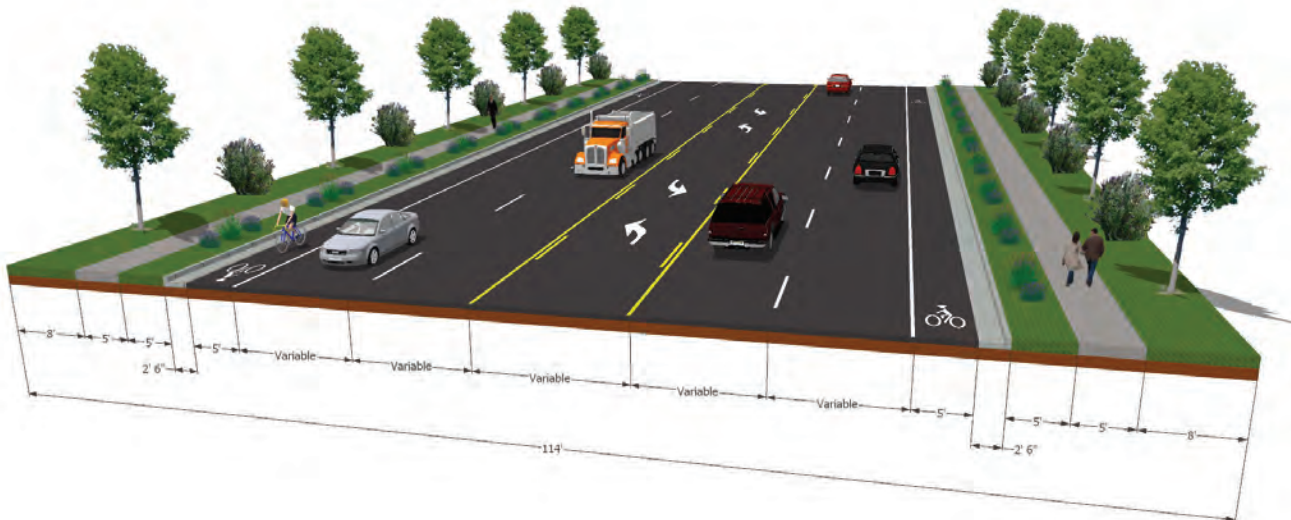
US 74 East, through Marshville (note freight train on CSX tracks to the north)

Mode	Q/LOS Score	Volume Per Day
Auto (avg. speed)	45.5mph	13k – 27k
Transit	0.0	None or Very Few
Pedestrian	5.5	1 to 25
Bicycle	4.7	1 to 25

Existing Cross-Section (US 74 through Marshville):

Existing Cross-Section (US 74 East of Marshville, with Median):

Recommended Cross Section: This section of US 74 is proposed to be improved through access management strategies and the provision of 5’ sidewalks, but only on a short section between Wingate and Marshville. Otherwise, this other portions of US 74 will remain as 4-lane divided sections

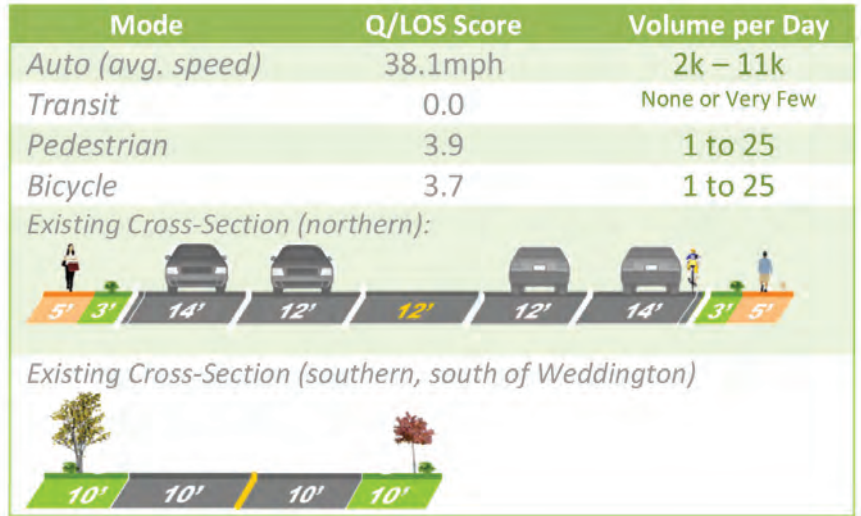


NC 16 (Providence Road)

Providence Road emerges from Mecklenburg County as a four-lane, divided arterial serving about 23,000 vpd, and maintains good access control in the median into Weddington. This northern section of the road has sidewalks on both sides but, except for a very small section of bike lane south of Weddington Road, there are no bicycle facilities and the lanes become narrower (10') south of Weddington to NC 16 in Waxhaw. This much longer stretch between Weddington and Waxhaw serves lower volumes, but without access control or provisions for left- or right-turns, small perturbations in traffic create delays. There is no fixed-route transit service in this corridor.



Providence Road at Weddington (left) and further south (right)



Recommended Cross Section: Providence Road is slated to be improved through access management strategies from the Mecklenburg County line to Rea Road, while the southern portion, from Rea Road to Waxhaw, will be widening from a 2-lane to 4-lane section and will also include sidepaths.



Waxhaw-Indian Trail Road

This long road, extending from US 74 all the way to Waxhaw, provides relief from other, similar routes for automobile travel. The road is generally one lane in each direction, although an occasional center turning lane precedes a major intersection. In the northern section, from US 74 to Old Monroe Road, there are sidewalks, not uncommonly on both sides of the road. There are no bicycling facilities to speak of anyplace along the roadway, little control of access either in the center of the roadway or observed along the edge of the road, and no public transportation service. The road transitions to a very rural context south of Old Monroe Road, although some newer tract housing emerging on the roadside is a harbinger of future changes to come as the area develops. (See also Potter/Stallings Road)



Waxhaw-Indian Trail Road, south of Monroe Road

Mode	Q/LOS Score	Volume per Day
Auto (avg. speed)	20.4mph	13k – 23k
Transit	0.0	None or Very Few
Pedestrian	5.4	1 to 25
Bicycle	4.7	1 to 25

Existing Cross-Section:

Recommended Cross Section: Waxhaw-Indian Trail Road, as an important connector between the towns of Indian Trail and Waxhaw is recommended to be improved to a 4-lane divided section with 5' shoulders and sidewalks.



NC 75 (Waxhaw Highway) / NC 200 South (Lancaster Highway) Corridor

The two principle roadways in this corridor connect their namesakes (Waxhaw and Lancaster, SC) to the City of Monroe. Both run in a generally southwest-northeast fashion, and both are typically two-lane undivided cross-sections, even inside much of the Waxhaw town limits. NC 75 is paralleled on its north side by the CSX railroad, which has lent this side of the corridor a more industrial context than that of NC 200 to the south. There is sidewalk along NC 75 (Franklin Street) for most of its length in Monroe but not further west. NC 200, which is slated to remain a two-lane facility, provides access to even more rural properties, particularly after passing the Central Academy of Technology and Arts. The road is a two-lane, undivided facility without sidewalks, provisions for cycling, or transit service.



Mode	Q/LOS Score	Volume per Day
Auto (avg. speed)	27.0 / 42.0	13k–23k/3k–9k
Transit	0.0 / 0.0	None or Very Few
Pedestrian	4.5 / 5.0	1 to 25
Bicycle	4.6 / 4.2	1 to 25

Existing Cross-Section:

Recommended Cross Section: NC 75 (Waxhaw Highway) is recommended for improvement to a 4-lane section with sidepaths from Waxhaw to Monroe, while NC 200 South is slated for access management improvements including driveway consolidation and passing lanes along with the addition of 5' shoulders.

NC 75 (left) and NC 200 serve as gateways from rural but transitioning areas

NC 75 (Waxhaw Highway)

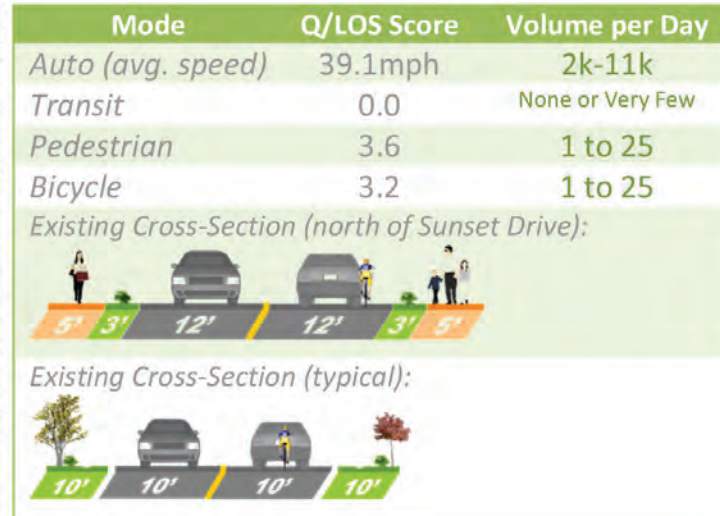


NC 207 (S. Hayne Street / Wolf Pond Road)

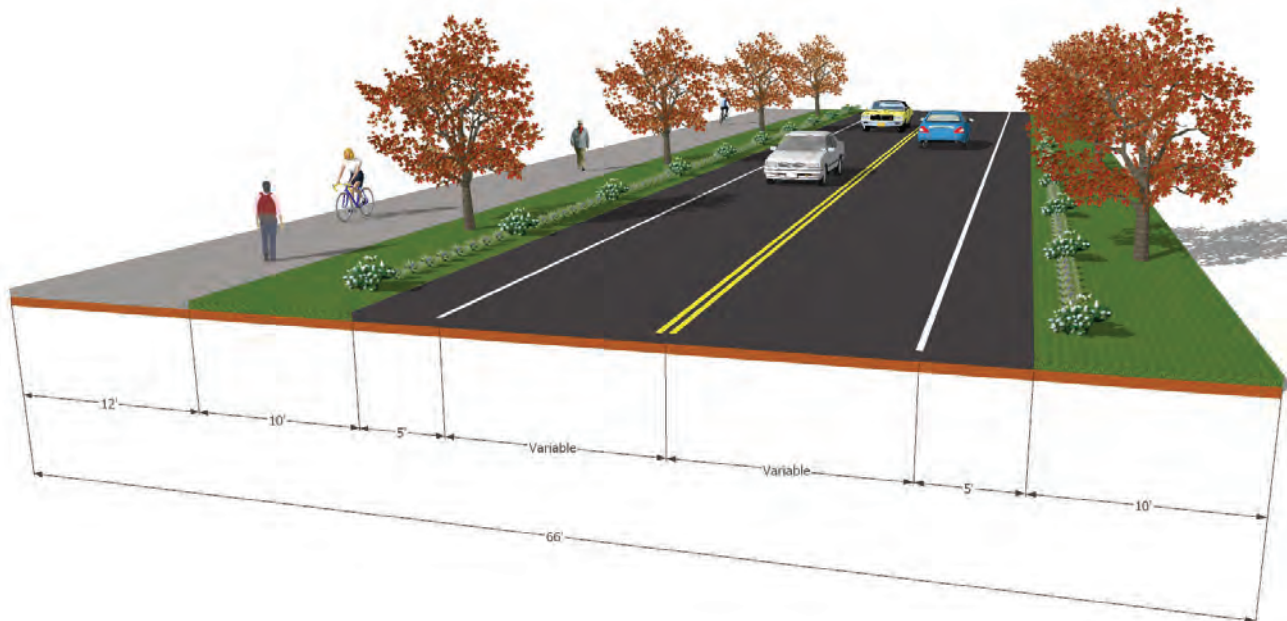
NC 207 passes nearly due south out of Monroe's downtown, traversing a rural landscape for nearly 12 miles before leaving the State. The road is generally two lanes, undivided, and without provisions for cycling or walking (sidewalks end at Sunset Drive). The posted speed is 35mph until the last residential subdivision in Monroe, then becomes a 45mph rural highway to South Carolina.



NC 207 is generally rural, even before leaving the City limits



Recommended Cross Section: The portion of this roadway within the city limits of Monroe (S. Hayne Street) is recommended for access management improvements as well as the addition of sidewalks and 5' shoulders. The portion extending from the southern border of Monroe southward to the South Carolina border is also recommended for improvement through access management strategies, but is recommended to include a sidepath instead of sidewalks.



North US 601 (Concord Highway)

The northern section of US 601 emerges from US 74 and runs north through the crossroads community of Fairview before entering Cabarrus County. Pavement conditions are currently better than on many of the state numbered routes, although the two-lane, undivided cross-section looks similar. One important difference is a striped shoulder ranging from two to three feet that provides some cycling and walking refuge, even in the most rural sections. Traffic volumes peak around the US 74 interchange, then drop off rapidly as the road moves north into rural, scattered residential and farming properties.



The northern section of US 601, while a major US route, maintains a rural character

Mode	Q/LOS Score	Volume per Day
Auto (avg. speed)	42.0mph	5k-13k
Transit	0.0	None or Very Few
Pedestrian	4.6	1 to 25
Bicycle	3.3	1 to 25

Existing Cross-Section (typical):

Recommended Cross Section: North US 601 is recommended for widening with sidewalks from US 74 northward until the Sikes Mill Road and US 601 split. In the more rural area north of Sikes Mill Road, US 601 is recommended to be improved through access management strategies and the addition of 3' shoulders.



South US 601 (Pageland Highway)

The southern section of US 601 crosses US 74 and runs south across Richardson Creek and into South Carolina. However, this roadway differs greatly from the northern reaches in that it has four travel lanes separated by a median and managed left-turn movements that translate into a 55mph speed limit. Pedestrian, cycling, and transit modes are not accommodated, although some segments of the roadway have a valley-style curb-and-gutter treatment that could support a sidewalk behind the curbline.



The southern stretch of US 601 is highly access-managed

Mode	Q/LOS Score	Volume per Day
Auto (avg. speed)	48.3mph	5k-13k
Transit	0.0	None or Very Few
Pedestrian	4.5	None or Very Few
Bicycle	2.9	None or Very Few

Existing Cross-Section (typical):

Recommended Cross Section: No additional improvements recommended at this time.

NC 200 North (Morgan Mill Road)

This roadway is to the east of US 601, starting from US 74 and gradually pulling away from it on a more easterly path. The automobile carriageway consists of a two-lane, undivided cross-section with no paved shoulders. Commercial and small industrial land uses taper off to agricultural fields and scattered residences on large lots. The single important crossing is with NC 218 about three-and-a-half miles before NC 200 reaches the Stanly County line. Only a few properties have sidewalk in front, and there are no provisions for cycling and no public transportation services.



Commercial and agricultural uses often share proximate spaces (NC 200 North)

Mode	Q/LOS Score	Volume per Day
Auto (avg. speed)	43.2mph	1k-9k
Transit	0.0	None or Very Few
Pedestrian	4.7	1 to 25
Bicycle	3.9	1 to 25

Existing Cross-Section (typical):

Recommended Cross Section: NC 200 North is proposed to be improved through access management strategies including driveway consolidation and passing lanes. Additionally, NC 200 North is recommended for improvements by adding a 5' shoulder and using shared lane markings for bicyclists to NC 218 and including 3' shoulder from NC 218 to the Stanly County line.



NC 218 (Fairview Road)

NC 218 (Fairview Road) has the unique distinction of being the only road that crosses the full east-west width of Union County, starting off just east of I-485 at Mecklenburg and continuing 26 miles later just south of Richardson Creek into Anson County. Fairview, New Salem, and Olive Branch are the small communities that are linked across the northern side of Union County by Fairview Road. Throughout its length, NC 218 is a two-lane, undivided cross-section with generally 10' lanes and a (maximum) one-foot-wide paved shoulder. Sidewalks and biking facilities are generally non-existent along this rural corridor.

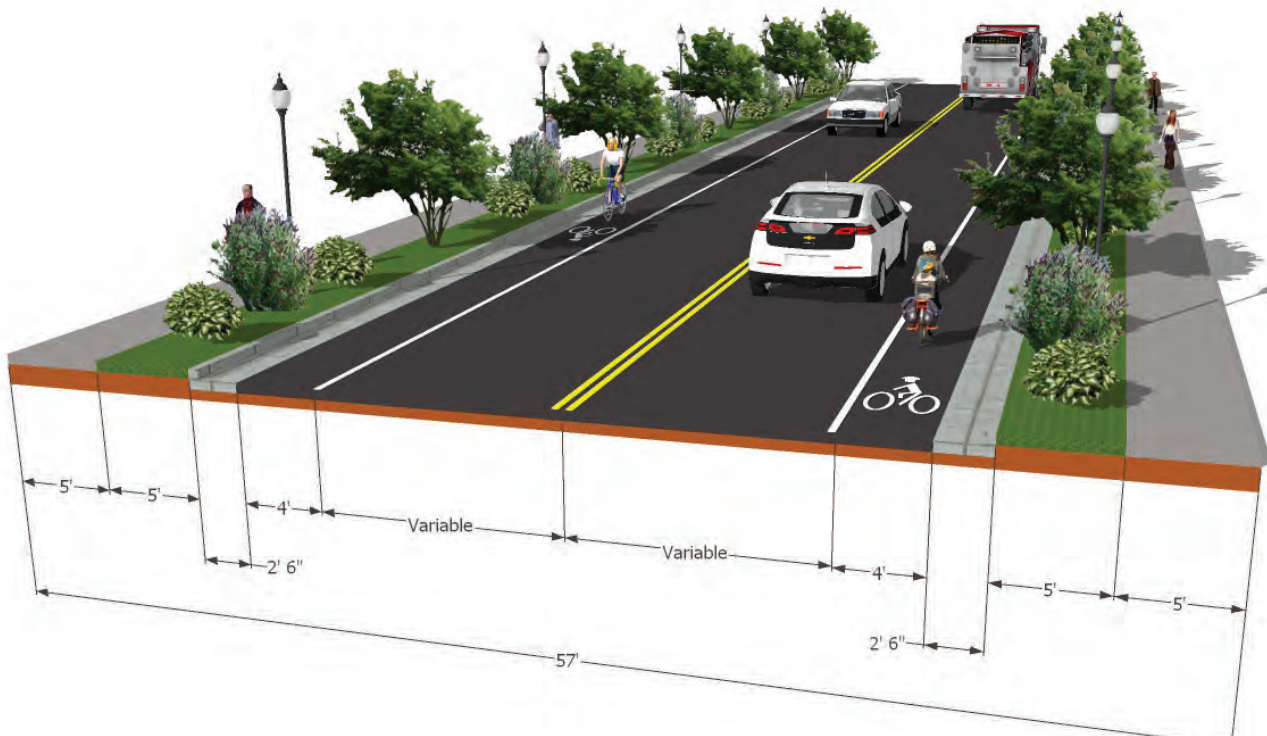


The typical cross-section of NC 218 extends virtually unchanged for 26 miles

Mode	Q/LOS Score	Volume per Day
Auto (avg. speed)	42.9mph	3k-8k
Transit	0.0	None or Very Few
Pedestrian	4.9	1 to 25
Bicycle	4.2	1 to 25

Existing Cross-Section (typical):

Recommended Cross Section: NC 218 is recommended for improvement through access management strategies, including passing lanes, and 3' bikable shoulders from the Mecklenburg County border to NC 205.



Stallings Road-Potter Road

Stallings Road emerges from Mecklenburg County heading southward across US 74 to the Town of Stallings, essentially staying parallel to the Mecklenburg County line. Crossing East John Street / Old Monroe Road, the roadway changes names to Potter Road, and goes from a two-lane, undivided street to a three-lane (center two-way, left-turn lane) until it reaches Chestnut Lane at which point it reverts back to a two-lane cross-section. The average and posted speeds drop between US 74 and Old Monroe Road, but sidewalks in this section are set well off the edge of pavement and exist almost the entire length of the road, likely serving cyclists as well as pedestrians. This section is also the most urbanized, with numerous commercial driveways serving small, stand-alone retail to larger distribution facilities. The road takes on a more rural character south of Chestnut Lane, losing sidewalks but still maintaining fairly high levels (8,000vpd) traffic numbers. While the CATS 74X Union Express Route crosses Stallings Road, there is no transit service otherwise along this route. Paved shoulders are non-existent, and there are no other cycling facilities. (Note: This transportation corridor extends only to Wesley Chapel Road, where the road changes names again to South Potter Road.)



