Lewisville Greenway and Pedestrian Connections Plan

September 2011

Susan Hatchell
Landscape Architecture, PLLC

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EXECUTIVE SUMMARY

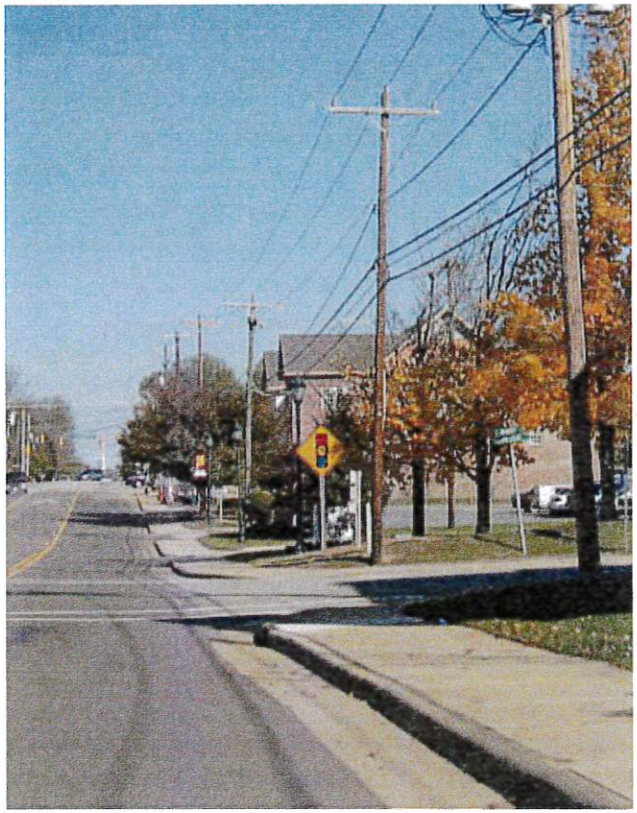
Introduction

Many communities are discovering the importance of greenway and pedestrian networks in improving the health and wellness of its citizens, as well as providing an alternate means of transportation. The addition of greenways and sidewalks also offer environmental and economic benefits, which often make communities more desirable places to live.

The Town of Lewisville is located along the western edge of Forsyth County, along the Yadkin River. The Study Area for the project is comprised of approximately 22,000 acres; bounded to the north by Bashavia Creek, to the east by the proposed future beltway, to the west by a boundary approximately one mile east of the Yadkin River, and to the south by the Yadkin River and Styers Ferry Road. Primary goals for the project includes providing connectivity to the downtown areas as well as the Muddy Creek Greenway. Other project goals are listed below:

- Creating an interwoven network of pedestrian based facilities
- Fostering a sense of community by creating opportunities to bring people together outdoors
- Promoting Lewisville as an attractive community to live, work and play
- Creating a neighborhood identity for Lewisville

Known for its rolling hills, rural character and long history, the Town of Lewisville offers many opportunities for integrating such themes in the pedestrian network. Several other communities have been successful in implementing trails which focus on town history, rural character or public art.



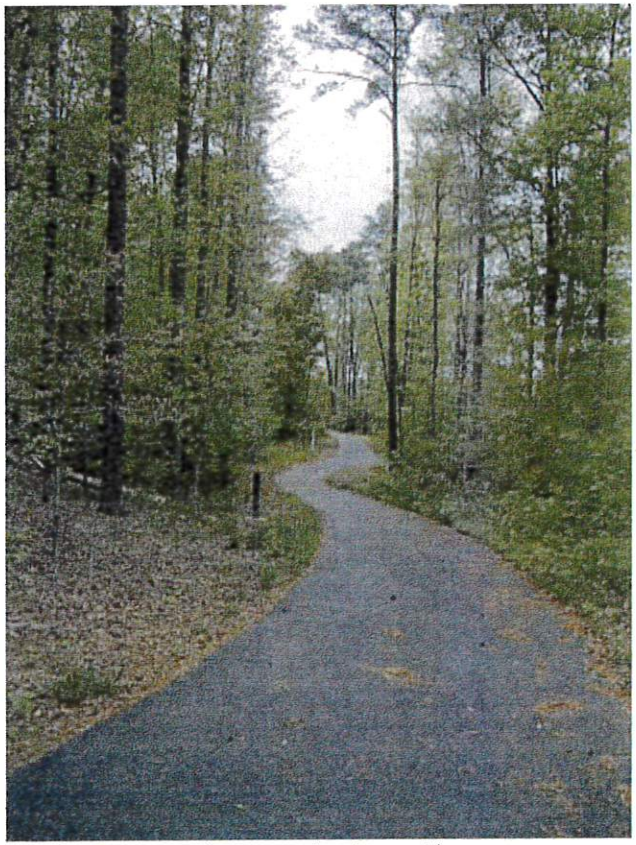
Existing sidewalks in downtown Lewisville

Existing Conditions

The locations of the proposed sidewalk and trail network are based on several months of field work and research on factors such as natural features, existing and proposed road conditions, existing and new development, parks and recreation facilities, cultural history, and other variables within the Study Area. An assessment of the opportunities and constraints within the Study Area helped to determine the level of suitability for individual segments of greenway trail and sidewalk, as well as the larger network.

The Greenway and Pedestrian Connections Plan

Based on the assessment and analysis of the existing conditions in the Study Area, the proposed greenway and pedestrian network includes a combination of greenway trails and sidewalks. The Lewisville Greenway and Pedestrian Connections Plan is a long range plan for over 32 miles of sidewalks and approximately 38 miles of greenway trails. Ten (10) greenway trail segments and seventeen (17) sidewalk segments throughout the Study Area will provide connectivity and linkages for the residents of Lewisville. Some segments respond to the anticipated needs of the community which haven't yet been realized, others to regional connections such as the Winston-Salem and Forsyth County Greenway Plan and the Yadkin River Greenway in the Village of Clemmons and the Town of Bermuda Run.



Greenway trails provide green pedestrian corridors

Costs, Phasing and Implementation

Typical greenway trails and sidewalk costs include right of way acquisition, design fees, as well as construction costs. As with any long range plan, the Lewisville Greenway and Pedestrian Connections Plan will evolve over time, changing and responding to future conditions, such as economic climate, implementation issues, and future recreational, residential and commercial development. Typically, greenway costs range from $100 - $165 per linear foot depending on the type of trail and if there is a need for boardwalks and bridges. Trail material can vary from crushed gravel screenings to paved asphalt. Sidewalk costs range from $15 - $80 per linear foot depending on project complexity. Funds for greenways and sidewalks can be sought on the federal, state and local level through a variety of ways including grants, new development and private donations.

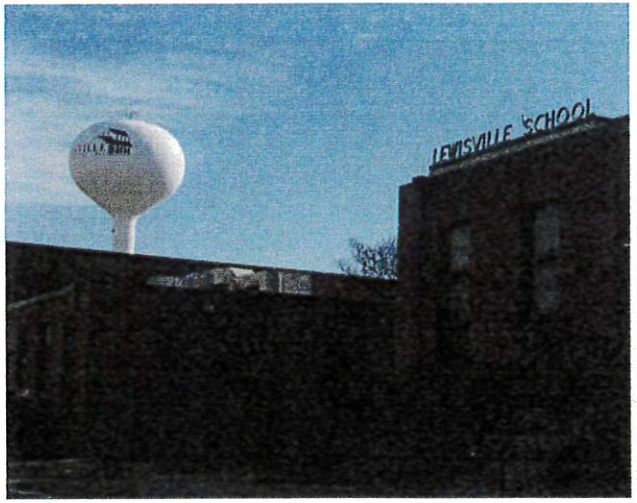
The highest priorities for greenway trails and sidewalks have been given to those projects which can create the maximum amount of connectivity to the more densely developed areas around the downtown area, and where sidewalks are currently not continuous. Connections to the Muddy Creek Greenway and other recreational amenities such as existing parks are equally important.

In order to implement the Lewisville Greenway and Pedestrian Connections Plan, the Town of Lewisville must determine the proper managing department and staff for the project. Coordination between the Town and other municipalities, and the Winston-Salem Urban Area Metropolitan Planning Organization (MPO) will also be needed. Several steps must be taken to make this long range project a reality. Some of these steps include creating an Advisory Board, facilitating planning approvals, drafting a "Complete Streets" policy, and developing a pilot project to create momentum, among others.

CHAPTER ONE: Project Background, Goals and Placemaking

Introduction

Susan Hatchell Landscape Architecture, PLLC was hired as the consultant to create the Lewisville Greenway and Pedestrian Connections Plan. The plan assesses an existing plan of pedestrian linkages, and proposes new connections where desirable and feasible. The Winston-Salem Urban Area Metropolitan Planning Organization provided the consultant with an existing preliminary greenway and trail plan originally planned for Lewisville. The consultant took this preliminary plan and investigated if the alignment of the proposed trails were feasible and offered the maximum amount of pedestrian connectivity. New routes were proposed in addition to this plan, while other routes were eliminated if they were deemed unfeasible or were not needed. Special consideration was given to connecting other forms of transportation and destinations such as the Yadkin River Greenway, Muddy Creek Greenway, existing and proposed parks, schools, recreational facilities, historical and cultural attractions, and bike routes.



Downtown Lewisville

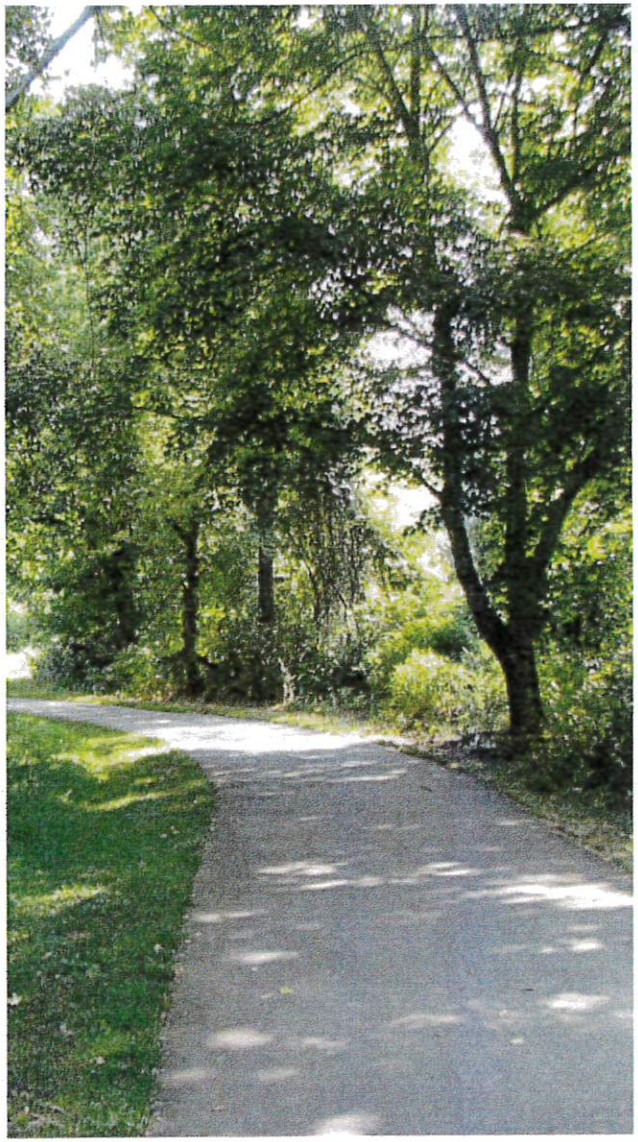
Project Goals and Objectives

A network of trails and sidewalks will benefit the community in many ways. Providing opportunities for citizens to enjoy the outdoors and promoting physical and mental health is just one important way these facilities can improve the quality of life in a community. Additional project goals and objectives are as listed below.

Create an interwoven network of pedestrian based facilities to:

- Provide connections to existing schools, parks, commercial centers, public services and neighborhoods
- Improve pedestrian safety and accessibility
- Encourage the use of alternative transportation
- Facilitate healthy lifestyles and balanced living
- Integration with existing and proposed bike and pedestrian networks to create a high level of connectivity in the region

Greenways provide an alternate means of transportation, Photo by Derek Hatfield



A pedestrian network allows citizens a safe place to exercise

Foster a sense of community by creating opportunities to bring people together outdoors:

- Providing outdoor spaces that promote community involvement such as clean-up volunteer groups, exercise clubs, and walking groups
- Enhancing community relationships by providing greenway trails and sidewalks where neighbors can meet and interact

Promote Lewisville as an attractive community to live, work, and play:

- Ensure that the network is as accessible as possible for all in order to promote health and wellness in the community
- Attract new home buyers and new businesses who prefer walkable communities and recreational facilities

Create an identity:

- Create an identity for the region, incorporating art and the interpretation of historic and cultural resources
- Maintain the "sense of place" by using context sensitive site amenities, using existing materials and preserving existing vegetation
- Educate the community about how land conservation and smart growth land practice create a higher quality of life for citizens
- Educate visitors about local ecology with the use of environmental interpretive panels and displays where applicable

Project Methodology

The project began with an initial meeting with the Lewisville Greenway and Pedestrian Connections Steering Committee comprised of local citizens. The intent of the meeting was to focus on the scope and purpose of the project. The site analysis included a compilation of relevant Geographic Information System (GIS) mapping provided by the Winston-Salem Urban Area MPO, the Town of Lewisville, state agencies and online resources. In addition to base mapping, the consultant began reviewing existing planning documents that are applicable to the Study Area.

The next steps in the process included:

- Identified potential "placemaking" opportunities for the network
- Compiled detailed on-site inventories of the existing pedestrian network
- Prepared preliminary recommendations for the network, priorities and phasing
- Compiled preliminary cost & maintenance information
- Presented the preliminary recommendations for review

Placemaking

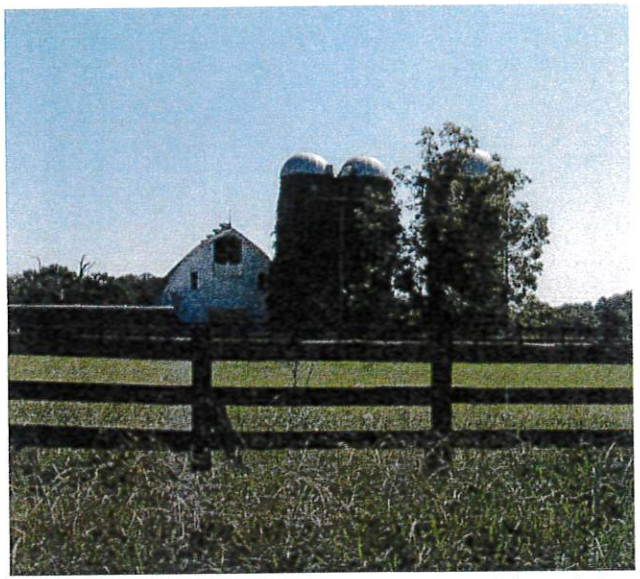
"Placemaking" is a term that describes a broader vision for integrating the proposed network of greenway trails and sidewalks with places that people identify with the Town of Lewisville. This can be achieved by highlighting the rural character of the area and the Yadkin River, historic preservation, and education and interpretation. Making sure to highlight what makes Lewisville special is key in the success of the pedestrian network. Several examples of creating this "sense of place" were explored by researching how other communities have made pedestrian connectivity a valued and unique part of the community. The following examples highlight these success stories:

Historic Albemarle Trail - Albemarle, NC

This large scale self-guided tour winds through 32 sites and 17 communities. It is the state's oldest heritage trail, and connects museums, aquariums, historic plantations and gardens among other sites.

Southport Historic Walking Trail - Southport, NC

This is a small scale, self-guided walking/bike tour that links important sites in the Town. The sites include the Maritime Museum, the historic jail, the historic cemetery, the Indian Trail Tree, river overlooks and Civil War sites. Interpretive signage at each site inform visitors about local history.



The rural character of the Study Area should be preserved and celebrated

Southport, NC waterfront, a part of the walking trail

Asheville Urban Trail, Photo by Elizabeth Blackwell

Appalachian Quilt Trail - Tennessee and North Carolina

This trail celebrates the heritage and the culture of the Appalachian people through tourism and economic development. The driving/biking/walking trail ties together craft and antique shops, farmers markets, agritourism farms, general stores, recreational facilities, wineries and historic sites. A quilt square motif is located at each site which leads visitors through the region, and tells a unique story at each stop along the way.

Asheville Urban Trail - Asheville, NC

The Asheville Urban Trail is approximately two miles long, and includes 30 sites which include various types of art, sculpture and architecture. Distinct time periods significant to Asheville are highlighted by granite markers in the sidewalk - the Frontier Period, Civic Pride, Age of Diversity and others.

Virginia Birding and Wildlife Trail - Virginia

This is a large scale trail that covers the Coastal, Piedmont and Mountain regions of Virginia. Each trail is made up of several loops for exploring and discovering local flora and fauna.

Uptown Lexington "Start with Your Heart Trail" - Lexington, NC

This is a joint effort between the Davidson County Healthy Carolinians Partnership and Uptown Lexington, Inc. The trail received funding from Start With Your Heart (funded by the Centers for Disease Control and Prevention). The self-guided fitness trail includes thirty-one granite markers embedded in the sidewalks throughout the uptown district and surrounding neighborhoods. The walking trail includes several measured routes which offer people of varying agility and skill levels an opportunity to tailor their fitness routine to their ability.

Summary of Existing Plans and Studies

North Carolina Bicycle Facility Planning and Design Guidelines (1994)

The North Carolina Bicycle Facility Planning and Design Guidelines was developed in 1994 with the purpose of informing engineers, planners and other transportation officials of the planning and design considerations recommended for good bicycle facility design.

Winston-Salem Urban Area Comprehensive Bicycle Master Plan (2005)

The Winston-Salem Urban Area Comprehensive Bicycle Master Plan was developed in 2005 to provide the necessary updates to the original bike route map and to support the integration of bicycle planning into the long-range growth management efforts of the community.

Winston-Salem and Forsyth County: Parks and Open Space Master Plan - 2015 (2006-2007)

The Winston-Salem and Forsyth County Parks and Open Space Master Plan - 2015 was adopted in 2006-2007 by the City-County Planning Board, the City of Winston-Salem, the Forsyth County Board of Commissioners, the Towns of Walkertown, Kernersville, Rural Hall, Lewisville, Bethania and the Villages of Clemmons and Tobaccoville. The goal of the Parks and Open Space Plan is to provide a system of parks, preserved natural areas, and recreational opportunities that improve the quality of life of residents.

Winston-Salem and Forsyth County Greenway Plan (2003)

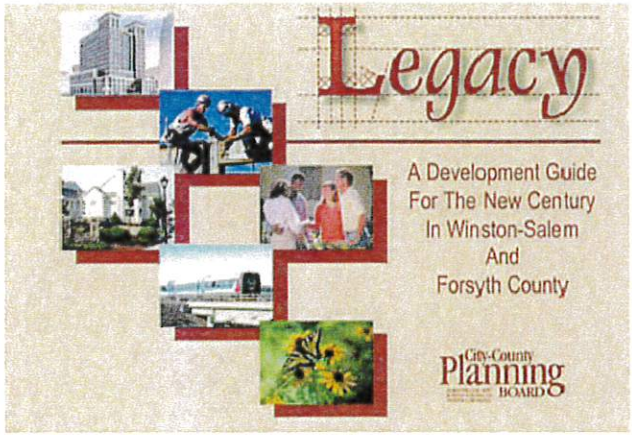
The Winston-Salem and Forsyth County Greenway Plan was created in 2003 as a supplement to the City-County Legacy Comprehensive Plan. The Greenway Plan was the first phase of implementation based on the recommendation from the Legacy Development Guide. The primary goal of the greenway plan is to achieve a comprehensive transportation network with pedestrian and bicycle facilities throughout Forsyth County.

Lewisville Comprehensive Plan (currently being updated)

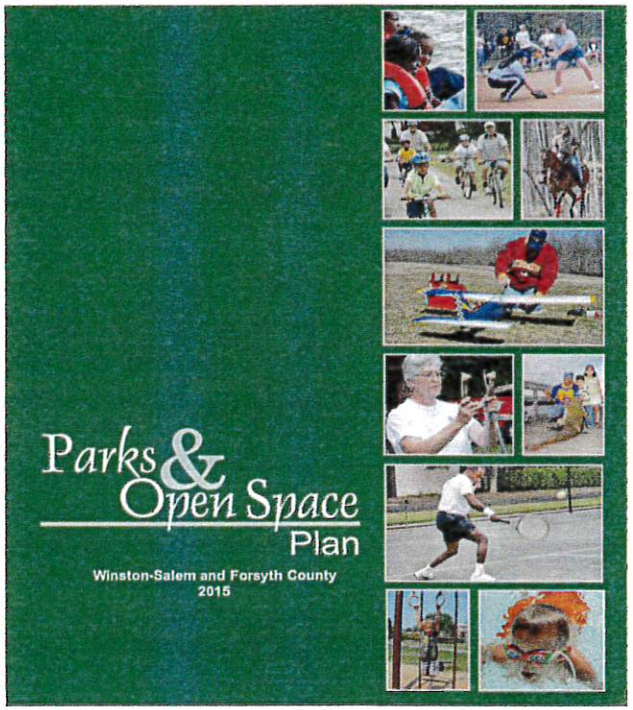
The Lewisville Comprehensive Plan is the town's "vision" for future growth and development. The plan provides the policy directions for framing land use decisions and growth management initiatives.

The Vienna Small Area Plan (VSAP)

The Vienna Small Area Plan (VSAP) is a policy document which establishes the long range plan for future land use, transportation, parks, open space, and the environment for approximately 140 acres located in northern Lewisville. The conceptual plan encompasses the area surrounding the intersection of Yadkinville Road and Lewisville-Vienna Road. The VSAP includes guidelines for preserving the context and setting of the area, and updates a portion of the Town's 2005 Comprehensive Plan and compliments the Forsyth Legacy Plan.



Winston-Salem Legacy Comprehensive Plan



Parks and Open Space Plan - Winston-Salem and Forsyth County 2015

Forsyth County Legacy Development Guide: Vision for the Year 2015 (2001)

The Legacy Development Guide was adopted in 2001 by Forsyth County and all eight of its municipalities. The guide was the result of a community-wide effort to develop a common vision for the future of Forsyth County. The guide describes the community vision for the year 2015 in a variety of areas that include: managing growth and development, transportation alternatives, economic vitality and environmental quality, building better neighborhoods, the future of downtowns, community character, community life, and active citizenship.

CHAPTER TWO:
Existing Conditions

Introduction

As part of the site analysis, the consultant examined the existing conditions of the Study Area and adjacent areas. Several site visits allowed for an assessment of the opportunities and constraints of the Study Area, which allowed the consultant to determine the level of suitability for a pedestrian trail and sidewalk network. Physical characteristics as well as social, historical and cultural elements were investigated and will influence pedestrian network recommendations.

The Study Area for the project is approximately 22,000 acres; bounded to the north by Bashavia Creek, to the east by the proposed future beltway, to the west by a boundary approximately one mile east of the Yadkin River, and to the south by the Yadkin River and Styers Ferry Road, as shown in Figure 2.1.

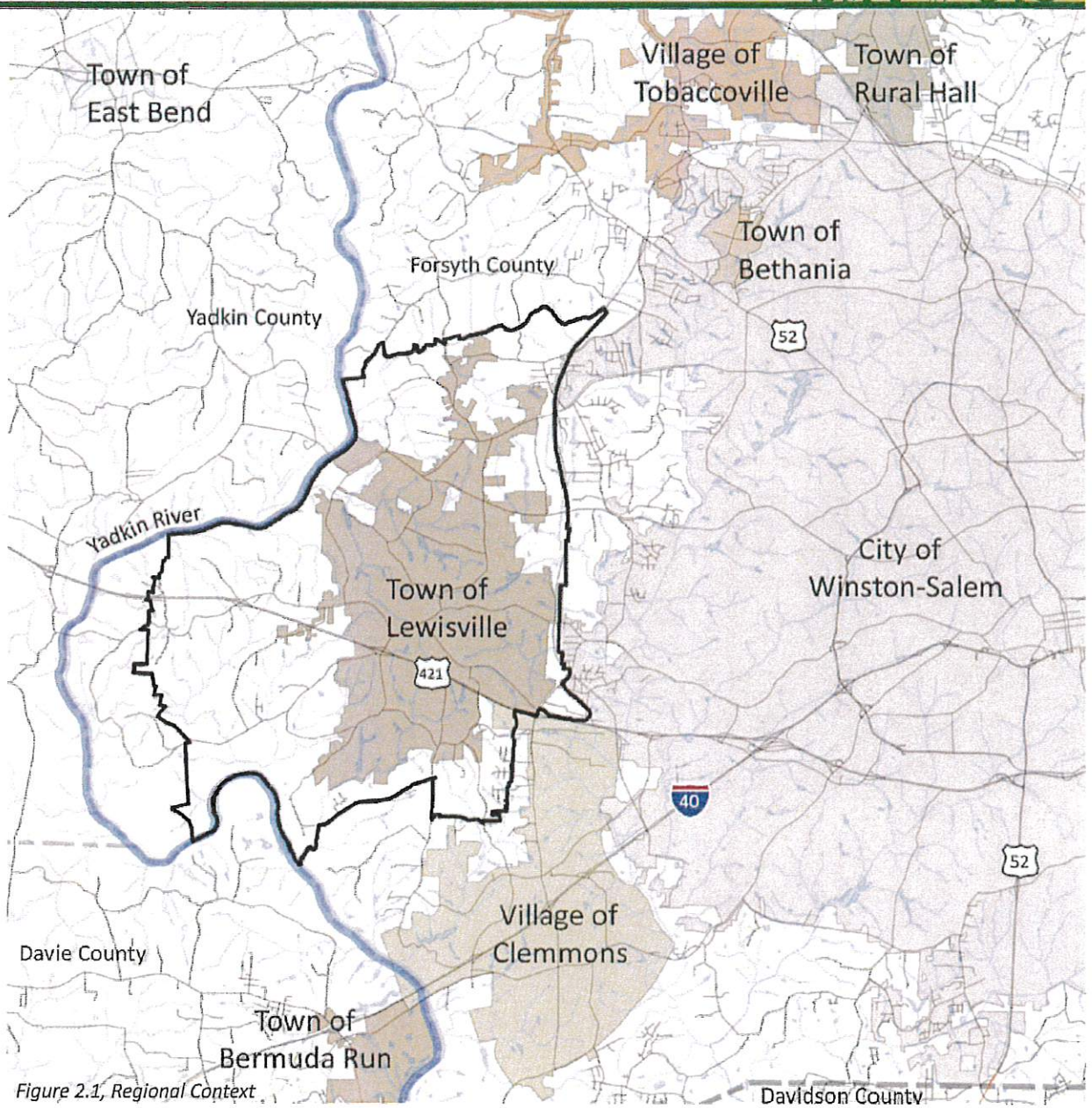


Figure 2.1, Regional Context

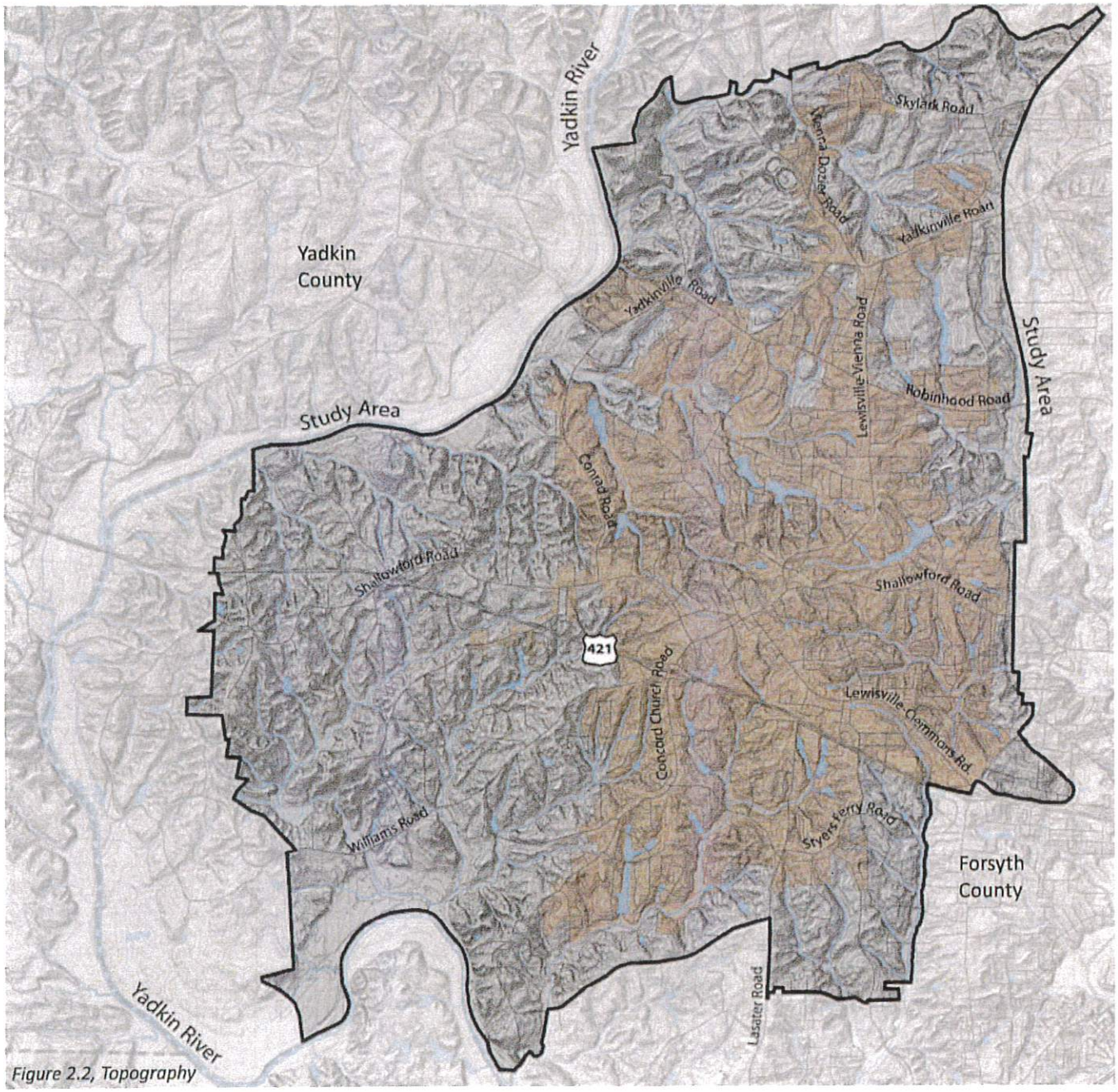


Figure 2.2, Topography

Topography

The Study Area is located in the foothills of the Piedmont and contains a large amount of topographic change. There are several ridgelines that exist in the Study Area, with a dominant ridgeline running north/south along Lewisville-Vienna Road.

Topography will influence the development of trails and sidewalks in terms of feasibility, accessibility, views, and sight lines. There are instances where topography and slope will be a limiting factor in the trail and sidewalk development.

Figure 2.2 illustrates four foot topographic contours for the Study Area. Contour data is based on 2007 LIDAR (Light Detection And Ranging) elevation data from the North Carolina Department of Transportation. Topographic surveys should be obtained during the design and layout of the actual greenway trails and sidewalks.

Legend

- = Town of Lewisville
- = Study Area
- = Roads
- = Four Foot Contours
- = Water
- = County Boundary

SCALE: 1"= 6500'

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Slope Analysis

The topography in the Study Area is varied, from gently sloping rolling hills to steep slopes. A large portion of the Study Area has slopes of five to ten percent and slopes exceeding twenty percent are common, as shown in Figure 2.3. Steep slopes adjacent to the tributaries are common throughout the Study Area, and often create challenges for accessibility.

The data for the slope analysis is based on LIDAR (Light Detection and Ranging) from the North Carolina Department of Transportation and does not represent survey quality data.

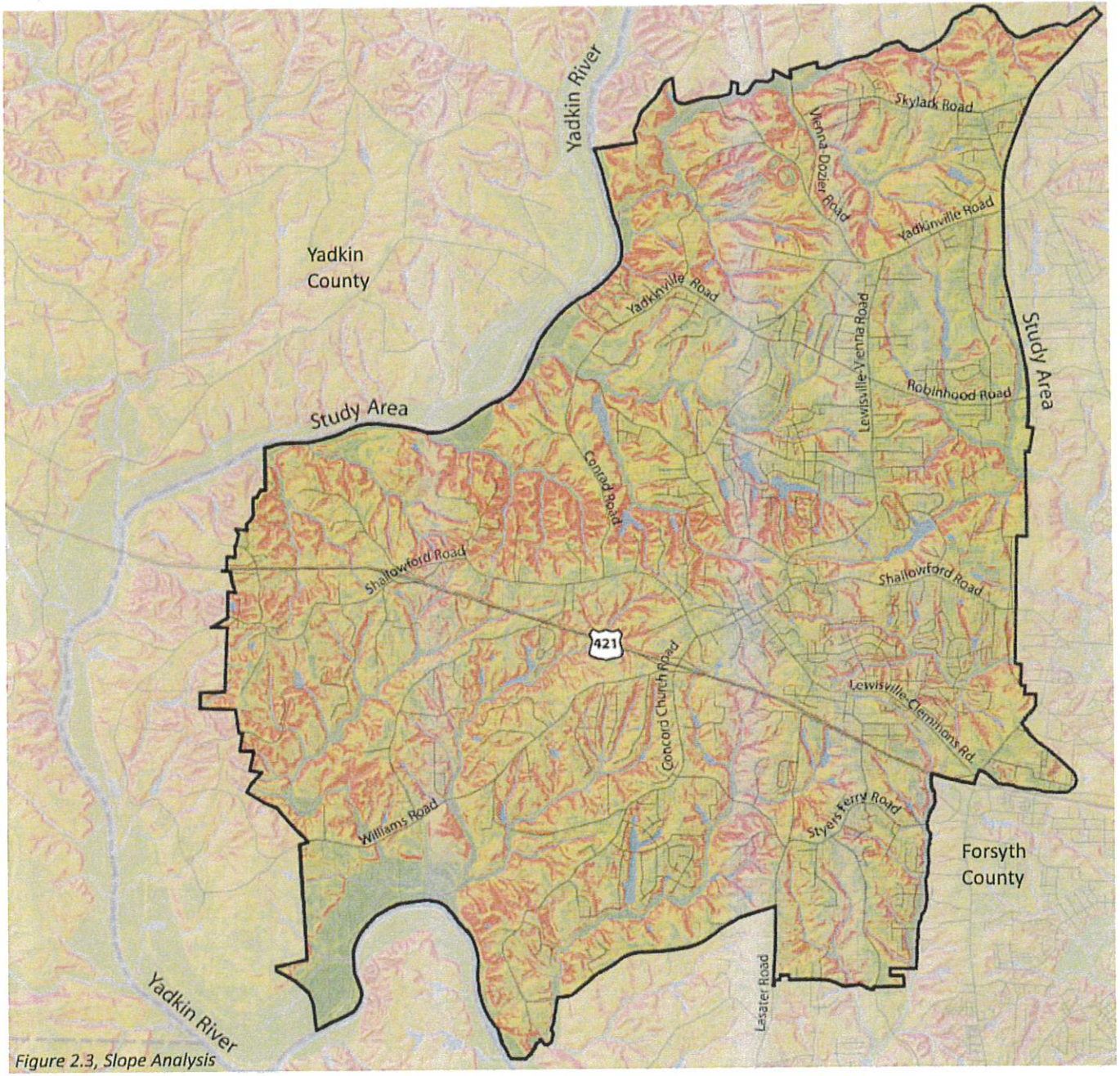


Figure 2.3, Slope Analysis

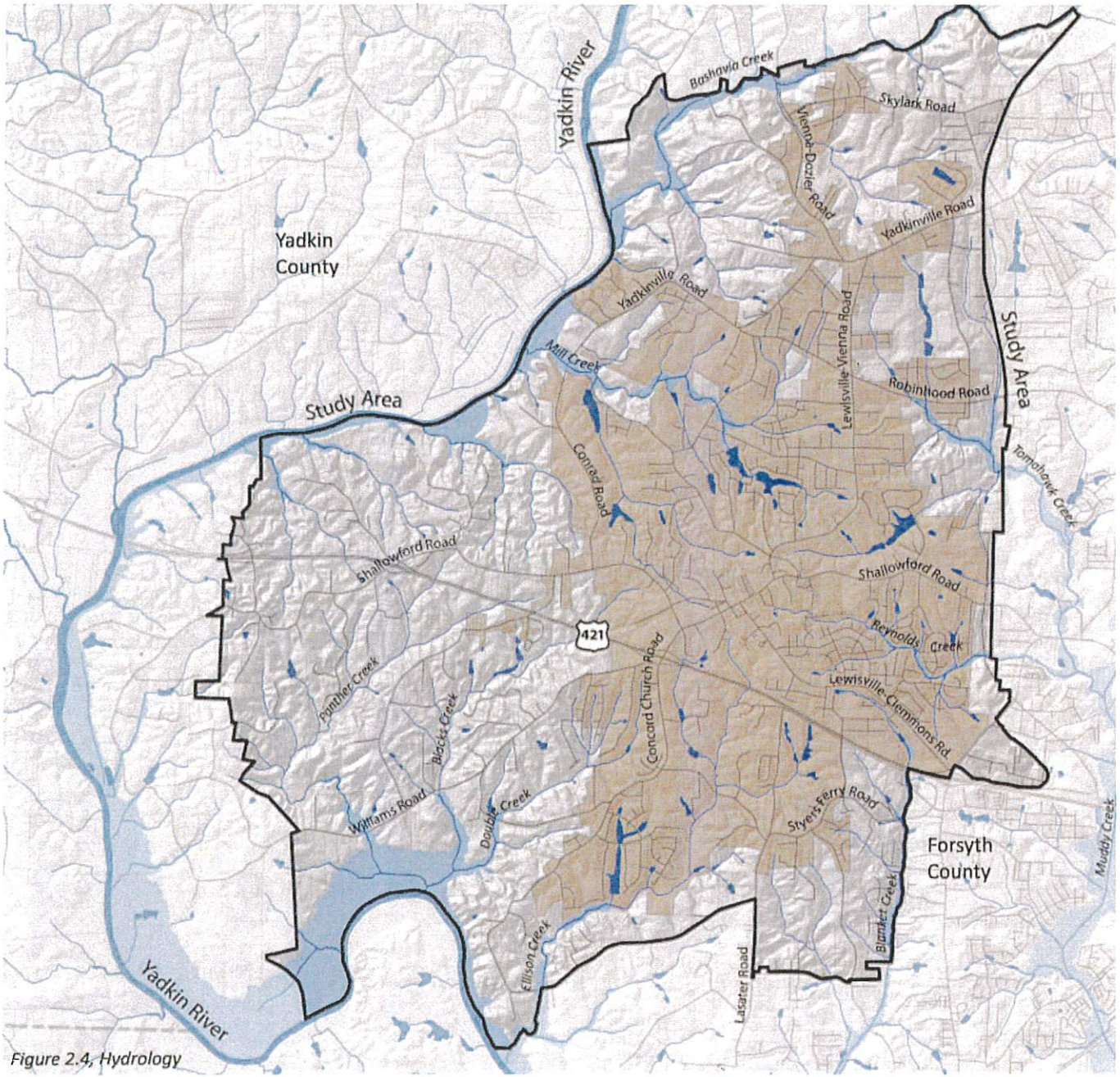


Figure 2.4, Hydrology

Hydrology

There are many creeks and tributaries located in the Study Area, as shown in Figure 2.4. Due to the topography and elevations, the creeks flow primarily from the high points in the center of the Study Area to the Yadkin River in the west and south as well as Muddy Creek to the east.

The creeks and rivers within the Study Area are classified as Class C and Water Supply-IV by the North Carolina Division of Water Quality. Water Supply-IV are waters protected as sources of water supply and are generally in moderately to highly developed watersheds or protected areas. Class C waters are protected for uses such as recreation, fishing, wildlife, and agriculture.

Zoning

A majority of the zoning within the Study Area consists of Agricultural/Conservation and Low Density Residential, as shown in Figure 2.5. Medium and High Density Residential as well as Commercial/ Business Development occurs mainly in the eastern side of the Study Area, closer to the City of Winston-Salem and within the boundary of the Town of Lewisville.

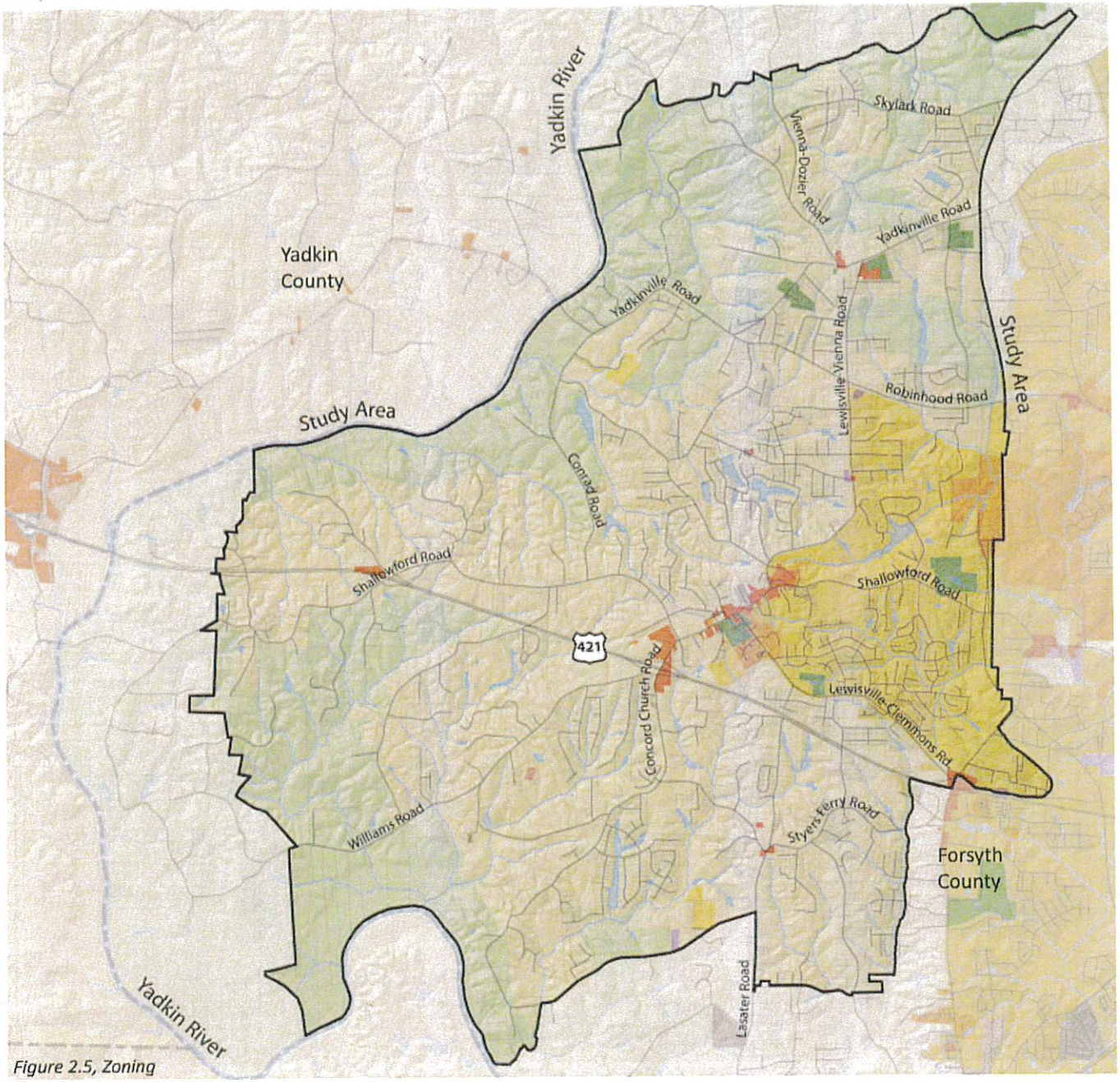


Figure 2.5, Zoning

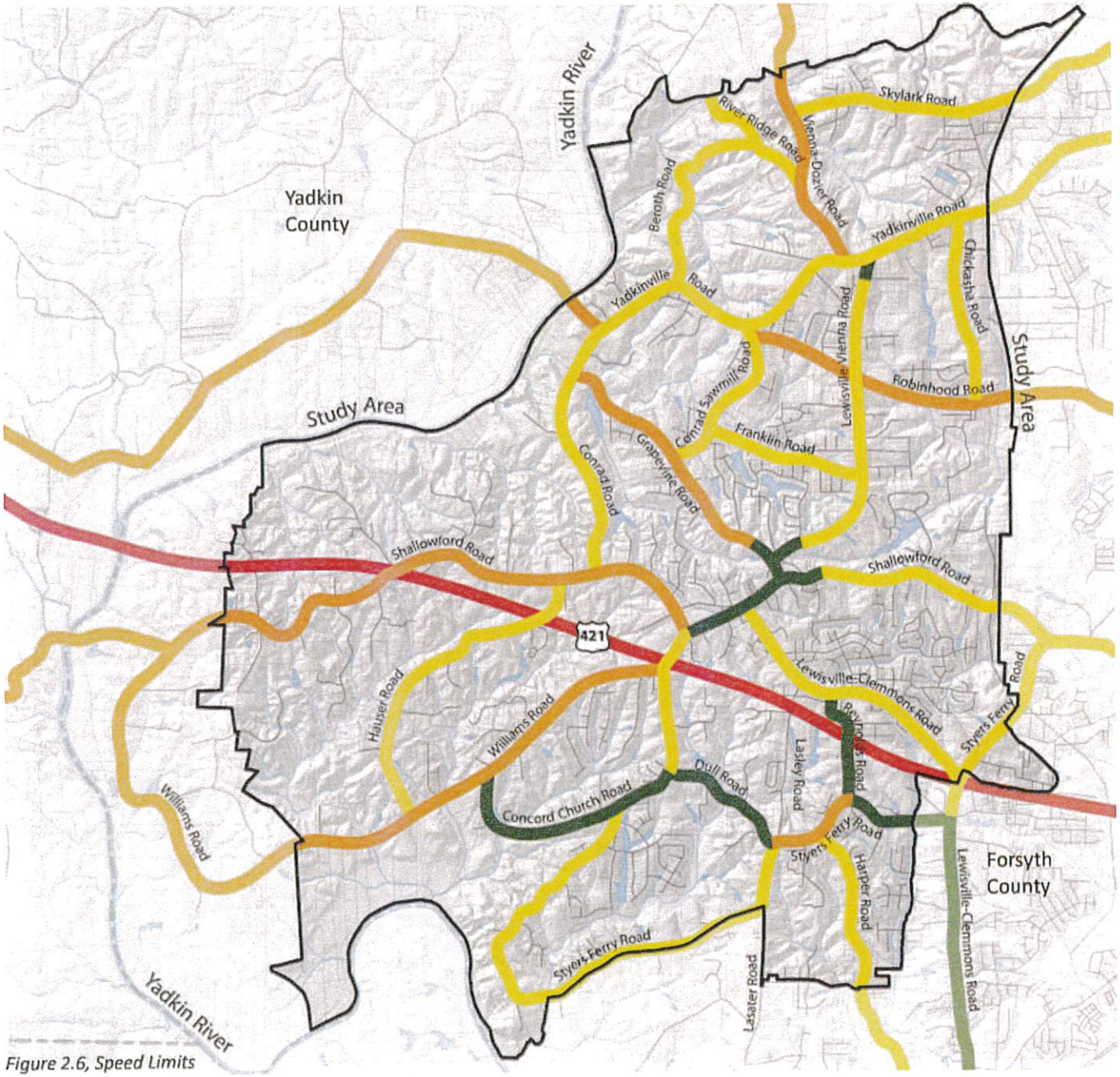


Figure 2.6, Speed Limits

Speed Limits

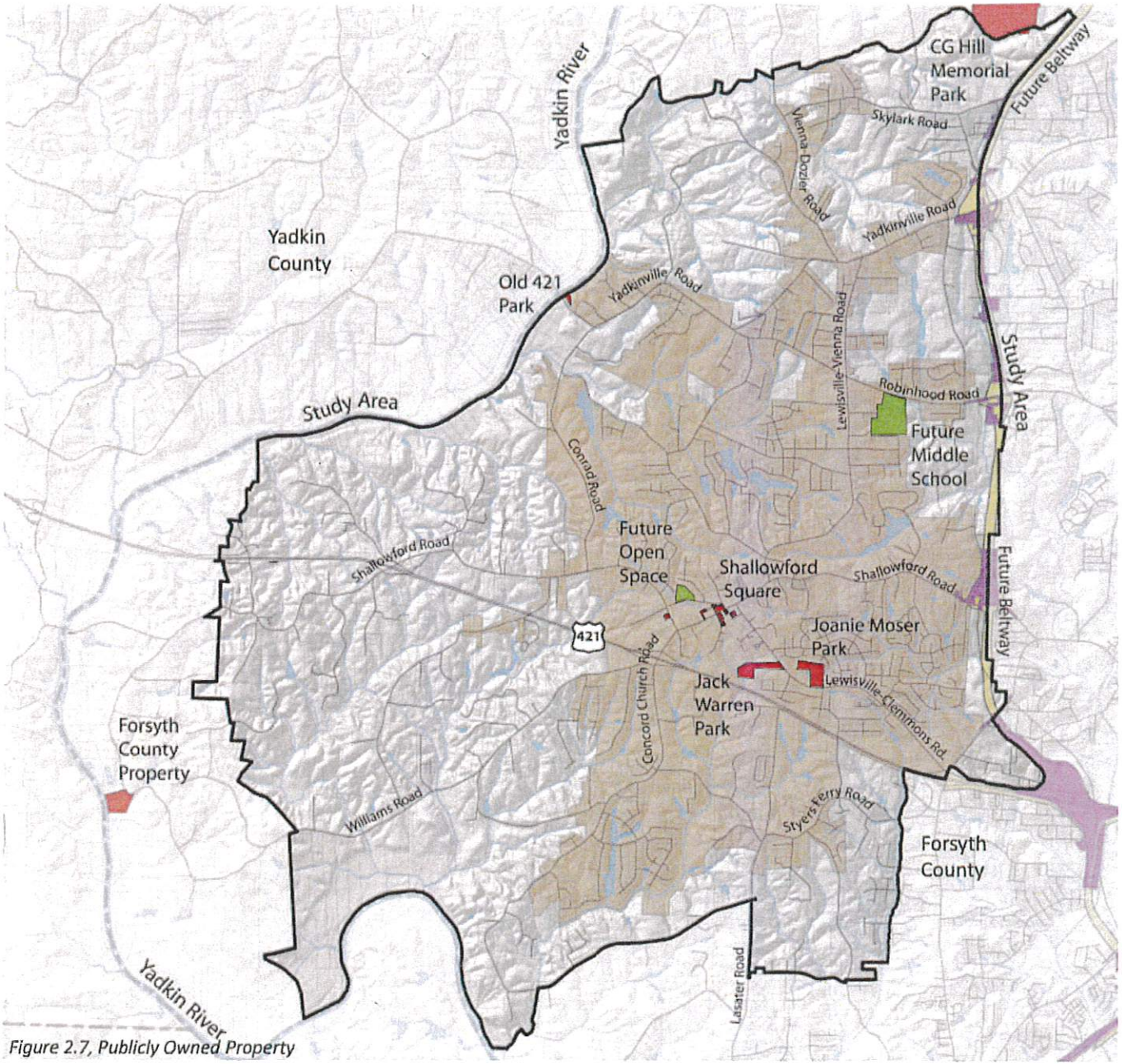
Speed limits will influence the development of the pedestrian network in the Study Area. Most of the roads located within the Study Area have speed limits of 45 mph or higher. In preparation for planning of trails and sidewalks, providing pedestrians a safe place to walk adjacent to the roadways will be an important consideration.

Figure 2.6 highlights the speed limits throughout the Study Area.

Publicly Owned Property

Publicly owned property in the Study Area is located primarily around downtown Lewisville as well as along the eastern edge of the Study Area in the future Beltway corridor.

Figure 2.7 shows the property owned by the Town of Lewisville, Forsyth County, the State of North Carolina, as well as North Carolina Department of Transportation.



Legend

- = Town of Lewisville
- = Existing Public Properties
- = Future Public Properties
- = Future Beltway
- = NC DOT Properties
- = Study Area
- = Roads
- = Parcels
- = Water
- = County Boundary

SCALE: 1"= 6500'

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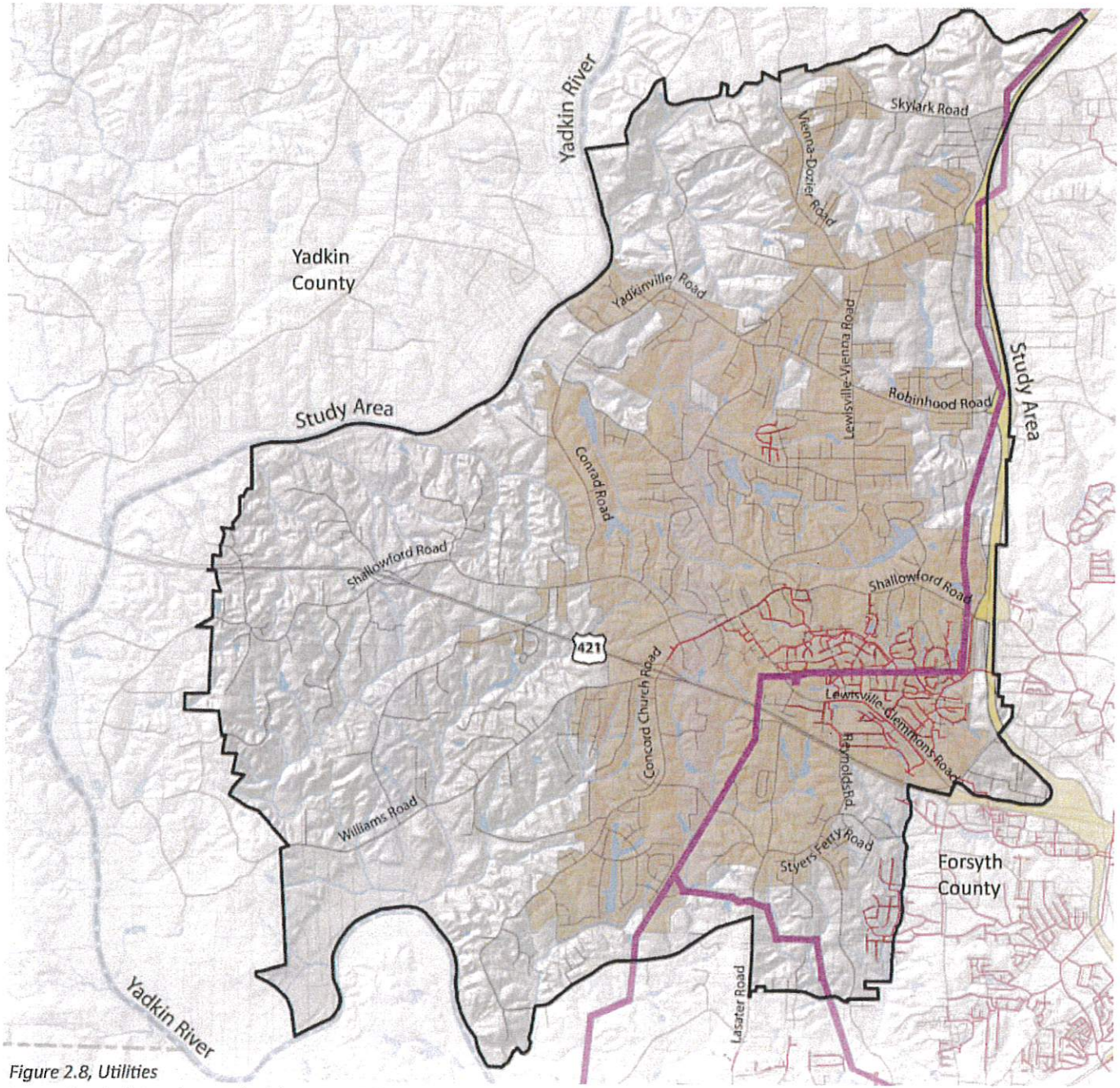
Figure 2.7, Publicly Owned Property



Utilities

A small section of the Town of Lewisville is serviced by water and sewer, primarily surrounding the downtown area and the Lewisville-Clemmons Road corridor, as shown in Figure 2.8.

A Duke Energy Transmission line runs through the southern portion of the Study Area to a substation near Joanie Moser Park. From the substation, the transmission line then runs east approximately 1.8 miles to the eastern edge of the Study Area, then runs roughly parallel to the future Beltway.

Legend

- = Town of Lewisville
- = Duke Energy Easement
- = Local Water/Sewer Easement
- = Future Beltway
- = Study Area
- = Roads
- = Water
- = County Boundary

SCALE: 1"= 6500'

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Figure 2.8, Utilities

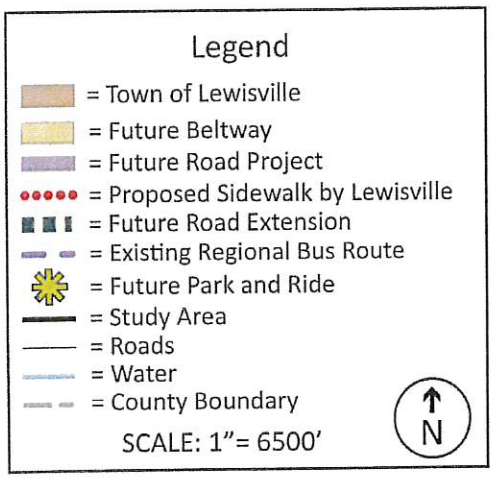
Susan Hatchell Landscape Architecture, PLLC

Road Projects and Transit

Future road projects are planned throughout the Study Area on most of the major transportation corridors, as shown in Figure 2.9. These road improvement plans offer opportunities for future sidewalks and bike lanes.

Future road improvements include projects such as new road construction and accommodation for bicycle lanes.

There are limited existing transit choices within the Study Area as shown in Figure 2.9. A regional bus route exists on US 421, but the remainder of the Study Area does not currently have access to a transit network. A proposed Park and Ride near the intersection of US 421 and Lewisville-Clemmons Road will offer additional transit opportunities in the future.



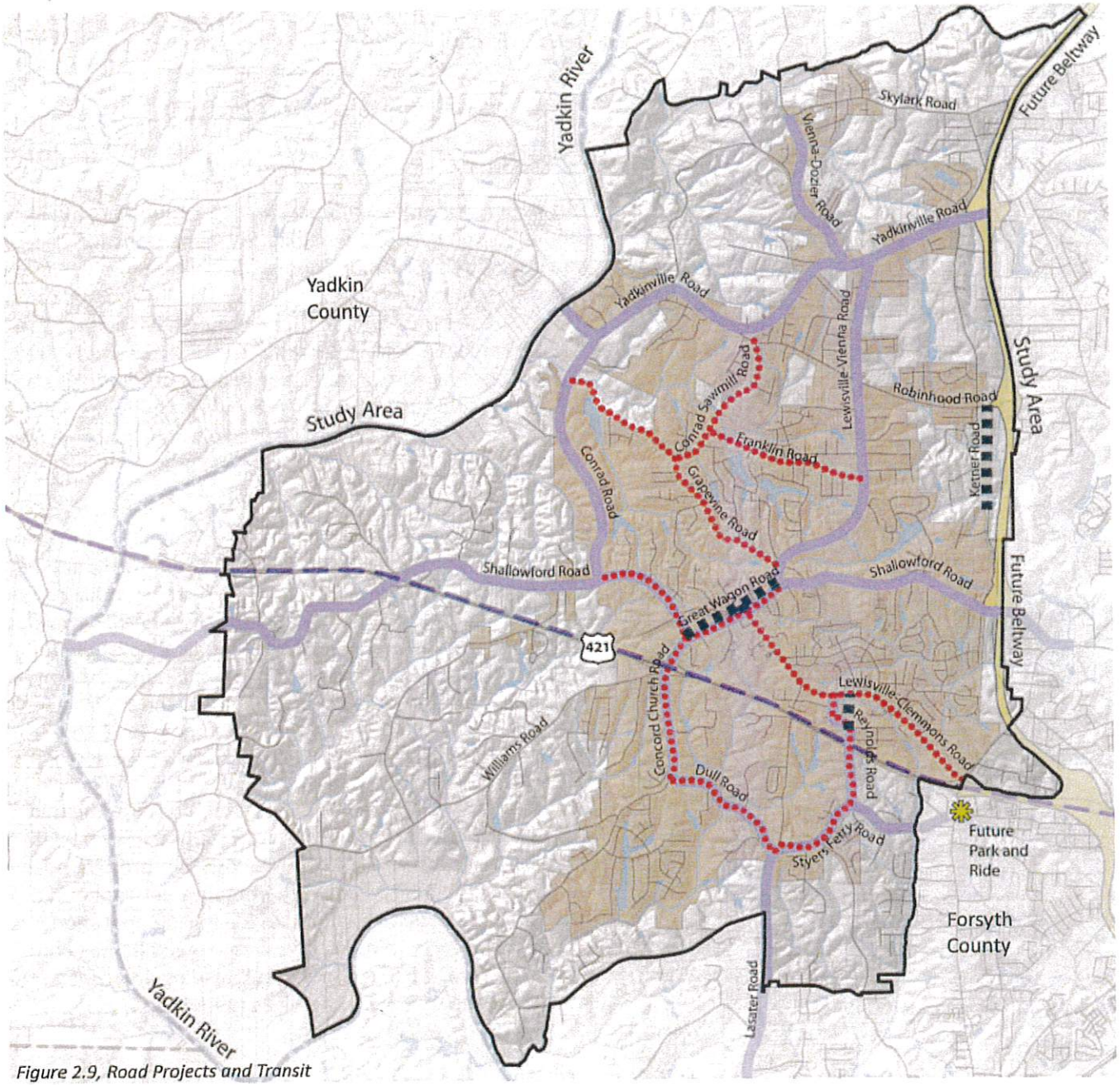
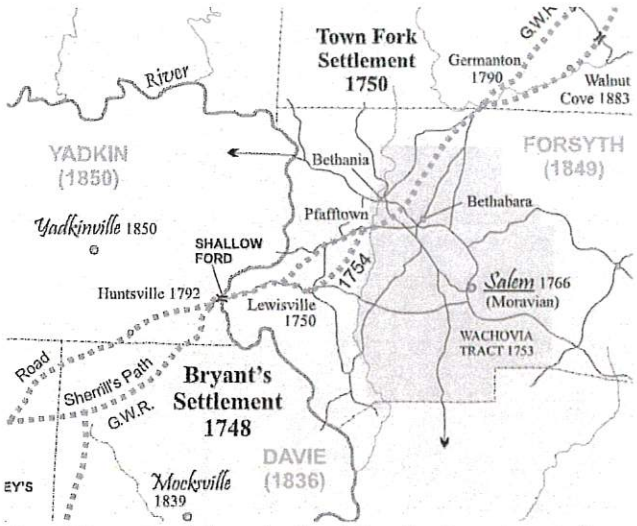


Figure 2.9, Road Projects and Transit



Great Wagon Road, from the North Carolina Department of Cultural Resources

Nissen Wagon, Shallowford Square

History and Points of Interest

Early History

This region has a long and interesting history, beginning with the American Indians who populated the area and utilized the Yadkin River for transportation, trading and sustenance. The Yadkin River was originally called the "Sapona" in the early 18th Century, and the origin of the name "Yadkin" is uncertain. Nomadic native peoples settled in seasonal camps along the river. The Donnaha people lived at the "Great Bend" area of the river north of the Study Area. Remnants of their culture are found in over 100 archaeological sites within or near the Study Area. They used the fertile floodplains along the river for farming corn, beans, squash and gourds. They also hunted deer, squirrel, wild turkey, raccoon, beaver, fox, and turtle. Stone fishing weirs that were utilized by American Indians for trapping fish can still be seen in some places when the water is at low levels. Around 1710, American Indians of the Yadkin began a 50-year exodus from the area.

European and Colonial Settlements

As settlement of the back country of the Southern United States by German and Scots-Irish immigrants expanded, the Great Wagon Road from Pennsylvania to Georgia became the most popular route. The Great Wagon Road was at one time the most heavily traveled road in the country. Heavier wagons could only cross the Yadkin at the Trading Ford near Salisbury and the Shallow Ford, a gravel and sand bar. The depth of the river there is about 18" during normal to low water levels. Because of the crossing, several roads converged on both sides of the river, and towns and villages soon followed, including the Town of Lewisville. The site later became important in both the Revolutionary and Civil Wars. The Shallow Ford is on private property, but it can be viewed about 500 yards downstream from the Old US 421 Bridge.

Incorporated in 1991, Lewisville's history began in the mid 1770's as pioneers passed through the area. Lewis Laugenour donated land for development in the late 1850's on Shallowford Road, which was the original Great Wagon Road. The Shallow Ford brought business to the town, and helped it grow to what it is today. The Roller Mill (which operated between 1910 and 1984) continues to be the center of the community of Lewisville, although it's milling operation has ceased. The Nissen Wagon in Shallowford Square is a great reminder of how far Lewisville has come since the days pioneers were crossing the Shallow Ford. It is housed in a small building adjacent to the square. There are also numerous historic churches within the area, as well as the Nissen House and Jones Grocery Store.