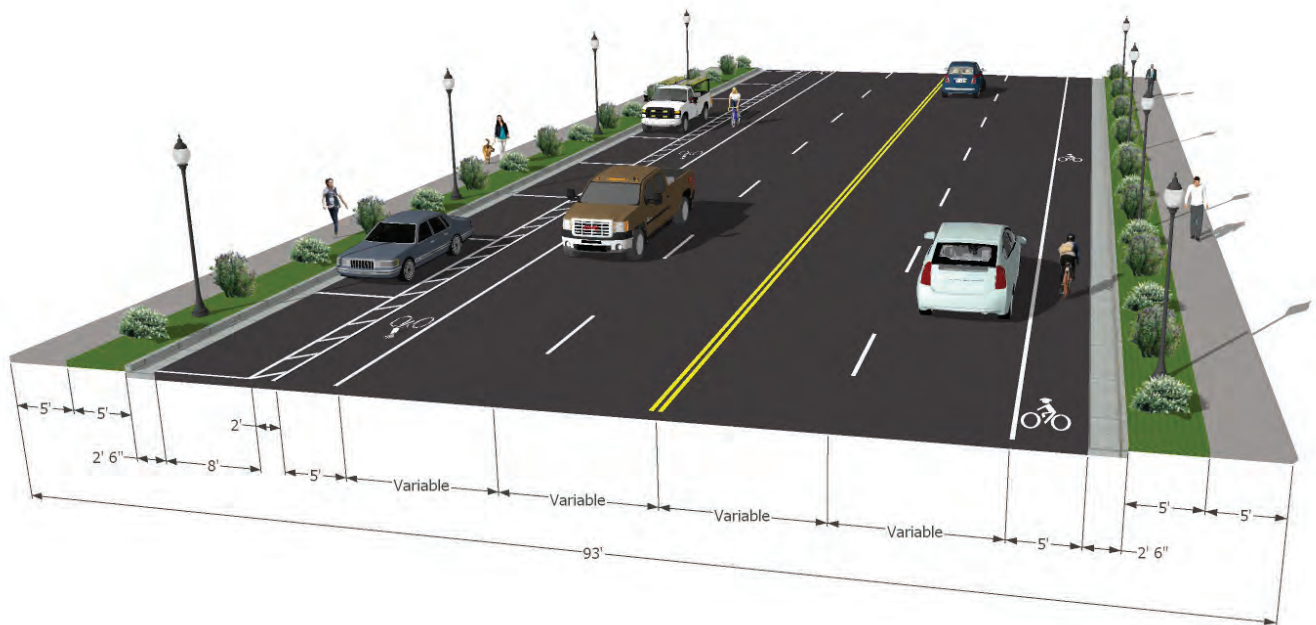
Mode	Q/LOS Score	Volume per Day
Auto (avg. speed)	36.9mph	3k-11k
Transit	0.0	None or Very Few
Pedestrian	4.2	26 to 100
Bicycle	3.9	1 to 25

Existing Cross-Section (typical of Stallings area):

Existing Cross-Section (typical south of Chestnut Ln):

Stallings Road services light industrial, commercial and some scattered residential uses before becoming Potter Road, assuming a more rural context south of Chestnut Lane

Recommended Cross Section: Stallings Road from the Mecklenburg County border to US 74 is proposed for widening from a 2-lane to 4-lane section. Beyond US 74, Stallings/Potter Road is proposed for improvement through access management strategies including driveway consolidation. Both sections are proposed for improvements through 5' sidewalks and 5' shoulders.



Weddington-Matthews Road

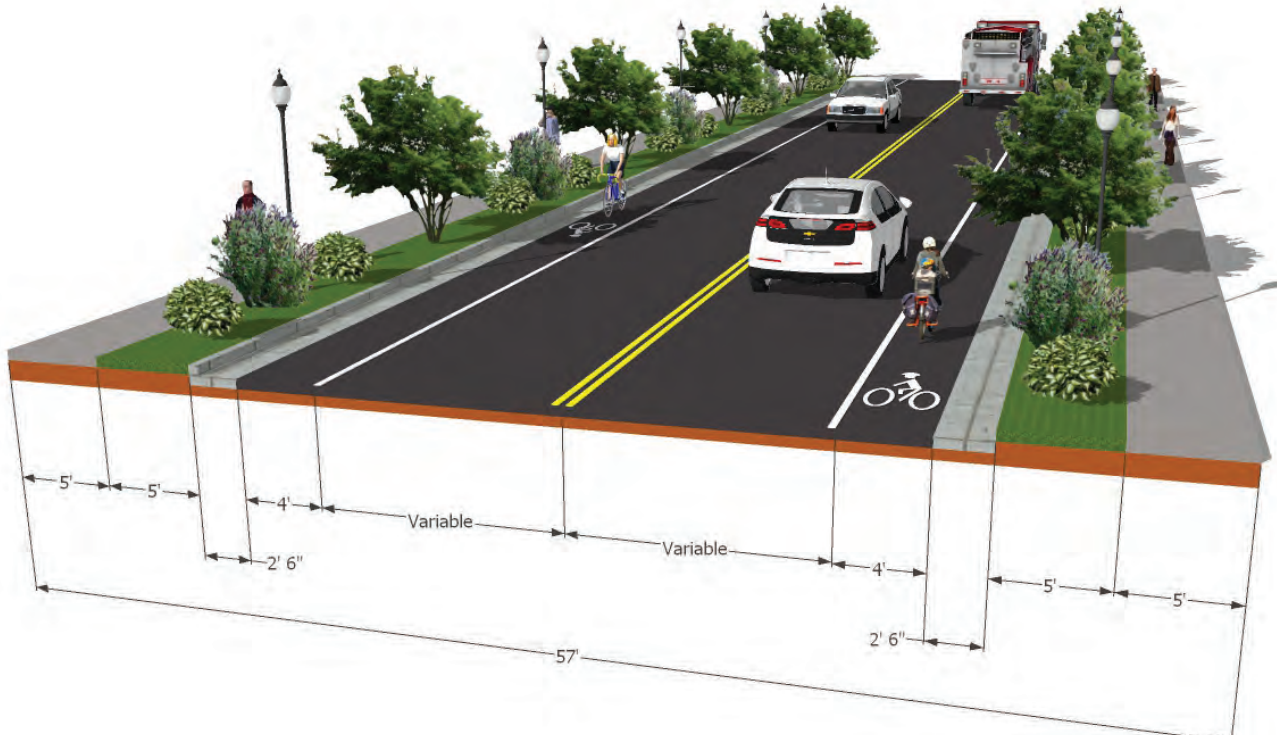
Not to be confused with Weddington Road to the south, this street comes out of Mecklenburg County and runs southwest to the community of Weddington (and Weddington Road) where it terminates at a roundabout. This road is a two-lane, undivided roadway that looks like it might be more in character with a road much further away from the boundary with Mecklenburg County. Scattered residential driveways and even a small farm or two dot the roadside.



Mode	Q/LOS Score	Volume per Day
Auto (avg. speed)	44.3mph	3k-8k
Transit	0.0	None or Very Few
Pedestrian	4.2	1 to 25
Bicycle	3.4	1 to 25
Existing Cross-Section (typical):		

Recommended Cross Section: Weddington-Matthews Road is proposed for improvement through access management and operational improvement strategies as well as the provision of buffered bicycle lanes and sidewalks.

The southern terminus of Weddington-Matthews Road is three miles and five minutes from the I-485 / Providence Road interchange, and is indicative of areas ripe for new development



New Town Road

Entering Union County from the northern peninsula of Lancaster County, SC, New Town Road enters the small community of Marvin from the west, crosses NC 16 and Waxhaw-Indian Trail Road (south) before taking a sharp turn towards Monroe and ending at NC 75 (Waxhaw Highway). Traffic volumes actually increase away from Monroe, falling to about 3,000 vpd close to NC 75. The roadway is typically a two-lane, undivided road with no paved shoulders or sidewalks regardless of its location; there is not transit service provided at any point along the route. Small farms and older, isolated homes vie for dominance with newer, tract-style subdivisions that increase as the road reaches the South Carolina border.



Proximity to South Carolina translates into more homes and more traffic on New Town Road (top), but the rural cross-section persists for the road's entire length.

Mode	Q/LOS Score	Volume per Day
Auto (avg. speed)	39.5mph	3k-11k
Transit	0.0	None or Very Few
Pedestrian	5.0	1 to 25
Bicycle	4.6	1 to 25

Existing Cross-Section (typical):

Recommended Cross Section: New Town Road is proposed for widening from a 2-lane to 4-lane divided section with the provision of a sidepath.

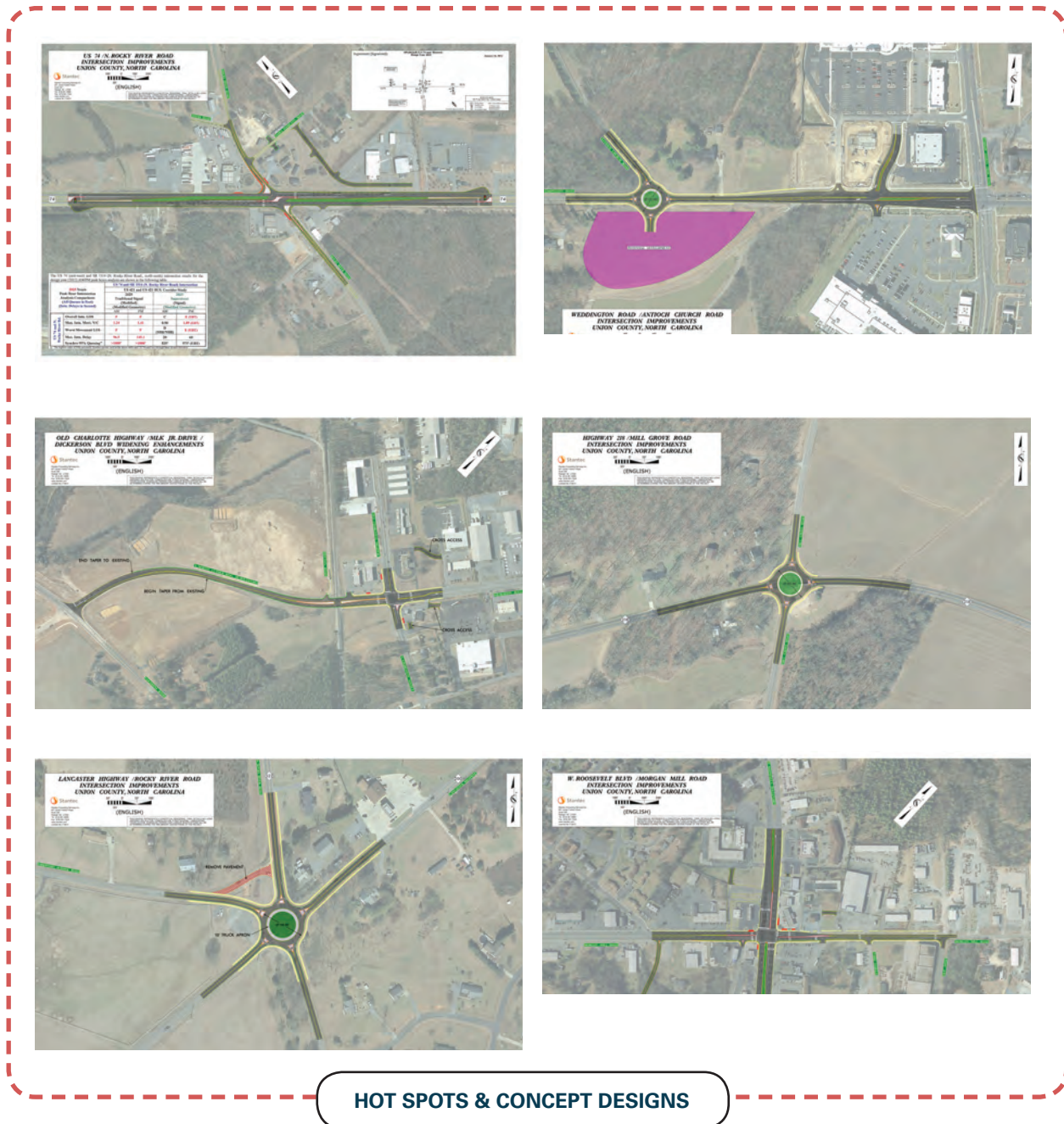


HOT SPOTS & CONCEPT DESIGNS

It is apparent that large, costly highway projects are becoming less frequent and more controversial every day. Our gas tax dollars are not able to fund projects of significant magnitude. However recently, smaller, more cost-effective projects have been successfully implemented through smaller funding sources like Spot Safety and Hazard Elimination programs. The purpose of this section is to provide a higher level of detail for specific high priority projects through the development of Hot Spot and Corridor Concept Designs (20% design detail). The intent of the Hot Spot projects is to highlight specific projects within the study area that were

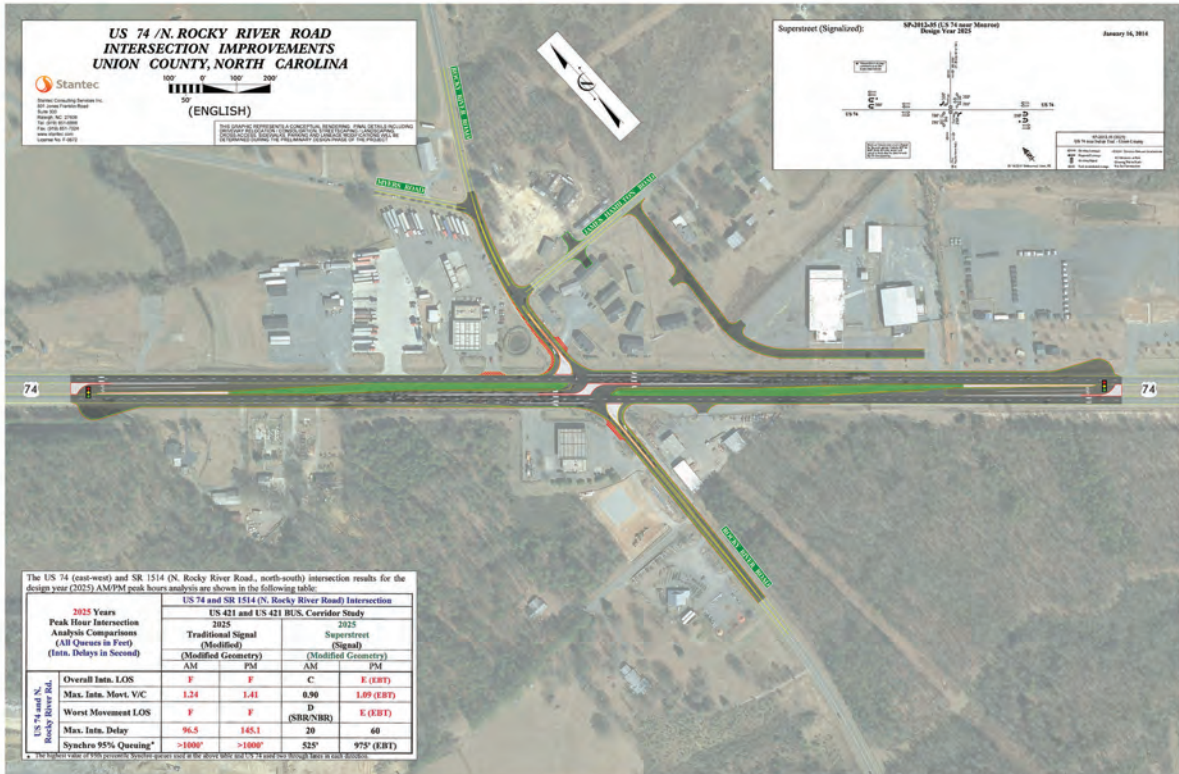
selected by the Advisory Committee as “High Priority.” In turn, the information contained in the concept designs could be used by local champions to lobby for future funding and ultimately, full implementation. In today’s environment and with SPOT prioritization process, small type projects are less likely to compete at the level of major mobility carrier type projects. This innovative program leverages alternative funding sources to administer and implement smaller type projects.

Note: These locations are based on safety. They represent concepts for improving individual intersections which could be applied to other intersection locations (i.e., traffic operations plan)



HOT SPOTS & CONCEPT DESIGNS

Figure 3-6: US 74 (Roosevelt Boulevard)/ Rocky River Road Intersection Improvements



US 74/Independence Boulevard in Union County is one of the major transportation corridors in the region and serves as an important mobility corridor between Union County and Uptown Charlotte. Assigned the project number SP-2012-35, this project has been vetted with NCDOT and programmed for funding.

Figure 3-7: Weddington Road/Antioch Church Road Intersection Improvements



In order to provide an increased safety benefit and improve traffic operations at a skewed intersection close to a major shopping area, this hotspot treatment recommends replacing the traditional intersection with a roundabout. Additionally, this roundabout would provide easy access to a developable parcel south of the intersection.

Figure 3-8: Old Charlotte Highway/MLK Jr. Drive/Dickerson Boulevard Widening Enhancements



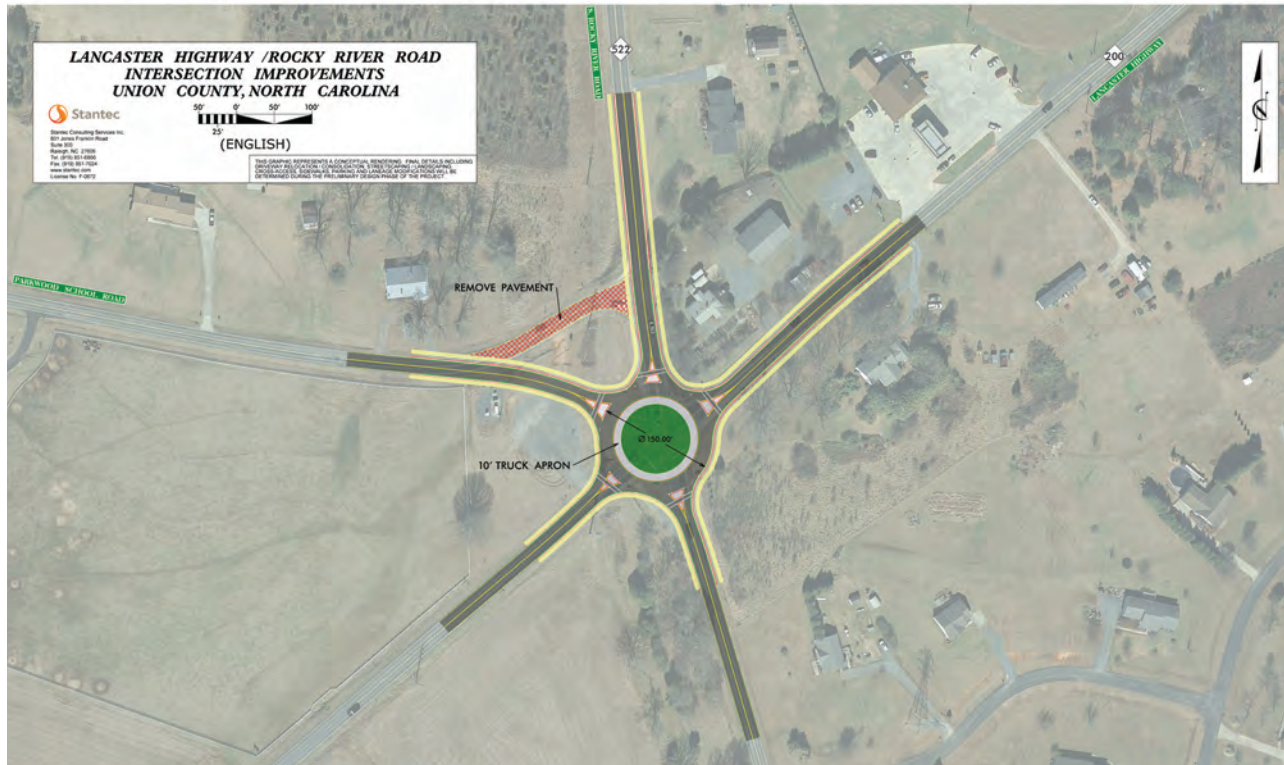
These improvements target a section of Dickerson Blvd. south of US 74 that transitions from rural road to a suburban corridor with major retail amenities on both sides. In order to create a smoother transition between the 2-lane and 5-lane sections, these improvements widen the roadway to accommodate two lanes in the southbound section as well as in the northbound section closer to the railroad crossing.

Figure 3-9: Highway 218/Mill Grove Road Intersection Improvements



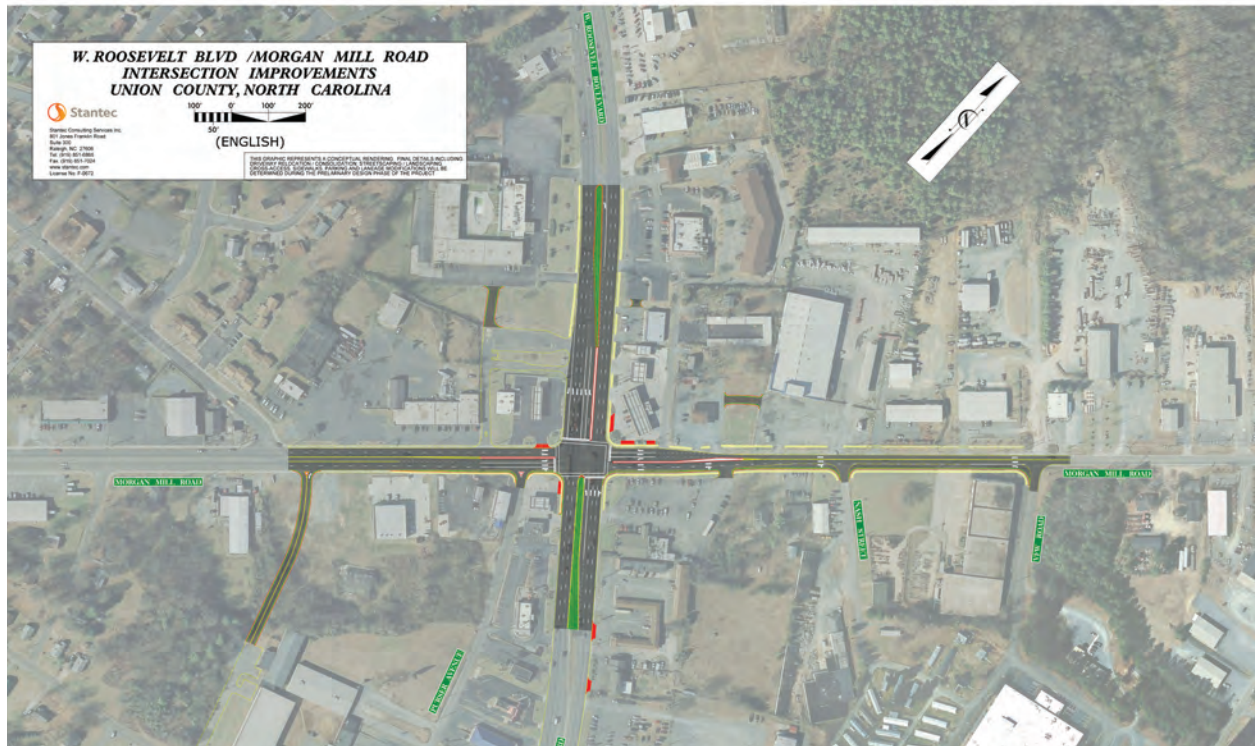
NC 218 and Mill Grove Road are rural, relatively high-speed roads that provide east-west and north-south mobility in northwestern Union County. In lieu of the safety flashing warning signals currently in place along NC 218, this hotspot treatment calls for the installation of a roundabout, which will substantially improve safety at this location.

Figure 3-10: Lancaster Highway/Rocky River Road Intersection Improvements



Improvements at this location are not only restricted to implementing a roundabout, but also mandate realigning Parkwood School Road, which will help avoid issues related to having two intersections in such close proximity to one another. In addition to improving safety, these improvements will facilitate easier traffic flows along both corridors.

Figure 3-11: US 74 (W. Roosevelt Boulevard)/Morgan Mill Road Intersection Improvements



As US 74 carries the most traffic in Union County, these improvements are designed to facilitate smoother traffic movements along the corridor as well as improve safety. This hotspot recommendation provides an additional left turn lane on the western leg of US 74, an additional right turn lane on Morgan Mill after the intersection going northward, and also calls for additional sidewalk construction and driveway consolidation.





04

Multimodal Recommendations

Ultimately, the goal for bicycle and pedestrian mobility is to increase the number of trips made on foot or bicycle significant enough to realize economic, health and social benefits. There are three main ways for this to occur: connectivity, safety and access. Several key tenets were adhered to during recommendations development to ensure that strategies recognized the diversity of cyclist types—experienced, novice, and child — functional vs. recreational.

PEDESTRIAN AND BICYCLE PLANNING CONTEXT

Union County and the municipalities within it have previously studied bicycle and pedestrian travel to a great extent. The predominant movements in and out of Charlotte and its attendant commercial centers hampers long-distance bicycle travel to a degree, but so do the lack of dedicated facilities that can accommodate any but the most serious of cyclists. Crash distributions and causes were studied for the current plan as well, and coalesce where there are known pedestrian and cycling activity centers and along major and some minor thoroughfares. The past planning efforts, crash studies, and recommendations for project, program and policy actions are described in further detail in the following sections.



Past Efforts and Adopted Plans, Policies

Carolina Thread Trail Master Plan for Union County and Participating Municipalities (2011)

The Plan assigns the goal of creating 1.5 to 3.0 miles of greenway each year in Union County, providing an estimate of the costs of construction and financial resources. The stated goal of the planning process was, among others, to adopt the Carolina Thread Trail (CTT) Master Plan, which describes a trail system interconnected among 15 counties of the Piedmont Region. The Plan also describes popular destinations indicated by public outreach efforts, and delves into demographic and economic forces shaping or supporting trail development.



Contact Points with Current Plan:

- Establishes construction goal of 1.5 miles of trail each year through 2020; 3.0 miles each year thereafter
- Establishes the preeminence of the CTT in Union County
- Parks, town centers, and museums (Museum of the Waxhaws, JAARS) as well as creeks (Twelve-Mile, Cane, Goose, Six-Mile) established as destinations and corridors for off-road trail development and destinations
- Stallings Road, Old Charlotte Highway, Old Monroe Road, and other roadways are cited as having an important place in the development of an adjacent trail facility to complete the CTT



US-74 Corridor Revitalization Study (2013)

The public survey for this Study suggested that nearly 44% of survey respondents used US 74 to commute to and from work, and another 37% used it for shopping. However, more respondents commuted to Monroe than to Mecklenburg County. Less than two percent used public transit, and less than three percent carpooled to work (13% of the populace cited that they carpooled to work in the 2010 Census, so the sample population is not representative for this aspect of travel). Although only one percent of respondents have ridden their bike along US 74, nearly 28% said that they would like to be able to do so. Respondents also wanted to improve traffic flow far more than any other aspect of the corridor, with aesthetics and more commercial development coming in a distant second and third choice.



Contact Points with Current Plan:

- Recommendations from the Study include gateway centers, intersection improvements, driveway closures/consolidations, and parallel street connections were commonplace; the parallel road network proposed should be represented in this plan, particularly
- The typical cross-section is proposed to be 10' paved paths offset 14' from the edge of pavement on both sides of the road
- In commercial centers, bicyclists are in mixed, low-speed traffic on frontage roads (or on bicycle lanes where no on-street parking is permitted) while pedestrians are accommodated along storefront sidewalks (10')
- Crossing US 74 on bike or by foot may remain problematic, as "superstreet" treatments are recommended in the corridor at intersections

Transit recommendations being considered along the Independence Corridor in Mecklenburg County include Bus Rapid Transit (BRT); if this option is to remain viable in Union County, then adequate right-of-way for the main line as well as on- and off-ramps will need to be considered in future widening projects, as well as accessways for foot and bicycle travel.

Indian Trail Comprehensive Pedestrian Plan (2009)

This Plan indicated that safety and sidewalk connectivity were the most important features of the pedestrian environment missing in Indian Trail. Other plans reviewed, including the Defining the Vision for Downtown Indian Trail and Downtown Master Plan, underscore the importance of downtown as a walkable place in the future of Indian Trail.



Contact Points with Current Plan:

- Identifies several intersections needing improved pedestrian accommodations, including US 74 and its intersections with Wesley Chapel Stouts Road, Indian Trail Road, and Unionville-Indian Trail Road; Secret Shortcut Road and Wesley Chapel Stouts Road as well as Old Monroe Road were identified priority corridors for improvements
- Programs like National Trails Day, walk-to-school, fun runs, and web- and print-based education materials were also deemed important priorities
- Policies including those associated with interconnectivity, land dedication, sidewalk construction on both sides of new streets, lighting adequacy, maintenance programs, and upgrading curb ramps to meet with ADA requirements are cited
- Specific greenways are identified, as are many sidewalk projects and a number of intersection crossing improvements (pages 42-43)
- The town has a two-cent property tax tied to transportation improvements, including sidewalk development and intersection/crossing treatments



Indian Trail Comprehensive Bicycle Plan (2011)

The Plan identifies parks/greenways, grocery stores, and events (to avoid parking) as major destinations for cycling in Indian Trail. Neighborhood loops, connector routes, and neighborhood connections that are informal accessways between neighborhoods were identified during the planning process. About 50% of crashes involve people 18 years of age or younger. The current bicycle facilities were deemed unsafe, and more facilities should be constructed for cyclists of all levels of ability.



Contact Points with Current Plan:

- Eventually, a 10'-wide adjacent sidepath is planned for US 74, required in conjunction with new development projects
- Connecting Austin Village with Beatty Park, more greenways, educational programs, and safe/accessible facilities were identified as priorities
- The Union Towne park-and-ride (74X) needs bicycle parking
- There are existing bicycle parking requirements in the UDO; plats have to show bicycle and pedestrian paths; incentives (not requirements) for developers to construct bicycle parking; and open space dedication are other requirements
- A list of pilot projects (page 6-11) is described to be undertaken in 1-3 years (e.g., Sun Valley HS, Poplin ES Connection with Bonterra, Idlewilds Shopping Center, and Red Lantern Road)
- Street design standards are textually described, but are not specific



Stallings Pedestrian Plan (2008)

This Plan recognizes that many of the streets and new subdivisions have existing sidewalks. Generally, the Plan's contents follow the NCDOT Bicycle and Pedestrian Plan Development Guidelines, otherwise.



Contact Points with Current Plan:

- A variety of policy measures including 5,000' maximum perimeter block length and 500' maximum cul-de-sac length, are noted in the current ordinance
- The downtown overlay district requires 12' sidewalks
- Greenways in an adopted plan may be counted against open space requirements
- The Plan calls for an adoption of mixed-use nodes to magnetize future development into areas that are walkable and bikeable.
- Trails are recommended along Twelve-Mile Creek, Goose Creek, Crooked Creek, North Fork, and a connection to Francis Beatty Park along Matthews-Weddington Road.



City of Monroe Downtown Master Plan (2008)

The Plan emphasizes the downtown’s status in Monroe as its “heart,” although it notes that commercial flight to the US 74 corridor hurt the downtown’s economic viability. The result is a downtown that still lacks many of the attractions to make it a daily destination, elements creating connectivity to surrounding neighborhoods like sidewalks and street trees, and services that would provide for the day-to-day needs of residents.



Contact Points with Current Plan:

- Jefferson Street and Franklin Street are too vehicular-oriented and warrant improved crossing provisions for pedestrians
- There is a need for better defining the pedestrian and trail system through signage
- Recommended downtown sidewalk width is 13 feet; create textured/colored paving for crosswalks at key intersections (e.g., Main/Franklin, Franklin/Charlotte, Franklin/Hayne)
- Jefferson and Franklin Streets are recommended to be converted to two-way traffic, with a roundabout at their juncture; and another roundabout at Charlotte Avenue/ Lancaster Avenue

Marshville Comprehensive Transportation Plan (2010)

The primary purpose of this Plan is to support the development of a bypass around Marshville and US Highway 74, due to traffic increases east of town from 17,000 vehicles per day (vpd) to 32,200 (the roadway capacity is 42,100 vpd) in 2035. Within Marshville the roadway capacity is 29,100 vpd with an expected 2035 volume of 39,800 vpd. The Plan notes a bus stop of the US 74 Union County Express (CATS) in Marshville, but this does not appear to be the case.



Contact Points with Current Plan:

- The Plan does not contain any recommendations directly referring to either bicycling or pedestrian modes of travel.
- Grade-separated crossings at Old Hwy 74, Dr. Blair Road, and Hasty Road may offer some options for connectivity of bicycle and pedestrian facilities

BICYCLE AND PEDESTRIAN SAFETY ANALYSIS

An assessment of crash data involving either a cyclists or a pedestrian was conducted for this plan at both a system level and to help identify individual activity centers for bicycle and pedestrian movements. The data are derived from 2007 through 2011 crash data statistics across Union County that included information about the characteristics of the crash and those involved in it. The following is a brief, graphical summary of that data.

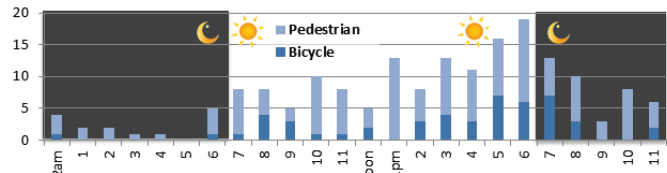


Figure 1: Cycling crashes often happen after working hours; many pedestrian crashes occur mid-day or late in the evening.

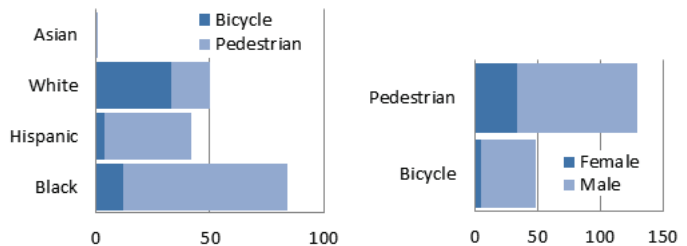


Figure 2: Cycling crashes tend to follow male/female and black/white trends; Hispanics are disproportionately represented in pedestrian crashes

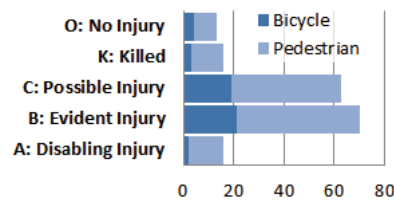
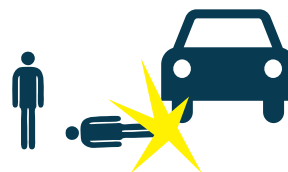


Figure 3: Pedestrian injuries - and pedestrian travel - occur more often than cycling



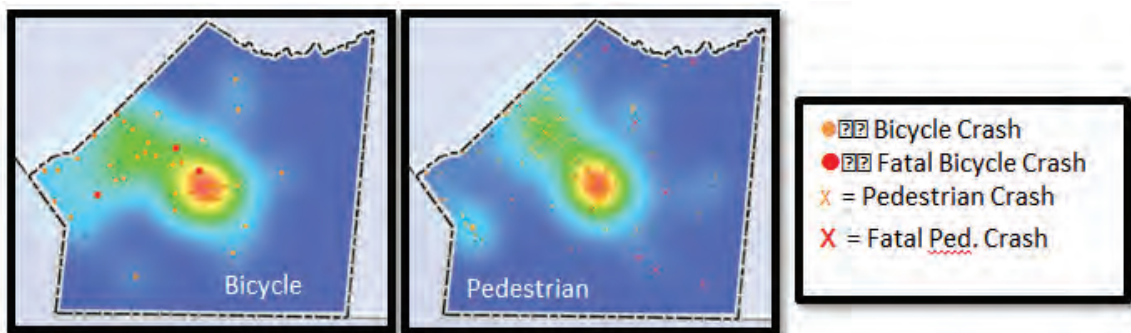


Figure 4-4: Cycling (0) crashes at left and pedestrian (x) crashes from at right from 2007 to 2011 tended to occur in downtown areas and along a few major corridors, particularly US 74; however, a number of fatal pedestrian crashes happened in rural areas to the south and east (right)

PUBLIC TRANSPORTATION PLANNING CONTEXT

There is not a “typical” bicycle or pedestrian crash victim; but we can say the following about many of these crashes looking at this data as well as individual crash records:

- While alcohol did not play a role in a large number of crashes, one high-activity center along Charlotte Avenue northwest of downtown Monroe involved a cluster of crashes that were related to alcohol consumption;
- Crashes often occurred for unexpected reasons: parents backing over their children, attempted (or successful) homicide, or domestic disputes;
- Minorities and Hispanic populations were disproportionately represented, although a study of the effects of income did not reveal a particular correlation to bicycle/pedestrian crashes;
- The US 74 corridor and some of its cross-streets stands out strongly as a place where both cycling and especially pedestrian crashes occur with regularity;
- There were actually more fatal pedestrian crashes in the sparsely populated rural parts of Union County (7) than in urban and suburban areas (6); and
- Downtown areas as well as some school areas were locations where crashes happened more often than other locations.

The state-leading pace of rapid growth of Union County’s population has underscored the demand for transportation services of every type. While the prevalent travel paths are and will continue to be between home-based origins in Union County to work- and shopping-based destinations in Mecklenburg County, the accessibility of existing and future services to create a more convenient situation is also worthy of exploration. This Plan’s public transportation planning is necessarily long-range in nature, but takes into account currently adopted plans, existing services, and recommendations from an array of stakeholders. The following sections start by considering the current services and adopted plans before moving into the timing of expansions of service levels and coverage. In these recommendations, we considered an appropriate level of service that match the population and employment densities and supportive design features that would have to be in place to make public transit a cost-effective means of transportation.

Union County also operates human service transportation for trips within and without the County, at fares ranging from \$2 to \$10 (Charlotte). A two-day advance notification is required. Participants must prove that they are senior citizen at least 60 years of age; a developmentally disabled adult; Medicaid client; veteran eligible for medical treatment at a VA Hospital or clinic; or physically disabled.

Current Public Transportation Services

The only fixed-route transit service currently in Union County is that of the 74X Regional Express route operated by the Charlotte Area Transit Service (CATS). Service is limited to weekdays, and only during peak morning and afternoon periods running on 20- to 30-minute headways. The base fare is \$3.50 per one-way trip, and the trip length from the K-Mart in Monroe to the Charlotte Transportation Center is approximately 50 minutes (about 17 minutes longer than using a private automobile). The most recent transportation plan describes the route performance as having an average of 19 passengers per hour in the AM peak period and 16 passengers in the PM peak. About 182 people ride the service each weekday. There was at one point in 2011 discussions of terminating service to Union County, although this action was not taken.

Past Efforts and Adopted Plans, Policies Countywide Transit Services Plan FY 2012-FY2017 (2012)

The five-year transit services plan describes the existing routes and (generally) minor modifications to them designed to provide improved cost-efficiency. The current service into Union County (74X Regional Express) does not have any changes proposed on the Union County side of the route, although re-routing on the Charlotte end will save some time overall on the route.



Contact Points with Current Plan:

- The short-term service plan does not contemplate any significant change to service on the 74X Regional Express route



2030 Transit Corridor System Plan - Charlotte (2006)

This long-range transit plan describes the Lynx Silver Line to the Levine Campus of CPCC at I-485 and Independence Boulevard as a bus-rapid transit service (buses on dedicated right-of-way generally not subject to in-traffic vehicular delays). The timeframe for reaching Union County is 2026, although there is no mention of extending this service all the way into Union County.



Contact Points with Current Plan:

- If the Lynx Silver Line continues to be viewed as a BRT service, then additional right-of-way in the Independence (or Old Independence) Boulevard corridor will need to be made available to provide for the service into Union County. Currently, there is no documentation illustrating service into Union County, only to Levine Campus.

US-74 Corridor Revitalization Study (2013)

The Study does not recommend a particular transit service in the important commuting corridor of US 74, but recognizes that Light Rail, Bus Rapid Transit (BRT), or Express Bus service would be options. Few specific details were provided in the document on the viability or preference of mode, or the possible location of future transit stops, park-and-ride facilities, or transfer centers.

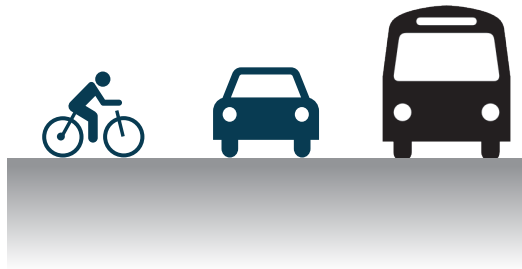


Contact Points with Current Plan:

- The CSX Company has stated that providing right-of-way inside the rail corridor is a non-starter due to significant freight traffic already present on the existing trackage
- Traffic disruption from at-grade crossings would also be a significant barrier to light rail service

SUMMARY OF EXISTING MULTI-MODAL CONDITIONS

Generally, the roadways in Union County, with a few exceptions tending towards US-numbered routes, are built and designed to accommodate fairly moderate traffic volumes (2,000 to 10,000vpd). A number of roads have at least short segments where these ideal volumes are being exceeded now; as the area continues to grow and develop, these segments will grow more numerous and experience congestion into ever-longer periods of the day. Intersection improvements are critical in the short-term, as is improving control of access and providing a strong connector-level street system.



The prospect for modes of travel other than by automobile is daunting. Conditions for cycling are very poor to marginal, favoring only the most experienced road cyclist, except in the core downtown areas of the municipalities. See Table 5.1 for a summary of multimodal conditions (QLOS) along key corridors in Union County. Opportunities for expanding or constructing adjacent paths, such as those found along parts of Stallings/Potter Road, are available but would be both expensive to construct and poorly utilized until more development arrives. Pedestrian accommodations are generally scant, poorly interconnected, and limited to the frontages of newly developed properties or inside municipalities. The same is true for a number of intersections that don't have marked crosswalks. Public transportation is provided now only through CATS service on one route (US 74 to Monroe), and there have been discussions in recent years about that route's affordability. Projects like the Carolina Thread Trail may provide the "trunk" system for off-road greenways, but progress is incremental. Instead of prioritizing long, expensive bicycle, pedestrian and transit facilities, creating environments that are supportive of these modes – and expanding the economic viability of town centers – may

Table 4.1: Summary of Existing (2012) Conditions on major roadways

Road Name	Roadway (avg. speed, mph) (QLOS)	Transit (higher is better) (QLOS)	Pedestrian (lower is better) (QLOS)	Cyclist (lower is better) (QLOS)
US 74 West (East Independence Boulevard/Andrew Jackson Highway/W. Roosevelt Boulevard) / Old Monroe Road- Old Charlotte Highway Corridor	17.9	1.6	7.0	4.9
US 74 East (Monroe Street/E. Roosevelt Boulevard)	45.5	0	5.5	4.7
NC 16 (Providence Road)	38.1	0	3.9	3.7
Waxhaw-Indian Trail Road	20.4	0	5.4	4.7
NC 75 (Waxhaw Highway) / NC 200 South (Lancaster Highway) Corridor	27.0 42.0	0	4.5 5.0	4.6 4.2
NC 207 (S. Hayne Street/Wolf Pond Road)	39.1	0	3.6	3.2
North US 601 (Concord Highway)	42.0	0	4.6	3.3
South US 601 (Pageland Highway)	48.3	0	4.5	2.9
NC 200 North (Morgan Mill Road)	43.2	0	4.7	3.9
NC 218 (Fairview Road)	42.9	0	4.9	4.2
Stallings Road-Potter Road	36.9	0	4.2	3.9
Weddington-Matthews Road	44.3	0	4.2	3.4

Note: QLOS is based on the Florida Department of Transportation Multimodal Level of Service Assessment (2009). QLOS values reflect active design conditions and provisions for on-road multimodal elements.