Points of Interest

Figure 2.10 shows various points of interest around the Lewisville area including:

- The Great Wagon Road and the Shallow Ford
- Jones Grocery Store
- Historic Churches
- Nissen Wagon at Shallowford Square
- Revolutionary and Civil War historical sites
- The Roller Mill built in 1910 and in operation until 1984
- West Central Community Center
- Westbend Vineyards

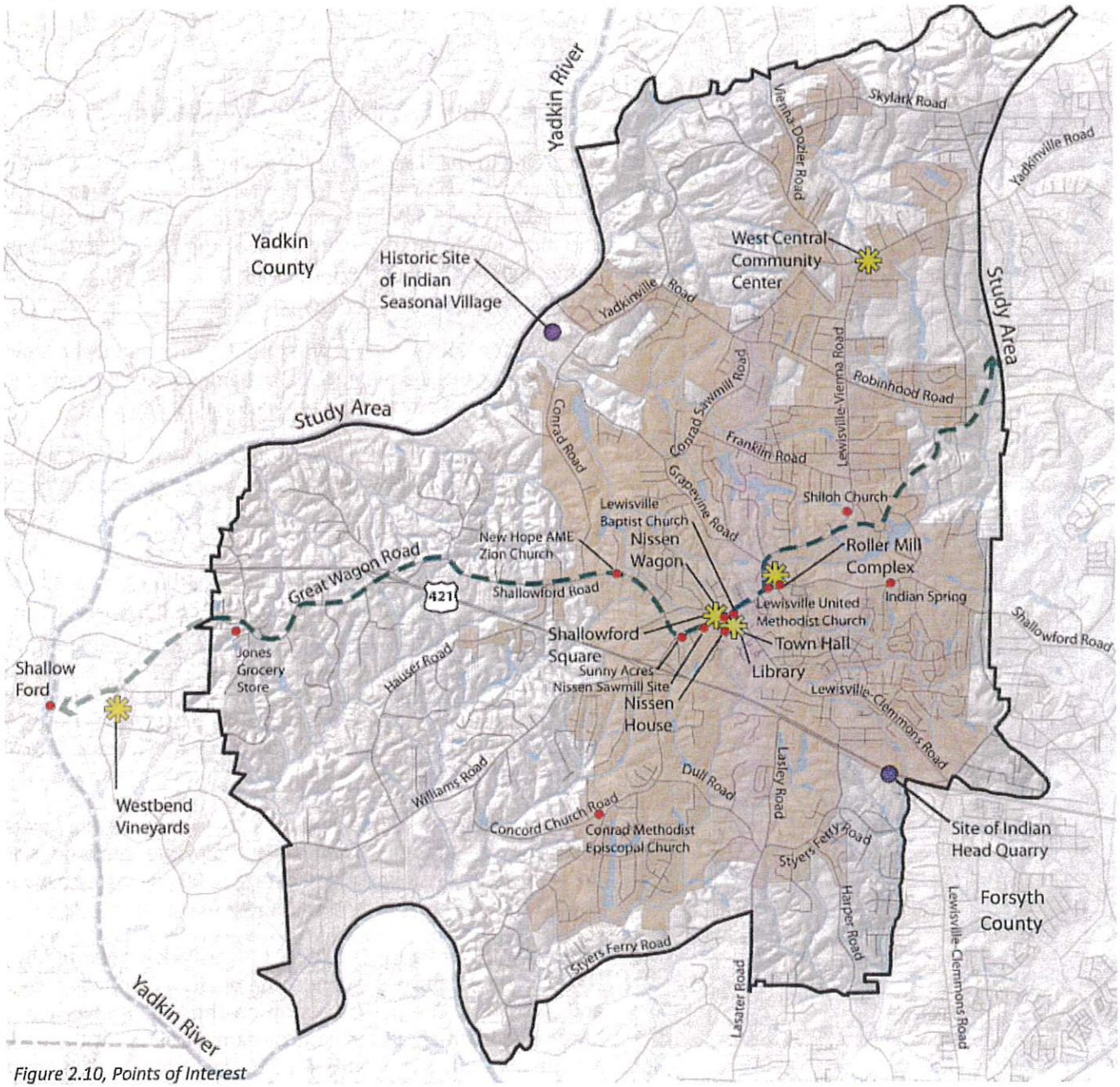
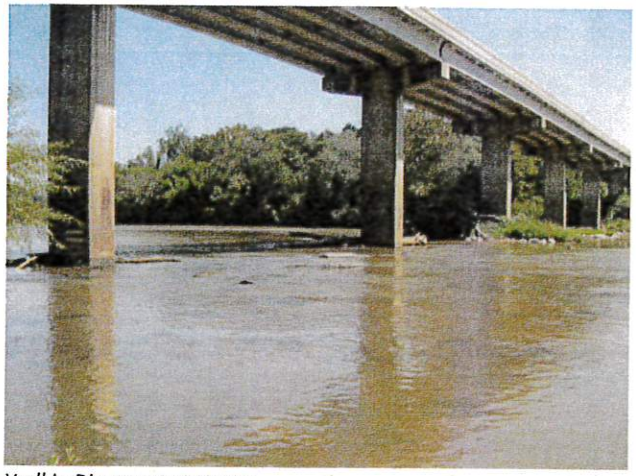
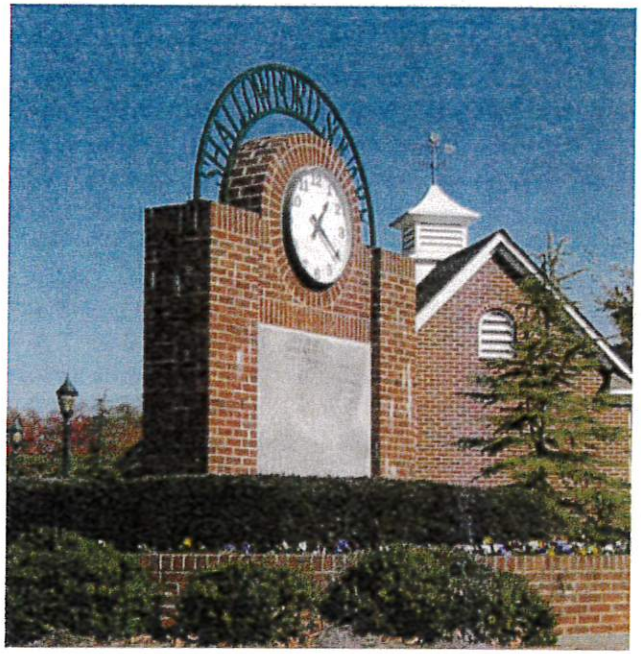


Figure 2.10, Points of Interest



Yadkin River canoe access



Shallowford Square

Recreational Facilities Needs Assessment

According to the National Survey of Recreation and the Environment (NSRE) in 2007, the most popular outdoor recreation activity for the North Region of North Carolina is walking for pleasure with 83.7% of residents participating, which is slightly above the state average of 82%. Walking for pleasure was the most highly rated activity in all of the regions in North Carolina. Second in importance is family gathering (74.4%), third is gardening or landscaping for pleasure (60.1%), and fourth is viewing and photographing natural scenery (56.6%).

The Winston-Salem and Forsyth County Parks and Open Space Plan 2015 shows walking and biking as rated among the top recreational activities enjoyed by residents. Walking and biking trails were ranked as the most urgently needed recreational facilities in the community.

It is important to make connections between existing and proposed recreational resources such as parks, trails, and greenways to create longer linkages and better access for pedestrians.

Forsyth County

Tanglewood Park – Located south of the Study Area in the Village of Clemmons, Tanglewood Park at 1,200 acres is the largest park in Forsyth County. Operated and maintained by the Forsyth County Parks and Recreation Department, the park offers a variety of facilities and amenities such as playgrounds, fishing at Mallard and Skilpot Lakes, paddle boat rentals at Mallard Lake, tennis, RV camping, golf, swimming, concert shell, athletic field, picnic shelters, hiking, equestrian and mountain biking trails, horse stables, a BMX track, Arboretum and the Manor House Bed and Breakfast. Numerous community events are held at the park including the Tanglewood Cup Steeplechase Race, the Festival of Lights, Easter Egg Hunts, and many others.

Joanie Moser Park – This 18-acre community park in Lewisville is operated by the Forsyth County Parks and Recreation Department. It offers two tennis courts, a softball field, a sand volleyball court, a horseshoe pit, a half basketball court, a 700 linear foot asphalt walking path, a playground, restrooms, and a 130-person capacity picnic shelter.

Old US 421 River Park – Old US 421 River Park is operated by the Forsyth County Parks and Recreation Department for the primary purpose of allowing public access to the Yadkin River for canoeing, fishing and picnicking. The park is a stop on the Yadkin River Paddle Trail, and a portage is located at the lower level dam about a mile upstream. Facilities at the park include a sand volleyball court, swings, a horseshoe pit, picnic tables, a 900 linear foot walking path, a concrete ramp for river access, and

a chemical toilet. This is a popular spot for cyclists to begin and end bike trips as they often use the parking provided here.

C.G. Hill Memorial Park – This 73-acre park has a rich history and offers a good location for small group gatherings. The park has an asphalt trail system for park walkers and bicycle riders, a picnic area, restroom building and a gazebo/courtyard nestled in the woods overlooking the two and one-half acre fishing lake. There is a yellow poplar that is over 500 years old that serves as a park attraction and gathering space.

Town of Lewisville

Jack Warren Park – This 15-acre park is a newly dedicated Town of Lewisville park. Facilities include walking trails, multi-purpose fields, bocce ball courts, playgrounds, and a pavilion.

Shallowford Square is a park located in downtown Lewisville. Facilities include a pavilion and amphitheater for outdoor movies, musicals, concerts, as well as public space for celebrations, carnivals, and charity events. The park also serves as a meeting place for cyclists in the area.

Greenways

Muddy Creek Greenway, managed by the City of Winston-Salem, is an asphalt paved greenway trail that is nearly three miles long. It is connected to several residential developments, Meadowlark Elementary and Middle Schools as well as the future Jamison Park. The greenway is heavily used and there are plans to extend it in the future. Tomahawk Creek Greenway, located in the southeast portion of the Study Area is a greenway proposed by the City/County Planning Board and is part of their Greenway Master Plan.

Paddle Trails

The Yadkin River Paddle Trail runs for 126 miles from the W. Kerr Scott Reservoir in Wilkesboro, NC, through the Study Area, see Figure 2.11. It is the longest river trail in North Carolina's trail system and includes developed access to various sites. These sites include Shoals access, Donnaha access, Old U.S. 421 River Park access and Tanglewood Park access. Two of these access points are located within the area, Old 421 Park access and the Huntsville access. Old 421 Park access offers parking, picnicking, and sanitary facilities. The Huntsville access is undeveloped at present and is located off Shallowford Road.

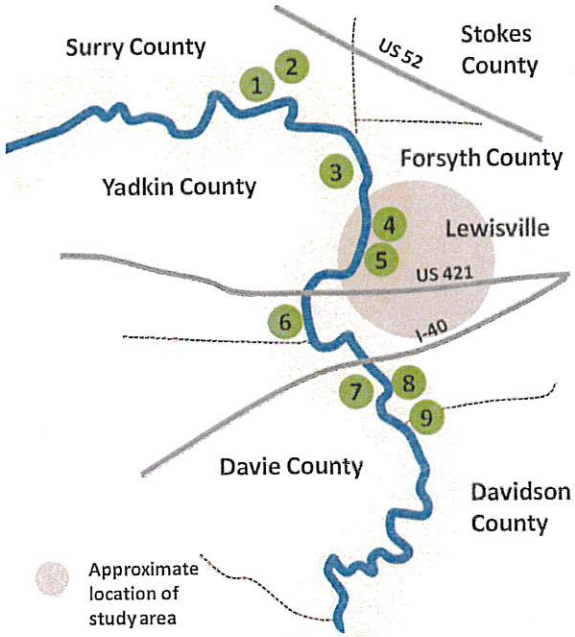
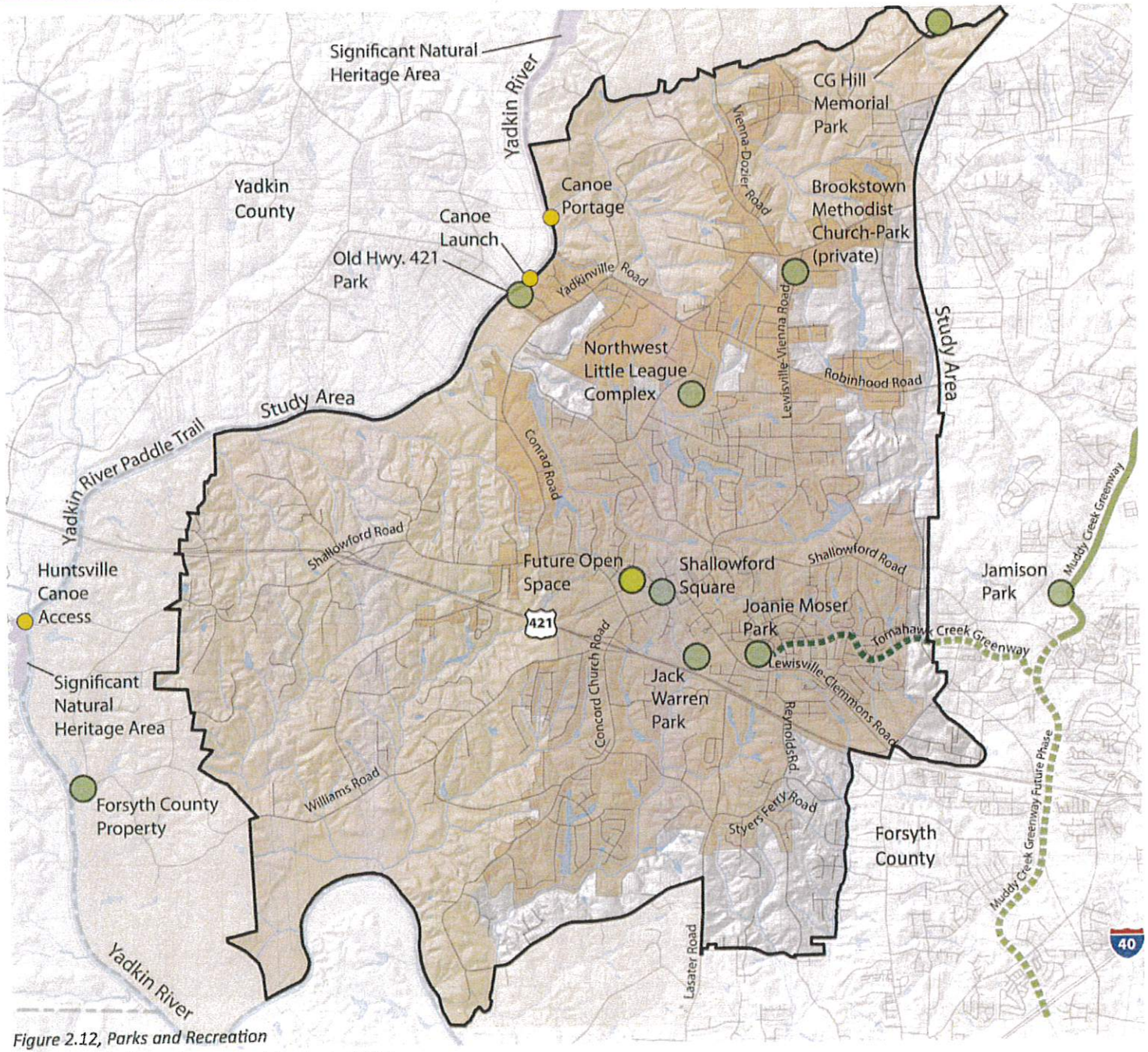


Figure 2.11, Yadkin River Paddle Trail

1. Shoals access
2. Pilot Mountain State Park
3. Donnaha access
4. Old U.S. 421 River Park access
5. Winston-Salem water intake dam portage
6. Huntsville access
7. Proposed Riverfront Park canoe access
8. Tanglewood Park/Canoe access
9. Idols Dam Portage



Parks and Recreation

There are eight public parks and recreational facilities located within or in close proximity to the Study Area, as shown in Figure 2.12. Muddy Creek Greenway is located approximately one mile east of the Study Area.

Figure 2.12, Parks and Recreation

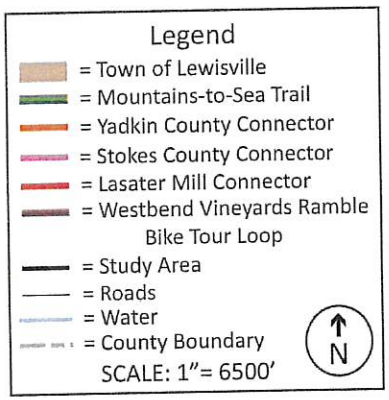
Susan Hatchell Landscape Architecture, PLLC

Existing Bike Routes

With the varied topography and rural setting of the region, cycling is a very popular activity in this area. There is an active cycling club that plays host to several cycling events throughout the year such as the Hoof and Paw Ride, RAW - Ride Around Wilkes, and the Triad First In Families Bike Ride event.

There are five signed NCDOT bike routes located within the Study Area including the Mountains-to-Sea Trail, Yadkin County Connector, Stokes County Connector, Lasater Mill Connector, Silas Creek Loop, as well as the local Westbend Vineyards Ramble Bike Tour Loop, as shown in Figure 2.13.

Most of the bike routes are along narrow roads with high speed limits that lack a shoulder or a striped bike lane. These routes would not be recommended for novice or family cyclists.



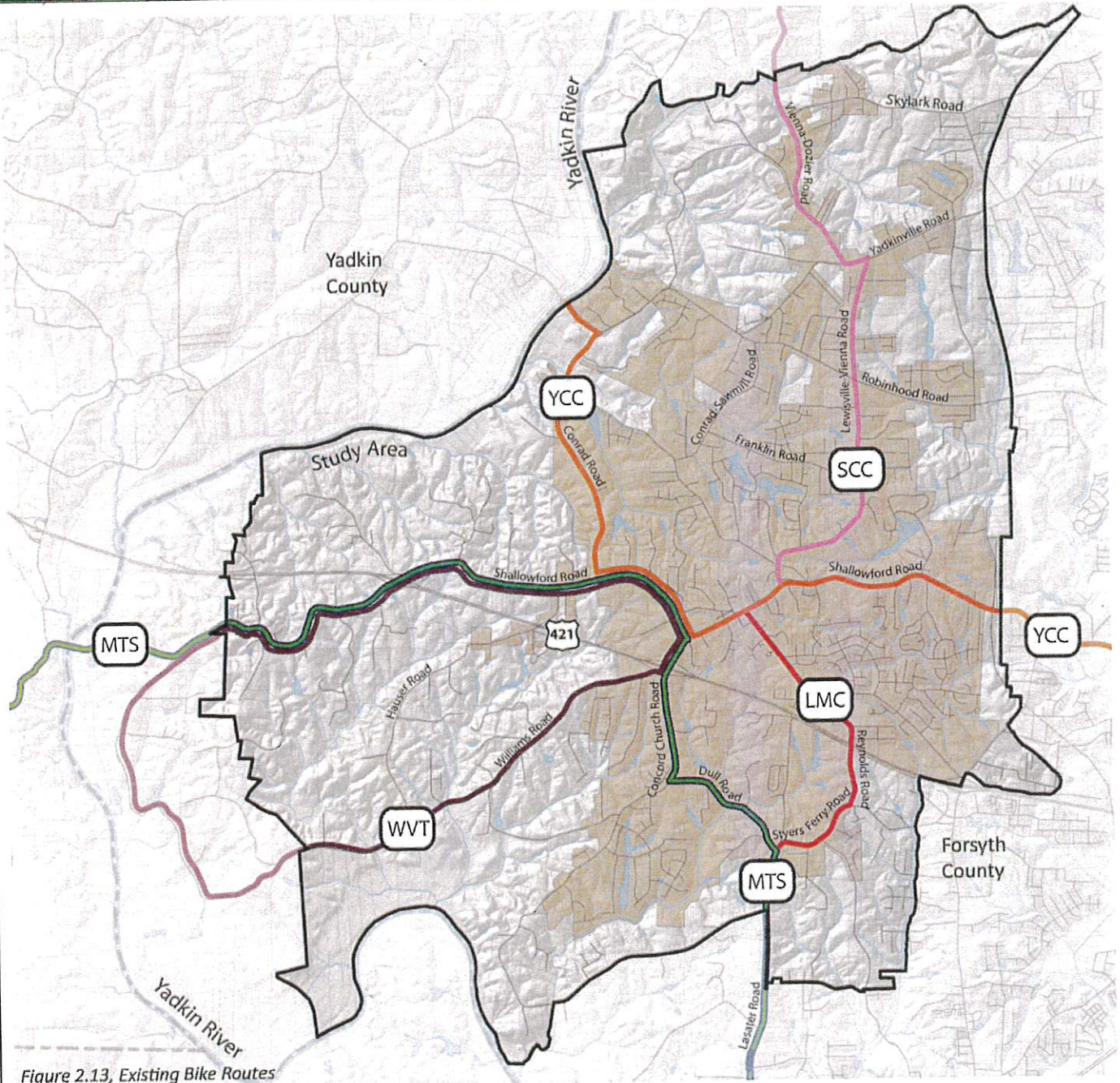
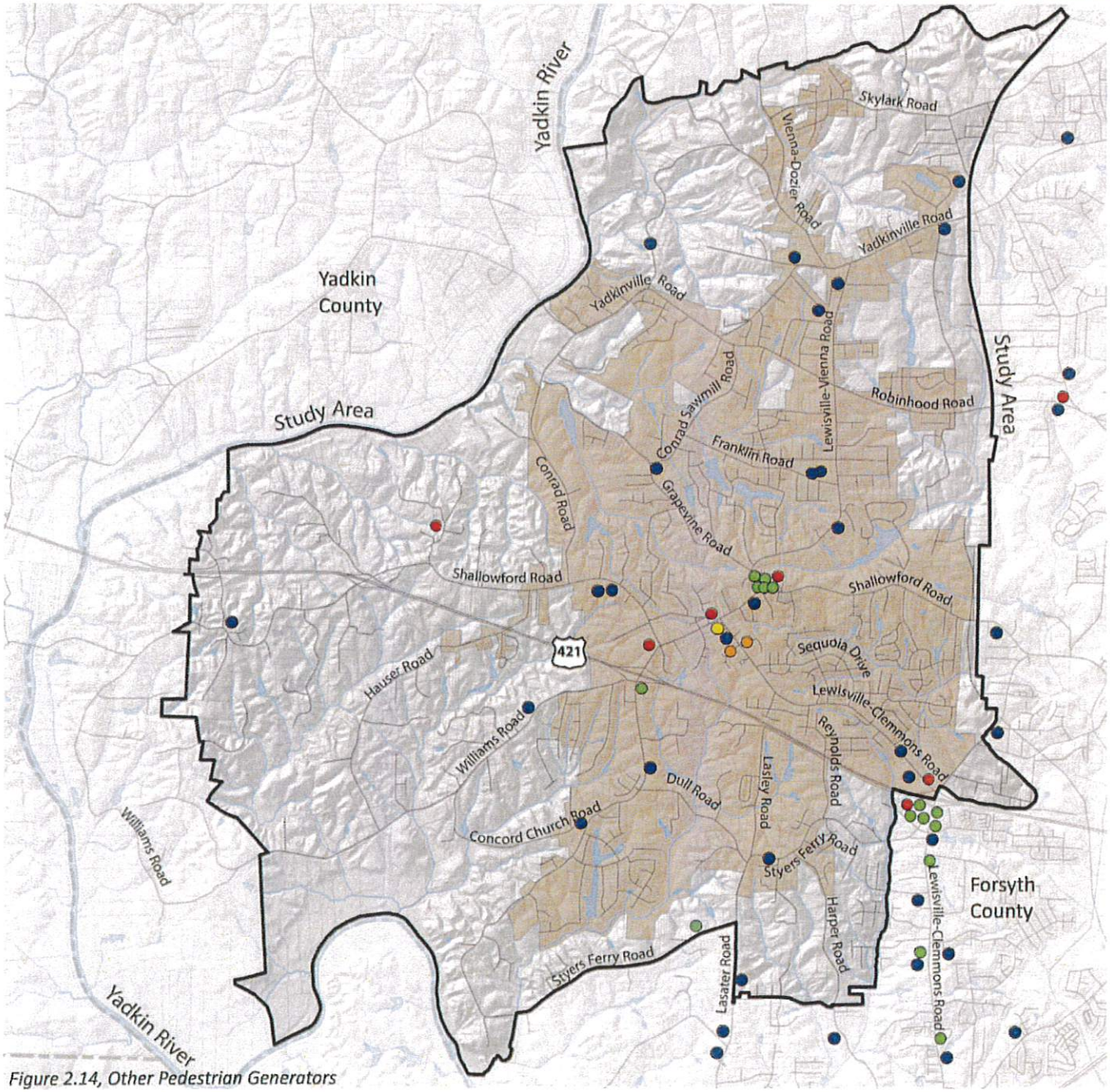


Figure 2.13, Existing Bike Routes



Other Pedestrian Generators

There are many pedestrian generators located throughout the Study Area, such as churches, apartments, commercial centers, and restaurants, shown in Figure 2.14. Analysis of these pedestrian generators help prioritize the areas where pedestrian connections would be in the greatest demand.

Legend

- = Town of Lewisville
- = Church
- = Apartments
- = Commercial
- = Restaurants
- = Post Office
- = Study Area
- = Roads
- = Water
- = County Boundary

SCALE: 1"= 6500'

N

Figure 2.14, Other Pedestrian Generators

Views and Scenic Routes

In reviewing the Study Area, the consultant mapped scenic views thought to be worth highlighting. Due to the rural character and rolling topography, the Study Area offers many beautiful scenic views, as illustrated in Figure 2.15. Corridors along the Yadkin River as well as the tree-lined Conrad Road provide for very scenic viewing opportunities. It is even possible to view Pilot Mountain from some of the road corridors in the northern portion of the Study Area.

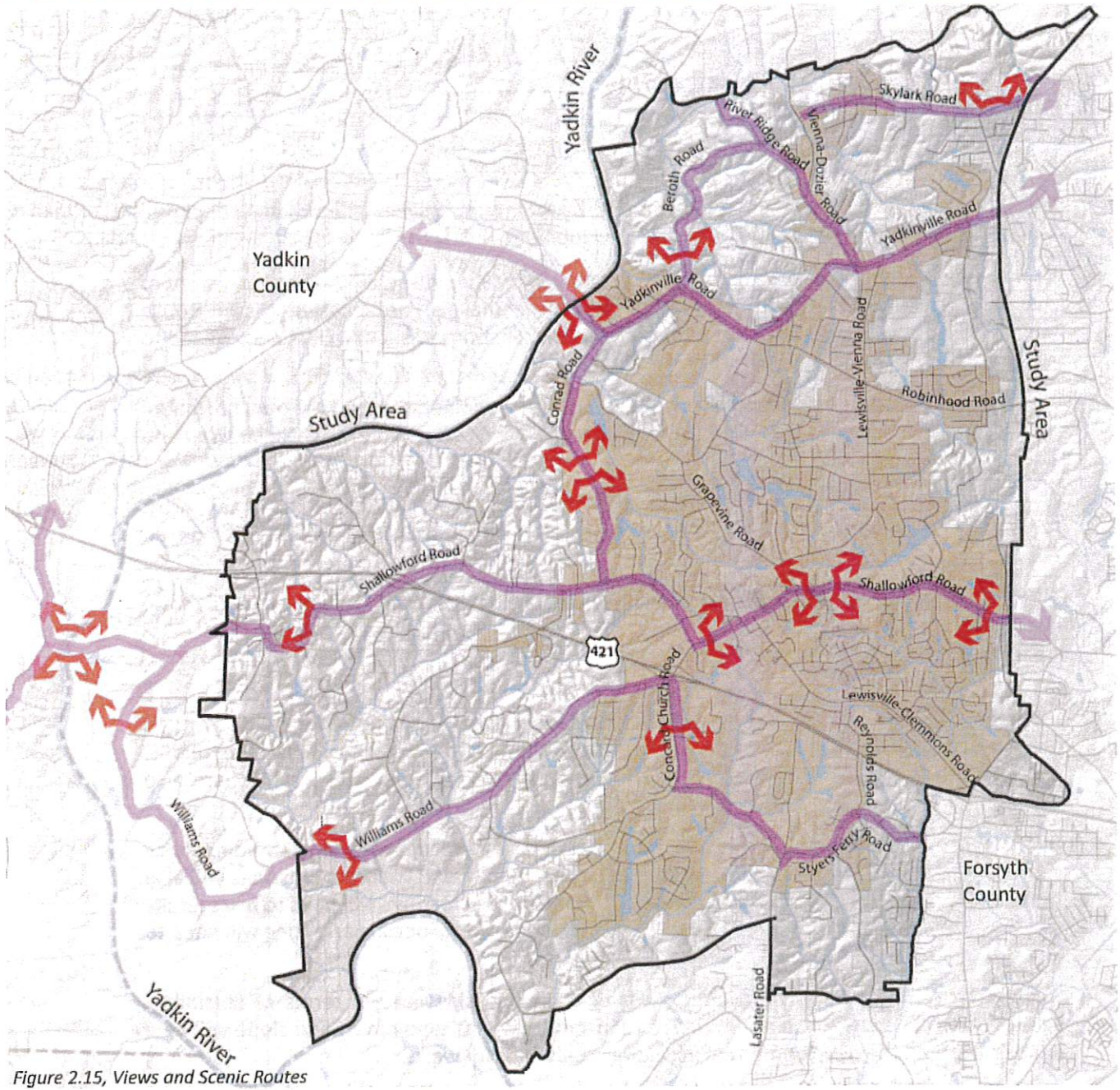


Figure 2.15, Views and Scenic Routes

Opportunities and Constraints

Opportunities

- Pleasant views and suitable conditions offered by rolling topography and broad floodplains, create ideal locations for trail and sidewalk development.
- Users who want to learn more about their community will be attracted by the rich history of the area including the historic Great Wagon Road, the Shallow Ford crossing, Nissen House and Wagon, as well as historic structures and markers. First time visitors will be encouraged to explore the area for shopping, restaurants and hotels.
- Many connections to residential and commercial development, recreation, transportation, and future developments that will ensure the greenway trails and sidewalks will be used and enjoyed by the maximum amount of people.
- Abundant natural resources and plant and animal habitats are found in the Study Area. Protection of natural resources and restoration of plant and animal habitat provide an educational opportunity for the trail users.
- The pleasant and moderate climate of the area encourages recreational activity for most of the year.

Constraints

- While the existing infrastructure in the Study Area is a great opportunity for connectivity, it does provide some challenges such as road speed limits, sight distances, slope limitations, and utility pole locations. Safe pedestrian and bicycle crossings over Highway 421 are also challenges for connectivity.
- Hydric soils and wetlands are not conducive to trail and sidewalk development. Avoiding these conditions will eliminate costly engineering solutions. Stream and tributary crossings will also be needed at various points along the greenway trails. These crossings will need to be carefully sited to avoid impacting regular drainage flows and flood issues. Special permitting will need to be acquired for many of these crossings.
- Topography will influence the development of trails and sidewalks in terms of feasibility, accessibility, views, and sight lines. There are instances where topography and slope will be a limiting factor in the development of accessible trails and sidewalks.

CHAPTER THREE: Greenway and Pedestrian Connections Plan

Introduction

The Town of Lewisville has a great opportunity to add a network of interconnected greenways and sidewalks to expand passive recreation opportunities and to increase public accessibility within the area. This Greenway and Pedestrian Connections Plan also creates existing and anticipated linkages for pedestrians to existing infrastructure maintained by public and private entities. This plan also encourages the expansion of Lewisville's parks and recreational facilities by providing additional opportunities for fitness and wellness, particularly at those sites which would link existing open space areas.

The existing greenway plan was reviewed and particular greenway trails and sidewalk segments were chosen based on certain criteria. Criteria such as speed limits, road type, accessibility, sight distance, slope, floodplain/wetland locations, schools, parks and open space, other publicly owned properties, future road projects, as well as pedestrian generators such as churches, apartment complexes, libraries, retail centers and transit connections are part of the analysis to determine the proper recommendation for the alignment of the pedestrian network.

Yadkin River

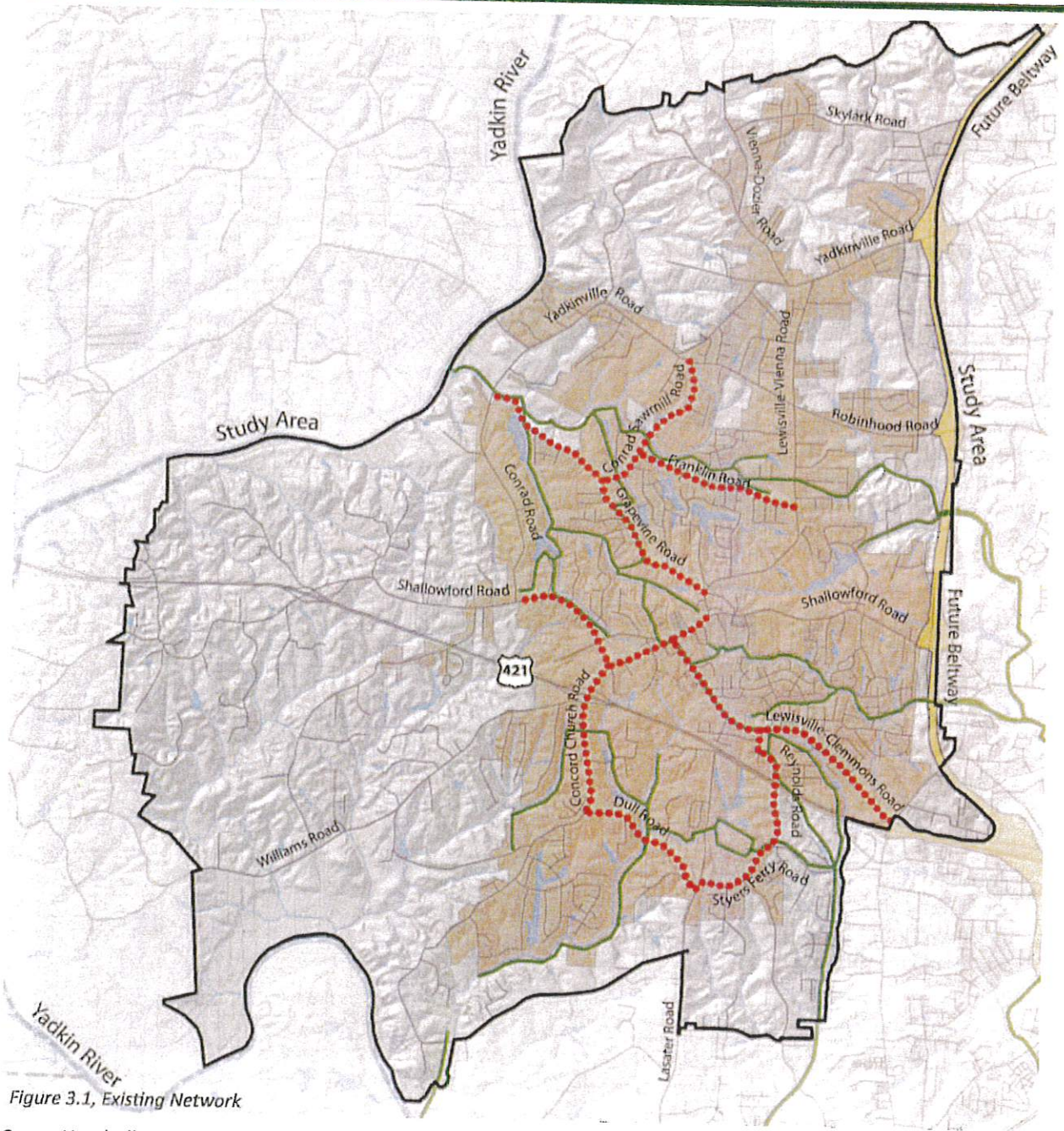


Figure 3.1, Existing Network

Existing Plan

The Winston-Salem City/County Planning Board and the Winston-Salem MPO had created a greenway network plan that is part of the Town's Greenway Master Plan. The plan includes greenway trails primarily following utility easements. See Figure 3.1.