RECOMMENDATIONS FOR BICYCLE & PEDESTRIAN

Our recommendations for bicycle and pedestrian modes of travel can comfortably fall within four categories: **off-road**, **on-road**, **policy/program**, and **short connections** (generally centered around the activity centers identified in the land use plan (Comp Plan) as well as through bicycle and pedestrian crash location studies). The following maps illustrate the location and type of improvements that are recommended to facilitate active modes of travel.

Figure 4-1

Union County 2040 Off-Road Pedestrian and Bicycle Recommendations

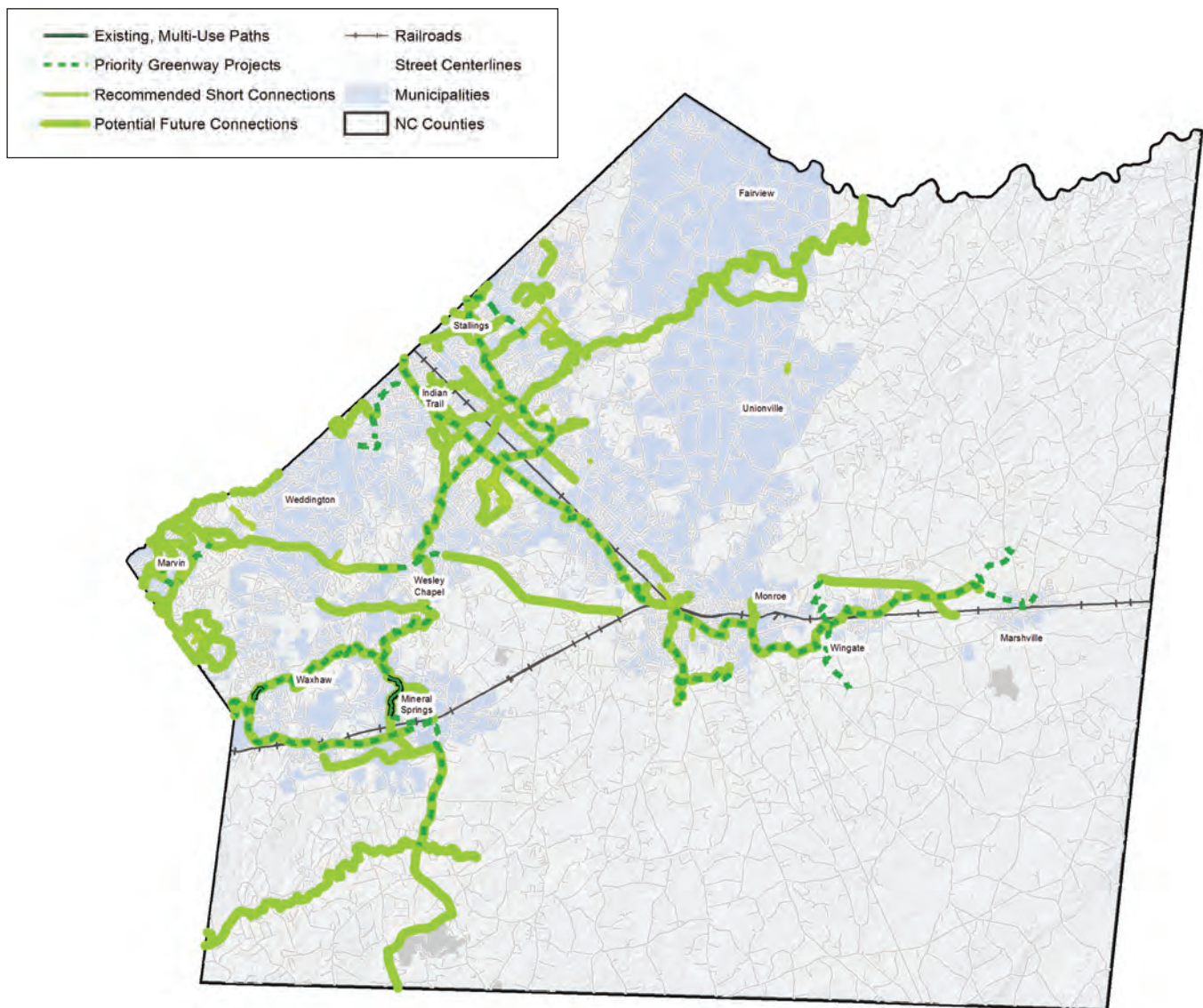
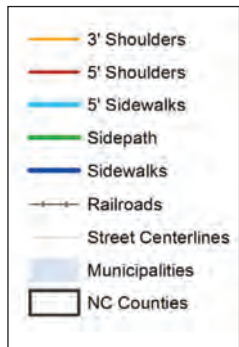


Figure 4-2

Union County 2040
On-Road Pedestrian Recommendations



Note: The 3' and 5' shoulder recommendations are not dedicated pedestrian facilities. However, they most likely will be used as such.

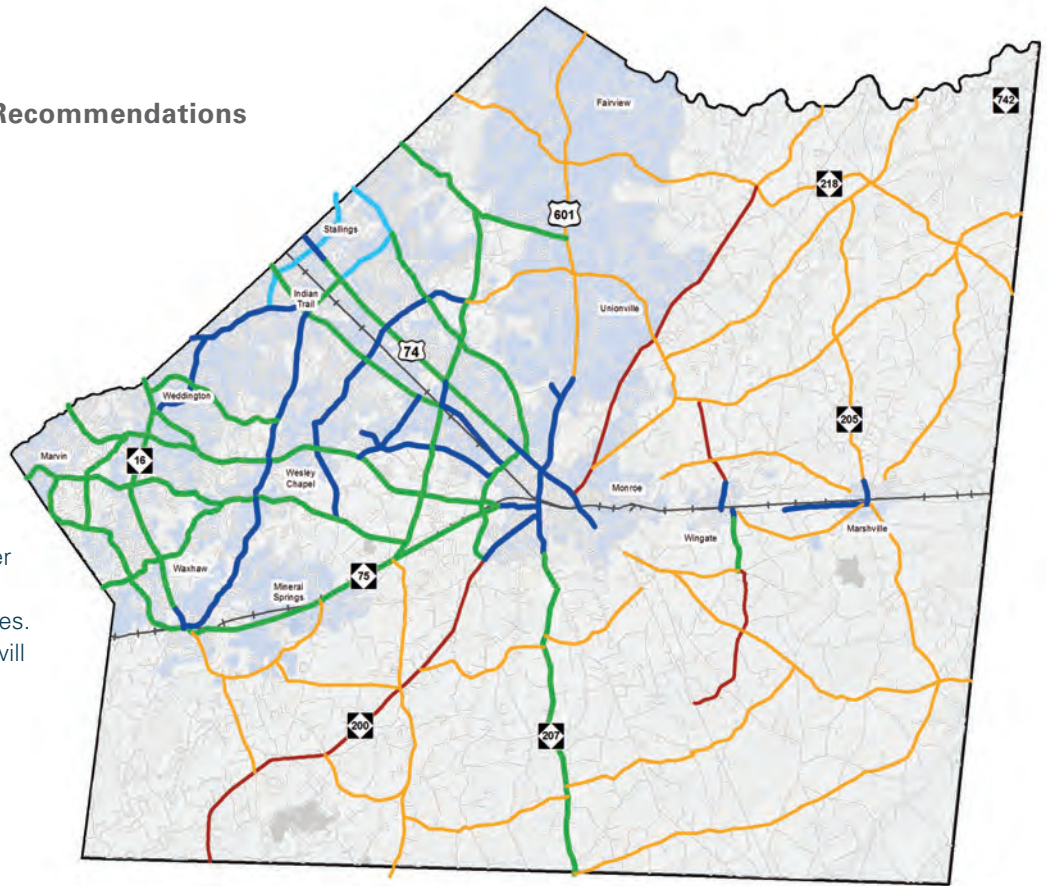
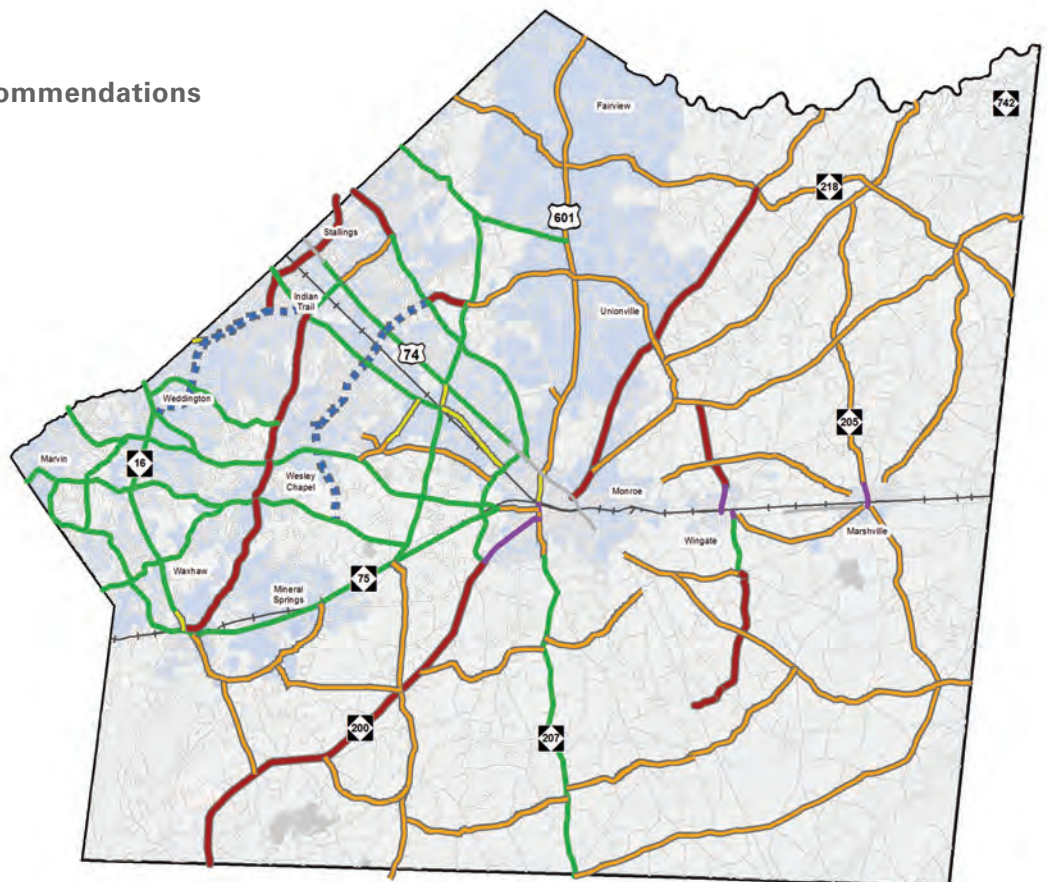
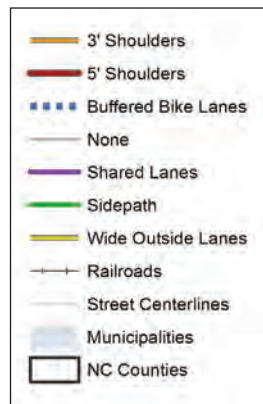


Figure 4-3

Union County 2040
On-Road Bicycle Recommendations



- Off-Road Recommendations.** This plan is not a surrogate for the updated Greenways Master Plan being conducted at the time of this writing, but certainly the prospect of implementing the Carolina Thread Trail (CTT) is foremost among the off-road pedestrian and bicycle objectives. Elements of the trail, along with its connections, traverse the county east-west, and parallel the US 74 corridor. Providing an alternative to on-road facilities is critical, since many trip ends lie within it, but are poorly accommodative of pedestrian and bicycle travel due to high volumes and truck traffic. Additional connections to this trail linking residential areas and other, planned greenways and on-road connections are also critical. Other elements of the off-road system will primarily be relative short, and link important destinations within each town. These are suggested by the mapping of projects, but it is fully anticipated that new/modified facility recommendations will occur as a result of the Greenways Master Plan update.
- On-Road Recommendations.** With the interest in complete streets reaching a high point in recent years, a renewed emphasis in accommodating pedestrian and bicycle travel (as well as public transportation) on major streets has occurred. This Plan makes specific recommendations for every street where a proposed widening or other improvement is being recommended; both pedestrian and bicycle recommendations are specified for each roadway segment. One important separator for Union County is the remarkably small number of driveways along many major and minor arterials. Union County's growth pattern and timing is such that major subdivisions were the norm, typically with no interconnection and with only one or two ingress/egress points to the surrounding street system. This situation creates an important opportunity for creating adjacent sidepaths. Sidepaths, typically 10' to 14' in width, are essentially paved greenways set off from the major roadway by at least 10 feet (and that deviate back toward an intersection when necessary to cross a perpendicular street; refer to Figure 7). A number of our recommendations are for sidepaths, creating a network of off-road facilities that can connect

to greenways and promote novice or youthful bicycle and pedestrian travelers. This recommendation comes with the caveat that Union County and its municipal governments exercise strict access management controls along the roadways where these sidepaths are to occur; otherwise the conflicts between sidepaths and intersecting streets become serious.

- Short Connections.** The final category of bicycle and pedestrian recommendations are focused on activity centers of bicycle and pedestrian crashes and nearby schools. These recommendations are typically low-cost, and provide connections between existing and proposed facilities and schools or residential neighborhoods. In some instances, intersection crossing treatments are specified, some of which will require redesign/reconstruction of roadway intersections to make them safer for all users.

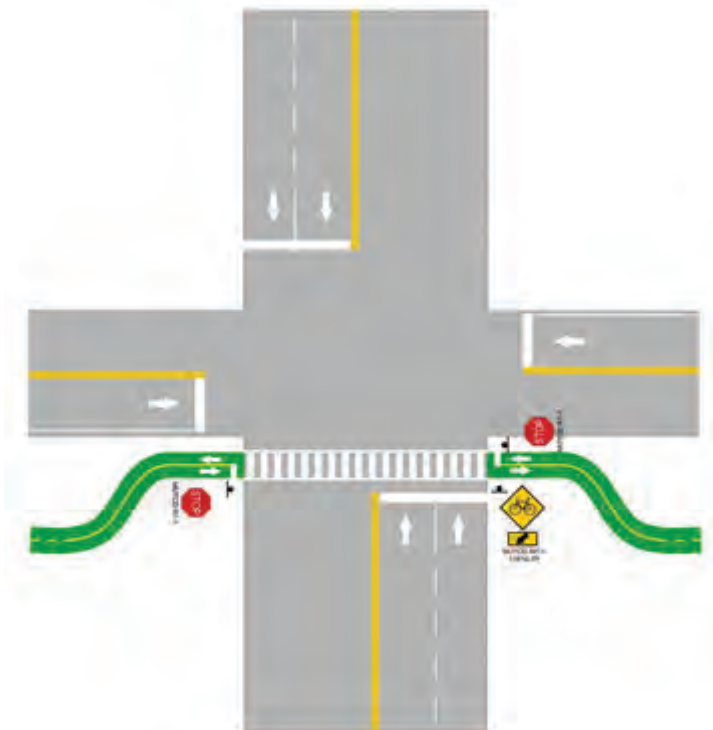


Figure 4-4: Sidepath crossings at street intersection

RECOMMENDATIONS FOR PUBLIC TRANSPORTATION

The role of public transportation is, for the vast majority of people in Union County, relatively small now. Only one regular, fixed-route service enters into the County, connecting Charlotte with the northwest side of Monroe. However, the role of transit in the future may be much larger, owing to the dominance of a single corridor (US 74/Old Monroe Road), the high rate of growth of many parts of the County, and the strong travel patterns linking Union and Mecklenburg counties together. The following recommendations recognize a fairly modest set of improvements given the long-term horizon of this Plan, but are considered to be feasible given the current starting point of public transportation in the County generally. Recommendations are broken out into two phases, short-term addressing the first ten years after plan adoption, and long-term recommendations that would occur thereafter.

- **Phase I: Short-Term Transit Recommendations.**
The initial impetus for public transportation is the US 74 corridor, and enhancing the 74X express route with improved headways and weekend services are logical next steps. Also within a short-term horizon, the route should be extended into downtown Monroe itself, setting up for a longer route to the east in the second phase of development.
- **Phase II: Long-Term Transit Recommendations.**
As the County continues to see increased densities of development, particularly in the land use high-activity nodes, additional services should be considered. A circulator system in Monroe and the creation of a downtown transit hub is recommended, preferably with 30-minute headways on the circulator system. The extension of the US 74X route to at least Wingate to the east is also recommended, along with the creation of a fourth park-and-ride location. The other area of moderate density is Waxhaw and the Providence Road corridor extending out of Charlotte. Ultimately, this second phase of transit development would see the 61X express route extending into Waxhaw on NC 16, a suitable station/park-and-ride facility developed in-town, and either route-deviated service or a companion circulator service to cover the areas of Waxhaw where lower car ownership rates might provide a market for transit services.



Figure 4-5

**Union County
Official Transit Map - Phase 1**

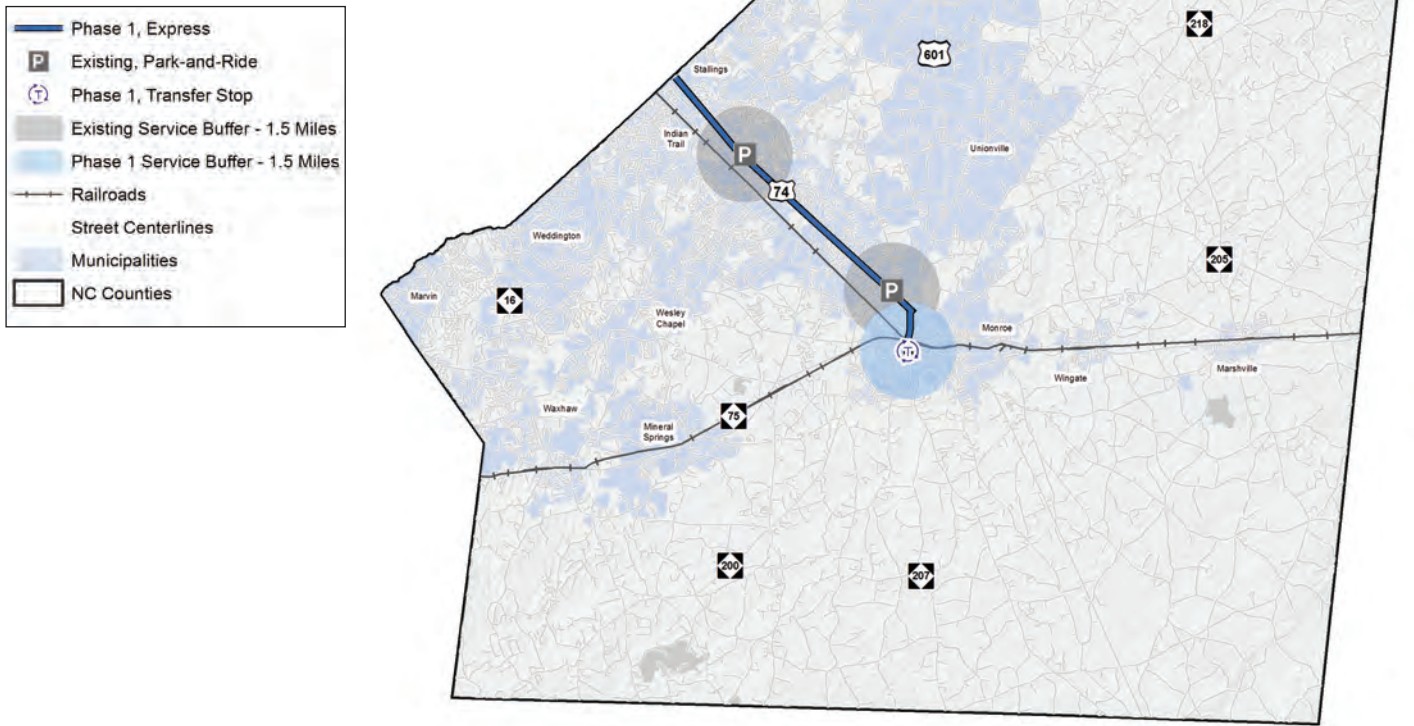


Figure 4-6

**Union County
Phase 1 Recommendations Household Concentration**

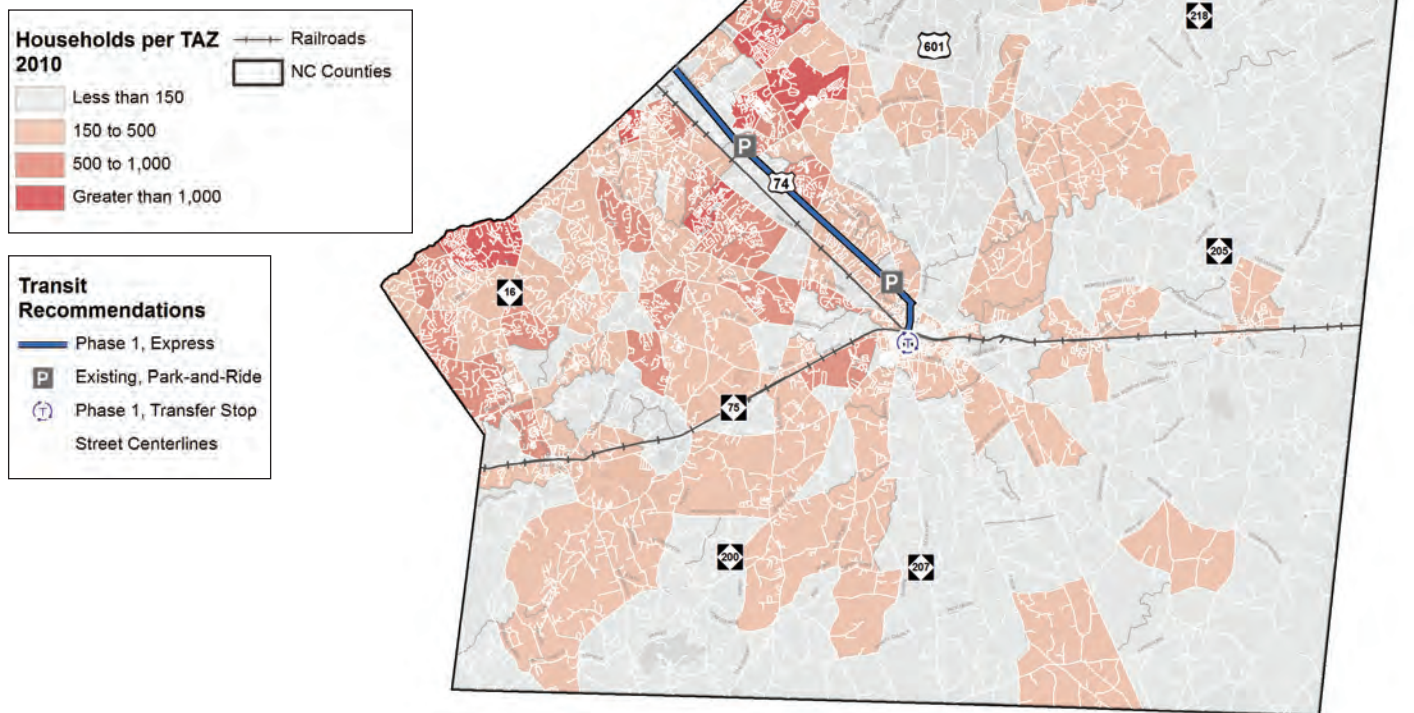


Figure 4-7

Union County
Official Transit Map - Phase 2

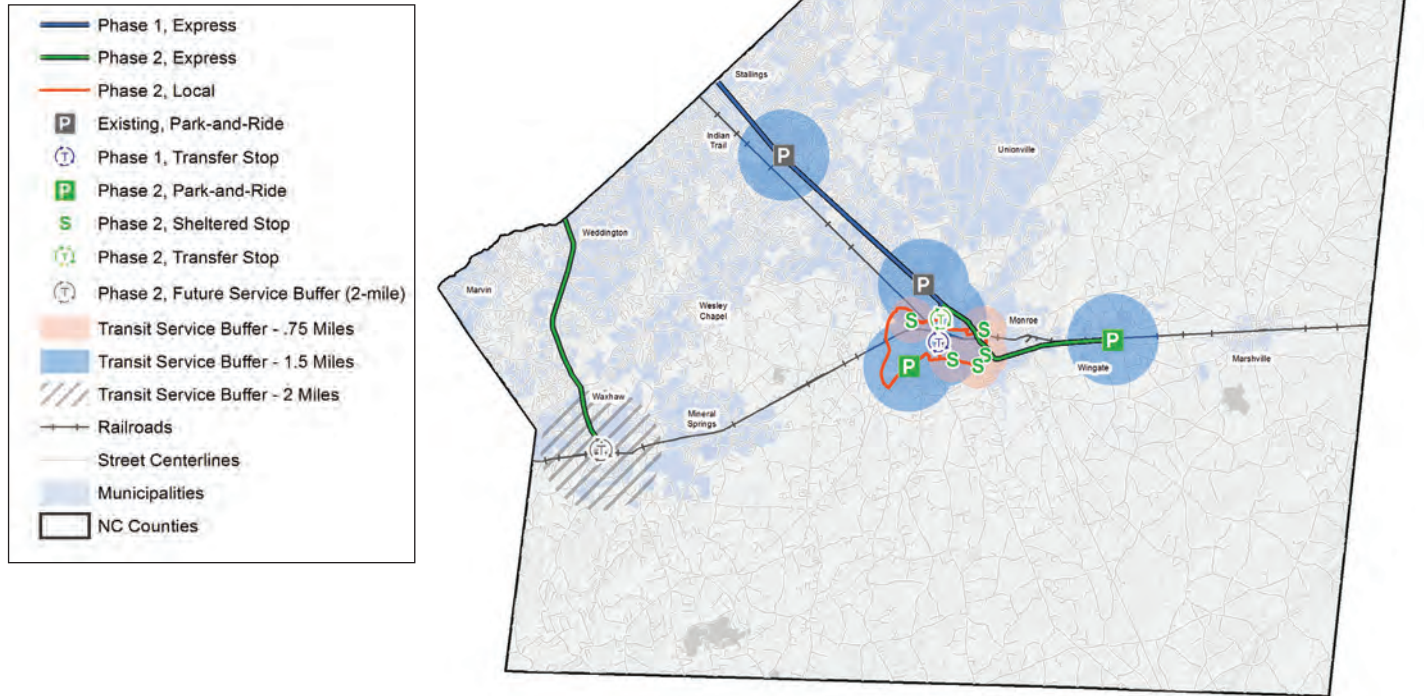
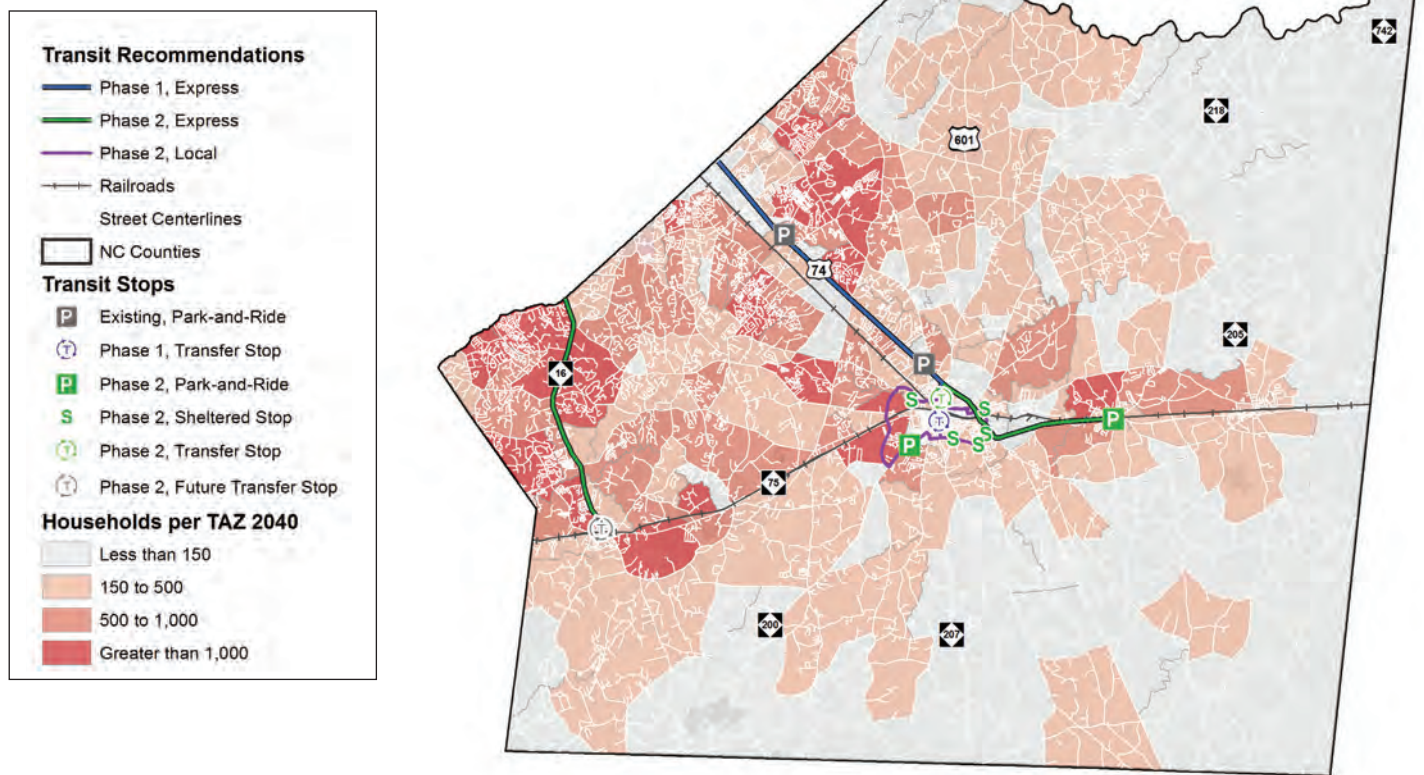


Figure 4-8

Union County 2040
Phase 2 Recommendations Household Concentration



The role of technology throughout the life of both phases of transit development should not be overlooked. **Traveler information systems**, including route pick-up data are important additions that would have to be made at the system and stop levels. These systems may create a renaissance for route-deviated services, whereby a standard bus vehicle is notified of a pick-up and can make small detours as needed to accommodate passengers. The explosion of alternative, **customer-oriented transportation services** that allow on-demand renting from public and private entrepreneurs has occurred in just the past few years, and holds promise for low-density areas that pervade much of Union County. Finally, the concept of **urban intersection bypassing**, whether through queue-jump lanes that allow buses to bypass other vehicles at intersections or with transponder/receiver technology that “trips” a green signal for an approaching bus (a side benefit is that these systems can and are being used for emergency response vehicles as well as buses), may be an important first-step in the US 74 corridor particularly to emphasize the importance of bus travel.





05

8th St

Complete Streets Design

“Complete streets” is a term that describes the transformation of vehicle-dominated thoroughfares to community-oriented streets with safe, convenient accommodations for all modes of travel. They are designed to be accessible to all types of transportation and, essentially, provide choice. There has been a tectonic shift in the United States from traditional automobile-dominated roadway design to the idea of “completing” streets. Complete Streets incorporate infrastructure into roadway design to move not only cars but also people walking, bicycling and using public transportation.

SETTING THE CONTEXT

A Complete Streets (CS) policy creates a platform for planners and designers to consider and incorporate all modes of transportation into the planning and building of new projects as well as into retrofitting of existing infrastructure. Aspects of a typical Complete Streets policy include ensuring the right-of-way is planned, designed, constructed, operated, and maintained to provide safe, comfortable, and convenient access for all users. The North Carolina Department of Transportation has adopted such a policy, and produced a companion design guide to help communities articulate the needs of their communities and the streets where they travel. Members of the public pointed to speeding motorists, unsafe and unpleasant conditions for pedestrians and bicyclists, and the lack of transit amenities as reason the Complete Streets approach is needed.

The ideal complete street accommodates every travel mode – pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. However, in many cases, Complete Street applications are limited by existing right-of-way or design constraints. Therefore, trade-offs need to be assessed to determine the best approach to implementation on each street segment. This is most important when an improvement is made to an existing facility (i.e., widening or retrofit) where residents and businesses have already claimed their space, making future capacity expansions generally expensive and unpopular options.



Complete streets include three distinct street zones that foster interaction between different modes of travel and adjacent land uses. The three basic context zones are the pedestrian, travelway, and building zones. Together these zones or realms define the space where interaction between modes and the built environment occur.

Complete Streets Context

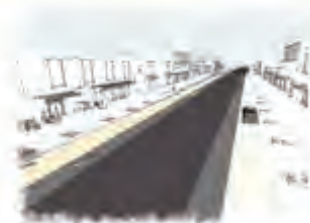
Context Zone

- Defined by the overall environment and framework of the corridor
- Stresses context-specific treatment for three primary areas:
 - Building form and massing
 - Pedestrian space and design treatments
 - Travelway modal integration (bike, transit, vehicular)



Travelway Zone

- Defined by the edge of pavement or curb line that traditionally accommodates the travel or parking lanes needed for vehicles in the transportation corridor
- Recommendations focus on modes of travel and medians
- Travelway zone focuses on two objectives:
 - Achieve greater balance between travel modes sharing the corridor
 - Promote human scale for the street and minimize pedestrian crossing distance



Pedestrian Zone

- Extends between the outside edge of the sidewalk and the face-of-curb located along the street
- Quality of the pedestrian realm is achieved through four primary areas:
 - Continuous pedestrian facilities (on both sides of the road if possible) to maximize safety and mobility needs
 - High-quality buffers between pedestrians and moving traffic
 - Safe and convenient opportunities to cross the street
 - Consideration for shade and lighting needs



Building Zone

- Defined by the buildings that frame the major roadway
- Building scale and massing focus on two areas:
 - Orientation (setbacks, accessibility, etc.)
 - Design and architectural character (height, etc.)

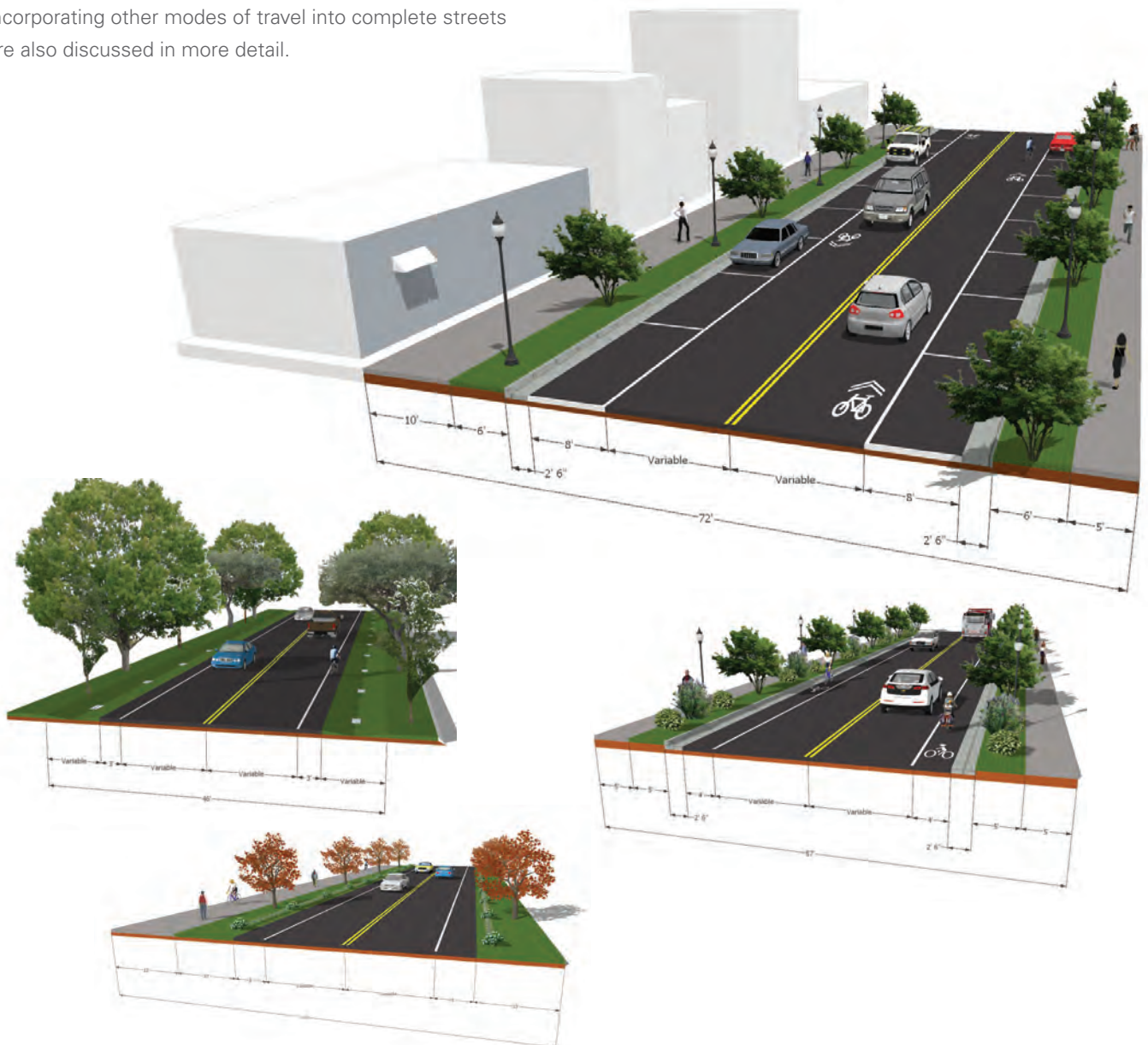


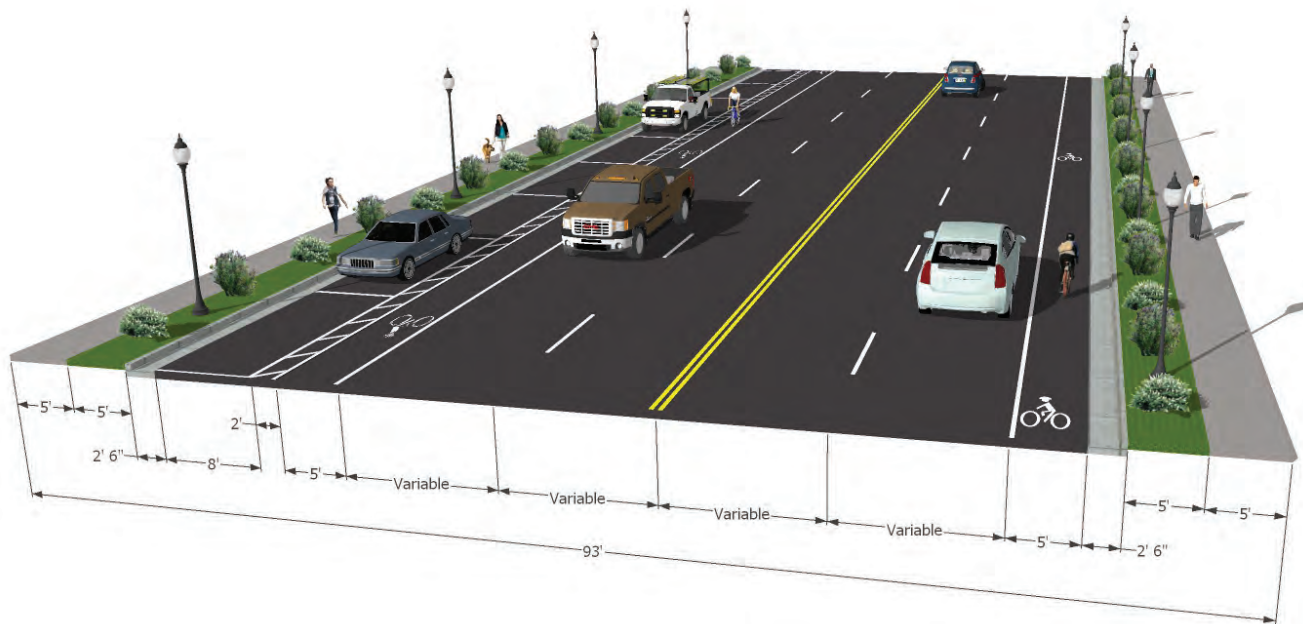
COMPLETE STREET DESIGN ELEMENTS

As the Project Team reviewed the demands being placed on each street now and in the future, considered the contexts of future development patterns, and assessed available resources and importance of various improvements, the streets were assigned one of the following cross-sections. A cross-section describes how the street should look in the future under ideal circumstances, including provisions for parking, walking, biking and locating transit facilities. Ultimate cross section details will be determined at the time of final design.

The cross-sections listed on the following pages are described in these terms; key design elements for incorporating other modes of travel into complete streets are also discussed in more detail.