This plan provides no connectivity to the north or west portions of the Study Area.

Legend

- = Town of Lewisville
- = Proposed Sidewalk by Others
- = Proposed Greenways by Others
- = Future Beltway
- = Study Area
- = Roads
- = Water
- = County Boundary

SCALE: 1"= 6500'

N

Overall Existing Street Types

Figure 3.2 shows the overall street types that occur in the Lewisville Study Area. Street types include Freeways, Major Thoroughfares, Boulevards, Minor Thoroughfares, Collector Streets and Local Streets.

Street types vary based on width, speed limit, level of connectivity, as well as level of use. The level of use is described by Average Daily Trips (ADT). ADT is measured by the number of vehicles passing a specific point in a 24 hour period.

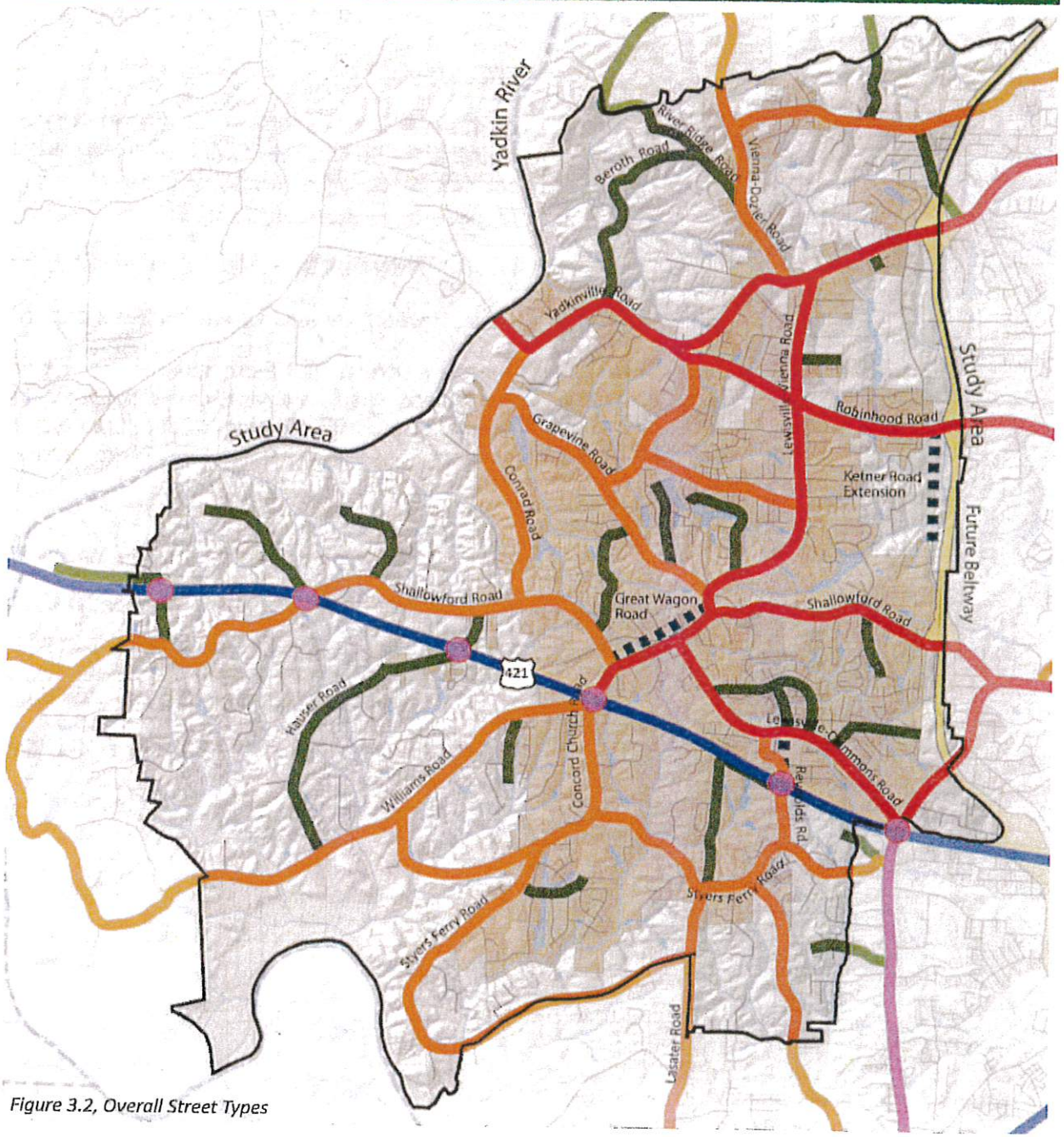


Figure 3.2, Overall Street Types

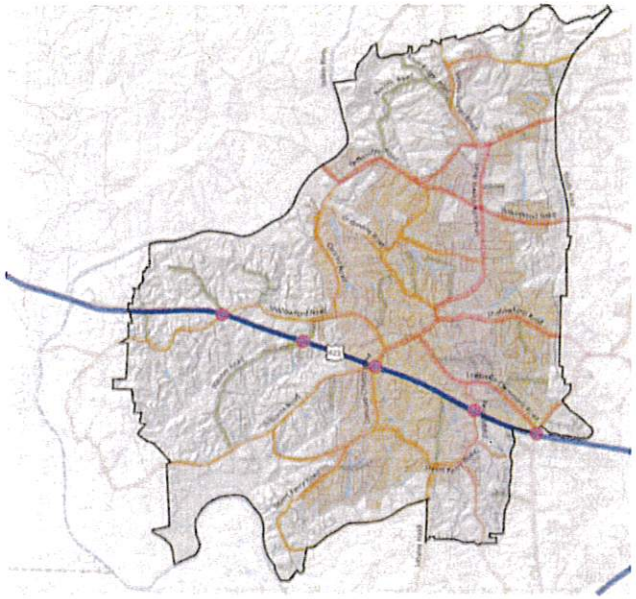


Figure 3.3, Freeways (not to scale)

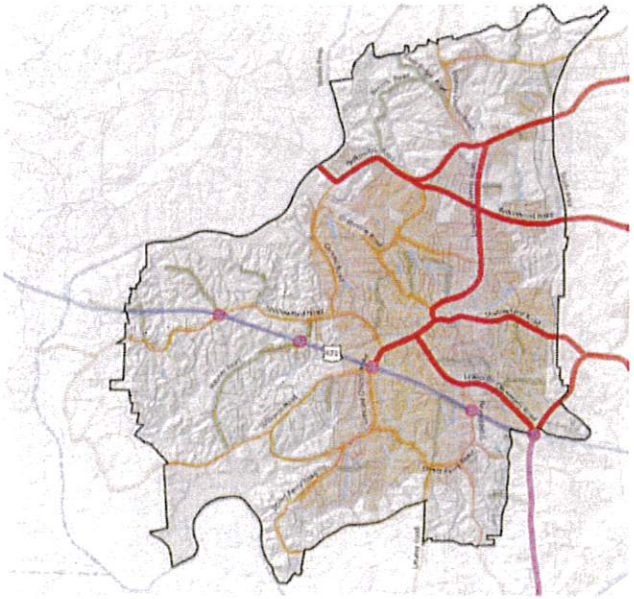


Figure 3.4, Major Thoroughfares and Boulevards (not to scale)

Freeway

US 421 is shown in blue in Figure 3.3. It has high volume of vehicular traffic, speed and capacity and connects the Town of Lewisville to regional destinations. The right of way width varies from 120' to 180' across four or more lanes of traffic and the typical speed is 55-65 mph. US 421 is not appropriate for pedestrians due to high speed.

Major Thoroughfare/Boulevard

(Major Thoroughfare shown in red, Boulevard shown in magenta on Figure 3.4)

There are seven major thoroughfares and one boulevard in the Town of Lewisville: Yadkinville Road, Styers Ferry Road, Lewisville-Vienna Road, Shallowford Road, Robinhood Road, portions of Williams Road and Lewisville-Clemmons Road. Each type of street has its own distinct purpose, capacity, and dimensions as shown below. Major Thoroughfares and Boulevards are shown in Figure 3.4.

- Primary traffic arteries in an area
- Large volume of traffic at moderate speeds
- Provide access to major commercial and residential land uses
- Typical speed limit is 35-55 mph with two to five lanes, typically 22'-75' in total width
- Right of way is typically 50'-120' in width
- High speeds require careful planning for safe pedestrian use, but this type of road provides a high level of connectivity

Minor Thoroughfare

Many of the roads in the Study Area are minor thoroughfares, shown in orange on Figure 3.5. These are: Grapevine Road, Conrad-Sawmill Road, Conrad Road, Franklin Road, Shallowford Road, Williams Road, Styers Ferry Road, Harper Road, Reynolds Road, Vienna-Dozier Road, Concord Church Road, Skylark Road, and Dull Road. Minor thoroughfares are described below:

- Collect traffic from local collector streets and carry it to major thoroughfares or freeways
- Moderate amounts of traffic at moderate speeds
- Access to low/medium density residential and commercial uses
- Typical speed limit is 35-45 mph with two lanes, typically 22' in total width
- Right of way is typically 50'-60' in width
- Higher pedestrian compatibility and connectivity with lower speed limits

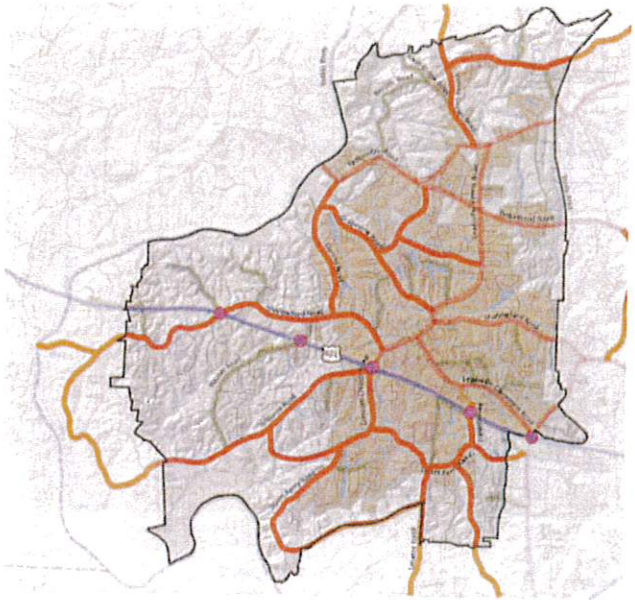


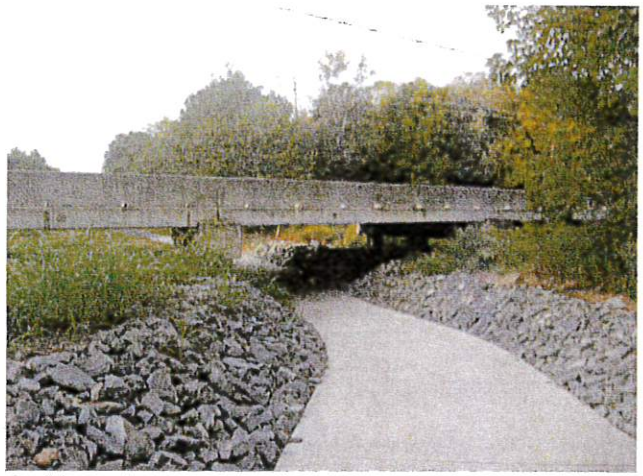
Figure 3.5, Minor Thoroughfares (not to scale)

Collector Street

Finally, there are many collector streets in the study area: River Ridge Road, Beroth Road, Sequoia Road, and Bebb Willow Lane are a few of them. These streets are shown in green on Figure 3.6. Collector streets are ideal for pedestrian environments, but they don't afford a high level of connectivity.

- Moderate to low vehicular volumes at low to moderate speed
- Typical speed limit is 25-35 mph with two lanes, typically 22'-24' in total width
- Right of way is typically 50'-60' in width
- High pedestrian compatibility, but low level of connectivity between multiple destinations

Figure 3.6, Collector Streets (not to scale)



Muddy Creek Greenway underpass

At-grade crossing in a residential subdivision

Overpasses, Underpasses, and At-Grade Crossings

The overall pedestrian plan will include overpasses, underpasses and at-grade crossings in order to provide the maximum amount of connectivity. Proper signage will be key to ensure pedestrian safety and wayfinding.

Overpasses

An overpass is a bridge or structure that crosses over roads, railways or streams. An overpass allows pedestrians and bicycles safe crossing without interacting with traffic.

Underpasses

An underpass provides a depressed sidewalk or trail under a road or railway for pedestrians and cyclists allowing safe access to the opposite side.

At-grade crossings

An at-grade crossing is an intersection at which two or more roads/trails/sidewalks cross at the same level (or grade). With areas of high volume or fast traffic, an at-grade intersection normally requires traffic control devices.

Trail and Sidewalk Types

Trail and sidewalk types were chosen based on the anticipated use of the facility, and the existing conditions of adjacent road corridors. The trail types for the system include an off-street eight to ten foot wide paved trail for bicycle and pedestrians, an on-street eight to ten foot wide paved trail, an on-street five to seven foot wide paved concrete sidewalk, and streetscape sidewalks for the downtown areas.

8-10' Bike/Ped Paved Trail (off and on-street)

This type of trail is typically constructed with asphalt and is used primarily by pedestrians and bicyclists. As shown in Figure 3.7, the trail is eight to ten feet wide, depending on its location in the trail system, with three foot wide shoulders on either side. The center of the trail should be crowned to provide drainage. Beyond the three foot shoulders, a six foot wide zone of selective vegetative clearing on each side of the trail will ensure clear visibility along the trail. A wide swath of existing or proposed vegetation between the trail and the street will buffer the sounds and sights of traffic where feasible. A ten foot zone of vertical clearing is necessary for user safety. When the trail is proposed in an on-street location, such as in Figure 3.8, a five foot or wider grass or vegetated area separating the user from the road should be included. A grass swale between the walk and the road is needed to maintain proper roadway drainage.

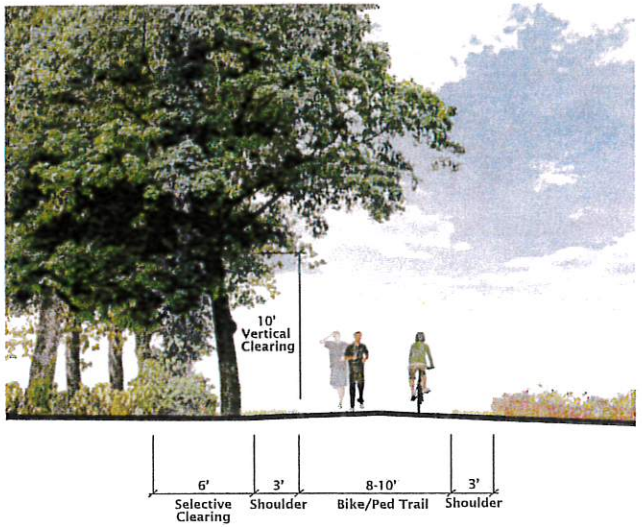


Figure 3.7, Bike/Ped Paved Trail (off-street)

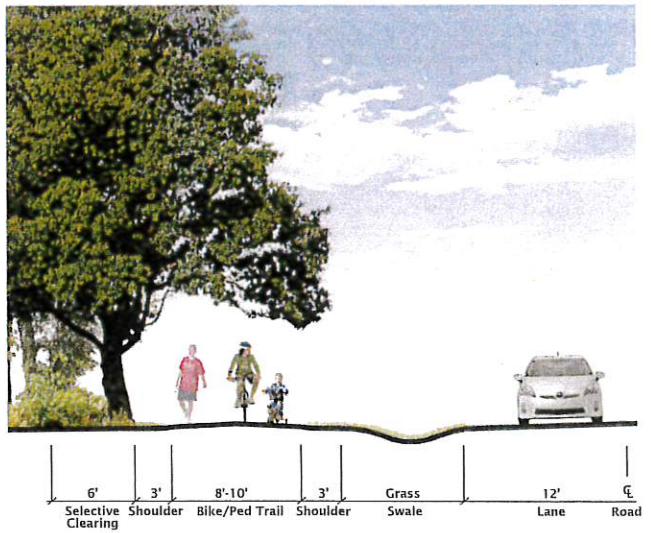


Figure 3.8, Bike/Ped Trail (on-street)

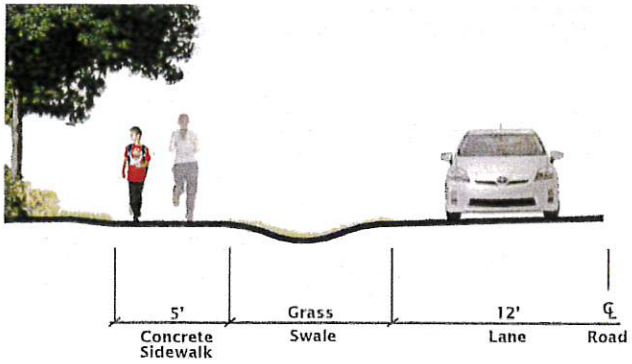


Figure 3.9, Concrete Sidewalk

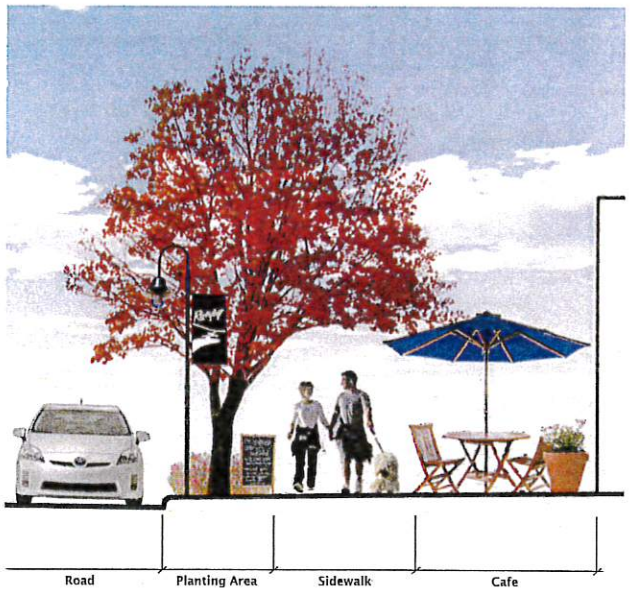


Figure 3.10, Downtown Sidewalks

5-7' Concrete Sidewalk (on-street)

A five to seven foot wide on-street concrete sidewalk, shown in Figure 3.9, is typically utilized by p destrians, but can accommodate bicycles if they yield to pedestrians. The sidewalk should be locate at least five feet away from the edge of the road to allow for a grass swale for drainage unless there curb and gutter.

Downtown Sidewalks

The quality and safety of the pedestrian experience in the downtown area is important in order reinforce its sense of place and economic vitality. It is important to allow space for larger groups of people as well as outdoor seating for cafes and restaurants, as shown in Figure 3.10. The downtown streetscape would be designed with concrete/brick paving. While trees, lamp posts, benches and bil racks provide valuable street amenities and urban character, it is important that the sidewalk have adequate width to allow for the safe and unimpeded passage of pedestrians, wheelchairs and baby strollers.

Greenway and Pedestrian Connections Plan

The Greenway and Pedestrian Connections Plan features a combination of greenway trails throug stream corridors and sidewalks and Bicycle/Pedestrian trails along roadways. These greenway ar pedestrian segments will provide connections throughout the Town of Lewisville as well as the larg Study Area. There are approximately 38 miles of proposed greenway trails and 32 miles of propose sidewalk and bicycle/pedestrian trails included in the pedestrian network.

The Greenway and Pedestrian Connections Plan Segments map shows 26 different greenway ar sidewalk connections. Greenway segments are shown in green and the individual sidewalk sectio are shown in seprate colors. Individual segment maps are shown using the same colors as shown the overall map.

Greenway and Pedestrian Connections Plan Segments

- #1 - Shallowford Road/Future Great Wagon Road
- #2 - Downtown Greenway Connector
- #3 - Sequoia Drive
- #4 - Woodview Ridge Trail
- #5 - Lewisville-Clemmons Road
- #6 - Reynolds Road
- #7 - Styers Ferry Road - South
- #8 - Shallowford Road
- #9 - Northeast Creek Greenway
- #10 - Styers Ferry Road - North
- #11 - Blanket Bottom Creek Greenway
- #12 - Lewisville-Vienna Road
- #13 - Yadkinville Road
- #14 - Vienna-Dozier Road
- #15 - Bashavia Creek Greenway
- #16 - Yadkin River Greenway
- #17 - Conrad Road
- #18 - Mill Creek Greenway
- #19 - Conrad-Sawmill Road
- #20 - Grapevine Road
- #21 - Shallowford Road
- #22 - Yadkin River West Greenway
- #23 - Robinhood Road
- #24 - Panther Ridge Creek Greenway
- #25 - Concord Church Road & Dull Road
- #26 - Ellison Creek Greenway

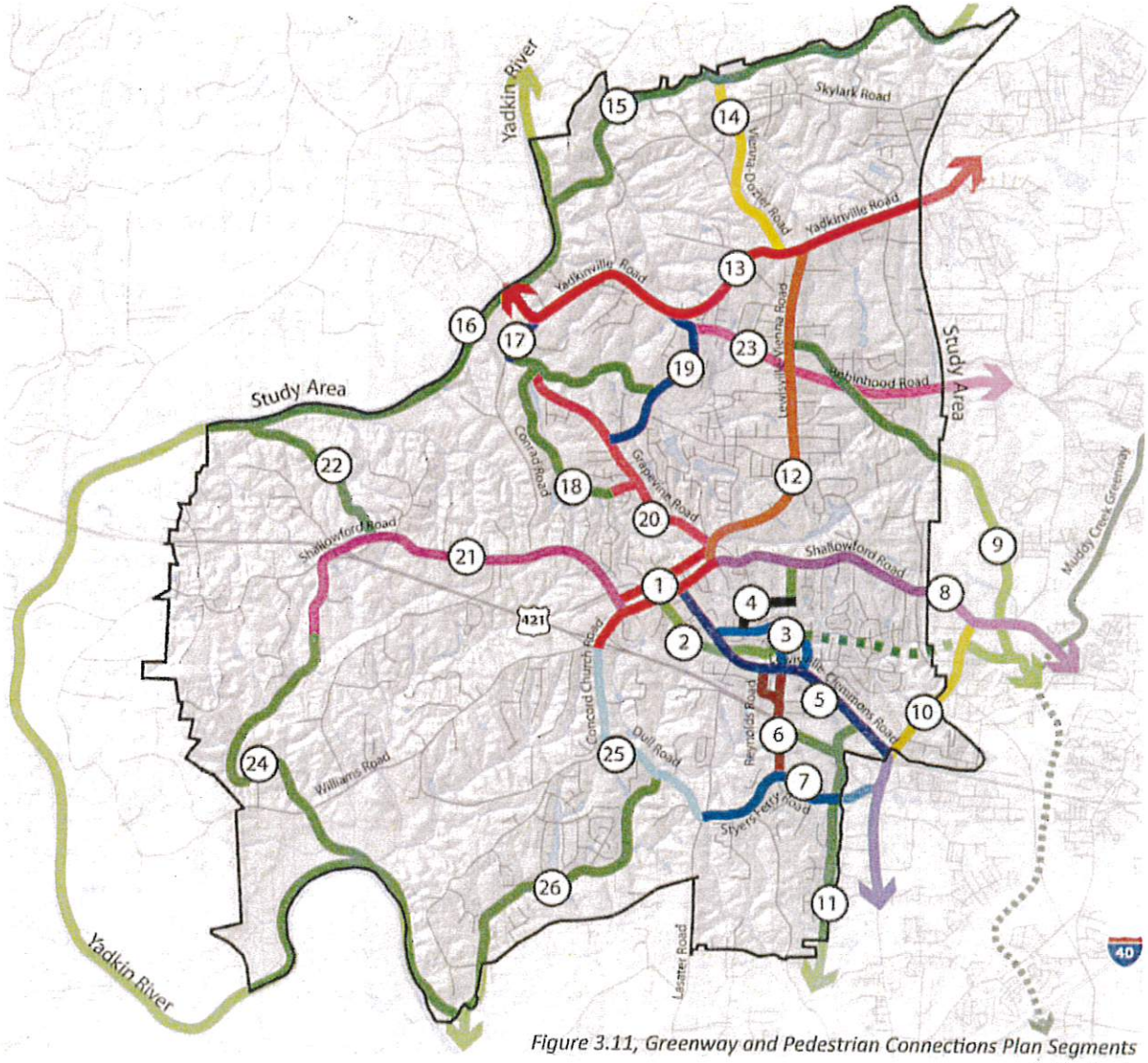


Figure 3.11, Greenway and Pedestrian Connections Plan Segments
Not to Scale

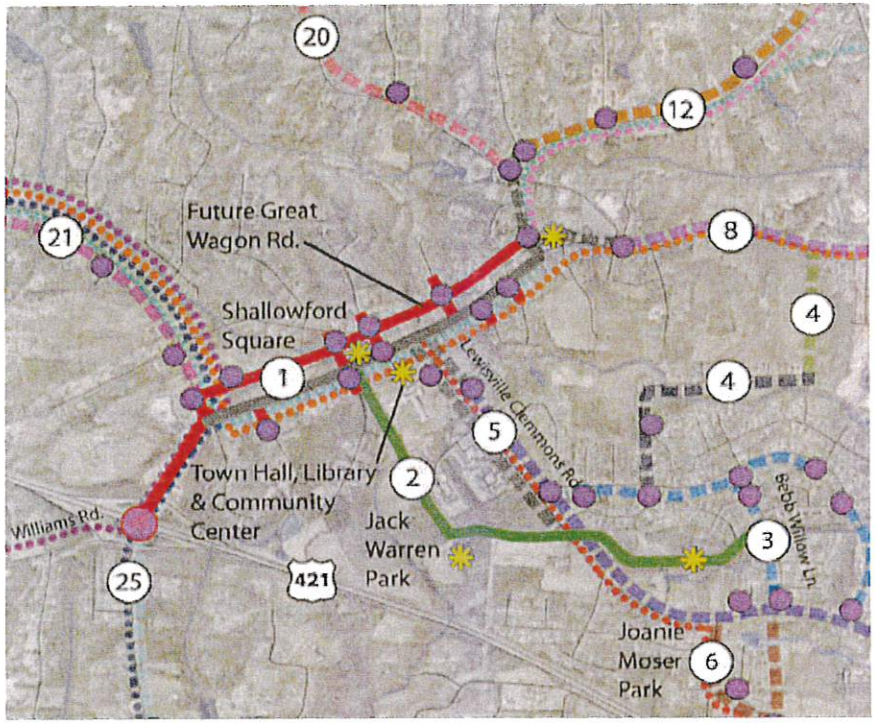


Figure 3.12, #1 Shallowford Road & #2 Downtown Greenway Connector

Existing sidewalk on Shallowford Road

#1 Shallowford Road/Future Great Wagon Road and #2 Downtown Greenway Connector

The downtown Lewisville sidewalk segment includes sidewalks and greenway These segments include streetscape improvements to the downtown core and w connect Shallowford Square, civic buildings, existing sidewalks and the downtov area to Jack Warren Park and Joanie Moser Park. See Figure 3.12. The future Gre Wagon Road could accommodate an informal temporary pedestrian trail un construction is completed.

These segments provide the opportunity to emphasize the cultural history of tl Town of Lewisville by incorporating historic themed paving, site amenities, ai artwork. There are two North Carolina bike routes through the downtown area, tl Mountains-to-Sea Trail as well as the Yadkin County Connector. The Mountains-t Sea Trail follows Shallowford Road to the west and connects to Williams Road. Tl Yadkin County Connector follows the alignment of Shallowford Road and continu south along Lewisville-Clemmons Road.

Legend

- = Future Great Wagon Road (1)
- = Downtown Greenway Connector (2)
- = Sequoia Drive (3)
- = Woodview Ridge Trail (4)
- = Lewisville-Clemmons Road (5)
- = Shallowford Road (8)
- = Lewisville-Vienna Road (12)
- = Grapevine Road (20)
- = Shallowford Road (21)
- = Concord Church Road/Dull Road (25)
- = Existing Sidewalks
- = Mountains-To-Sea Trail
- = Yadkin County Connector Bike Route
- = Stokes County Connector Bike Route
- = Lasater Mill Connector Bike Route
- = Westbend Vineyards Ramble Bike Tour
- = Historic Great Wagon Road
- = Point of Interest
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

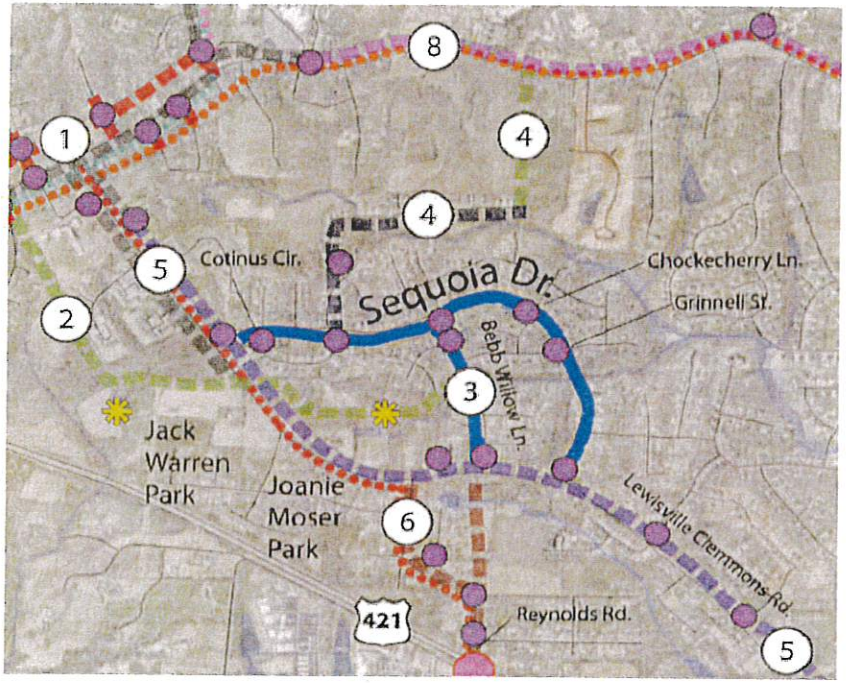
N

Major Thoroughfare

- 6,600 linear feet of sidewalk
- Several at-grade crossings
- Two lane road with a 35-45 MPH speed limit and 24'-36' total width
- 60' right of way

Greenway Trail

- 3,900 linear feet of greenway
- Several at-grade crossings



Legend

- = Sequoia Drive (3)
- = Future Great Wagon Road (1)
- = Downtown Greenway Connector (2)
- = Woodview Ridge Trail (4)
- = Lewisville-Clemmons Road (5)
- = Reynolds Road (6)
- = Shallowford Road (8)
- = Existing Sidewalks
- = Mountains-To-Sea Trail
- = Yadkin County Connector Bike Route
- = Stokes County Connector Bike Route
- = Lasater Mill Connector Bike Route
- = Westbend Vineyards Ramble Bike Tour
- = Historic Great Wagon Road
- = Point of Interest
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

N

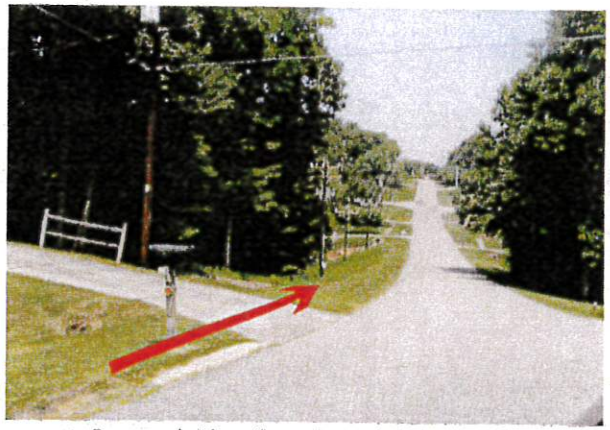
Figure 3.13, #3 Sequoia Drive

#3 Sequoia Drive

The Sequoia Drive segment includes sidewalks along the south side of Sequoia Drive and the east side of Bebb Willow Lane, providing connections to Jack Warren Park, Joanie Moser Park, Lewisville-Clemmons Road as well as the Downtown Greenway Connector and other future sidewalks and greenway trails. This segment would also provide an internal pedestrian network for residential neighborhoods. See Figure 3.13.