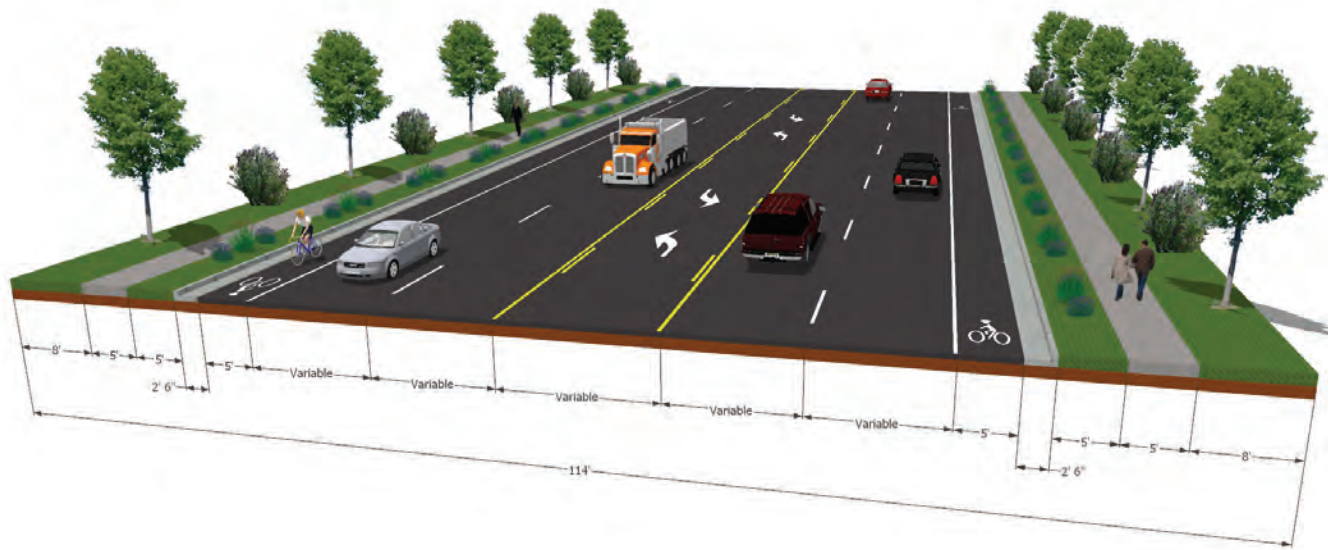
Two-Lane Roadways. Two-lane roads are commonplace throughout Union County, and can typically handle 12,000 to 16,000 vehicles per day (vpd) under ideal conditions. A great variety of these streets exist, with the urban version (right) illustrating how wide sidewalks and on-street parking accommodate a range of users. Other variations are shown on the left, with the rural road improvement at bottom-left indicating how the many miles of rural, two-lane roads can be made safer and accommodate users at the edge of the roadway. Right-of-way requirements typically range from 60' to 72' across.



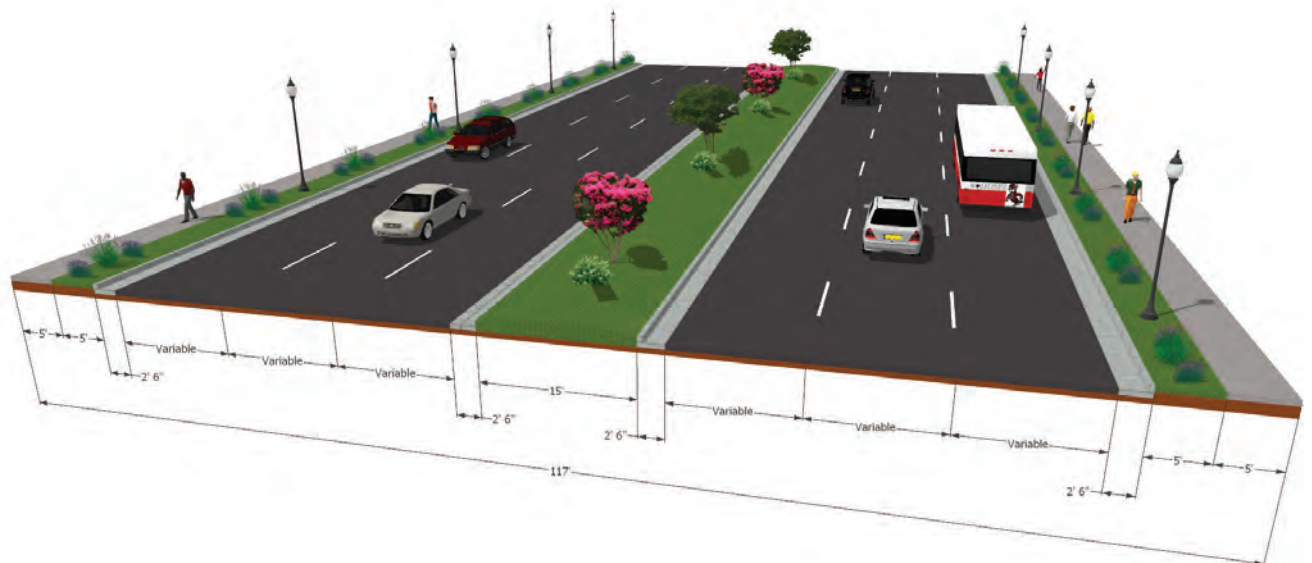


Four-Lane Roadways. The four-lane roadway serves longer travel distances, and is particularly valuable to freight shippers due to higher speed limits and greater reliability. The much-preferred version contains a median (bottom) to help limit conflict points, reduce crash rates, and create opportunities for landscaping and lighting as shown here. The undivided four-lane cross-section (top-left) will typically serve slower traffic and be located in urbanized areas where right-of-way is at a premium. Even with these higher-speed facilities, it is still very possible to create beautiful and pedestrian-friendly four-lane roadways. Typical right-of-way widths are approximately 100' from edge to edge.





Five- and Six-Lane Roadways. Streets with more than four lanes either serve commercial areas (top-left) with a center turn lane, or provide major through capacity at something less than freeway speeds (six-lane section at bottom). While provisions for bicyclsts and pedestrian are still recommended, the walking and biking environments become more strained especially as people attempt to cross heavy, high-speed traffic. Greater setbacks from sidewalks and even paths away from the road corridor altogether may be necessary to adequately serve these users. Rights-of-way widths may range from just under 100' to over 120'.



Bicycle and Pedestrian Travel

These are two distinct modes of travel, often lumped together for the sake of convenience but embodying different characteristics of maneuverability, skills, and mobility. Safe cycling has to include travel along streets, since automobile conflicts happen at the confluence of sidewalks with driveways or street crossings. Further, cycling improvements almost invariably provide improved roadway conditions, thanks to providing wider edge treatments that allow safer recovery areas or emergency zones for cars. Pedestrian accommodations are typically off the edge of the roadway well behind the curb or ditch lines, and accommodating pedestrians at street crossings can mean longer signal delay in urban areas to permit safer crossings, or slowing automobile turns through smaller corner radii. The following are some of the key elements to better integrate bicycle and pedestrian design in the pursuit of complete streets, broken out into three categories: along the street, across the street, and parking.

Along the Street. Bicycling facilities have to be carefully tailored to their environments; Figure 1 illustrates some – although not all – of the design decisions that lead to different kinds of facilities to serve different kinds of cyclists. Variations on the facilities described in this figure include separated bicycle lanes, cycle tracks, and bicycle boulevards (to name a few). Parallel paths can also be designed to accommodate cyclists and pedestrians together, but should be at least 10' to 12' in width to help separate the two kinds of traveler. More common are sidewalks, typically 5' in width but expanding to 8' or greater in downtown or heavily-traveled areas where pedestrians congregate and interact, often in tandem with pedestrian-oriented business activity. Bicycle boxes and stencils indicating the most favorable position for triggering signal detection equipment are helpful to cyclists and serve as reminders to motorists that bicycles may be present in the roadway.

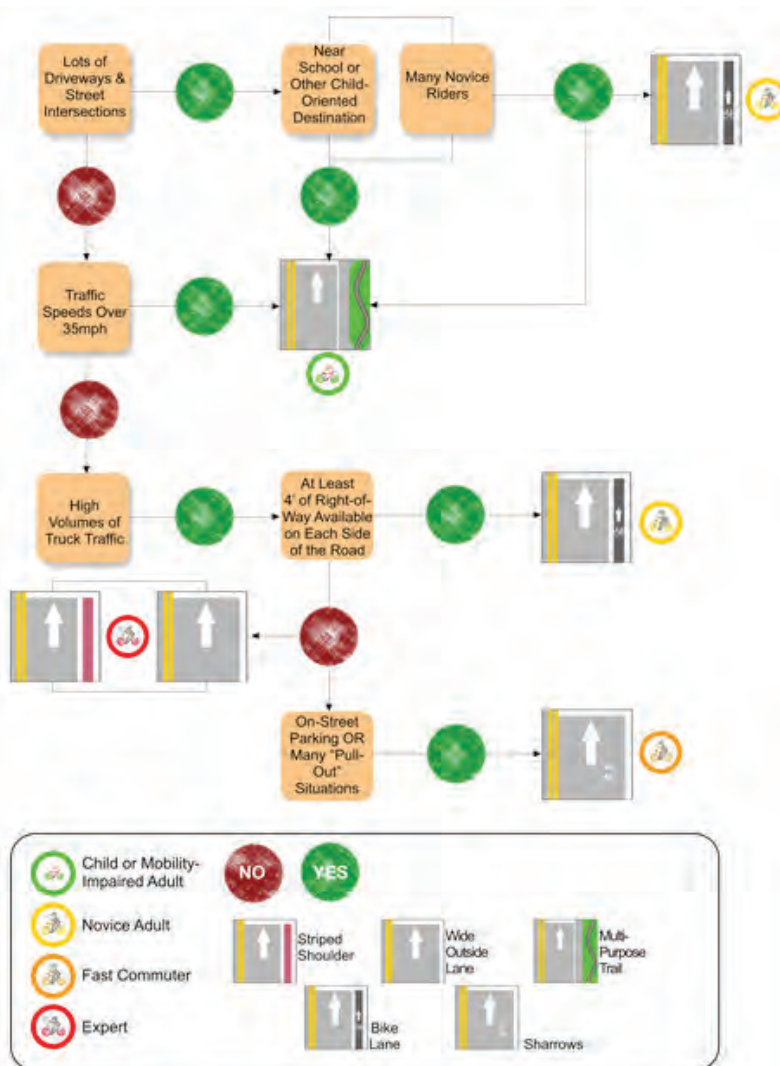
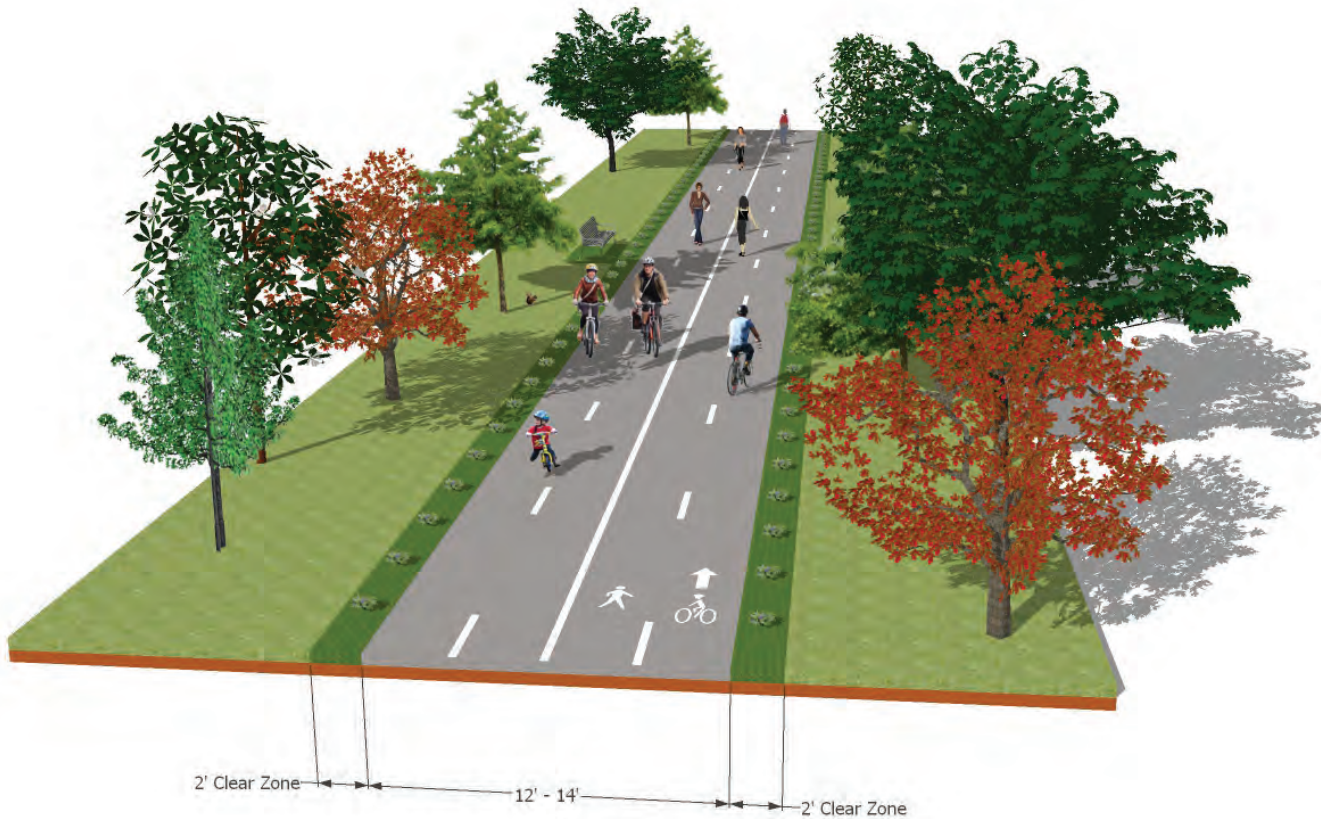


Figure 5-1: Bicycle Facility Selection Considerations



Greenways and Multi-Use Paths. When streets become too wide, too congested, or have speeds that are too high, then a separated path is recommended. Greenways provide even novice bicyclists and children with an opportunity to access important destinations and get some outside recreation. Major “trunk” greenways may have totally separate spaces for pedestrians and bicyclists (right) using 14’ or more of paved width; more common are 10’ – 12’ greenways that utilize careful design, pavement markings, and other treatments to create off-road corridors. Landscaping, seating, trash receptacles, lighting, and pet stations – as well as continuous maintenance – are paramount to creating a successful greenway facility. Rights-of-way will need to include a minimum 2’ “clear zone” on either side of the main passageway.





HOW IMPORTANT IS WALKABILITY TO PEOPLE?

Here are a few headlines from some diverse sources that tell us how critical walking and biking are to attracting talent, companies, retirees, and tourists

15 most Walkable Cities

(Good Housekeeping)

The Best US Cities for Walkers

(Prevention Magazine)

The 10 Most Walkable Cities

(Huffington Post)

10 Most Walkable Cities for Retirees

(MarketWatch)

America's Most Walkable Cities

(Forbes)

America's Most Walkable Big Cities

(MSN Real Estate)

20 Top

Walkable Cities

(Ideal Living Magazine)

The Future's Most Walkable Cities: Prepare to be Surprised

(Time Magazine)

Across the Street.

Getting pedestrians (and bicyclists) across the street is perhaps the most crucial element of street design. Pedestrian and bicycle accessibility in urban cores and along transit routes is a great influencer of the success of public transportation as well as creating livable areas in our cities and towns, accommodating lower-income persons without ready access to private automobiles, and generally creating a supportive business environment that attracts visitors as well as new companies. The figure below (Figure 2) illustrates some of the key provisions for pedestrian crossings and their usage. Generally, as the population density, proximity to schools or other places where children congregate, and vehicle volumes increase, the level of provisions increases similarly.

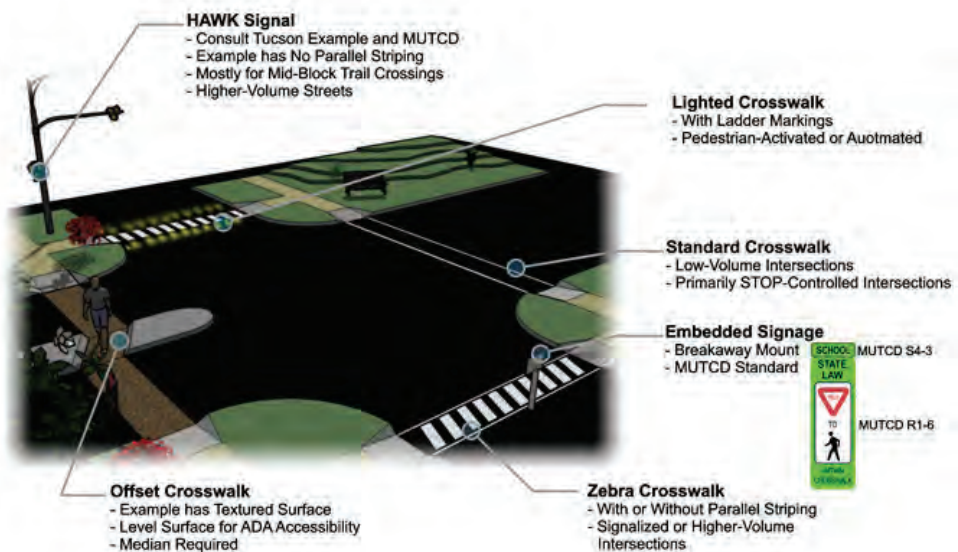


Figure 5-2: Crossing Provisions and Considerations



Figure 5-3: Bicycle Parking Lot

Parking Considerations.

Parking for bicycles should be included in every municipal and county ordinance for shopping, school, and multifamily residential development districts (over 50 units), generally at the rate of one, two-position rack for every 20 students or automobile spaces. The bicycle parking facilities should be within 50-100 feet of the main entrance, covered from the weather, well-lit, and be secured to the ground considering the space requirements illustrated in Figure 3.

Parking areas are where all motorists become pedestrians. Having well-lit, secure parking with uniform lighting across a parking area and more intense, non-glare lighting at cleared building entranceways provides a safer medium for walking. Parking areas are often designed very poorly, encouraging the majority of traffic to pass directly in front of a storefront, for example. Ordinances requiring at least 50% of all parking to be in side or rear areas will help improve the appearance of commercial developments, but also encourage developers to invest more in the rear of their properties – which often front the yards of concerned residents. Figure 4 illustrates some of the key points in parking lot design.

ACCESS MANAGEMENT DESIGN ELEMENTS

Managing Access and Resources. It is unlikely that almost anyone today would consider raising revenues through increased taxation a wise course of action without considering every possible alternative. And yet if public policies don't contemplate how streets and cities can grow in ways that consume roadway capacity, increase traveler delays, create more hazardous driving conditions, and require more frequent widening projects, new streets and maintenance then finding the money to pay for these costs is inevitable. Although a detailed discussion of access management is beyond the necessary scope of this document, the following elements are consistently the most important when considering how best to manage street access, preserve capacity and reduce dangerous and costly crashes.

Street Hierarchy. The overarching concept behind access management is creating and maintaining a strong hierarchy of street types that serve their purposes and users well. Streets do only two things to provide transportation service: mobility and accessibility. Mobility makes for better long-distance travel, useful for commuters going into Charlotte, farmers taking their produce to marketplaces, and freight shippers trying to reach airports, distribution centers, or retail outlets. Accessibility creates land value: where accessibility is high, land rents are also typically high, such as at the confluence of an interchange ramp or gridded street system in a downtown core. Problems occur when streets designed for one purpose become desirable for the other purpose. We see this happen as major arterials (like US 74) attract "strip" commercial development, or where conventional subdivisions have only one access point. Access management is really about keeping streets in their hierarchical place so that they can continue to serve their purposes optimally.

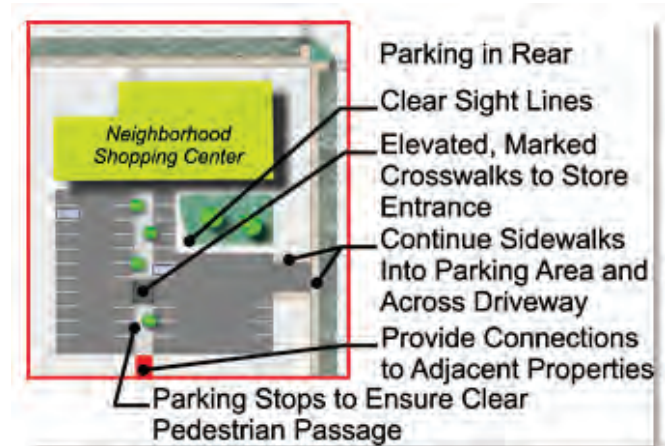


Figure 5-4: Parking Area Design Considerations



The relationship between mobility and accessibility

Driveway and Street Intersection Density. The number of driveways and street intersections severely impacts the mobility of those traveling along the street. As the number of driveways increases, so do the number of “conflict points;” the places where the travel paths of vehicles intersect. With more points of conflict, there are more potential crashes as well. Freeways, which provide excellent mobility, also have the fewest conflict points – and the fewest crashes per vehicle mile traveled. Providing a center median that either entirely or partially prohibits turning movements except at a few key locations is the single best provision for managing access and reducing conflict points; however, this measure is best taken before development occurs since adjacent property owners typically oppose any reduction of access to their own property, even though it may make travel easier and safer for them and their customers.

Driveway and Street Intersection Spacing Almost as important as the number of intersections along a street is their distance apart from each other. Obviously, as spacing increases between driveways, the number of driveways (or street intersections) decreases. But more than that, when driveway cuts are close together the potential for conflicts increases as drivers attempt to deal with what military strategists call “multiple threats.” Generally, people that drive (or ride a bicycle or walk) can deal with one issue at a time, but when there are multiple turning vehicles and others coming from behind and ahead of the driver, their ability to negotiate the space declines. Refer to Figure 5 for recommended spacing standards (note: these standards may be slightly different from and more aggressive than those used by NCDOT).