Collector Street

- 7,830 linear feet of sidewalk
- Several at-grade crossings
- Two lane road has a 35 MPH speed limit and 20' total width
- 50' right of way



Proposed sidewalk on the west side of Sequoia Drive

Proposed sidewalk on the south side of Sequoia Drive

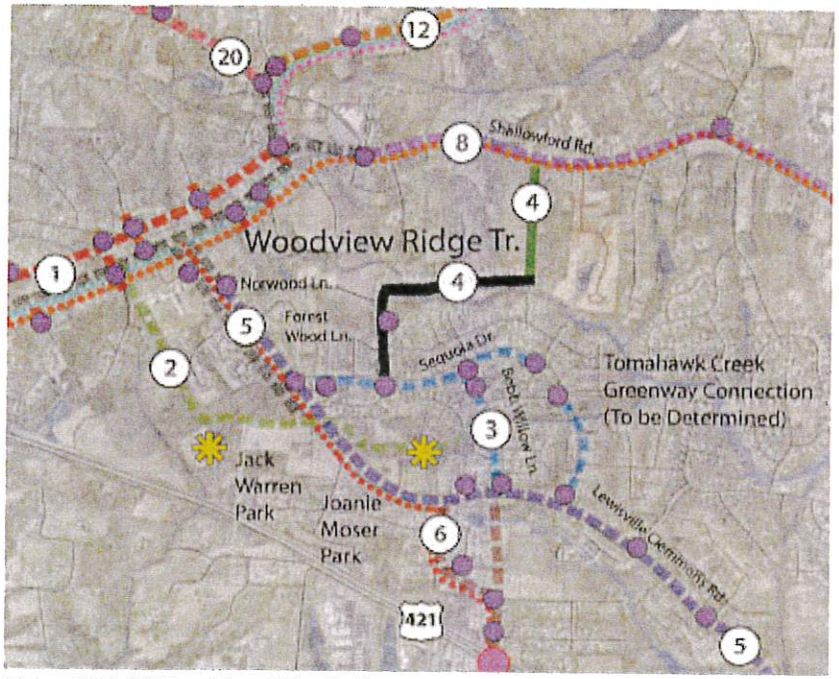


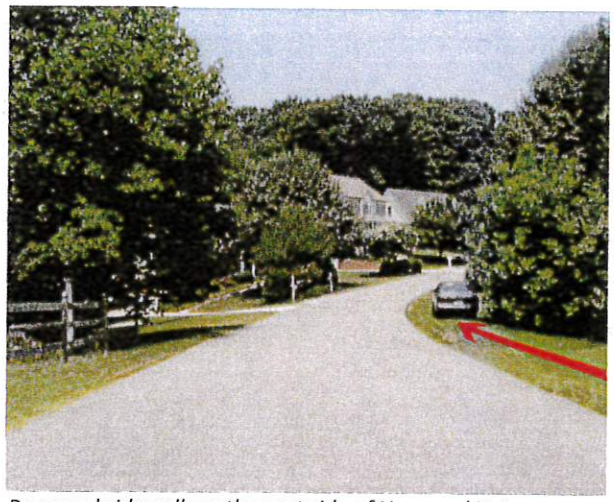
Figure 3.14, #4 Woodview Ridge Trail

#4 Woodview Ridge Trail

The Woodview Ridge Trail segment includes sidewalks along the southeast side of I Wood Lane, the east side of Norwood Lane, and the south side of Woodview Ridge A greenway trail connecting Woodview Ridge Trail and Shallowford Road and a sid through the subdivision are also proposed. See Figure 3.14.

Local Street

- 3,500 linear feet of sidewalk
- 1,400 linear feet of greenway
- Several at-grade crossings
- Forestwood Lane, Norwood Lane, and Woodview Ridge have two lanes with a 35 MPH speed limit and 22' total width
- 50' right of way



Proposed sidewalk on the east side of Norwood Drive

Proposed sidewalk on the south side of Woodview Ridge Trail

Legend

- = Woodview Ridge Trail (4)
- = Future Great Wagon Road (1)
- = Downtown Greenway Connector (2)
- = Sequoia Drive (3)
- = Lewisville-Clemmons Road (5)
- = Reynolds Road (6)
- = Shallowford Road (8)
- = Lewisville-Vienna Road (12)
- = Grapevine Road (20)
- = Existing Sidewalks
- = Mountains-To-Sea Trail
- = Yadkin County Connector Bike Route
- = Stokes County Connector Bike Route
- = Lasater Mill Connector Bike Route
- = Westbend Vineyards Ramble Bike Tou
- = Historic Great Wagon Road
- = Point of Interest
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

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#5 Lewisville-Clemmons Road

Lewisville-Clemmons Road is a major north/south connector in the Study Area. This segment includes the development of sidewalks and trails adjacent to the road. The segment south of US 421 includes sidewalk on the east side of Lewisville-Clemmons Road. The segment north of US 421 includes a sidewalk on the north side of the road and a on-street bike/ped paved trail on the south side extending from Jack Warren Park to the intersetion of Lewisville-Clemmons Road and Styers Ferry Road.

There are several sections of Lewisville-Clemmons Road that have existing sidewalk and a section of sidewalk that is currently under construction. Proposed sidewalks would eliminate missing segments in the current sidewalk network. See Figure 3.15.

This segment would provide connections to several schools, commercial centers and residential developments, and downtown Lewisville.

The Lasater Mill Connector Bike Route begins in downtown Lewisville and follows Lewisville-Clemmons Road. At Joanie Moser Park, the bike route continues south along Reynolds Road.

Major Thoroughfare and Boulevard

- 9,000 linear feet of sidewalk
- 8,000 linear feet of greenway
- Several at-grade crossings, one pedestrian/bicycle overpass at Hwy. 421 and future Beltway
- Two to five lane road with a 35-45 MPH speed limit and 22'-59' total width
- 60'-128' right of way
- 8,200-25,000 ADT (avg. daily traffic)
- 7,500-26,600 ADT (projected for 2035)

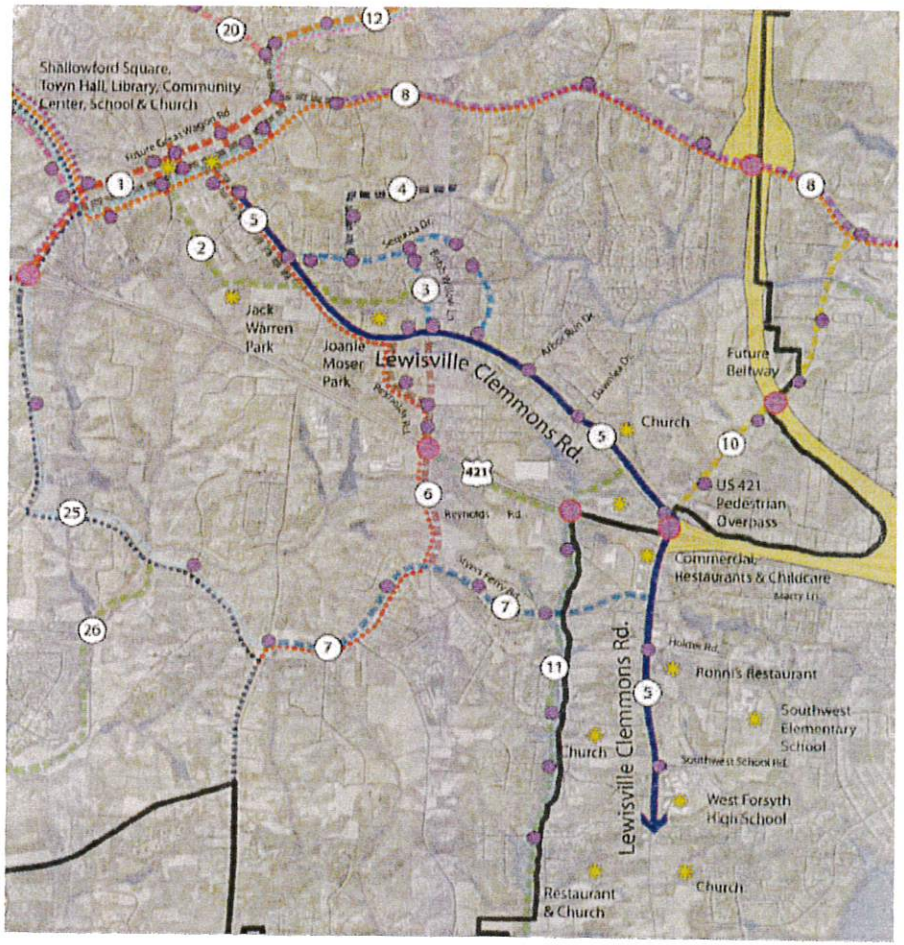


Figure 3.15, #5 Lewisville - Clemmons Road

Proposed sidewalk on the north side of Lewisville - Clemmons Road

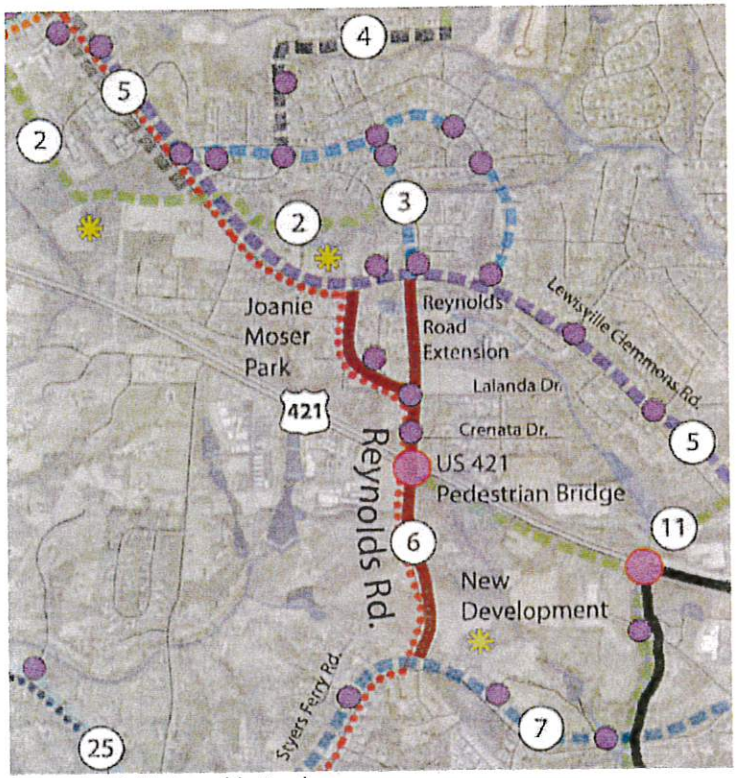


Figure 3.16, #6 Reynolds Road

#6 Reynolds Road

The Reynolds Road segment includes an on-street bike/ped paved trail along the east side of the road, a pedestrian/bicycle bridge over US 421 as well as a small pedestrian bridge along the Reynolds Road extension project. Connections include new residential development, Joanie Moser Park, Bottom Blanket Creek Greenway and Styers Ferry Road. See Figure 3.16.

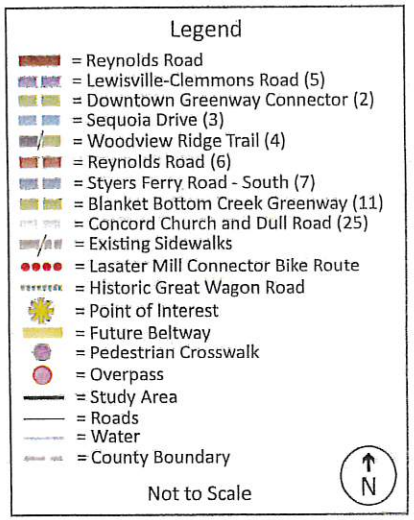
The Lasater Mill Connector Bike Route meets Reynolds Road at Lewisville-Clemmons Road and follows Reynolds Road to Styers Ferry Road.

Minor Thoroughfare

- 6,600 linear feet of greenway
- Several at-grade crossings
- Two lane road with 35 MPH speed limit and 17' total width
- 50' right of way
- 1,600 ADT
- 1,500 ADT (Projected for 2035)

Proposed sidewalk on the west side of Reynolds Road

Proposed sidewalk on the west side of Reynolds Road



#7 Styers Ferry Road - South

The Styers Ferry Road South segment includes sidewalks along the north side of the road from Lewisville-Clemmons Road to the intersection of Lasley Road. This segment provides the opportunity to connect to the retail and commercial areas along Lewisville-Clemmons Road as well as Blanket Bottom Creek Greenway. See Figure 3.17.

The Lasater Mill Connector Bike Route follows the alignment of the road from Reynolds Road to the intersection of Lasley Road where the segment ends. The bike route continues south along Styers Ferry Road.

Minor Thoroughfare

- 9,050 linear feet of sidewalk
- Several at-grade crossings
- Two lane road with 35-55 MPH speed limit and 18' total width
- 60' right of way
- 3,600-5,400 ADT
- 4,000-6,800 ADT (Projected for 2035)

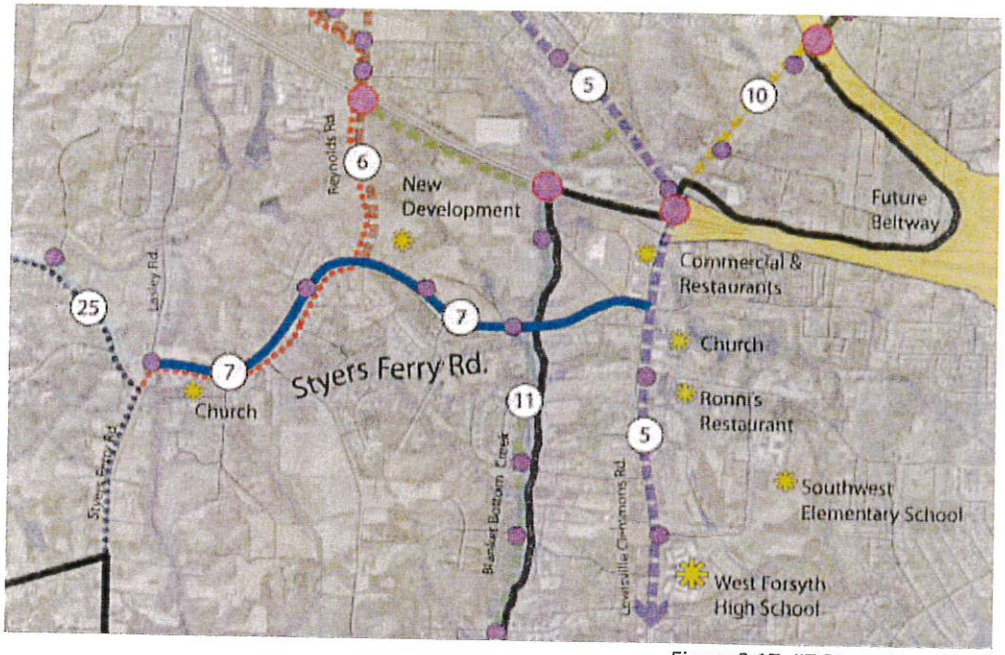
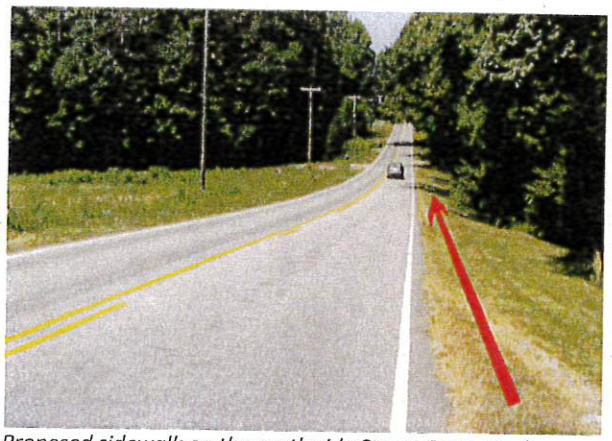
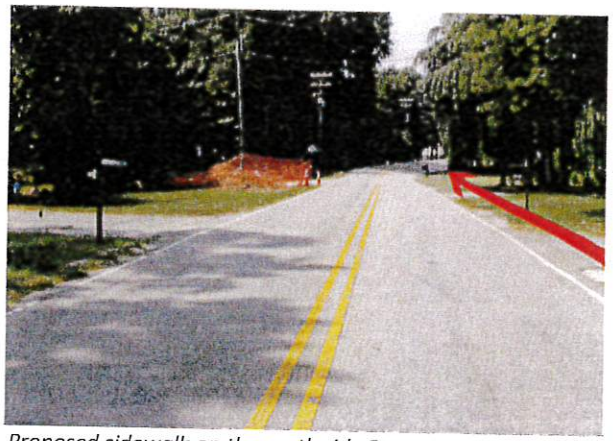


Figure 3.17, #7 Styers Ferry Road



Proposed sidewalk on the north side Styers Ferry Road



Proposed sidewalk on the north side Styers Ferry Road

Legend

- = Styers Ferry Road - South (7)
- = Lewisville-Clemmons Road (5)
- = Reynolds Road (6)
- = Styers Ferry Road - North (10)
- = Blanket Bottom Creek Greenway (11)
- = Concord Church and Dull Road (25)
- = Existing Sidewalks
- = Mountains-To-Sea Trail
- = Lasater Mill Connector Bike Route
- = Point of Interest
- = Future Beltway
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

N

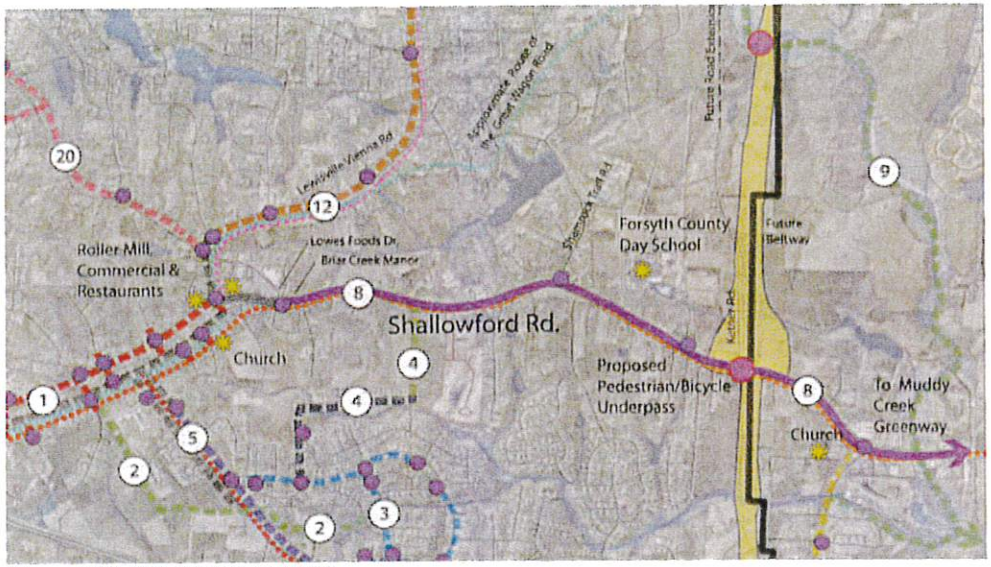


Figure 3.18, #8 Shallowford Road

Legend

- = Shallowford Road (8)
- = Future Great Wagon Road (1)
- = Downtown Greenway Connector (2)
- = Sequoia Drive (3)
- = Woodview Ridge Trail (4)
- = Lewisville-Clemmons Road (5)
- = Northeast Creek Greenway (9)
- = Lewisville-Vienna Road (12)
- = Grapevine Road (20)
- = Existing Sidewalks
- = Mountains-To-Sea Trail
- = Yadkin County Connector Bike Route
- = Stokes County Connector Bike Route
- = Lasater Mill Connector Bike Route
- = Westbend Vineyards Ramble Bike Tour
- = Historic Great Wagon Road
- = Point of Interest
- =Future Beltway
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

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#8 Shallowford Road

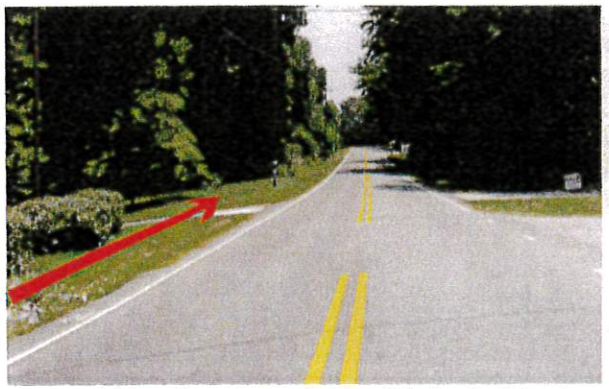
Shallowford Road is a major east/west connector for the Town of Lewisville. This segment includes sidewalks on the north side of the road extending from the existing sidewalk near the Roller Mill to the eastern edge of the Study Area. Further expansion of the sidewalk to the east is planned in the future. This segment connects downtown Lewisville and the Roller Mill area to the Muddy Creek Greenway to the east. See Figure 3.18.

The Yadkin County Connector Bike Route follows the alignment of Shallowford Road and continues east toward the City of Winston-Salem.

Major Thoroughfare

- 8,800 linear feet of sidewalk
- Several at-grade crossings
- One pedestrian/bicycle underpass at the future Beltway
- Two lane road with a 35-45 MPH speed limit and 24' total width
- 60' right of way
- 5,200 ADT
- 6,500 ADT (Projected for 2035)

Proposed sidewalk on the north side Shallowford Road



Proposed sidewalk on the north side of Shallowford Road

#9 Northeast Creek Greenway

The Northeast Creek Greenway segment includes a greenway trail that follows a tributary that empties into Tomahawk Creek. See Figure 3.19. The alignment can occur along an existing utility easement. The on-street bike/ped paved trail provides connections from Lewisville-Vienna Road and a future Lewisville Middle School to the Muddy Creek Greenway and Shallowford Road to the south. A proposed pedestrian/bicycle underpass at the future Beltway will need to be accommodated in the final roadway bridge design.

Greenway Trail

- 23,780 linear feet of greenway
- Several at-grade crossings
- One pedestrian/bicycle underpass
- Several culverts, bridges and boardwalks

Typical paved greenway

Legend

- = Northeast Creek Greenway (9)
- = Sequoia Drive (3)
- = Woodview Ridge Trail (4)
- = Shallowford Road (8)
- = Styers Ferry Road - North (10)
- = Lewisville-Vienna Road (12)
- = Robinhood Road (20)
- = Existing Sidewalks
- = Yadkin County Connector Bike Route
- = Stokes County Connector Bike Route
- = Lasater Mill Connector Bike Route
- = Historic Great Wagon Road
- = Point of Interest
- = Future Beltway
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

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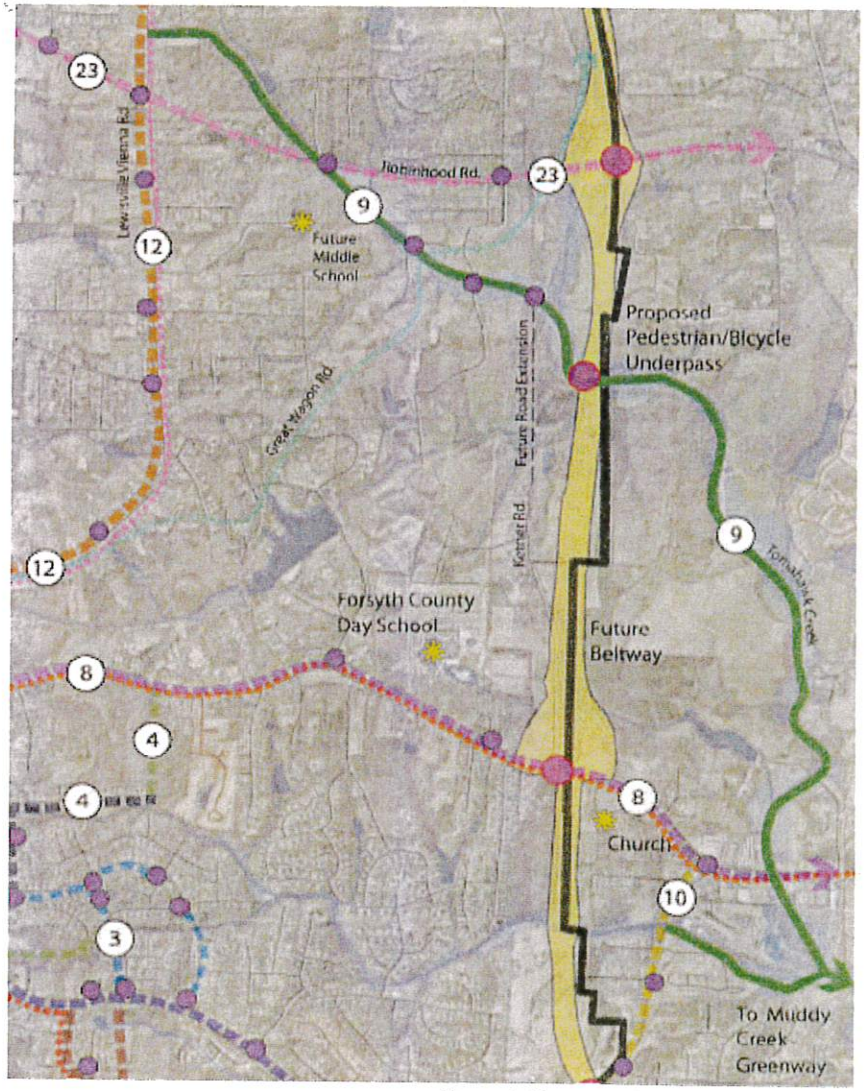


Figure 3.19, #9 Northeast Creek Greenway

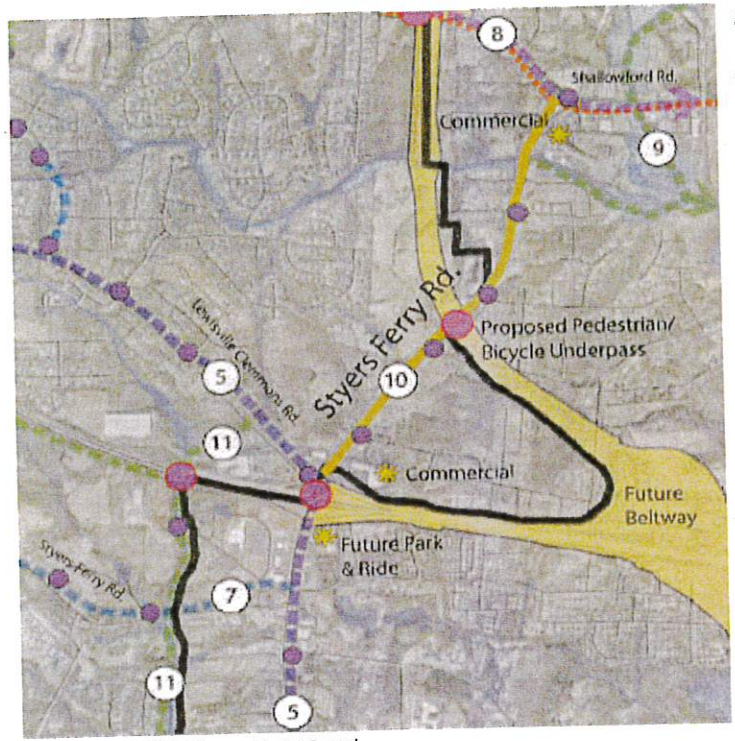


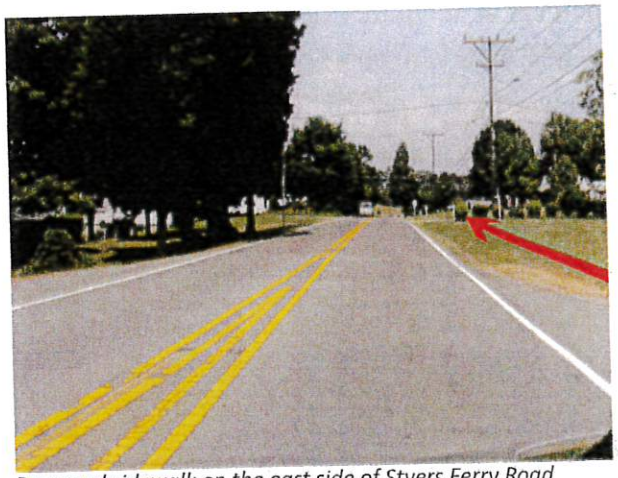
Figure 3.20, #10 Styers Ferry Road

#10 Styers Ferry Road - North

The Styers Ferry Road North segment includes a sidewalk on the east side of the road. See Figure 3.20. This segment connects to an existing sidewalk and commercial and retail areas on Lewisville-Clemmons Road, to sidewalks on Shallowford Road as well as a greenway trail connection to the Muddy Creek Greenway. A future park and ride lot will be located on Lewisville-Clemmons Road just south of US 421.

Minor Thoroughfare

- 7,000 linear feet of sidewalk
- Several at-grade crossings
- Two lane road with a 45 MPH speed limit and 25' total width
- 60' right of way



Proposed sidewalk on the east side of Styers Ferry Road

Legend

- = Styers Ferry Road - North (10)
- = Lewisville-Clemmons Road (5)
- = Styers Ferry Road - South (7)
- = Shallowford Road (8)
- = Northeast Creek Greenway (9)
- = Blanket Bottom Creek Greenway (11)
- = Existing Sidewalks
- = Yadkin County Connector Bike Route
- = Point of Interest
- = Future Beltway
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

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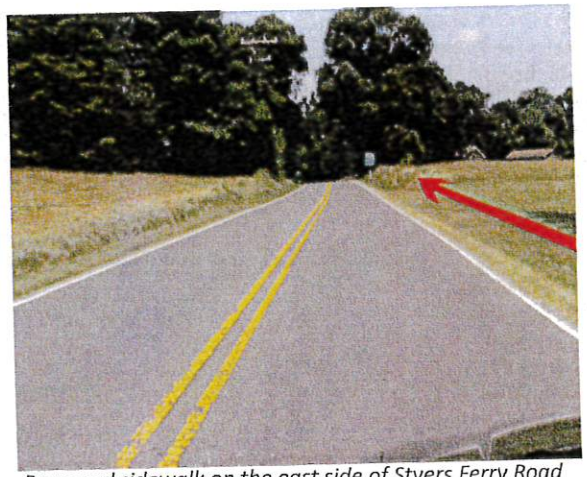


Proposed sidewalk on the east side of Styers Ferry Road

Proposed sidewalk on the east side of Styers Ferry Road

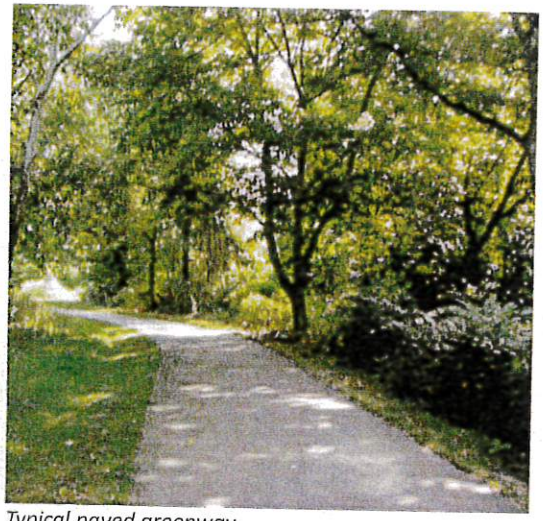
#11 Blanket Bottom Creek Greenway

The Blanket Bottom Creek segment includes a greenway trail that runs from Lewisville-Clemmons Road, across US 421 via a pedestrian bridge, and continues along Blanket Bottom Creek. A second segment continues on the south side of US 421 and connects to Reynolds Road. See Figure 3.21. This segment provides a connection from the Town of Lewisville south to the Village of Clemmons and the Yadkin River Greenway.

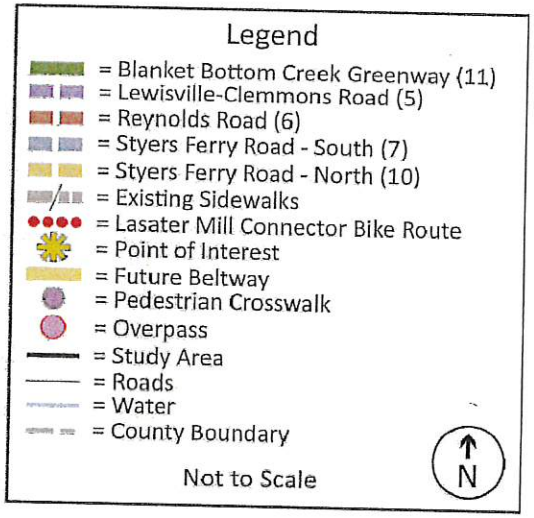
A future pedestrian/bicycle bridge will be required to cross US 421 as well as several at-grade crossings.

Greenway Trail

- 13,100 linear feet of greenway
- Several at-grade crossings
- Several culverts, bridges and boardwalks



Typical paved greenway



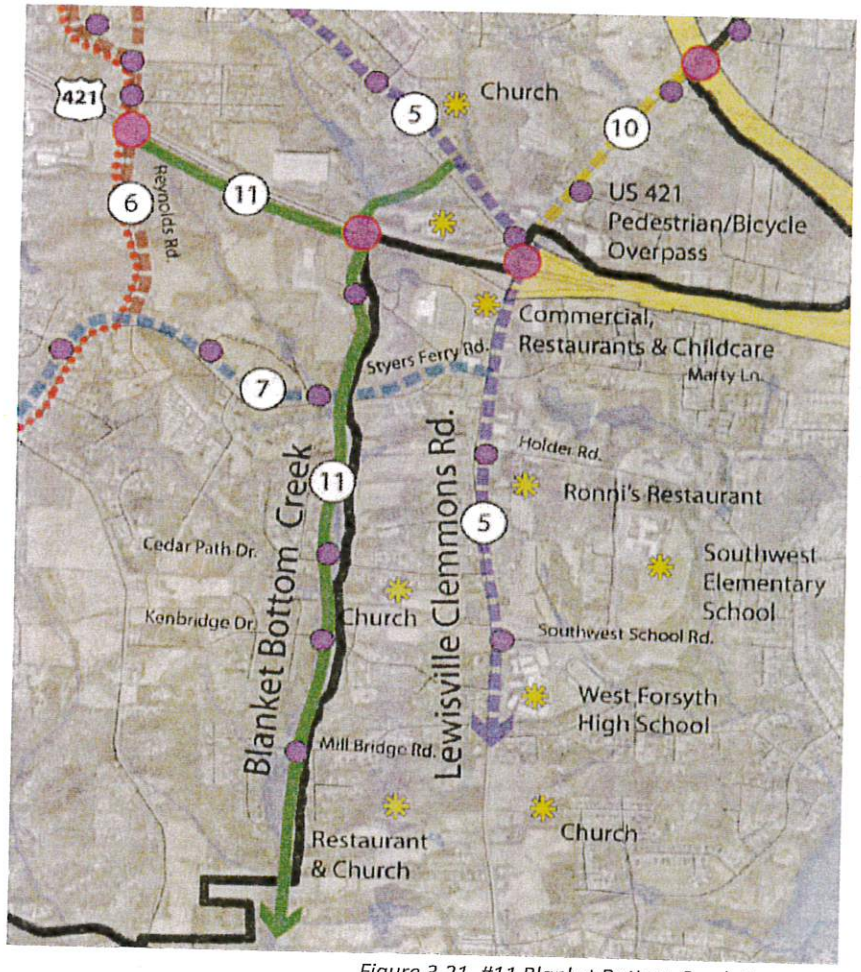


Figure 3.21, #11 Blanket Bottom Creek Greenway

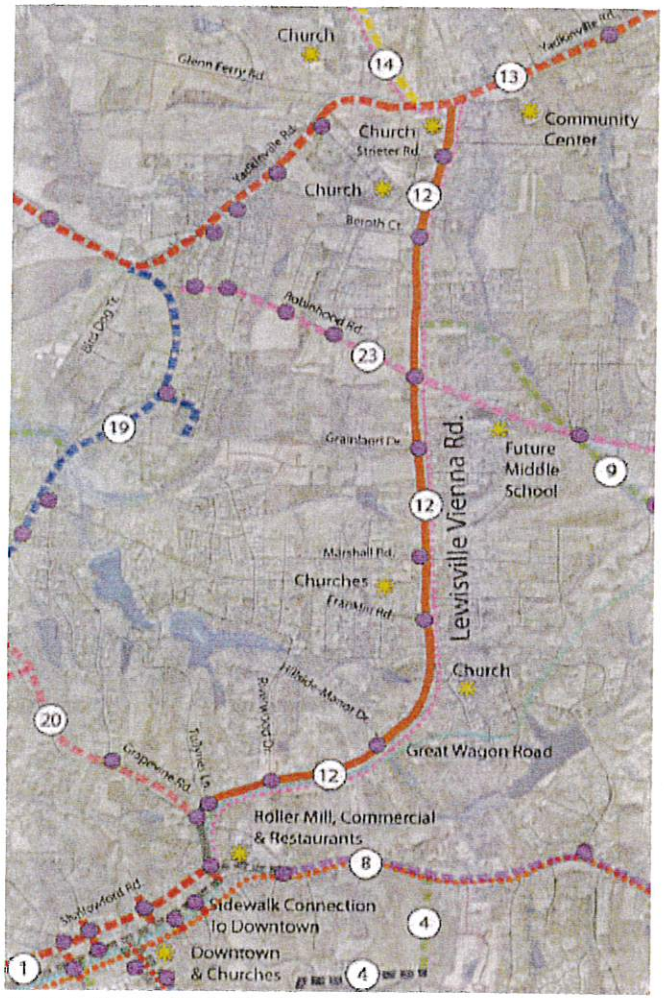


Figure 3.22, #12 Lewisville-Vienna Road

#12 Lewisville-Vienna Road

The Lewisville-Vienna Road segment includes an on-street bike/ped paved trail on the east side of the road. See Figure 3.22. This segment connects commercial and retail areas on Shallowford Road to Yadkinville Road to the north. The road is a major transportation corridor for the area and is heavily used. It serves as the main connector to downtown Lewisville.

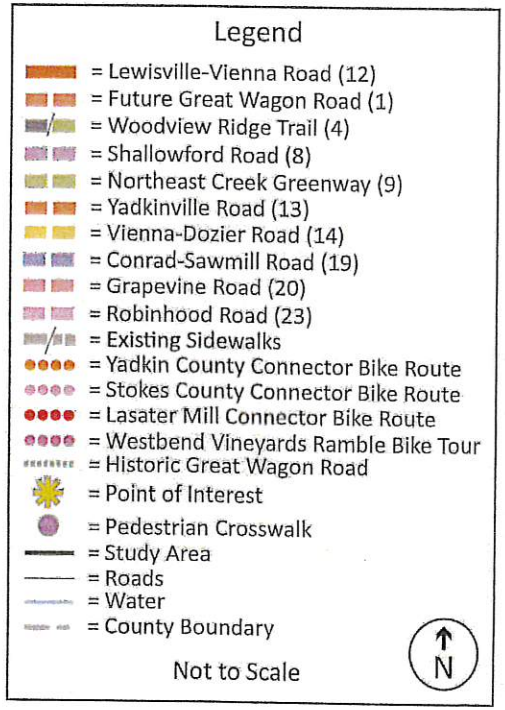
The Winston-Salem Forsyth County School System has been investigating property in the southeast quadrant of the Lewisville-Vienna/Robinhood Road intersection for a middle school. This could also be a popular destination along the proposed Northeast Creek Greenway.

The Stokes County Connector Bike Route follows the alignment of Lewisville-Vienna Road to the intersection of Yadkinville Road. The route continues west on Yadkinville Road and north on Vienna-Dozier Road.

Major Thoroughfare

- 15,030 linear feet of greenway
- Several at-grade crossings
- Two lanes with a 35-45 MPH speed limit and 22' total width
- 60' right of way
- 4,900-9,700 ADT
- 6,600-11,200 ADT (Projected for 2035)

Proposed sidewalk on the west side of Lewisville-Vienna Road



#13 Yadkinville Road

The Yadkinville Road segment includes a sidewalk on the south side of the road. See Figure 3.23. This segment begins at Old 421 Park at the western edge of the Study Area and runs to the eastern edge of the Study Area. It is a major east/west connection in the northern portion of the Study Area. This segment also connects to recreational areas of the canoe access point at 421 Park and West Central Community Center in the east portion of the Study Area. Future connections to Yadkin County are possible. Pedestrian/bicycle access across the future Beltway on the north and south sides of Yadkinville Road will be needed.

Major Thoroughfare

- 21,250 linear feet of sidewalk
- Several at-grade crossings
- Pedestrian/bicycle overpass at the future Beltway
- Two lanes with a 45-55 MPH speed limit and 18-22' total width
- 80-90' right of way
- 2,800-7,500 ADT
- 4,200-11,500 ADT (Projected for 2035)

Proposed sidewalk on the south side of Yadkinville Road

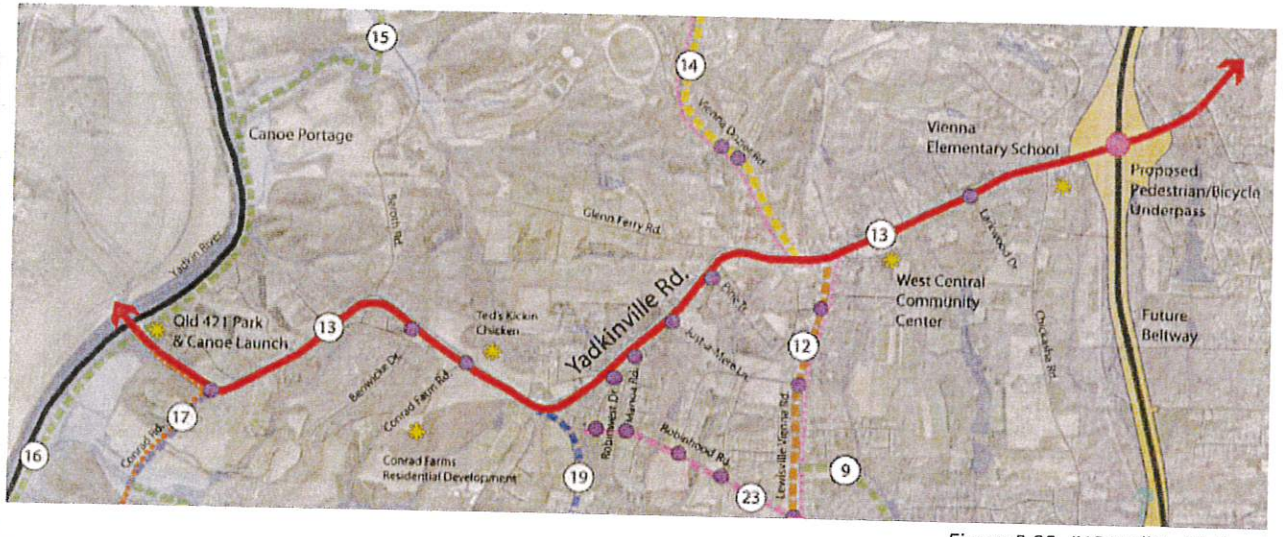


Figure 3.23, #13 Yadkinville Road

Legend

- = Yadkinville Road (13)
- = Northeast Creek Greenway (9)
- = Lewisville-Vienna Road (12)
- = Vienna-Dozier Road (14)
- = Bashavia Creek Greenway (15)
- = Yadkin River Greenway (16)
- = Conrad Road (17)
- = Conrad-Sawmill Road (19)
- = Robinhood Road (23)
- = Existing Sidewalks
- = Yadkin County Connector Bike Route
- = Stokes County Connector Bike Route
- = Point of Interest
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

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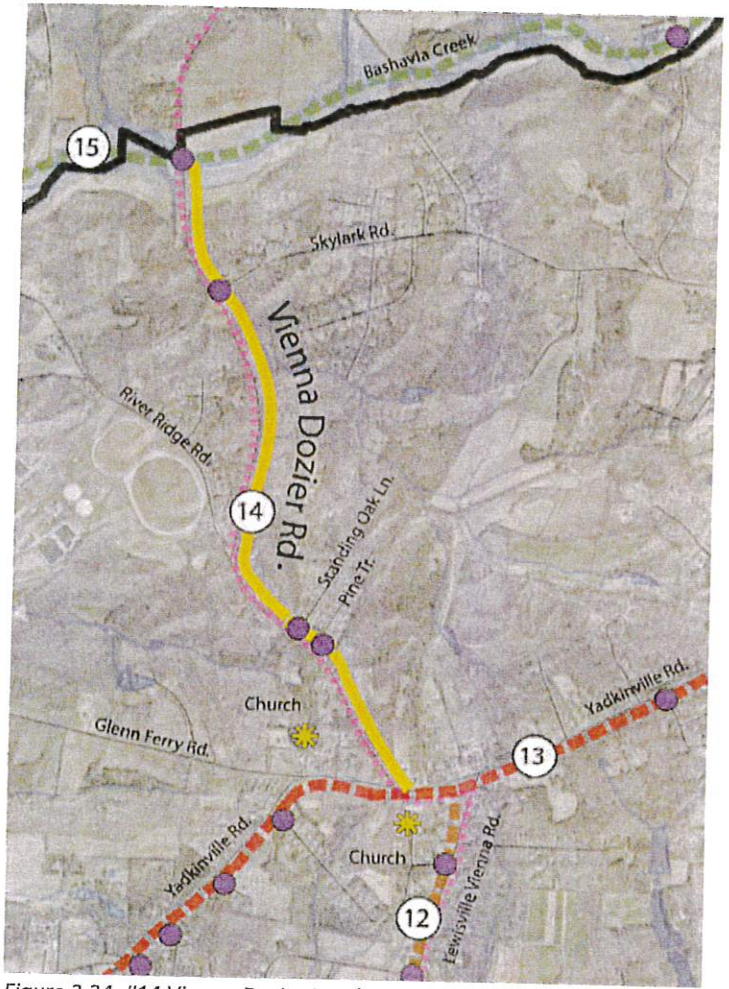


Figure 3.24, #14 Vienna-Dozier Road

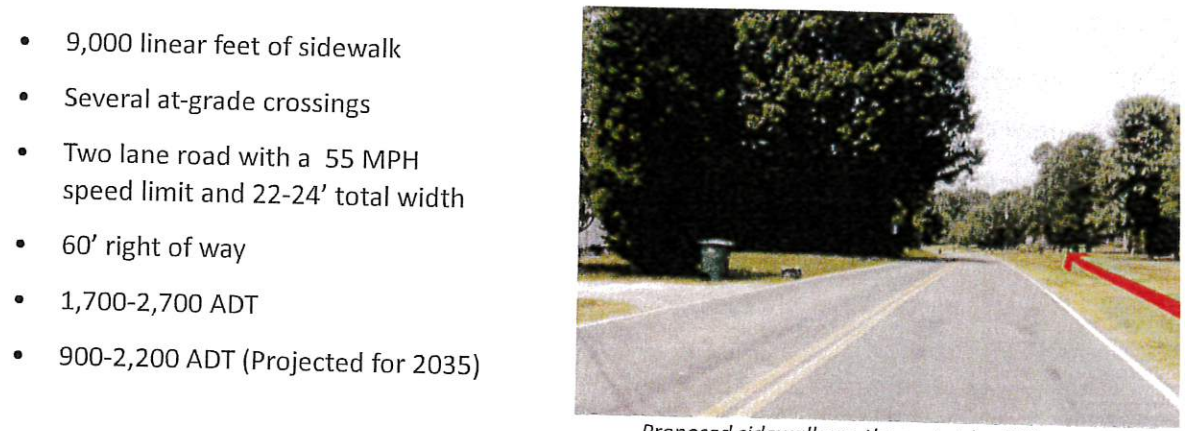
#14 Vienna-Dozier Road

The Vienna-Dozier Road segment includes a sidewalk on the east side of the road. See Figure 3. This segment connects to Bashavia Creek to the north and Yadkinville Road to the south.

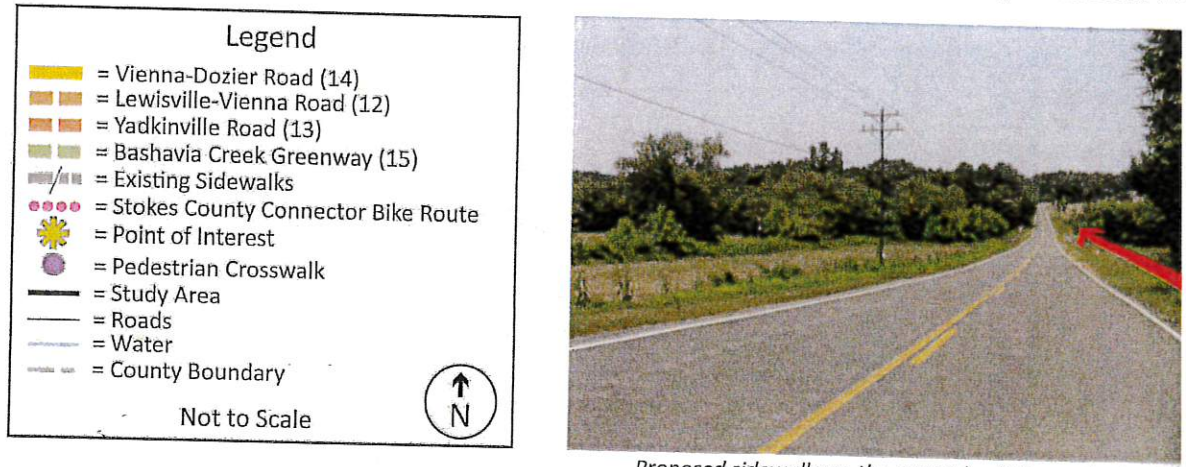
The Stokes County Connector Bike Route follows the alignment of Vienna-Dozier Road to the north edge of the Study Area. The route continues north on Vienna-Dozier Road.

Minor Thoroughfare

- 9,000 linear feet of sidewalk
- Several at-grade crossings
- Two lane road with a 55 MPH speed limit and 22-24' total width
- 60' right of way
- 1,700-2,700 ADT
- 900-2,200 ADT (Projected for 2035)



Proposed sidewalk on the east side of Vienna-Dozier Ro



Proposed sidewalk on the east side of Vienna-Dozier Roa

Legend

- = Bashavia Creek Greenway (15)
- = Robinhood Road (13)
- = Vienna-Dozier Road (14)
- = Yadkin River Greenway (16)
- = Existing Sidewalks
- = Stokes County Connector Bike Route
- = Point of Interest
- =Future Beltway
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

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Figure 3.25, #15 Bashavia Creek Greenway

#15 Bashavia Creek Greenway

The Bashavia Creek Greenway segment includes a trail that follows Bashavia Creek from GC Hill Memorial Park in the northeastern portion of the Study Area to the Yadkin River Greenway in the western portion of the Study Area. This segment would be a major east/west greenway connector for the northern portion of the Study Area. See Figure 3.25.

Greenway Trail

- 24,500 linear feet of greenway
- Several road crossings
- Several culverts, bridges and boardwalks

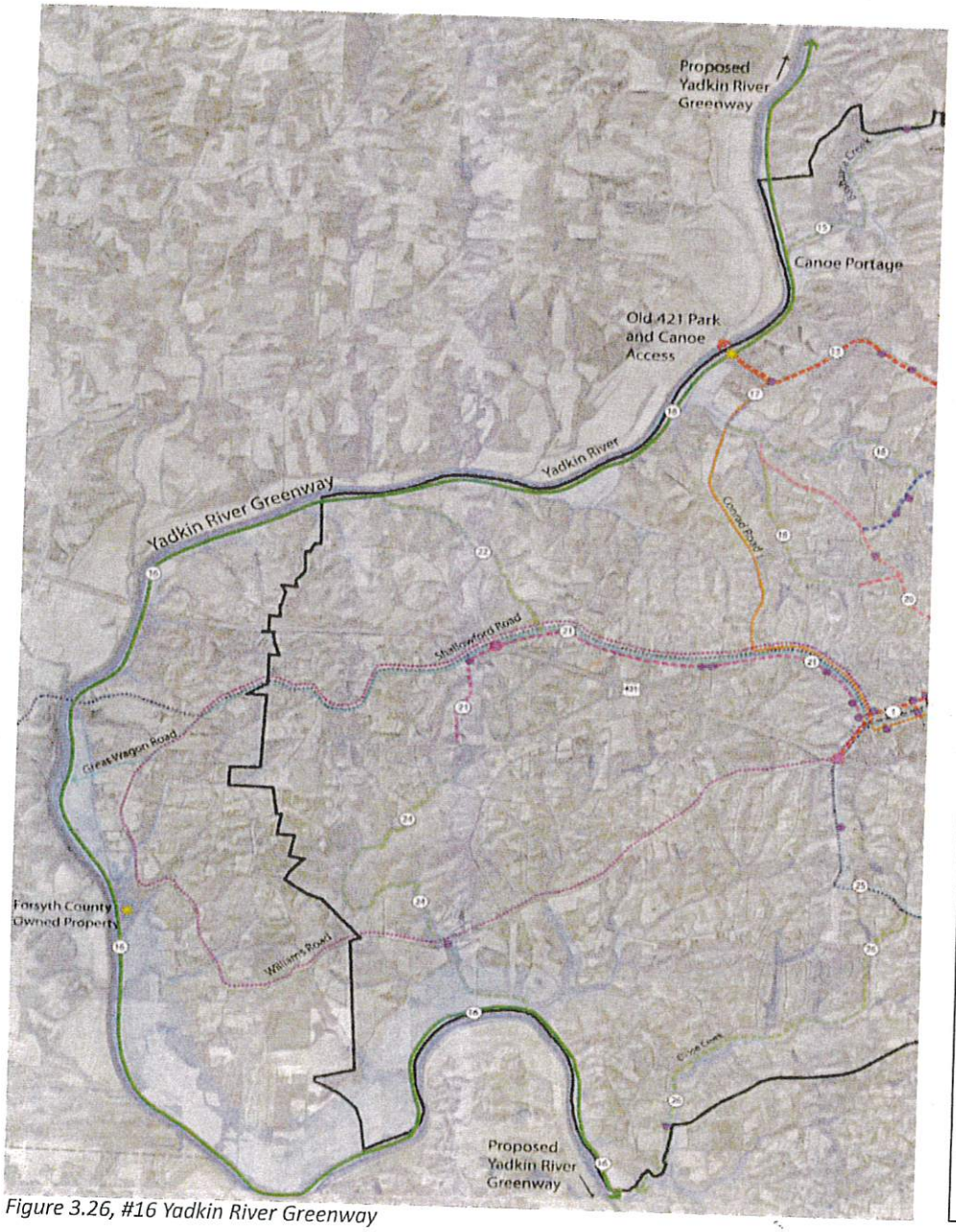


Figure 3.26, #16 Yadkin River Greenway

#16 Yadkin River Greenway

The Yadkin River Greenway is a long range plan and would include over miles of greenway trail adjacent to the Yadkin River east of the Study Area Figure 3.26.

There are many historic, cultural, and recreational connections along Yadkin River Greenway. There are two canoe launches, Old 421 Park as as the historic Shallow Ford located along the Yadkin River. There is a ca portage north of Old 421 Park.

The Yadkin River Greenway also connects to the Town of Bermuda Run and Village of Clemmons to the south.

Greenway Trail

- 77,250 linear feet of greenway
- Several road crossings
- Three pedestrian/bicycle underpas are located at Yadkinville Road, US and Shallowford Road
- Several culverts, bridges and boardwa

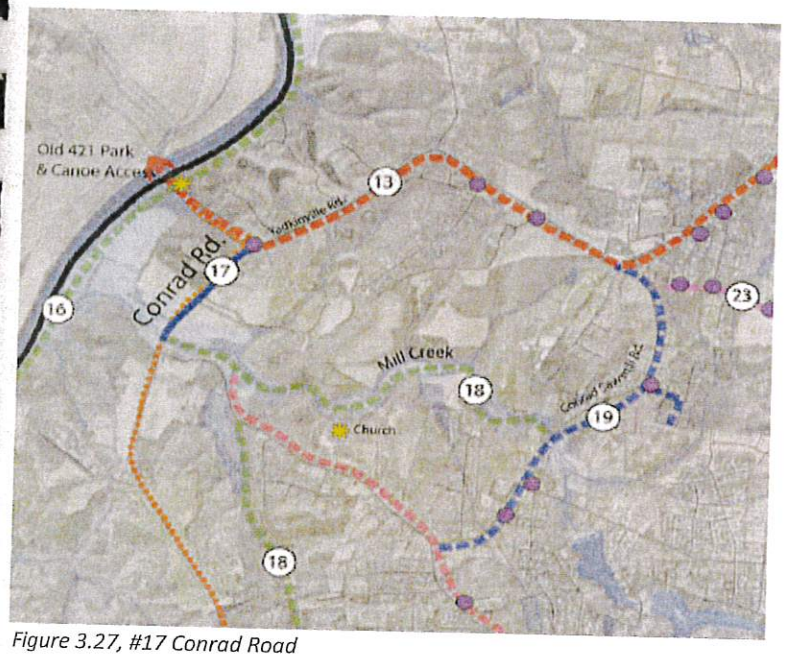


Figure 3.27, #17 Conrad Road

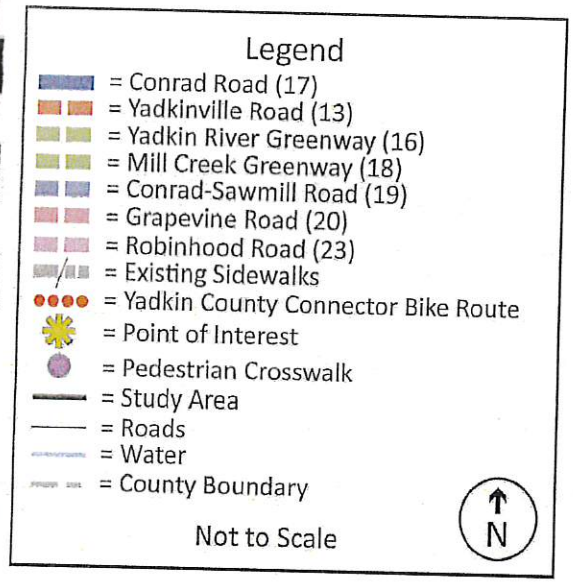
#17 Conrad Road

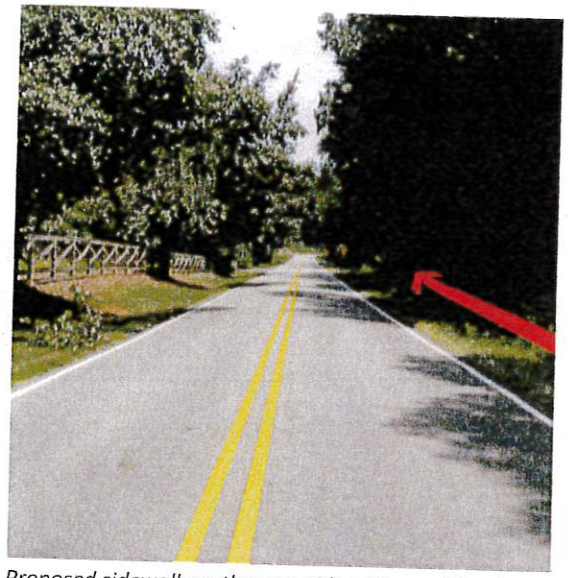
The Conrad Road segment includes a sidewalk on the east side of the road. See Figure 3.27. This segment connects the Mill Creek Greenway and Grapevine Road segments with Old 421 Park on Yadkinville Road. Further connections can be made to Yadkin County to the west.

The Yadkin County Connector Bike Route follows Conrad Road and connects Old 421 Park and Yadkin County to the Town of Lewisville.

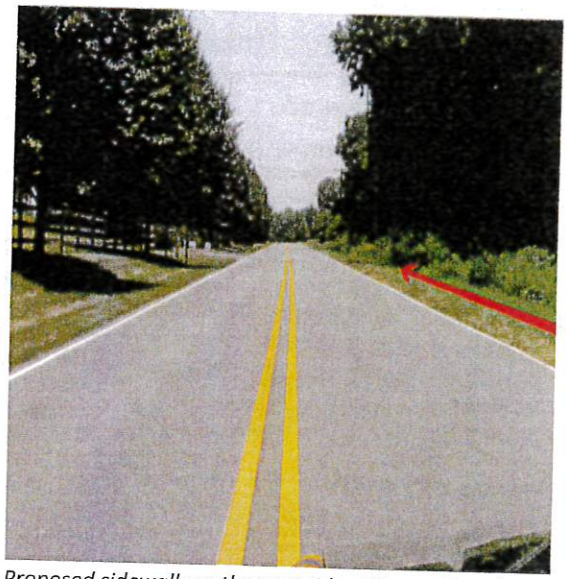
Minor Thoroughfare

- 2,300 linear feet of sidewalk
- Two lane road with a 45 MPH speed limit and 20' total width
- 50' right of way





Proposed sidewalk on the east side of Conrad Road



Proposed sidewalk on the east side of Conrad Road

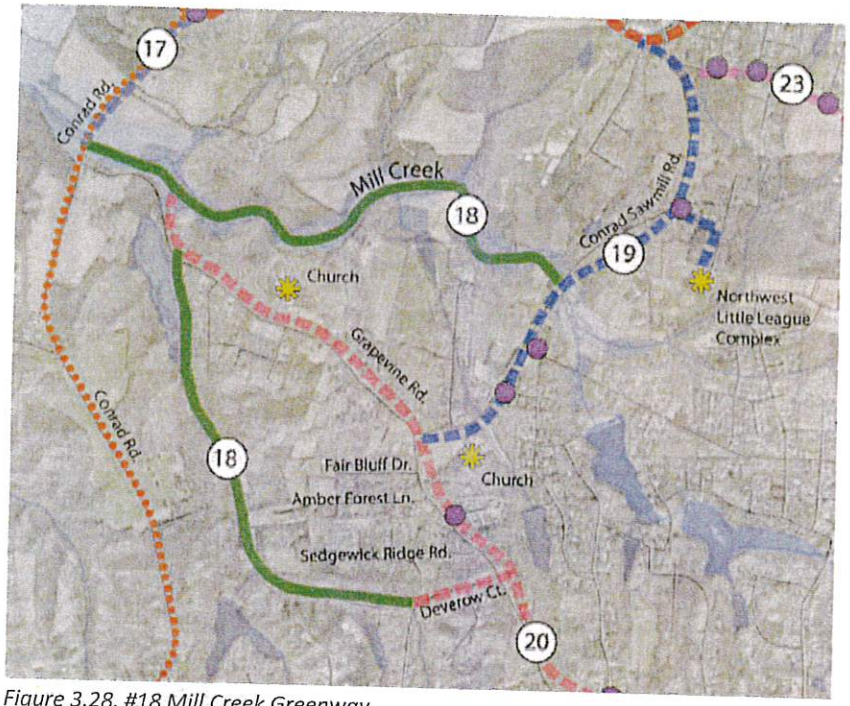


Figure 3.28, #18 Mill Creek Greenway

#18 Mill Creek Greenway

The Mill Creek Greenway segment includes two sections of greenway trail. See Figu 3.28. The northern segment follows Mill Creek. This segment connects Conrad Road a Grapevine Road to Conrad Sawmill Road. The southern segment follows a small tributa south of Grapevine Road and connects Grapevine Road to Deverow Court.

Greenway Trail

- Northern trail is 7,300 linear feet of greenway
- Southern trail is 6,450 linear feet of greenway
- Several culverts, bridges and boardwalks

Legend

- = Mill Creek Greenway (18)
- = Conrad Road (17)
- = Conrad-Sawmill Road (19)
- = Grapevine Road (20)
- = Robinhood Road (23)
- = Existing Sidewalks
- = Yadkin County Connector Bike Route
- = Point of Interest
- = Pedestrian Crosswalk
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

N

Cyclists on a typical greenway

#19 Conrad-Sawmill Road

The Conrad-Sawmill Road segment includes a sidewalk on the south side of the road. See Figure 3.29. This segment connects Grapevine Road to Robinhood Road and Yadkinville Road, as well as providing a connection along Proud Street to the Northwest Little League Complex.

Minor Thoroughfare

- 7,630 linear feet of sidewalk
- Several at-grade crossings
- Two lane road with a 35-45 MPH speed limit and 20' total width
- 60' right of way
- 870 ADT
- 900 ADT (Projected for 2035)

Figure 3.29, #19 Conrad-Sawmill Road

Proposed sidewalk on the west side Conrad-Sawmill Road

Proposed sidewalk on the west side of Conrad-Sawmill Road

Legend

= Conrad-Sawmill Road (19)
= Yadkinville Road (13)
= Mill Creek Greenway (18)
= Robinhood Road (23)
= Existing Sidewalks
= Point of Interest
= Pedestrian Crosswalk
= Study Area
= Roads
= Water
= County Boundary

Not to Scale

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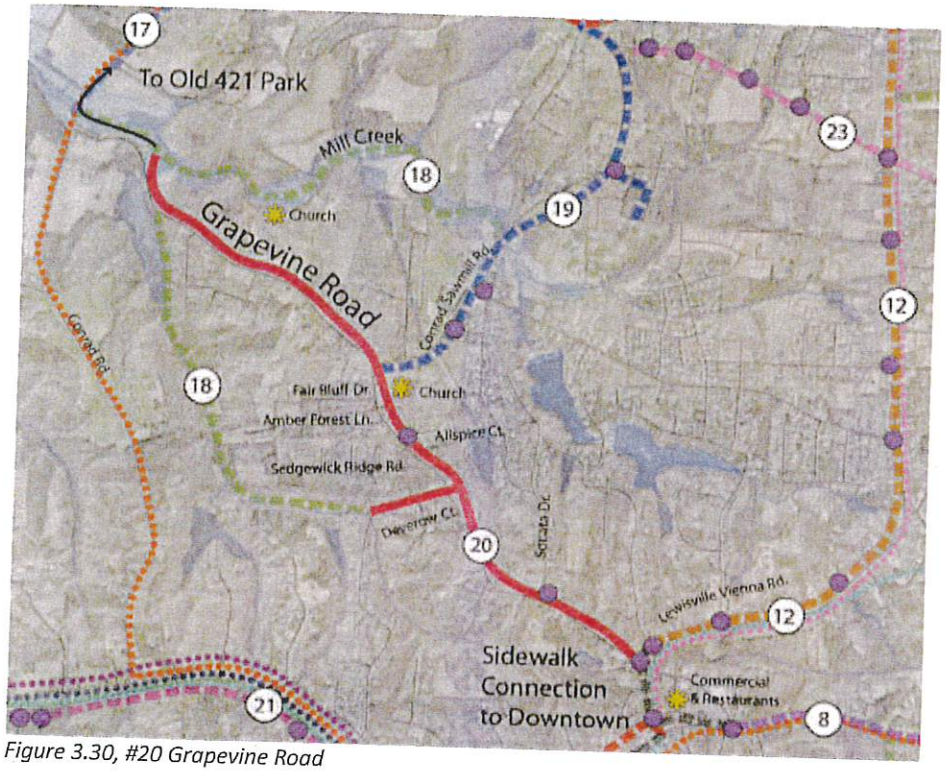


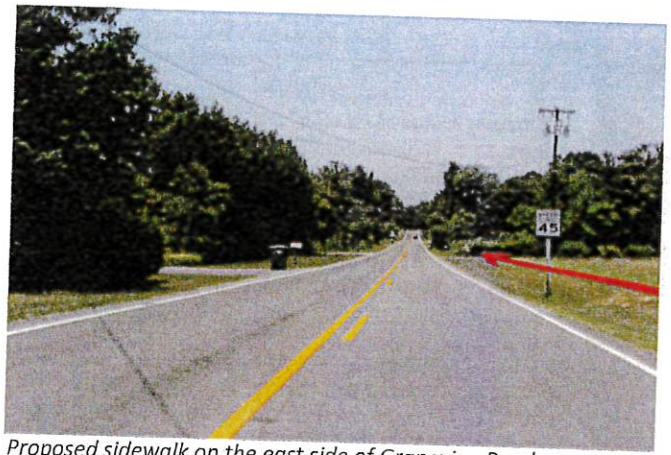
Figure 3.30, #20 Grapevine Road

#20 Grapevine Road

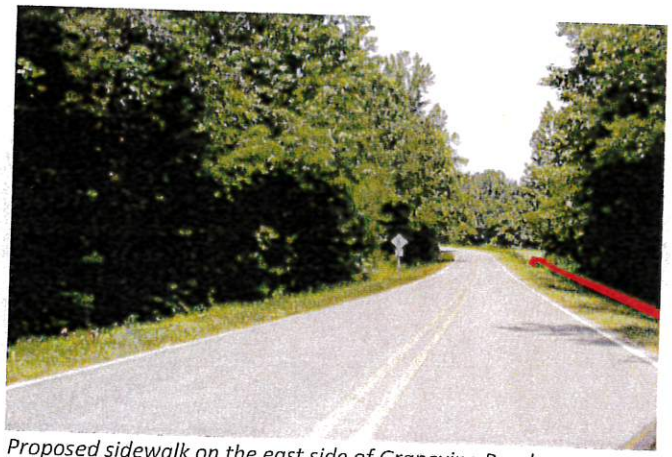
The Grapevine Road segment includes a sidewalk on the north side of the road. S Figure 3.30. This segment connects downtown Lewisville to the northern porti of the Study Area and Old 421 Park. The proposed sidewalk would also tie into existing sidewalk on Lewisville-Vienna Road.