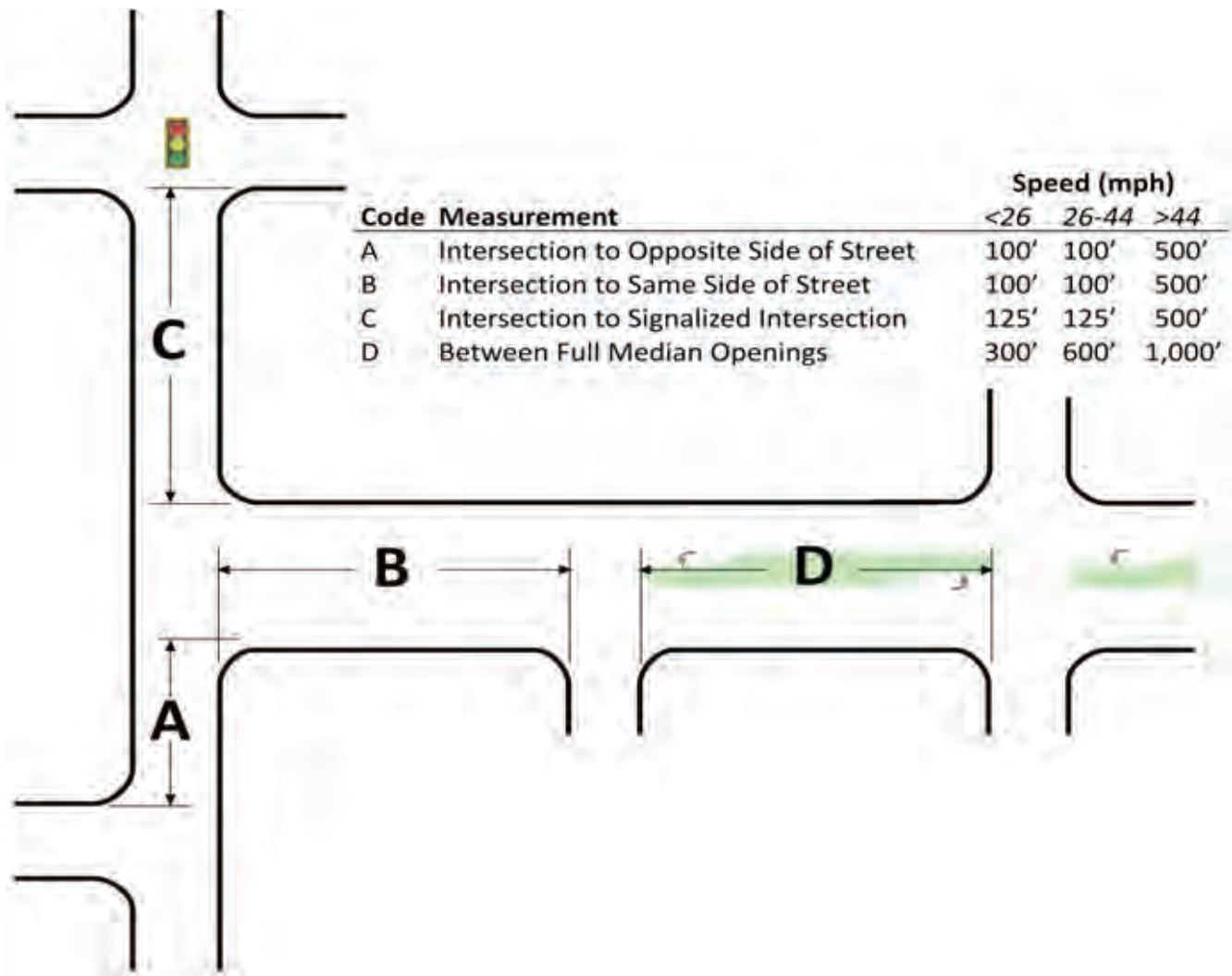
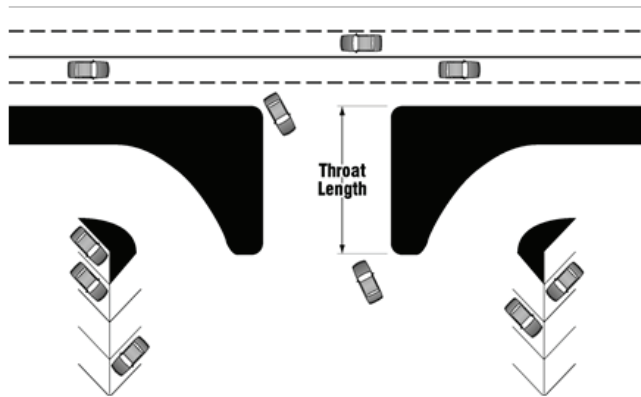


Figure 5-5: Driveway Spacing Standards



Site Activity	Throat Lengths
Regional Shopping Centers (Malls)	250'
Community Shopping Center (Supermarket, Drug Store)	100'
Small Strip Shopping Center	30'*
Regional Office Complex	250'
Office Center	100'
Small Commercial Developments	30'*

*NCDOT may adhere to 100' minimum

Figure 5-6: Throat Length Standards

Driveway and Street Intersection Design. Even away from the roadway, it is important to consider the design of our spaces, particularly parking areas and how corner design impacts turning speeds. The smaller the corner radius, the slower the travel speeds moving through the intersection. These slower speeds translate into more visibility and lower speeds at impact in the event of a crash (note that slower turning speeds can also translate into more rear-end collisions, although the severity of these seldom outweighs the benefits of reducing head-on or angle collisions). Similarly, when driving areas share cross-access, the necessity of traveling into the street is reduced for some customers; we speak of the result as “internal capture” among compatible land uses, and it is much sought-after by traffic engineers and developers alike to reduce conflicts, crashes, and traveler delays. Roundabouts are also becoming more popular as ways of reducing crashes (between 40% and 60% compared to conventional STOP- or signal-controlled intersections) and improving air quality.

Connectivity and Other Strategies. Even when we have situations where there are already too many driveways too close together and designed poorly, there are still opportunities to alleviate roadway congestion, reduce crashes and their severity, and generally improve travel conditions for everyone. One important solution is requiring connectivity between different developments, either through the cross-access between parking areas mentioned earlier, or through a system of frontage or “backage” streets that create pathways for residents to reach shopping, work, and transit options. A typical connectivity standard for new residential development is to have a full connection every 1,500 feet; any longer or shorter and performance for at least one mode of travel is compromised. These connectivity standards are typically applied during the site development stage, but should be supplemented with a collector street plan that specifies the general location, path and design of a network of collector streets across Union County. Other strategies include various enforcement techniques, improving sight distances, modifying signals or turning lanes, supplemental driver education programs, bicycle and pedestrian safety education programs, and general awareness campaigns. One of the latter that is targeted at the most vulnerable road users is the **Watch for Me NC** campaign being conducted now by the N.C. Department of Transportation.

PUBLIC TRANSPORTATION DESIGN ELEMENTS

Traditional public transportation for the past 50 to 60 years has nearly always meant providing bus service along a fixed route on a regular schedule. Improving this service can happen in many ways, described in the hierarchy of service provisions in Figure 7. As this figure indicates, the popular conception of bus-oriented transit service is just one “stop” along a continuum of services that increases in complexity, cost and sensitivity to both good design and the number of potential riders.

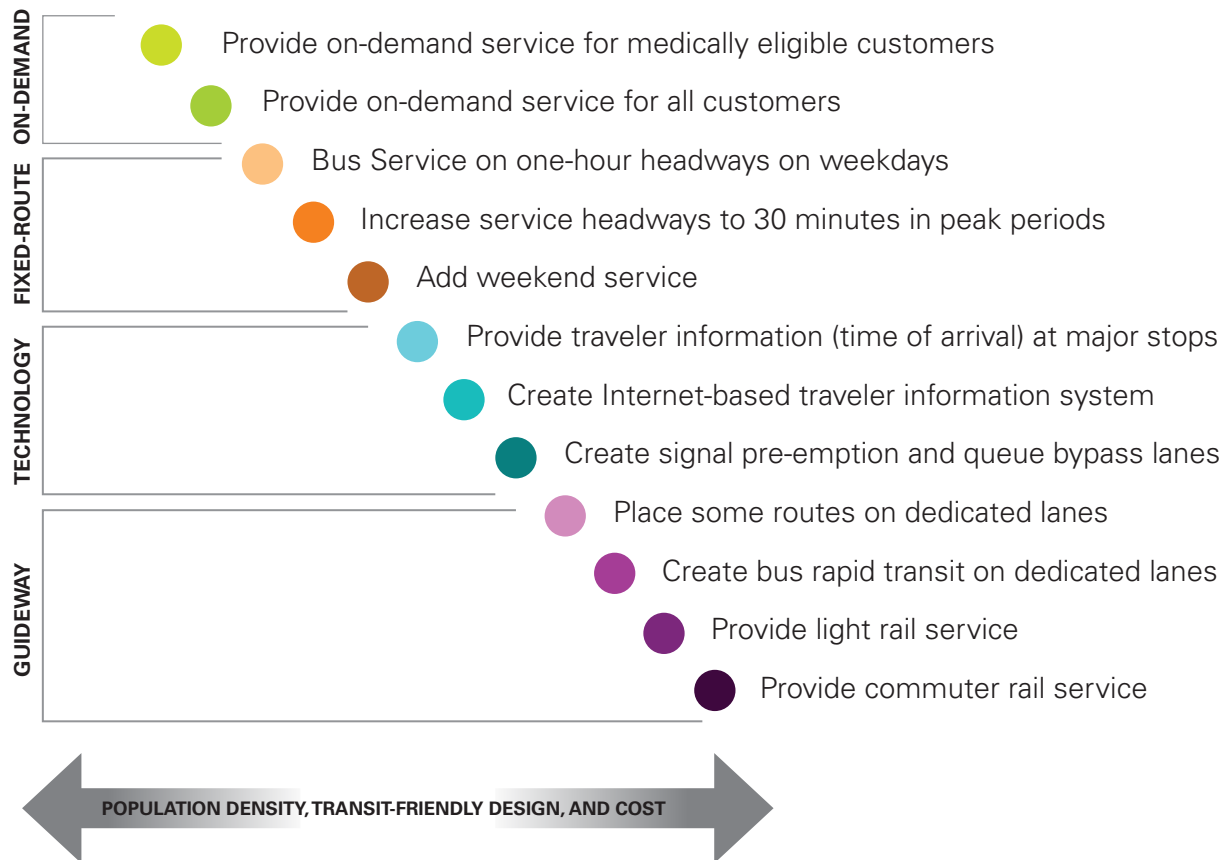


Figure 5-7: Driveway Spacing Standards

The design of bus stops indicates if the service will attract new riders, even those that may have the choice of using the service occasionally or riding in a car (Figure 8). Bus stops should generally be located on the “far side” of an intersection so that people can cross on foot to the stop quickly, and the bus driver can wait for the signal to provide a gap to re-enter the traffic stream. Depending on the bus operator policy, transit stops should be provided with a sitting area, covered shelter with transparent sides, and a waste receptacle. Many stops should also have provisions for securing bicycles, particularly when the stop is near a campus

or bicycle facility (e.g., bike lane). In every case, transit stops and particularly park-and-ride areas should be well-lit, clean, and connected with pedestrian facilities (usually sidewalks). Requiring private developers of major shopping, office, and multi-family projects to provide space for transit facilities and adequate room for bus turn-around maneuvers is important – just as with adding roadway capacity and access management, retrofitting is much harder to accomplish than having the right policies in place when public and private infrastructure is designed and approved.

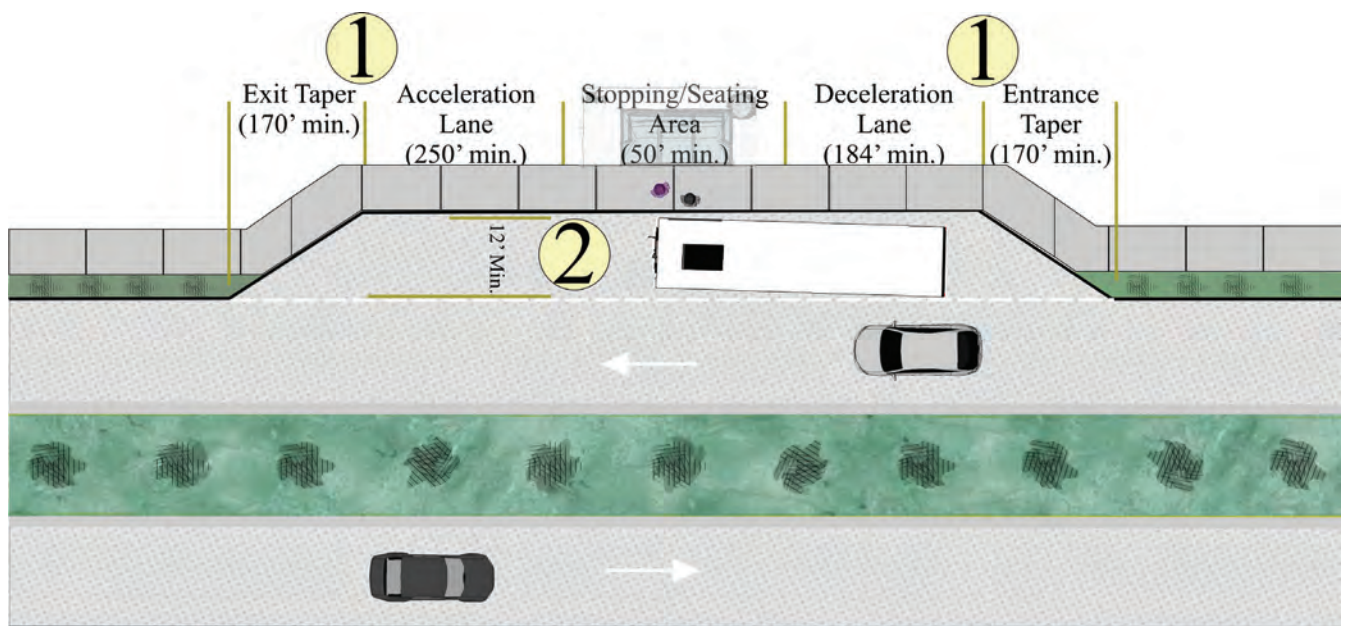


Figure 5-8: Ideal Transit Stop Design (Major Stop)





06

Action Plan & Initiatives

The purpose of this document is to provide a context for understanding the transportation issues confronting Union County; recommendations to resolve those issues; and, in this section, create some insight into the actions that will be required to make the objectives and recommendations from the study a future reality. This section will address the implementation context as it currently exists nationwide and within North Carolina and Union County; a matrix of action planning steps that include the recommended project and policy initiatives from this report as well as complimentary programmatic and policy actions; and primary and secondary financing opportunities.

INTRODUCTION

At the time of this plan's preparation and adoption, a number of factors that have been traditionally counted upon to drive how transportation improvements are selected, financed, and implemented are undergoing tectonic shifts, the most important of which are described below. These changes will substantially influence in the short- and mid-terms how Union County approaches project prioritization and, perhaps, the roles of local government and the private sector with respect to transportation infrastructure and service provision.

Perhaps the largest overall change in transportation implementation is coming from the state level. First, financing from state and federal (via state allocations) are undergoing monumental shifts from where they have stood for the past two decades. Funding allocations from North Carolina are now divided into statewide, regional and divisional categories of spending. In effect, these subcategories of spending, coupled with other legal and policy requirements, translate into fewer dollars being eligible for expenditures on local roads – generally any roadway without a federal or state route designation. Second, NCDOT has undergone a massive change in the way that it selects projects for funding, now relying on local inputs, but also based on technical performance areas (e.g., safety, economics). Much of the “local” input does not come directly from local governments like Union County or its municipalities, but instead is channeled through NCDOT Division offices and metropolitan/rural planning organizations.

The federal government, as it has continued to do over the past two decades, is wrestling with the dilemma of shrinking revenues from fuel taxes, as well as how to apportion those revenues fairly among the 50 states. While there is not a set course charted out as yet, discussions of congestion taxes – taxes applied directly to vehicle users rather than through the purchase of fuels for those vehicles – are getting renewed interest, as one example. Declines in expected revenues have forced the federal government to issue rescissions to the states, essentially “taking back” funds already allocated based upon too-optimistic revenue pictures. Besides the major debate on transportation funding, the other two changes in the federal implementation process are (a) an increased reliance on performance-based metrics to identify the best projects for funding (best represented by North Carolina's own increased reliance on performance-based funding); and (b) a consolidation of multiple funding categories into fewer categories, which has changed how some programs like Safe Routes to School are likely to operate in coming years.



How do these changes at the state and federal levels influence how we approach implementing transportation projects in Union County? While we cannot say with certainty how these and other policy changes will influence our thinking, there are a number of concepts that this Plan respected as it was being prepared, and that influence our implementation strategies:

- **Local Control.** North Carolina has made several moves towards pushing responsibility of secondary roads downward to counties and municipalities. This shift will ultimately translate into Union County desiring to work more closely with NCDOT Division and District offices to accomplish work collaboratively, including (perhaps) county and municipal funds being used by the State to improve and maintain roadways.
- **Bicycle and Pedestrian Travel Less a Factor at the State Level.** North Carolina passed legislation in 2013 that does not allow state monies to be used as a match to federal funds for bicycle and pedestrian projects. Even more than secondary roadway capacity, new active mode projects will now be required to have a non-state funding partner. However, public awareness of the health issues that envelope a sedentary lifestyle like those depicted in the graphic on this page have started to make positive changes in our people: in 2013, for the first time in many years, one age segment of children (aged 2 to 5 years) is not more obese than their predecessors³.
- **Performance + Collaboration.** As long as the current performance-based system for project selection continues, Union County will have to play the same tune as it thinks about backing its own transportation priorities – if it wants to receive state/federal funding for transportation improvements. Union County did receive top ten status for two projects in the available (May 2014) performance evaluation, one of which is the Monroe Northern Loop. Since both the technical merits and inputs of the Charlotte Regional Transportation Planning Organization (CRTPO) and NC Division 10 office are relevant to these rankings, maintaining a close relationship with both entities is highly advisable.

- **Local Financing on the Ascendant.** Whether through general bond issuances, sales taxes, property taxes or some other means, it is highly likely that the fastest-growing counties and cities in North Carolina will have to come to the table with additional ways of financing transportation projects. That promises to be a potentially painful discussion, but – along with a relaxation of state rules that prohibit certain types of revenue mechanisms being used at the local level without state authorization – one that is almost certainly going to take place if current devolution trends continue.



In the 1970's, 5% of children aged 2-19 were obese. By 2008 that number had tripled to 17%. During the same period (1969 to 2009), the percent of children walking to school dropped from 48% to 13%.

A final point should be included before leaving this introduction to implementation: things inevitably change. The fact that there are relatively few examples of local funding for major transportation initiatives is more a reflection of the history of North Carolina's peculiar funding policies than a harbinger of how the future will unfold (and examples of local financial participation, at least on the municipal side of the ledger, are becoming more commonplace). The current state of policy is just one consideration in how we craft our recommendations, but we did not rely on the current state of affairs to dictate our decision-making.

³Sources: Center for Disease Control (Childhood Obesity Facts, www.cdc.com); New York Times (Sabrina Tavernise, Obesity Rate for Young Children Plummets 43% in a Decade, February 25, 2014); and Harvard School of Public Health (Child Obesity: Too Many Kids are Too Heavy, Too Young, www.hsph.harvard.edu).

FUNDING SOURCES AND OPPORTUNITIES

As mentioned previously, funding sources are a continuous topic of discussion, and one that frequently changes. The following describe how different funding mechanisms can be considered, particularly in light of both current policies and this Plan's recommendations.

State/Federal Funding. These two sources are frequently “lumped” together since they are both ultimately apportioned through the State. Federal influences are still felt through the state-level apportionment process, perhaps most strongly on public transportation projects. There are some opportunities for increasing transit service for the mid-and-term projects described in the recommendations, particularly through Job Access – Reverse Commute and New Freedom formula programs (although there is a 20% match, and these grant-type sources don't extend very far into operations). All state and federal funds practically speaking are now subject to the Strategic Transportation Investment prioritization system, which is updated periodically. Hence, considering which projects have the best scoring potential may be an important consideration as discussions move forward to encompass more detailed planning.

Local Government Funding. Although localities do have restrictions on adopting “new” funding tools that aren't already authorized by North Carolina (or where they have obtained enabling authority from the State in the past), the role of local governments, even counties that have traditionally played a small or non-existent role in transportation infrastructure investment or maintenance, is on the upswing in North Carolina. As mentioned earlier, local funding will likely take the place of some formerly state matches on federal dollars, particularly for pedestrian and bicycle infrastructure projects. Independent bond efforts, as well as property and sales taxes, are going to be closely scrutinized as sources that may increase in importance over the life of this Plan.

Private Sector Participation. One of the historic issues with the way that North Carolina has struggled to provide roadway capacity is the disjointedness between the bodies that approve the development that creates demand for transportation services (municipalities and counties) and the entity that owns and maintains three-fourths of the roadway network (state). In order to better link private actions with public need, we should expect to see a greater reliance on plan reviews that generate impact statements, which in turn can impose requirements or restrictions on private actions that generate traffic. The desire to lure more private investment – and thus higher property tax revenues – has kept impact fees and contingent development standards in check, but as the need for more and better infrastructure grows without a concurrent increase in federal and state revenues to create more supply, the pressure will increase on the private sector to participate more directly and earlier in the development cycle. Public-private partnerships (PPPs) have become more commonplace in recent years, taking a variety of forms from right-of-way dedications to utility agreements to full-scale construction of interchanges and sections of arterial roadway.

With the preceding review of revenue sources, trends and background context in mind, the discussion of prioritizing and implementing the major recommendations contained in this Plan is possible.



PRIORITIES AND ACTION PLAN

Given the recommendations contained in this Plan as well as the current and anticipated future policy contexts at the federal, state, and local government levels, the following action plan was developed.

The priority factors listed in the following table (Table 6.1) were used to choose which projects to pursue as top priorities (balanced by cost and constructability):



Table 6.1- Transportation Project Priority Factors

Roadways	Bicycle	Pedestrian	Public Transportation
Volume-to-Capacity Ratios (Forecasted)	Distance to ES or MS	Distance to ES or MS	Existing Population + Employment Density
Quality-of-Service Assessment	System Connectivity	System Connectivity	Future Population + Employment Density
Public Input	“Fixable” Crash History	“Fixable” Crash History	System Connectivity/Enhancement
	Minority Population	Minority Population	Low-Income Population
		Supportive Land Use Patterns	Supportive Land Use Patterns

Utilizing these priority factors, many of which are represented in the current version of the North Carolina DOT project priority system as well, the following tables present information on roadway, public transportation and bicycle-pedestrian facility and program recommendations. The “Term” in each table describes short-, middle-, and long-term implementation timeframes:

- **Short-Term:** Within the next five to seven years (many policy-level actions are possible in this timeframe, as are some small-scale, low capital cost projects);
- **Middle-Term:** Between 8 and 20 years from now, these projects could be financed through state/federal sources in the Transportation Improvement Program (TIP); and
- **Long-Term:** After 20 years, these higher capital cost projects could be financed, particularly through participation from non state/federal partners or should future growth place sufficient pressure for these projects to score well in future project priority exercises conducted to determine projects for state and federal funding in the TIP.



While the Hotspot locations are all short-term recommendations, they have been included here to provide approximate cost information and to ensure that future funding be allocated to these projects on equal footing with other short-term recommendations.

Table 6.2- Hotspot Locations

Project/Policy	Description	Term	Capital Cost
County-Wide Hotspot Safety Study	In order to evaluate which locations are in need of hotspot safety improvements, this study, to be performed by a consultant, will provide the requisite detail with regard to costs and benefits for each location.	Short-Term	\$75,000
Weddington Road/Antioch Church Road Intersection Improvements	In order to provide an increased safety benefit and improve traffic operations at a skewed intersection close to a major shopping area, this hotspot treatment recommends replacing the traditional intersection with a roundabout. Additionally, this roundabout would provide easy access to a developable parcel south of the intersection.	Short-Term	\$750,000
US 74/N. Rocky River Road Intersection Improvements	US 74/Independence Boulevard in Union County is one of the major transportation corridors in the region and serves as an important mobility corridor between Union County and Uptown Charlotte. Assigned the project number SP-2012-35, this project has been vetted with NCDOT and programmed for funding.	Short-Term	\$1,000,000
Old Charlotte Highway/MLK Jr. Drive/Dickerson Boulevard Widening Enhancements	These improvements target a section of Dickerson Blvd. south of US 74 that transitions from rural road to a suburban corridor with major retail amenities on both sides. In order to create a smoother transition between the 2-lane and 5-lane sections, these improvements widen the roadway to accommodate two lanes in the southbound section as well as in the northbound section closer to the railroad crossing.	Short-Term	\$1,200,000
Highway 218/Mill Grove Road Intersection Improvements	NC 218 and Mill Grove Road are rural, relatively high-speed roads that provide east-west and north-south mobility in northwestern Union County. In lieu of the safety flashing warning signals currently in place along NC 218, this hotspot treatment calls for the installation of a roundabout, which will substantially improve safety at this location.	Short-Term	\$600,000
Lancaster Highway/Rocky River Road Intersection Improvements	Improvements at this location are not only restricted to implementing a roundabout, but also mandate realigning Parkwood School Road, which will help avoid issues related to having two intersections in such close proximity to one another. In addition to improving safety, these improvements will facilitate easier traffic flows along both corridors.	Short-Term	\$750,000
US 74 (W. Roosevelt Boulevard/Morgan Mill Road Intersection Improvements	As US 74 carries the most traffic in Union County, these improvements are designed to facilitate smoother traffic movements along the corridor as well as improve safety. This hotspot recommendation provides an additional left turn lane on the western leg of US 74, an additional right turn lane on Morgan Mill after the intersection going northward, and also calls for additional sidewalk construction and driveway consolidation.	Short-Term	\$1,100,000

Table 6.3- Roadway Priority Actions

Project/Policy	Description	Term	Capital Cost
US 74 (Roosevelt Boulevard)	<i>This corridor is the most heavily traveled corridor in Union County and is recommended for improvement through access management and operational improvement strategies as well as the provision of a sidepath. Sidewalks are recommended along US 74 within the city limits of Monroe. A small portion of this roadway is programmed for access management improvement through TIP Number R-3329, the Monroe Bypass.</i>	Short	\$ 40,600,000
NC 16 (Providence Road)	<i>NC 16 provides an important connection between Mecklenburg County and Waxhaw in the western portion of Union County. This roadway is recommended for improvement through both access management and operational improvement strategies and the provision of a sidepath along the corridor.</i>	Short	\$ 57,600,000
Waxhaw-Indian Trail Road	<i>Waxhaw-Indian Trail Road is an important north-south connector from US 74 to Waxhaw is recommended for widening from a 2-lane section to a 4-lane section. Other improvements to this corridor include the implementation of 5' shoulders and sidewalks on both sides.</i>	Middle	\$ 87,400,000
NC 75 (Waxhaw Highway)	<i>NC 75 is an important connector between Waxhaw with Monroe and is proposed for improvement by widening between from a 2-lane to 4-lane section and providing a sidepath along the corridor.</i>	Middle	\$ 104,300,000
NC 84 (Weddington Road)	<i>NC 84 is an east-west route in the rapidly suburbanizing area of western Union County spanning from the Town of Marvin east through Wesley Chapel to Monroe. This roadway is proposed for widening from a 2-lane to 4-lane section with a sidepath from Rea Road Extension (4-lane section on new location) to West Franklin Street in Monroe</i>	Middle	\$ 93,700,000
NC 200 South (Lancaster Highway)	<i>NC 200 spans all of Union County, reaching from Stanly County in the north to the South Carolina border in the south. This roadway is recommended for improvement through access management and operational improvement strategies and 5' shoulders as well as streetscape improvements including sidewalks along the portions of the roadway in Monroe.</i>	Middle & Long	\$ 11,000,000
NC 207 (S. Hayne Street/Wolf Pond Road)	<i>NC 207 is another corridor linking Monroe in the north to the South Carolina border and is proposed for improvement through access management and operational improvement strategies. The portion within Monroe (S. Hayne Street) should be improved with sidewalks, while a sidepath is recommended along the Wolf Pond Road section.</i>	Middle	\$ 28,900,000
North US 601 (Concord Highway)	<i>As the name implies, North US 601 reaches from Monroe in the south to Cabarrus County and Concord in the north. This route is proposed for improvement through access management and operational improvement strategies and the provision of 3' shoulders following the Sikes Mill Road split. From US 74 to the Sikes Mill Road split, the roadway is recommended for widening from a 2-lane section to a 4-lane section with sidewalks and 3' shoulders.</i>	Middle	\$ 31,600,000
South US 601 (Pageland Highway)	<i>South US 601 stretches from Monroe southward to the South Carolina border and is not proposed for improvement at this time.</i>	Middle	N/A
NC 200 North (Morgan Mill Road)	<i>NC 200 North stretches from Monroe in a northerly direction and is also proposed for improvement through access management and operation improvement strategies and the provision of 5' shoulders.</i>	Middle	\$ 4,700,000
NC 218 (Fairview Road)	<i>NC 218 stretches in an east-west direction from Mecklenburg County in the west to Anson County in the east. With the exception of the easternmost section of roadway (east of NC 205), this corridor is proposed for improvement through access management and operation improvement strategies and the provision of 3' shoulders.</i>	Middle	\$ 3,000,000
Stallings Road/Potter Road	<i>This section of urbanized roadway provides local access from the Mecklenburg County border across US 74 to the more suburban areas in the vicinity of the Town of Indian Trail. The portion north of US 74 is proposed for a widening from a 2-lane section to 4-lane section, while the section south of US 74 is proposed for improvement through access management and operation improvement strategies. The entire corridor is proposed to include 5' sidewalks and 5' shoulders.</i>	Middle & Long	\$ 19,800,000
Weddington-Matthews Road	<i>This section of roadway spans from the Mecklenburg County border south through the community of Weddington. This roadway is proposed for improvement through access management and operation improvement strategies as well as the provision of sidewalks and buffered bicycle lanes.</i>	Middle	\$,100,000
New Town Road	<i>New Town Road is a cross-county connecting route, spanning from the town of Marvin to Rocky River road just west of Monroe. This route is recommended for widening from a 2-lane to 4-lane section with a sidepath.</i>	Long	\$ 90,000,000
Old Charlotte Highway	<i>Running parallel to US 74 just to the south, Old Charlotte Highway provides important access in an urbanized area of Union County. This roadway is proposed for widening from a 2-lane to a 4-lane section with a sidepath from the Mecklenburg County border until Rocky River Road and then wide outside lanes and sidewalks closer to Monroe.</i>	Long	\$ 82,300,000

Table 6.4- Priority Transit Action Items

Project/Policy	Description	Lead Authority	Potential Partners	Term	Capital Cost
US 74 Express Service Enhancements	<i>Increase headways; expand service to weekends</i>	CAT	Union Co., Monroe, State/Federal	Short	\$300,000
US 74 Express Extension, Phase I	<i>Extend route to Monroe Downtown; create 1 new Park-and-Ride station</i>	CAT	Union Co., Monroe, State/Federal, Private Sector	Short	\$1,000,000
Support Land Uses that Support Transit	<i>Adopt supportive land use ordinances to increase densities around transit stations; remove density barriers</i>	City of Monroe, Towns	Union County, CRTPO, Private Sector	Short & Middle	\$50,000 (to develop transit-supportive ordinance for adoption)
Support Activity Centers	<i>Infrastructure funds should be directed towards high-activity locations identified in the Comprehensive Plan</i>	City of Monroe, Towns, Union County	CRTPO, State/Federal	Short, Middle & Long	N/A
Providence Road (61X) Express Extension	<i>Extend the current route to Waxhaw; create 1-2 new Park-and-Ride stations</i>	CAT	Union Co., Monroe, State/Federal, Private Sector	Middle	\$ 450,000
Monroe Circulator	<i>Create bus circulator around and into downtown Monroe</i>	City of Monroe, CAT	CRTPO, State/Federal	Middle	\$ 300,000
US 74 BRT	<i>Add BRT Lanes to outside lanes of US 74</i>	NCDOT / CAT	CRTPO, State/Federal	Long	variable
US 74 Express Extension, Phase II	<i>Extend route to Wingate</i>	CAT	Union Co., Monroe, State/Federal, Private Sector	Long	\$ 500,000
Waxhaw-Area Circulator	<i>Provide circulator service around Waxhaw area</i>	Town of Waxhaw	CAT, CRTPO, Union County, State/Federal, Private Sector	Long	\$ 300,000



Table 6.5- Priority Bicycle-Pedestrian Action Items

Project/Policy	Description	Lead Authority	Potential Partners	Term	Capital Cost
High-Activity Center Solutions Program	Create an outreach program to identify and create solutions to small-scale issues, prioritizing schools and transit connections	City / Towns	CRTPO	Short, Middle, & Long	variable
Adopt a Complete Streets Policy	Create standard policy and resolution supporting Complete Streets (reference NCDOT guidance)	City / Towns	Union County	Short	\$50,000, Study by Consultant
Initiate County-Wide Child Pedestrian and Bicycle Safety Program	Create a program in cooperation with Union County School System to utilize K-5 training materials from NCDOT to teach pedestrian, bus, and bicycle safety	Union County (School System)	NCDOT	Short	\$75,000
Complete Carolina Thread Trail, Phase I	Complete the Carolina Thread Trail to City west of Monroe to Mecklenburg County Limits	City of Monroe	Union County, CRTPO, State / Federal	Middle	\$59,890,000
Complete Carolina Thread Trail, Phase II	Complete the Carolina Thread Trail east of Monroe to Union County Limits	Union County	State/Federal	Long	\$33,380,000
Update Policies / Ordinances	Create ordinances referencing (1) required connectivity (or maximum block lengths), (2) multi-modal traffic impact assessment guidelines, (3) define a collector street network and design policy	City / Towns / Union County	CRTPO (input from Private Sector)	Middle	\$50,000, Study by Consultant
US 74 Parallel Trail	Construct a multi-use path either as a priority segment of the CTT or along the edge of road right-of-way on US 74 between Mecklenburg County and Monroe downtown	Monroe / Indian Trail / Union County	State/Federal, CRTPO	Middle	\$17,200,000
Intersection and Connector Improvements	The Transportation Plan identifies 42 different small-area improvements, ranging in size/scale from crossing improvements to greenway connectors and intersection geometry corrections	Union County / various towns	NCDOT, CRTPO	Short and Middle	variable

CONCLUSION

To suggest that Union County has changed over the past two decades is an understatement. Continued suburban sprawl and development patterns have placed a growing burden on existing infrastructure to the point of frustration, impact on economic potential, and lack of a good understanding of community priorities. Relying on true partnerships between municipal, CRTPO, and NCDOT will be the key to success, not only to rebuild existing deficient infrastructure, but to work in collaboration with the development community to incorporate better choices (bike, pedestrian and transit) for regional mobility. The communities of Union County are building on the established momentum in the area. To continue attracting economic development and expanding transportation choices, the communities need to be proactive when addressing needs and issues. The success of the Union County Transportation Plan relies in part on how well local and regional officials and leaders collaborate to make difficult decisions. The highest priority initiatives developed as part of the study are summarized in this chapter along with key projects. It will be up to local and regional decision-makers to identify the most desirable recommendations for implementation, but it will be the combined efforts over many years of decision-making that creates the sustainable, vibrant, and economically sound communities where people want to continue to live.

Note: a companion document - Union County Comprehensive Plan has been developed in addition to the Multimodal Transportation Plan to provide a comprehensive look at land use, transportation, economic development, housing, health, and the environment in Union County. Please refer to this document for more detail about how transportation fits in with the overall vision for Union County.



The logo for Union County, featuring a stylized orange and white symbol that resembles a cross or a four-pointed star.

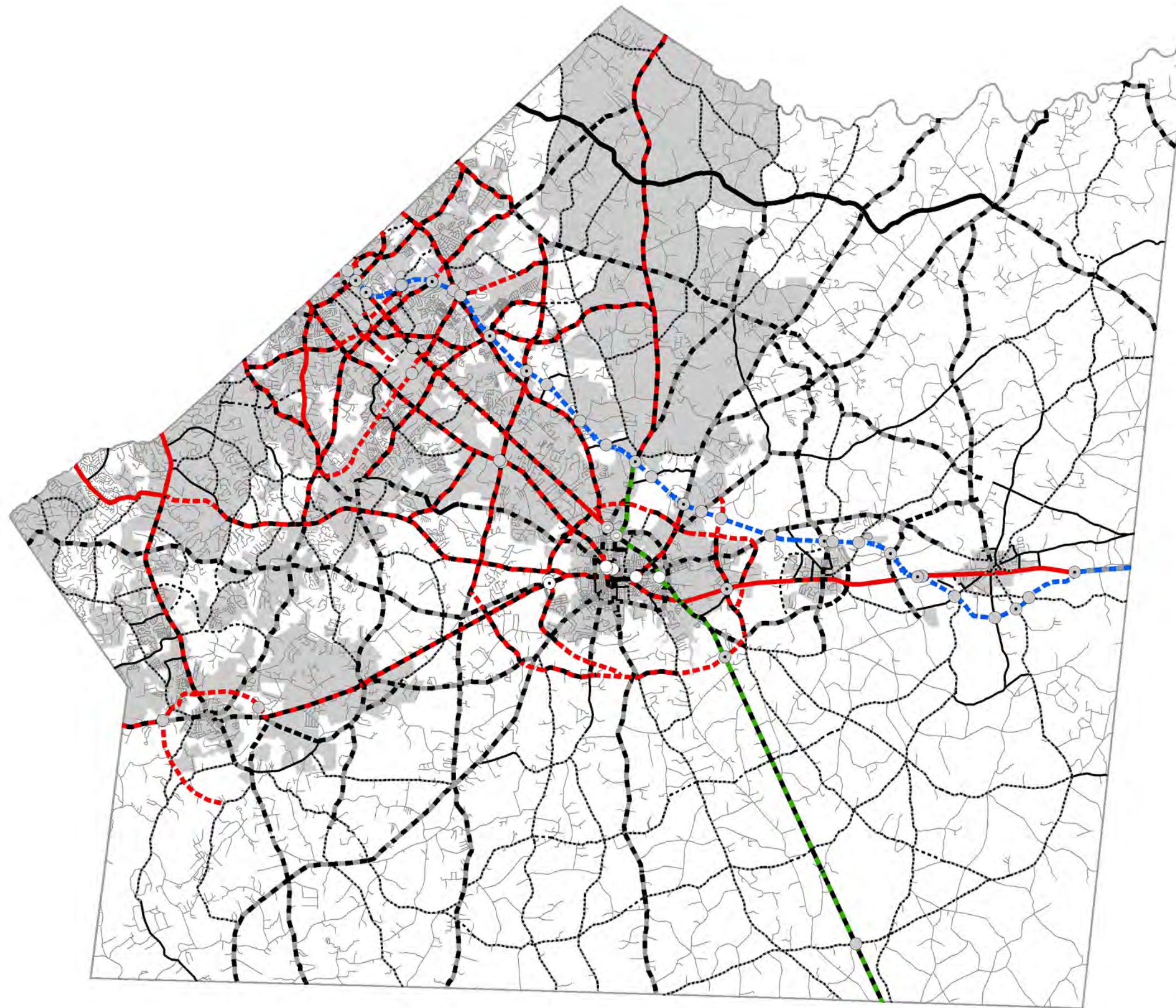
Union County

Appendix A - Roadway Maps

Figure 1: Existing Facilities with CRTPO and Rocky River RPO Improvements

Union County 2025
transportation plan / comprehensive plan update

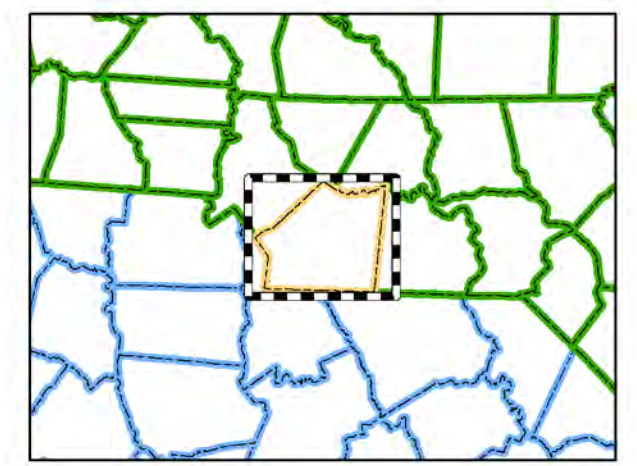
**Multimodal
Transportation Plan**
Plan date: June 25, 2014



- Existing Grade Separation
- Proposed Grade Separation
- ◉ Existing Interchange
- ◉ Proposed Interchange
- ◉ Interchange Needs Improvement
- Freeways, Existing
- - Freeways, Needs Improvement
- · - Freeways, Recommended
- Expressways, Existing
- - Expressways, Needs Improvement
- · - Expressways, Recommended
- Boulevards, Existing
- - Boulevards, Needs Improvement
- · - Boulevards, Recommended
- Other Major Thoroughfares, Existing
- - Other Major Thoroughfares, Needs Improvement
- · - Other Major Thoroughfares, Recommended
- Minor Thoroughfares, Existing
- - Minor Thoroughfares, Needs Improvement
- · - Minor Thoroughfares, Recommended



Base map date: June 25, 2014
Refer to CTP document for more details



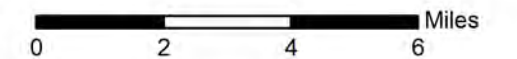
**Figure 2: CTP
Base Map**

Union County 2025
transportation plan / comprehensive plan update

**Multimodal
Transportation Plan**

Plan date: September 16, 2014

- Existing Grade Separation
- Proposed Grade Separation
- Existing Interchange
- ⊙ Interchange Needs Improvement
- Proposed Interchange
- Freeways, Existing
- - Freeways, Needs Improvement
- - Freeways, Recommended
- Expressways, Existing
- - Expressways, Needs Improvement
- Boulevards, Existing
- - Boulevards, Needs Improvement
- - Boulevards, Recommended
- Other Major Thoroughfares, Existing
- - Other Major Thoroughfares, Needs Improvement
- - Other Major Thoroughfares, Recommended
- Minor Thoroughfares, Existing
- - Minor Thoroughfares, Needs Improvement
- - Minor Thoroughfares, Recommended
- Railroad



Base map date: September 16, 2014
Refer to CTP document for more details