Minor Thoroughfare

- 11,150 linear feet of sidewalk
- Several at-grade crossings
- Two lane road with a 35-55 MPH speed limit and 18-20' total width
- 60' right of way
- 2,500 ADT
- 3,100 ADT (Projected for 2035)



Proposed sidewalk on the east side of Grapevine Road



Proposed sidewalk on the east side of Grapevine Road

Legend

- = Grapevine Road (20)
- = Shallowford Road (8)
- = Lewisville-Vienna Road (12)
- = Conrad Road (17)
- = Mill Creek Greenway (18)
- = Conrad-Sawmill Road (19)
- = Shallowford Road (21)
- = Robinhood Road (23)
- = Existing Sidewalks
- = Mountains-To-Sea Trail
- = Yadkin County Connector Bike Route
- = Stokes County Connector Bike Route
- = Lasater Mill Connector Bike Route
- = Westbend Vineyards Ramble Bike Tour
- = Historic Great Wagon Road
- = Point of Interest
- = Pedestrian Crosswalk
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

N

#21 Shallowford Road

The Shallowford Road segment includes a sidewalk on the south side of the road. See Figure 3.31. This segment connects Lewisville to the western portion of the Study Area.

The Mountains-To-Sea Trail, West Bend Vineyards Ramble Bike Tour Loop and the historic Great Wagon Road follows the alignment of Shallowford Road.

Major Thoroughfare

- 18,500 linear feet of sidewalk
- Several at-grade crossings
- One pedestrian/bicycle overpass at Hwy. 421
- Two lane road with a 35-55 MPH speed limit and 18-22' total width
- 60' right of way
- 1,500 - 6,100 ADT
- 2,100 - 11,400 ADT (Projected for 2035)

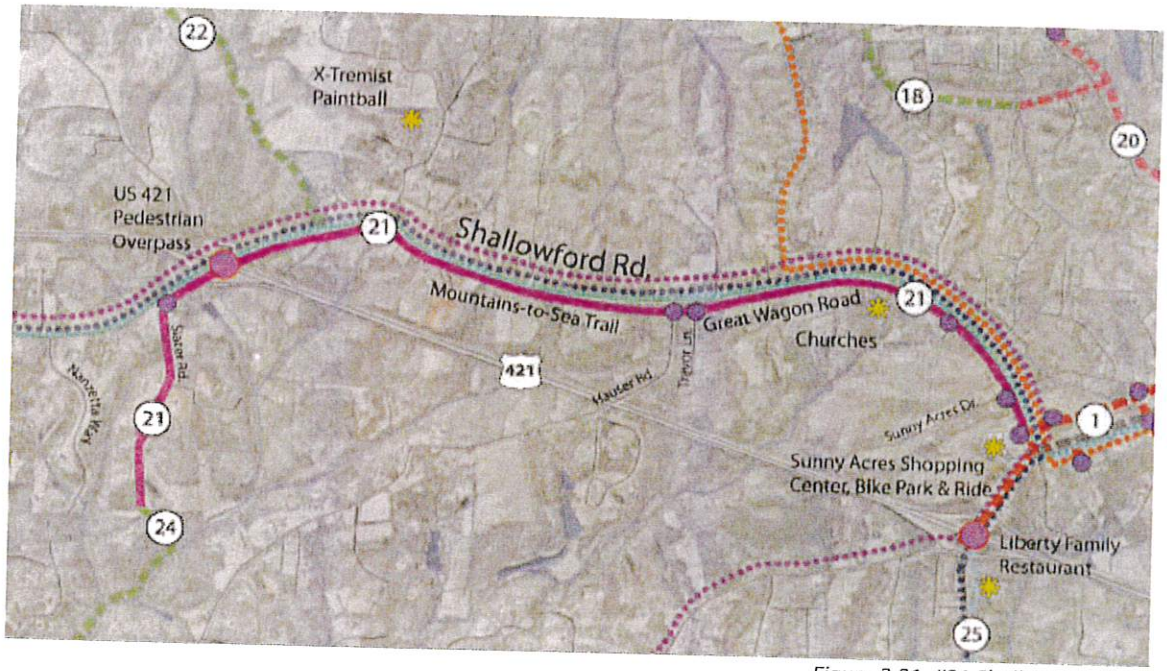


Figure 3.31, #21 Shallowford Road

Legend
- = Shallowford Road (21)
- = Future Great Wagon Road (1)
- = Mill Creek Greenway (18)
- = Grapevine Road (20)
- = Yadkin River West Greenway (22)
- = Panther Ridge Creek Greenway (24)
- = Concord Church Roadand Dull Road (25)
- = Existing Sidewalks
- = Mountains-To-Sea Trail
- = Yadkin County Connector Bike Route
- = Stokes County Connector Bike Route
- = Lasater Mill Connector Bike Route
- = Westbend Vineyards Ramble Bike Tour
- = Historic Great Wagon Road
- = Point of Interest
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

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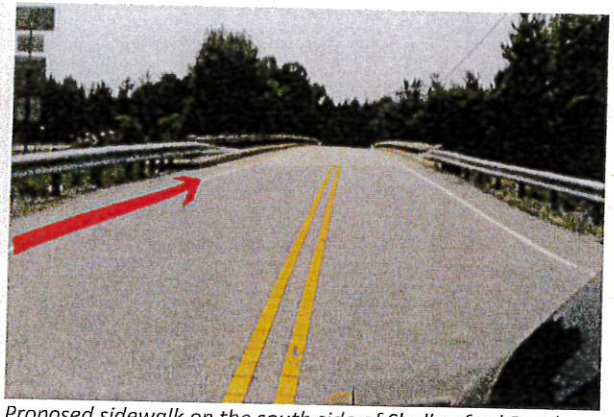


Proposed sidewalk on the south side of Shallowford Road

Proposed sidewalk on the west side of Slater Road

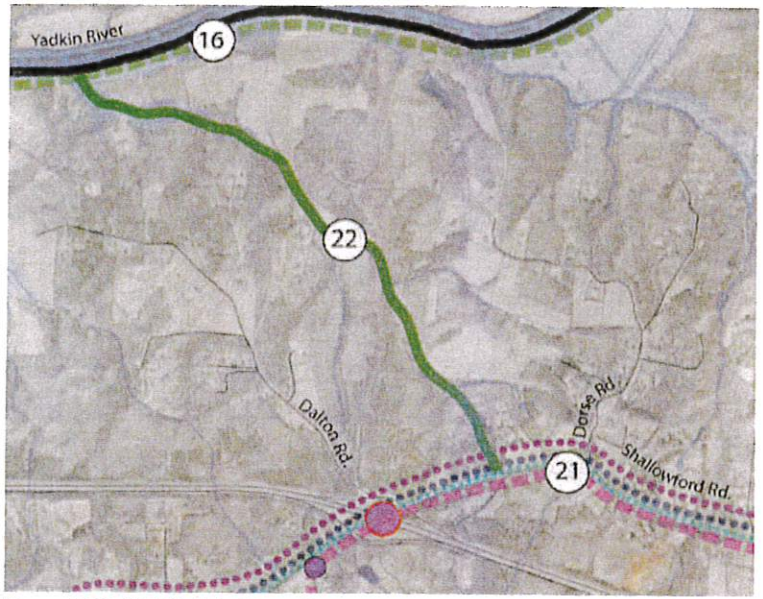


Figure 3.32, #22 Yadkin River West

#22 Yadkin River West Greenway

The Yadkin River West Greenway segment includes a greenway trail along a small tributary of Yadkin River. See Figure 3.32. This segment connects the Yadkin River Trail to Shallowford Roa

Greenway Trail

- 10,200 linear feet of greenway
- Several culverts, bridges and boardwalks

Legend

- = Yadkin River West Greenway (22)
- = Shallowford Road (21)
- = Yadkin River Greenway (16)
- = Existing Sidewalks
- = Mountains-To-Sea Trail
- = Stokes County Connector Bike Route
- = Lasater Mill Connector Bike Route
- = Historic Great Wagon Road
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

N

Typical greenway bridge crossing

Proposed sidewalk on the south side of Robinhood Road

Proposed sidewalk on the south side of Robinhood Road

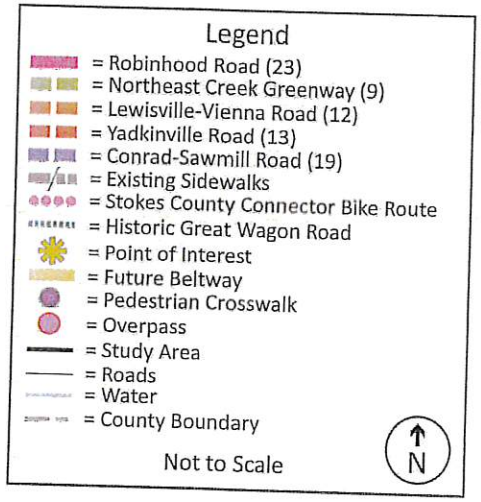
Proposed sidewalk on the south side of Robinhood Road

#23 Robinhood Road

The Robinhood Road segment includes an on-street bike/ped paved trail on the south side of the road. See Figure 3.33. This would connect to the Robinhood Village Shopping area, the proposed Northeast Creek Greenway and strengthen the importance of pedestrian and bicycle connectivity across the Future Beltway at the Robinhood Road interchange. This segment provides an east/west connection in the northern portion of the Study Area and further east to Winston-Salem. Pedestrian/bicycle access across the Northern Beltway on the north and south sides of Robinhood Road should be accommodated.

Major Thoroughfare

- 12,150 linear feet of greenway
- Several at-grade crossings
- One pedestrian/bicycle overpass at the future Beltway
- Two lane road with a 45 MPH speed limit and 24' total width
- 60' right of way
- 1,900 ADT
- 6,500 (Projected for 2035)



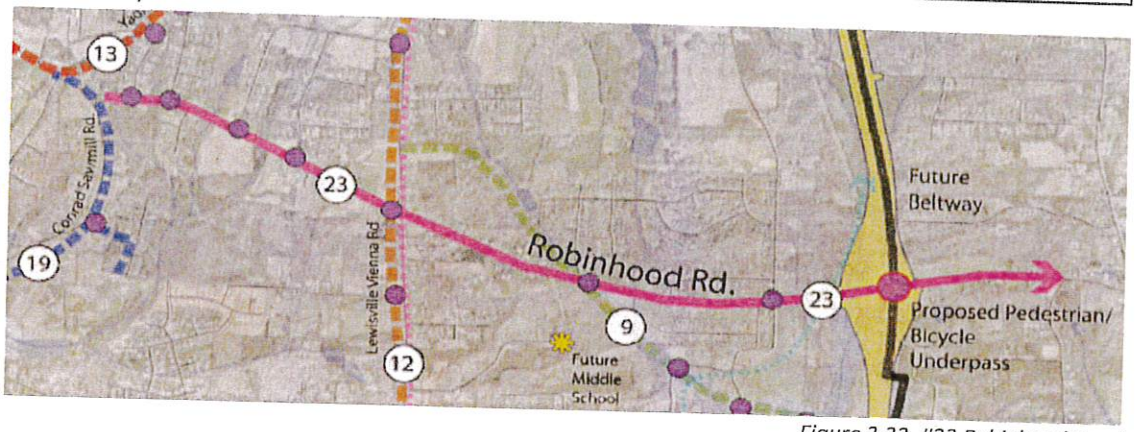


Figure 3.33, #23 Robinhood Road

Figure 3.34, #24 Panther Creek Greenway

#24 Panther Creek Greenway

The Panther Creek Greenway segment includes a greenway trail along Panther Creek. See Figure 3 This segment connects Slater Road and Shallowford Road to the Yadkin River Greenway.

Greenway Trail

- 17,800 linear feet of greenway
- Several culverts, bridges and boardwalks

Legend

- = Panther Ridge Creek Greenway (24)
- = Yadkin River Greenway (16)
- = Shallowford Road (21)
- = Existing Sidewalks
- = Mountains-To-Sea Trail
- = Westbend Vineyards Ramble Bike Tour
- = Historic Great Wagon Road
- = Lasater Mill Connector Bike Route
- = Westbend Vineyards Ramble Bike Tour
- = Pedestrian Crosswalk
- = Study Area
- = Roads
- = Water
- = County Boundary

Not to Scale

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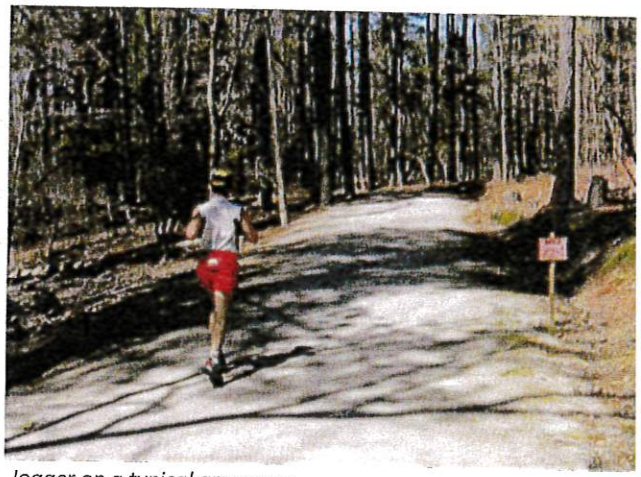
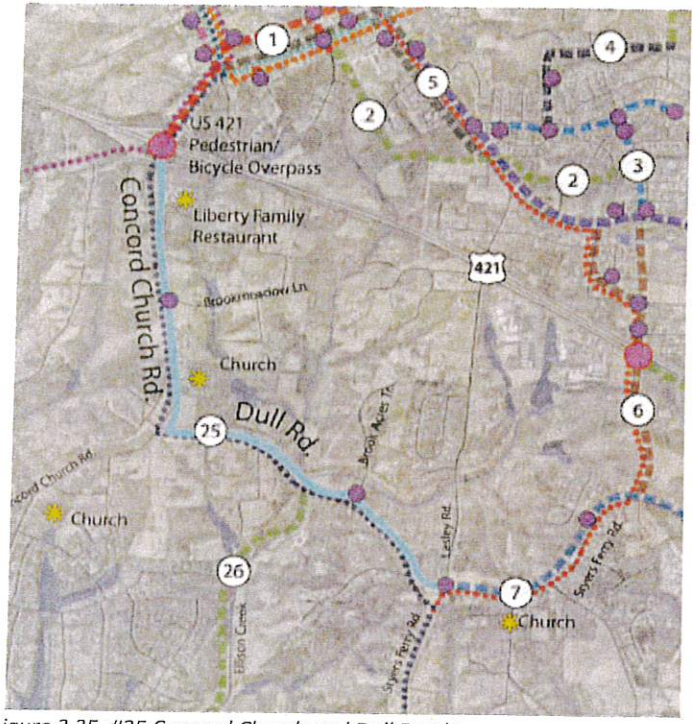


Jogger on a typical greenway



igure 3.35, #25 Concord Church and Dull Roads

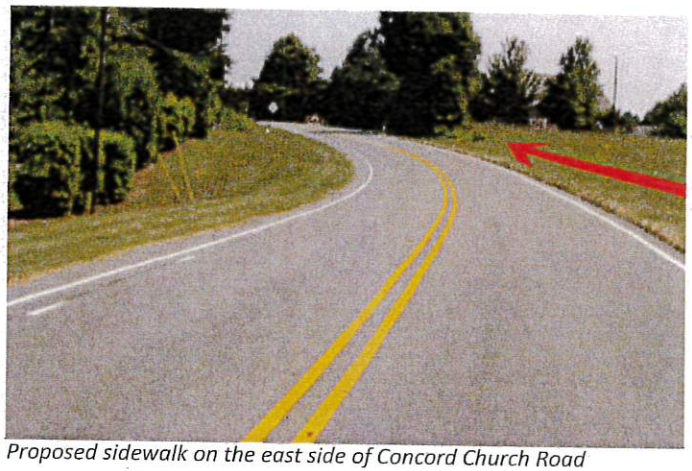
#25 Concord Church Road and Dull Road

The Concord Church Road and Dull Road segments include a sidewalk on the north side of the roads. See Figure 3.34. These segments run from the US 421 overpass to Styers Ferry Road. These segments connect commercial and residential areas, are very scenic and complete a loop from downtown Lewisville. There are steep slopes along Dull Road that could be a challenge for accessibility.

Minor Thoroughfares

- 5,650 linear feet of sidewalk
- Several at-grade crossings
- One pedestrian/bicycle overpass at US 421
- Two lane roads with a 35 MPH speed limit and 22' total width
- 60' right of way
- 2,500-4,900 ADT
- 3,100-7,300 ADT (Projected for 2035)

roposed sidewalk on the north side of Dull Road



Proposed sidewalk on the east side of Concord Church Road

Legend

- = Concord Church and Dull Road (25)
- = Future Great Wagon Road (1)
- = Downtown Greenway Connector (2)
- = Sequoia Drive (3)
- = Woodview Ridge Trail (4)
- = Lewisville-Clemmons Road (5)
- = Reynolds Road (6)
- = Styers Ferry Road - South (7)
- = Ellison Creek Greenway (26)
- = Existing Sidewalks
- = Mountains-To-Sea Trail
- = Yadkin County Connector Bike Route
- = Stokes County Connector Bike Route
- = Lasater Mill Connector Bike Route
- = Westbend Vineyards Ramble Bike Tour
- = Historic Great Wagon Road
- = Point of Interest
- = Pedestrian Crosswalk
- = Overpass
- = Study Area
- = Roads
- = Water
- = County Boundary

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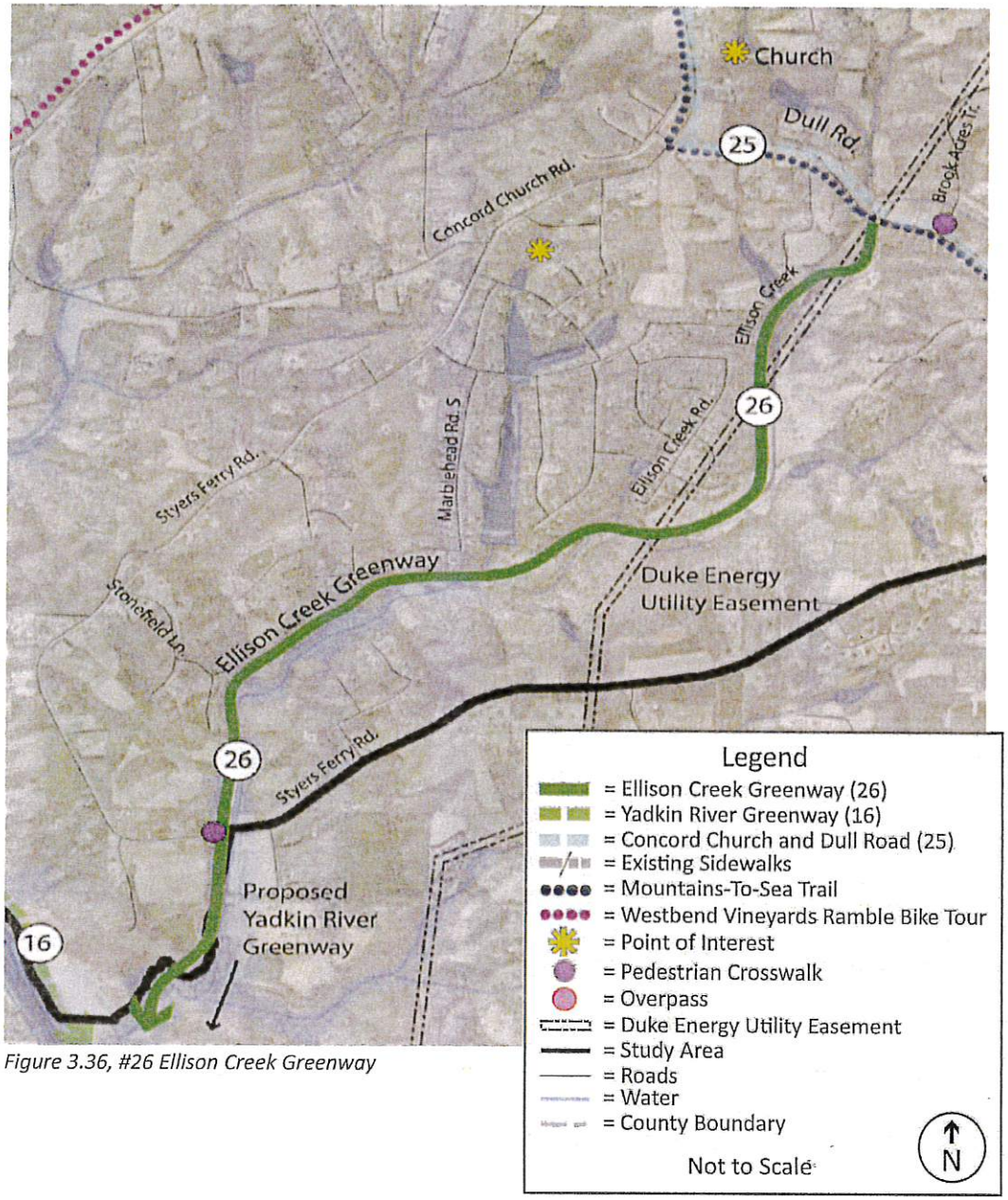


Figure 3.36, #26 Ellison Creek Greenway

#26 Ellison Creek Greenway

The Ellison Creek Greenway segment includes a trail along Ellison Creek. See Figure 3.36. This segment connects Dull Road to the Yadkin River Greenway. It also connects to the Town of Bermuda Run and the Village of Clemmons to the south.

Part of this segment runs along sections of an existing Duke Energy utility easement.

Greenway Trail

- 16,900 linear feet of greenway
- Several culverts, bridges and boardwalks

Typical bridge crossing on a greenway

Plan Comparison

Figure 3.37 shows the comparison of the proposed routes recommended by the consultant and the routes previously identified by the Winston-Salem City/County Planning Board, Winston-Salem MPO and the Town of Lewisville.

Proposed greenway corridors are shown in green, with proposed sidewalk or on-street bike/ped paved trails shown in red.

Corridors not chosen to be included in this plan are shown highlighted orange.

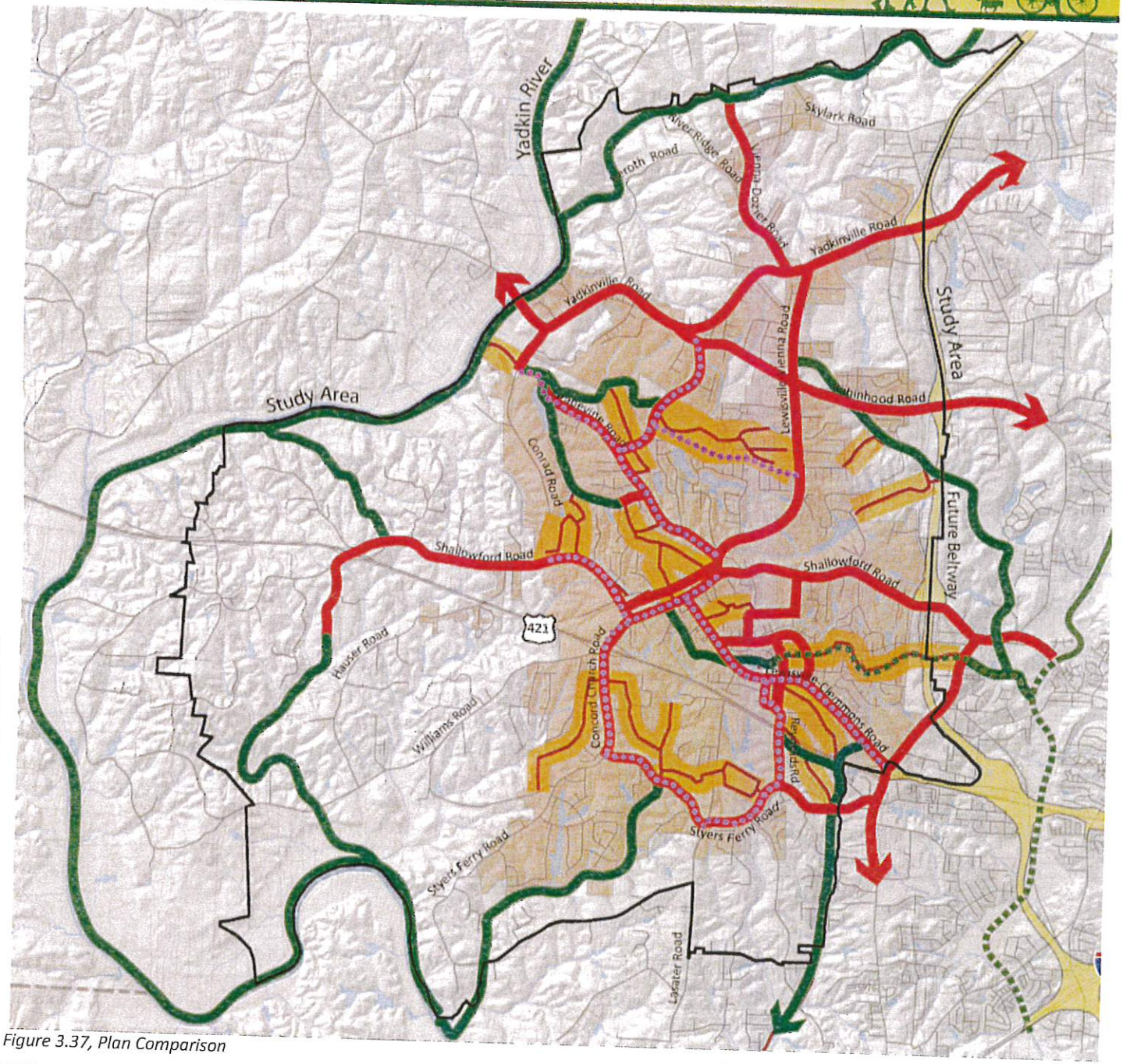


Figure 3.37, Plan Comparison

CHAPTER FOUR: Project Costs, Phasing, and Implementation

Introduction

The following chapter describes general cost information, phasing priorities and suggestions as well as project implementation considerations. As with any long range plan, the Lewisville Greenway and Pedestrian Connections Plan will evolve over time, changing and responding to future conditions. This plan should be evaluated on a regular basis to determine which facilities should be implemented based on several conditions such as economic climate, implementation issues, and future recreational, residential and commercial development.

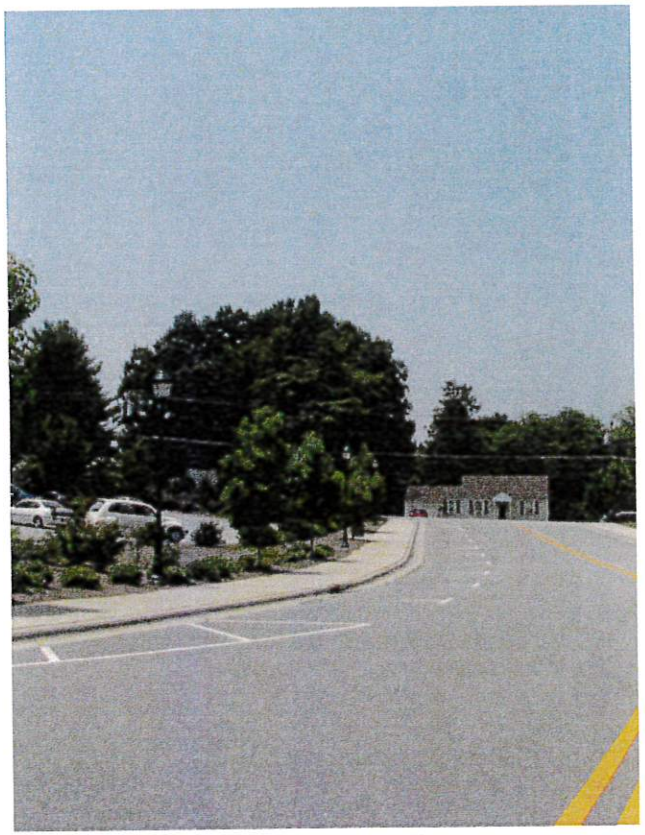
Project Costs

Typical greenway trails and sidewalk costs include right of way acquisition, design fees, as well as typical construction costs. Design and engineering costs for greenways and sidewalks include a variety of professional services. Specialty design services, such as those provided by structural and geotechnical engineers will be necessary as actual site conditions dictate. Design fees typically vary from 8-12% of the total expected construction costs. Design costs will depend on project phasing and economy of scale.

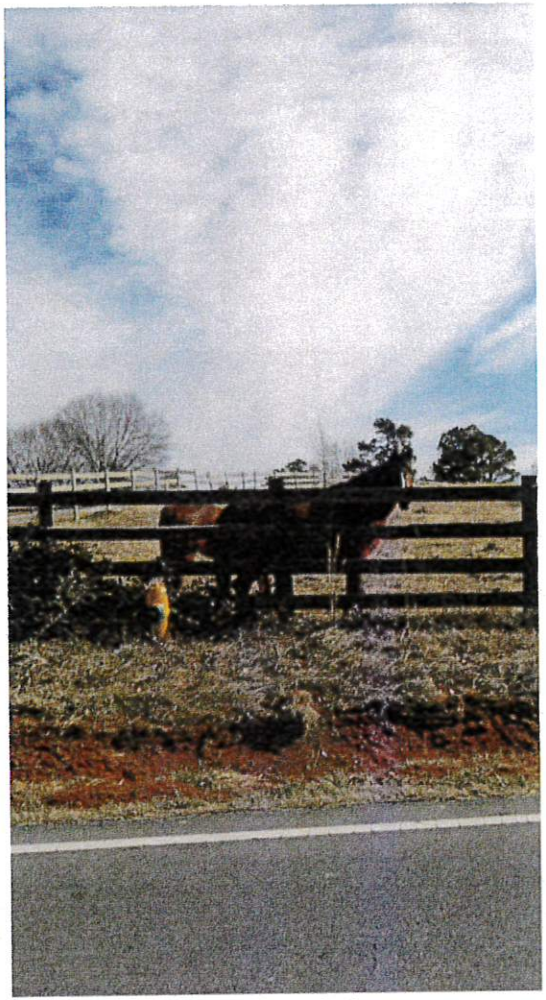
Typically, construction of sidewalks can be estimated between $15 - $80 per linear foot, while greenways and trails can be estimated between $100 - $165 per linear foot. These costs include both design and construction costs, but not land acquisition or permitting. Additional costs for retaining walls, pedestrian bridges, underpasses, overpasses and at-grade crossings have been estimated based on conceptual plans, but are very preliminary at this level of design.

These generic costs are rough estimates in 2011 dollars, without any adjustment for inflation, and do not include costs of property acquisition, permitting or specialty engineering. Only standard construction methods and materials were included, so this should be taken into consideration if specialty materials are desired or are required.

Construction costs may vary due to construction phasing, economy of scale, revisions to the design required by local, state and federal permitting agencies, fluctuation of commodity prices, selection of materials, types and quantity of amenities desired, among other issues.



New sidewalks as part of the Great Wagon Road Extension



Existing rural character in the Study Area

Costs are based on "Order of Magnitude", a preliminary, conceptual level understanding of the greenway and sidewalk components, so it is not intended as a detailed design cost estimate. ASTM Standard E2620 defines "Order of Magnitude" as being accurate to within plus 50% or minus 30%. Due to the uncertainty of actual design conditions and implications, they serve only to demonstrate the range of costs.

Phasing Strategies and Goals

Phasing priorities for the greenway and pedestrian plan are based on several factors. While working with the Steering Committee, it became clear that the greenway and sidewalk segments could be grouped in short, medium and long range implementation projects.

Short Range Projects (1-10 Years)

- Address pedestrian safety issues and accessibility.
- Provide access to trip generators such as schools, employment centers, neighborhood shopping centers, historic sites, transit and recreational facilities, and multi-family housing.
- Connect to Muddy Creek and other planned pedestrian facilities.
- Enhance downtown connectivity to the surrounding neighborhoods.
- Add sidewalk segments along major corridors, where the largest number of pedestrians would be concentrated.
- Connect existing sidewalks sections to improve continuity and create loops.

Middle Range Projects (10-20 Years)

- Extend network of sidewalks along corridors that connect residential areas to the downtown area as well as recreational facilities.
- Create additional loops and links to neighborhoods and commercial growth areas.

Long Range Projects (20 years or more)

- Provide connectivity to the Yadkin River and to the north and west of the Study Area.

The short, medium and long range priorities are subject to change based on available funds and economic climate, changing priorities, grant opportunities, and new roadway projects that become priorities in the future. Other factors would include implementation constraints, changing pedestrian patterns, and new recreational, residential and commercial development that will need connectivity. These pedestrian connectivity priorities will likely evolve over time and should be frequently reviewed to determine changing conditions within the community and region. For example, some projects considered long range priorities may actually become higher priorities if they are considered inexpensive to fund or can be constructed in conjunction with road widening projects.

Typically, the highest priorities have been given to those projects which create the maximum amount of connectivity to the more densely developed areas around the downtown area, and where sidewalk gaps currently exist. Connections to the Muddy Creek Greenway and other recreational amenities were considered equally important. To help determine priorities, a map of the Study Area with the pedestrian generators discussed in Chapter Two was overlaid with a 1/2 mile walking radii, shown in Figure 4.1. It was then possible to focus on the greenway and sidewalk segments which would be the biggest improvement to pedestrian connectivity in the short, medium and long range. The phasing priorities plan shown in Figure 4.2 illustrates those projects considered short, medium, and long-range priorities.

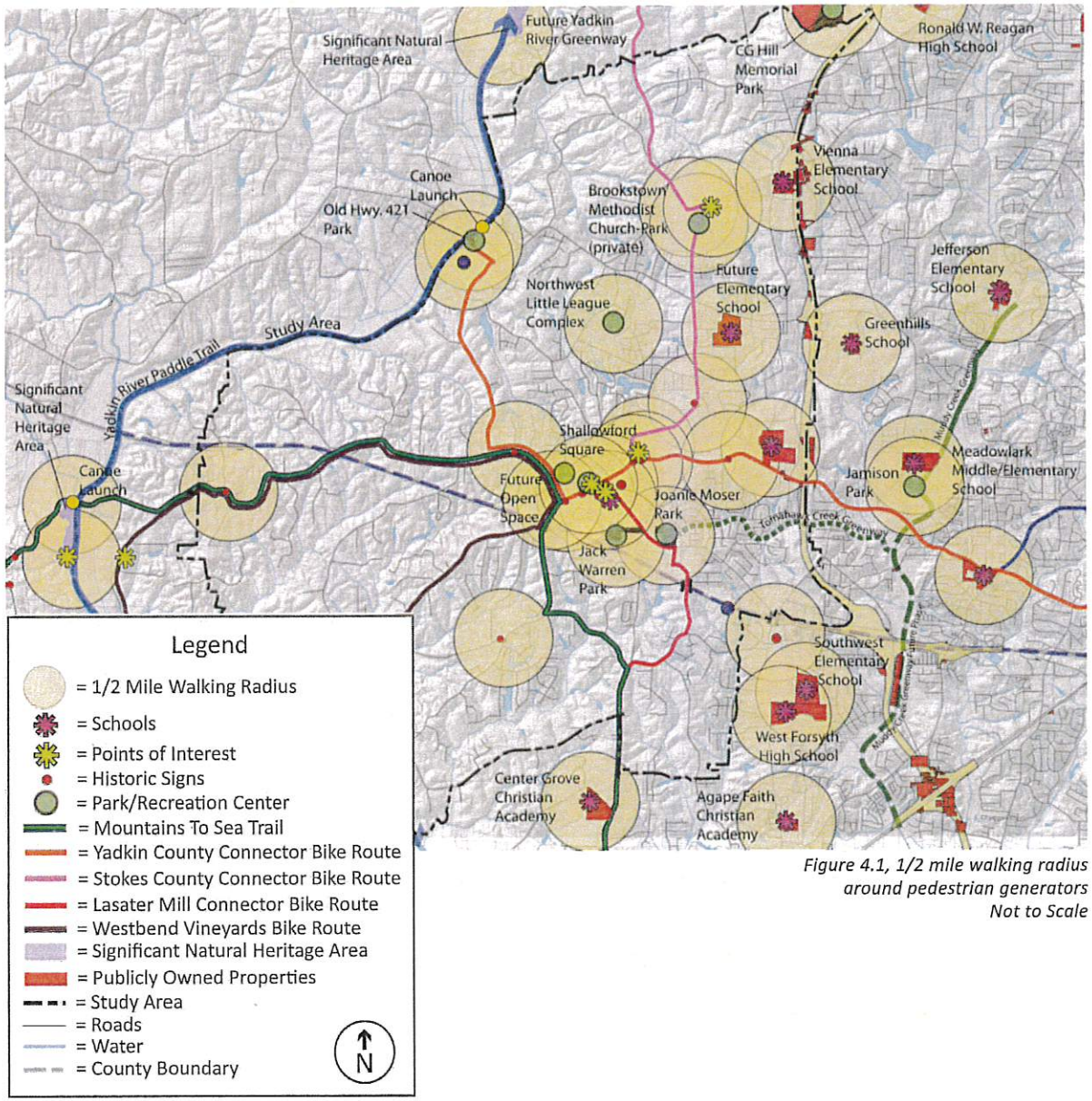


Figure 4.1, 1/2 mile walking radius around pedestrian generators
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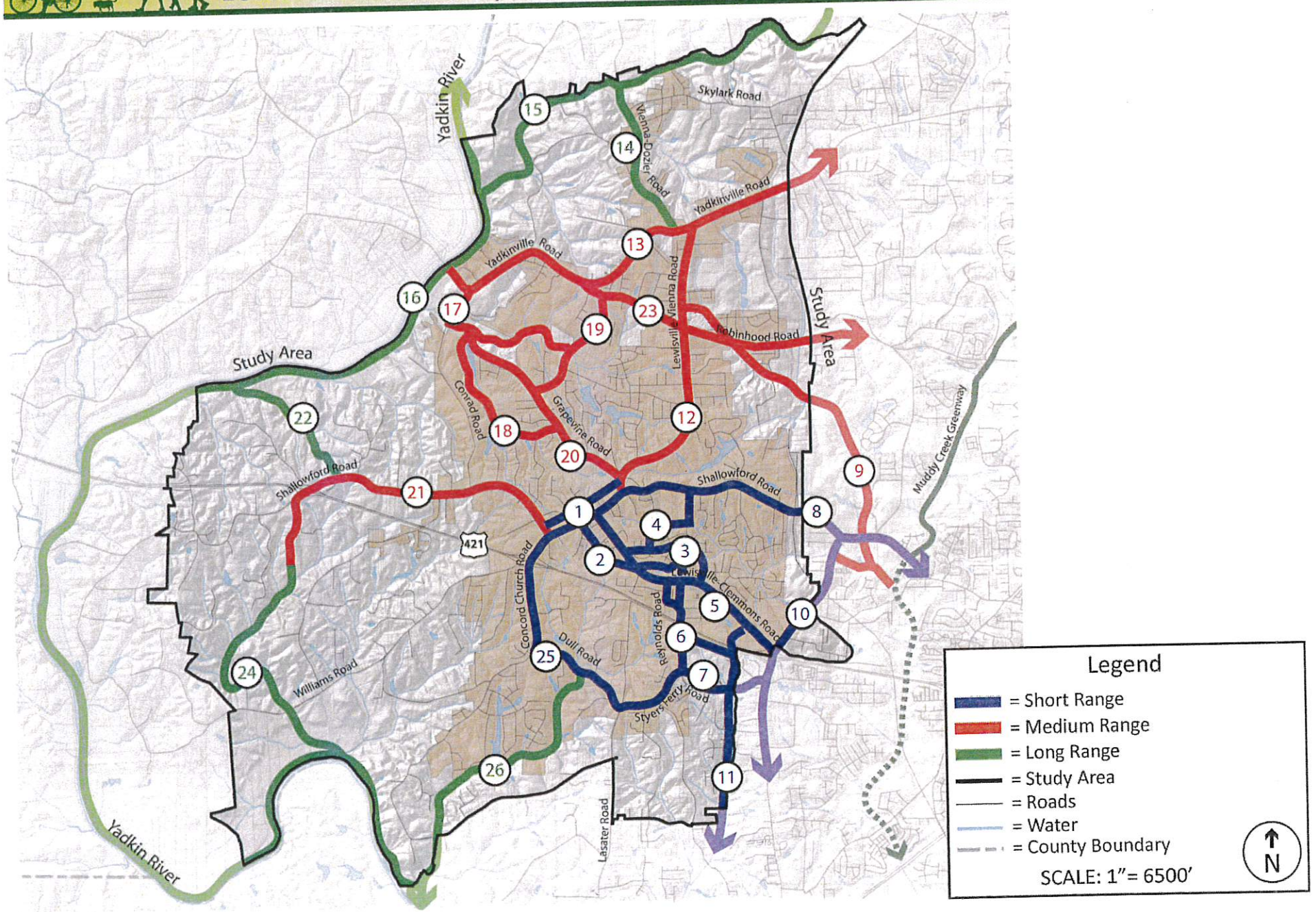
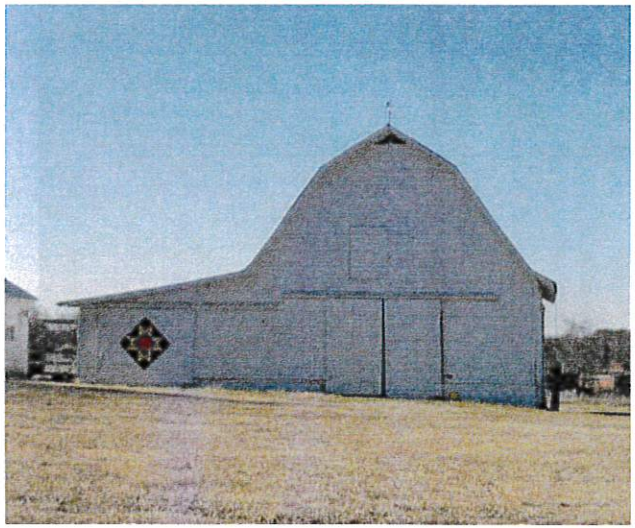


Figure 4.2, Phasing Priorities, Not to Scale

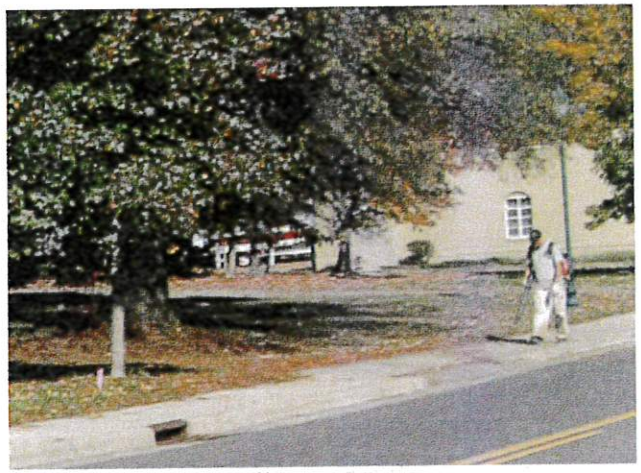
Implementation of the greenway and sidewalk network plan will take a coordinated effort between the Town of Lewisville and other stakeholders. The managing department from the Town should be determined in the early stages in order to ensure that all aspects of the long term goals can be realized. The following steps should be followed as the plan evolves over time:

- Determine which Town Departments will plan, construct, and maintain the system. Develop and establish the roles for the Town Departments and staff.
- Create a Greenway and Pedestrian Connections Plan Citizen Advisory Board to provide general guidance and recommendations to staff and elected officials. This task could become an additional responsibility of the existing Town of Lewisville Parks, Recreation, and Cultural Development Board, or a separate board could be developed.
- Facilitate planning approvals required for pedestrian facilities, and draft policies for system implementation, such as a "Complete Streets" policy for new development. By adopting a "Complete Streets" policy, communities ensure that new roadway and streetscape development incorporates pedestrian and bicycle friendly design.
- Determine programming initiatives such as the "Safe Routes to School" program which provides children with the opportunity to walk or bike safely to school, while also increasing the level of health and wellness for citizens of all ages.
- Locate and evaluate potential corridors for environmentally sensitive areas such as wetlands, rare species and mature vegetation. Ecologically sensitive areas should be protected and enhanced.
- Develop and implement a long range land acquisition and management plan which anticipates future development where possible. Land can be acquired through easements, donations, purchase, or other means.
- Create a vision for the network by identifying overall themes - health and fitness, environmental protection and preservation, education, preservation of rural character, and connectivity are all examples of possible guiding themes. Designing a logo, system signage, and mapping and brochures will bring awareness to the plan, and create anticipation for future projects.

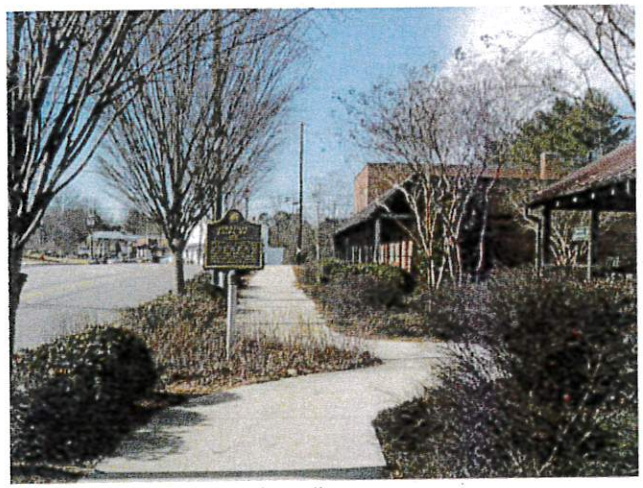
Lewisville Town Hall



Quilt square on local barn



Maintenance staff blowing leaves in fall



Existing sidewalk at the Roller Mill

- Ongoing research on possible funding sources and partnerships (See Appendix A for a list of possible funding resources)
- Develop a pilot project to be implemented as quickly as possible in order to build enthusiasm for the entire network.
- Ensure facilities and properties are well maintained and functioning properly. Create a maintenance plan for routine and remedial maintenance tasks.

Maintenance

The maintenance of greenway trails and sidewalks is an important aspect of the success of any pedestrian network. Developing a management plan will help staff identify maintenance items and determine a proper schedule.

Maintenance tasks can be divided into three categories, routine maintenance, remedial or long term maintenance, and emergency repairs. Routine maintenance tasks relate to the general upkeep against normal wear and tear of facilities, equipment, and site furnishings. Routine maintenance can be defined as daily, weekly, monthly, or annually scheduled activities such as trash removal, sweeping trail surfaces, trimming of vegetation, mowing lawns, mulching planting beds, and clearing culverts and drains.

Remedial maintenance can be defined as the repair, replacement, or restoration of major facilities, furnishings, or fixtures that have been destroyed, damaged, or have exceeded their useful life. Remedial maintenance tasks are conducted less frequently than routine maintenance tasks and are scheduled on an as-needed basis or at the end of a system or facility's useful life.

Emergency repairs may be necessitated by storm damage, flooding, or other accidents. A contingency plan should be included in the maintenance management plan for these events. For example, this might include mobilizing on-call contractors or staff who can operate the equipment necessary for clearing downed trees and large limbs after an intense storm or ice event.

APPENDIX A: Federal and State Funding Opportunities

Federal Funding Sources

Land and Water Conservation Fund

The Land and Water Conservation Fund (LWCF) is administered by the Department of the Interior, National Park Service. The fund provides matching grants for acquisition and development of public outdoor and recreation facilities. It can be used for community park and recreation facilities, including trails and greenways. Money is allocated through the State Division of Parks and Recreation. Fifty percent of the local project costs must be met through in-kind services or cash. Source: www.nps.gov/lwcf/

Federal-aid Highway Program

The Federal-aid Highway Program provides funding for the surface transportation system through money distributed to individual States through several program areas. These program areas include Interstate Maintenance, National Highway System, Bridge, Surface Transportation Program, Congestion Mitigation and Air Quality Improvement Program, Highway Safety Improvement Program, and the Recreational Trails Program along with some discretionary programs and other high priority projects as directed by Congress. These funds can be used for pedestrian facilities, bicycle transportation facilities and other recreational use facilities, as well as benefiting recreational interests indirectly by providing access to new facilities. Source: www.fhwa.dot.gov

Surface Transportation Program

The Surface Transportation Program (STP) provides funding which can be used for bridge projects located on any public road, transit capital projects, intracity/intercity bus terminals and facilities, and any project located on a Federal-aid highway. Source: www.fhwa.dot.gov

Surface Transportation Program – Direct Attributable

The Surface Transportation Program (STP) STP-DA provides funding for transportation planning, bicycle, greenway, sidewalk, and street and highway projects in the urban area. STP-DA grants require a twenty percent local match and can be used for the design phase through the construction phase of the project.

Surface Transportation Program – Transportation Enhancement Activities

The Surface Transportation Program (STP) provides funding which can be used for pedestrian and bicycle projects. Ten percent of these funds must be used for Transportation Enhancement Activities (TE). TE funds are limited to project construction and cannot be used to cover the cost of routine maintenance. Source: www.fhwa.dot.gov/environment/te and www.enhacements.org

Surface Transportation Act (SAFETEA-LU)

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) provides is the largest surface transportation funding source in the nation and provides guaranteed funding for highways, highway safety and public transportation. The SAFETEA-LU includes programs such as Congestion Mitigation and Air Quality Improvement (CMAQ), Safe Routes to School, Recreational Trails Program, and the Transportation, Community and Systems

Preservation Program (TCSP). Source: www.fhwa.dot.gov/safetealu/

Congestion Mitigation and Air Quality

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) strives to reduce transportation related emissions by providing funding to projects and programs in air quality nonattainment and maintenance areas based on population and severity of pollution in ozone and carbon monoxide areas. Source: www.fhwa.dot.gov

Safe Routes to School

The Safe Routes to School (SR2S) Program provides funding for both infrastructure-related and behavioral projects geared toward providing a safe, appealing environment for walking and/or biking that will improve the quality of children's lives and support national health objectives by reducing traffic, fuel consumption and air pollution in the vicinity of schools. Eligible projects may be undertaken on any public road, bicycle or pedestrian path or trail near schools and includes such improvements as sidewalk improvements, traffic calming/speed reduction, pedestrian/bicycle crossing, on-street bicycle facilities, off-street bicycle/pedestrian facilities, secure bicycle parking and traffic diversion. Source: www.fhwa.dot.gov

Recreational Trails Program

The Recreational Trails Program (RTP) provides funding to develop, construct, rehabilitate and maintain trails for recreational purposes that include pedestrian, equestrian, and bicycling. Matching grants are available to eligible entities for development of trails for use by hikers, equestrians and/or mountain bikes. Source: www.fhwa.dot.gov/environment/rectrails/

Transportation, Community, and System Preservation Program

The Transportation, Community, and System Preservation Program (TCSP) provides funding to carry out eligible projects to integrate transportation, community, and system preservation plans and practices. Source: www.fhwa.dot.gov

Wetland Reserve Program

The Wetland Reserve Program is administered by the US Department of Agriculture's Natural Resource Conservation Service and offers technical and financial assistance to landowners who want to restore and protect wetland areas for water quality and wildlife habitat. The program pays private landowners who agree to place sensitive wetlands under permanent easements, and it can be used to fund protection of open space and greenways within riparian corridors. Source: www.nrcs.usda.gov

FEMA - Hazard Mitigation Assistance

FEMA administers the Hazard Mitigation Assistance (HMA) program which provides funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages. The HMA includes the following grant programs; Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), Repetitive Flood Claims (RFC), Severe Repetitive Loss (SRL). These grants are administered through the North Carolina Department of Crime Control and Public Safety. Source: www.fema.gov

U.S. Fish and Wildlife Service Grant Opportunities

The U.S. Fish and Wildlife Service offers several federal grants that help protect habitat for fish and wildlife in the Southeastern states. Source: www.fws.gov/southeast/grants/GrantOpportunities.html

Environmental Protection Agency – Environmental Education Grants Program

The Environmental Education Grants Program is sponsored by the EPA's Environmental Education Division (EED) and provides funding for environmental education projects. The purpose of the program is to improve the public's awareness and knowledge, and create skills that help citizens make educated decisions that have an effect on environmental quality. Source: www.epa.gov

National Endowment for the Arts Grant Opportunities

The National Endowment for the Arts offers several federal grants that provide funding for public art. For a complete list of grant programs, refer to the website listed below. Source: www.nea.gov

Watershed Program

The Watershed Program is implemented by the Natural Resources Conservation Service (NRCS). The program provides funding and technical assistance to states and local agencies to plan and implement projects that include soil conservation, flood prevention, utilization and disposal of water, and conservation and proper utilization of land. Source: www.nrcs.usda.gov

State Funding Sources

NC Adopt-A-Trail Grant Program

The NC Adopt-A-Trail Grant Program (AAT) provides funding for engineering and environmental studies as well as trail construction and maintenance up to a maximum of $5,000. Source: www.ncparks.gov/About/trails_grants.php

Recreational Trails Program

The North Carolina Division of Parks and Recreation the Recreational Trails Program through its NC Trails Program. The grant is open to government agencies and non-profit organizations for trail construction and maintenance projects, trail side facilities construction and land acquisition for trails. Source: www.ncparks.gov/About/trails_grants.php

NC Agricultural Development & Farmland Preservation Trust Fund

The NC Agricultural Development & Farmland Preservation Trust Fund was established by the NC General Assembly. The fund protects farmland from development through the acquisition of the land for conservation easements. Source: www.ncadfp.org

NC Clean Water Management Trust Fund

The NC Clean Water Management Trust Fund (CWMTF) is one of the largest sources of money in North Carolina for conservation, preservation and restoration of environmental and natural resources. The CWMTF provides funding for land acquisition, planning, and stormwater and wastewater projects. Source: www.cwmtf.net

Conservation Reserve Enhancement Program

The Conservation Reserve Enhancement Program (CREP) uses federal and state resources to fund conservation easements for landowners in approved watershed areas to provide protection of environmentally sensitive cropland and pastureland. Source: www.enr.state.nc.us/dswc/pages/crep.html

Ecosystem Enhancement Program

The Ecosystem Enhancement Program (EEP) uses funding allocated to the NC DOT to purchase and protect lands impacted by road projects and achieve open space protection for the State. Source: www.nceep.net/pages/apartnershipfor.html

NC Conservation Tax Credit Program

The NC Conservation Tax Credit Program is administered by NCDENR in which a credit can be received against income taxes when property is donated for conservation. This tax credit equals 25% of the fair market value of properties donated for conservation purposes - up to $250,000 for an individual or $500,000 for a corporation. Source: www.onencnaturally.org/pages/ConservationTaxCredit.html

NC Parks and Recreation Trust Fund

The NC Parks and Recreation Trust Fund (PARTF) is the leading source of funding for building and renovating recreation areas, and acquiring land for new and existing recreation areas in North Carolina. The PARTF requires a 50/50 match from local government. The PARTF funds can be used for acquisition, development and renovation of recreational areas. Source: www.partf.net

Wetlands Reserve Enhancement Program

The Wetlands Reserve Enhancement Program (WREP) is administered by the USDA Natural Resources Conservation Service to acquire and protect wetland, stream and riparian buffer areas to ensure their continued functioning in the areas of water quantity and quality control and as wildlife habitat. Source: www.nc.nrcs.usda.gov/programs/WRP/WREP.html

Bicycle and Pedestrian Planning Grant Initiative

The Bicycle and Pedestrian Planning Grant Initiative is a joint effort between the NCDOT Division of Bicycle and Pedestrian Transportation and the Transportation Planning Branch. The initiative is a matching grant program which provides funding for municipalities to develop comprehensive bicycle and pedestrian plans. Source: www.ncdot.org/bikeped/planning/

NC Arts Council Grant

The NC Arts Council, a division of the NC Department of Cultural Resources, provides numerous grants to nonprofit organization for arts programming. The NC Arts Council typically requires grant recipients to match funds one-to-one, and the funding can be used to hire accomplished artists to produce work or conduct programs. Source: www.ncarts.org

Conservation Trust for North Carolina

The Conservation Trust for North Carolina (CTNC) is a non-profit organization working to protect areas with significant scenic, ecological, recreational, agricultural, historic or cultural value. The CTNC works with local land trusts around the state, including the Piedmont Land Conservancy and The Land Trust for Central North Carolina, in working with landowners to procure property or easements in significant areas, and to obtain grants and other funding for projects. Source: www.ctnc.org

The Nature Conservancy

The North Carolina Chapter of The Nature Conservancy (TNC) is a non-profit organization that works with individuals, businesses, communities, local governments and partner organizations to help protect the natural environment through a number of programs such as prescribed burns, conservation easements and working to address threats to biodiversity such as invasive plants and animals. TNC uses a scientific approach in selecting preservation areas, and works with land owners to create conservation easements and develop programs to help the environment. Although TNC does not provide grants, they provide information and help in finding/acquiring funding for projects involving conservation. Source: www.nature.org

Private Funding Sources

Kodak American Greenways Awards Program

The Kodak American Greenways Awards Program is based on a partnership between the Conservation Fund and the National Geographic Society. The program provides up to four awards each year to individuals, corporations, organizations or public agencies that have undertaken greenway, trail or natural area projects. Source: www.conservationfund.org/kodak_awards

Z. Smith Reynolds Foundation

The Z. Smith Reynolds Foundation is a Winston-Salem based foundation assisting environmental projects of local governments and non-profits in North Carolina, but they do not fund land acquisition. Source: www.zsr.org

The Wal-Mart Foundation

The Wal-Mart Foundation seeks to fund initiatives that integrate their current focus of hunger relief into their main focus areas of Education, Workforce Development/Economic Opportunity, Environmental Sustainability, and Health and Wellness. Source: http://walmartstores.com/communitygiving/

Deutsche Bank Americas Foundation and Community Development Group

The Deutsche Bank Americas Foundation and Community Development Group provide an assortment of community development grants for projects involving environmental sustainability. Source: www.db.com/community

Golden Leaf Foundation

The Golden Leaf Foundation funds projects that focus on opportunities to support and develop economic strength in tobacco-dependent, economically distressed, and/or rural communities. Source: www.goldenleaf.org

NC Rural Economic Development Center, Inc.

The NC Rural Economic Development Center, Inc. addresses economic revitalization in North Carolina's rural areas. The Small Town's Initiative Grant supports projects in 56 selected towns that preserve and enhance important resources and provide new economic opportunities. Source: www.ncruralcenter.org

Student Conservation Association

The Student Conservation Association (SCA) is a non-profit group consisting of young people giving hands-on service to national parks, cultural landmarks, and community green spaces. The SCA provides such services as trail maintenance and clearing, construction of erosion prevention structures, stream bank stabilization and invasive plant control. Source: www.thesca.org

AmeriCorps NCCC

The AmeriCorps NCCC (National Civilian Community Corps) will partner with organizations such as non-profits, local municipalities and state governments to complete service projects including infrastructure improvement, environmental stewardship and conservation, urban and rural development. Source: www.americorps.gov

The Conservation Fund

The Conservation Fund is a non-profit organization that works with government agencies, land trusts, nonprofit organizations and others in helping to acquire and protect landscape with significant value for recreation, wildlife habitat or history. Source: www.conservationfund.org

Audubon North Carolina

Audubon North Carolina is a grassroots organization which focuses on conserving and restoring natural habitats, with a major focus on the needs of birds. Audubon North Carolina utilizes science-based research and conservation, education, outreach and advocacy in an effort to improve natural habitats. Source: http://nc.audubon.org

Trust for Public Land

The Trust for Public Land (TPL) is a national non-profit organization that helps agencies and communities identify and generate funds for conservation from federal, state, local and philanthropic sources. TPL does not provide any grants or funding. Source: www.tpl.org

Other Resources

There are many resources that could offer resources or funding such as creative partnerships with the cycling community, the medical community and conservation groups, private donations, and donated time and materials.

APPENDIX B: Project Resources

Digital Resources

N.C. River Basin Map,
http://www.eenorthcarolina.org/public/ecoaddress/riverbasins/riverbasinmap/interactive.htm

N.C. Geology Map,
http://www.geology.enr.state.nc.us/usgs.geomap.htm

N.C. State Physiographic Map, NC Geological Survey Division of Land Resources,
http://www.geology.enr.state. nc.us

U.S. Forest Service, Equestrian Design Guidebook for Trails, Trailheads, and Camping,
http://www.fs.fed.us/t-d/pubs/htmlpubs/htm07322816/pqge 12.htm

USFS National Survey on Recreation and the Environment (NSRE) for North Carolina and the North Carolina Market Region,
http://www.srs.fs.usda.gov/trends/Nsre/nsremod.html

N.C. Department of Water Quality, http://portal.ncdenr.org/web/wq

Hard Copy Resources

Town of Lewisville Comprehensive Plan, Town of Lewisville, 2005

Town of Lewisville - Vienna Small Area Plan, Town of Lewisville, 2006

Vienna Planning Committee Final Report, Town of Lewisville, 2006

Yadkin Valley Heritage Corridor Master Plan, The Yadkin Valley Heritage Corridor Partnership, 2009

Growth Management Plan, Winston-Salem/Forsyth County Unified Development Ordinance

Independent Bicycle Projects, 2006-2012 Transportation Improvement Plan, North Carolina Department of Transportation

Yadkin River Paddle Trail Map, Yadkin River Trail Association

Yadkin River Boating and Recreation Map, Yadkin Riverkeeper, 2009

AASHTO Guide for the Development of Bicycle Facilities, American Association of State Highways and Transportation Officials, 1999

North Carolina Bicycle Facility Planning and Design Guidelines, North Carolina Department of Transportation, 1994

National Survey of the Recreation and Environment, Pioneering Research Group, Southern Research Station, USDA Forest Service, Athens, GA, 2007

Duke Energy Developers Guide, Duke Energy

Yadkin-Pee Dee River Basin, N.C. Office of Environmental Education

North Carolina Water Quality Assessment and Impaired Waters List, N.C. Division of Water Quality (NCDWQ) 2007

Digital Mapping Resources

File	File Name	Source	Year
Forsyth County parcels	FC_parcels.shp	City of Winston-Salem-MPO	2008
Hydrology- Streams/Rivers	hydro24k_arc.shp	North Carolina Division of Water Quality	2006
Hydrology- Lakes	hydro24k_poly.shp	North Carolina Division of Water Quality	2006
Landcover	lc96.shp	NC Center for Geographic Information and Analysis	1998
Municipal Boundaries	MunicipalBoundaries_polys.shp	City of Winston-Salem-MPO	2008
Roads	LRS_Arcs.shp	NC Department of Transportation	2008
Forsyth County Elevation-LIDAR	elevation.lyr	NC Department of Transportation	2007
Davie County Elevation-LIDAR	elevation.lyr	NC Department of Transportation	2007
Railroad	MPO_railroads.shp	City of Winston-Salem-MPO	2007
Soil-Forsyth County	soils.shp	US Department of Agriculture, Natural Resources Conservation Service	2009
Soil-Davie County	soils.shp	US Department of Agriculture, Natural Resources Conservation Service	2007
Soil-Yadkin County	soils.shp	US Department of Agriculture, Natural Resources Conservation Service	2007
Utilities	Census2000_utilities.shp	City of Winston-Salem-MPO	2000
Clemmons-Bike/Ped routes	Bike_Ped_Rec_052908.shp	Village of Clemmons	2009
Utilities	Census2000_utilities.shp	City of Winston-Salem-MPO	2000
Forsyth County 100 year Flood	FC_fema2008.shp	North Carolina Division of Emergency Management	2007
Davie County 100 year Flood	DveC_fema2008.shp	North Carolina Division of Emergency Management	2007
Forsyth County buildings	DveC_plan_buildings.shp	City of Winston-Salem-MPO	2007
Davie County buildings	FC_plan_buildings.shp	City of Winston-Salem-MPO	2007
Forsyth County Schools-campus	SchoolCampuses.shp	City of Winston-Salem-MPO	2009
Forsyth County Schools	MPO_schools.shp	City of Winston-Salem-MPO	2009
Forsyth County-Existing Sidewalks	MPO_sidewalks_existing.shp	City of Winston-Salem-MPO	2007
Forsyth County-Proposed Sidewalks	MPO_sidewalks_recommended.shp	City of Winston-Salem-MPO	2008
Study Area	YadkinRiverGreenwayCorrStudy2009.shp	City of Winston-Salem-MPO	2010
Hillshade-Forsyth County	hillshade.lyr	NC Department of Transportation	2007
Hillshade-Davie County	hillshade.lyr	NC Department of Transportation	2007
Hillshade-Yadkin County	hillshade.lyr	NC Department of Transportation	2007
Forsyth County Parks	parks.shp	City of Winston-Salem-MPO	2011
Davie County Zoning	zco.shp	City of Winston-Salem-MPO	2008
Forsyth County Zoning	zoning.shp	City of Winston-Salem-MPO	2009
Town of Bermuda Run Zoning	zbr.shp	Planning Department of Winston-Salem & Forsyth County	2009
Wetland	JurisdictionalWetlands-Approx.shp	U.S. Fish & Wildlife Service, National Wetlands Inventory	1999
Forsyth County Topography-LIDAR	Contour_002.shp	NC Department of Transportation	2007
Forsyth County Topography-LIDAR	Contour_002.shp	NC Department of Transportation	2007
Bike Routes	BikeRoutes.shp	NC Department of Transportation	2005
Orthophotography Data	naip_1-1_2n_s_nc197_2005_2_merg.jp2	USDA/FSA - Aerial Photography Field Office	2005
Geology	geol.shp	N.C. DENR-Division of Land Resources, N.C. Geological Survey	1998
County Boundary	CountyBoundaryShoreline.shp	NC Department of Transportation	1998