White Knoll Sub-Area Plan

prepared for

CENTRAL MIDLANDS
Council of Governments

THE LPA GROUP
TRANSPORTATION CONSULTANTS

WHITE KNOLL SUB-AREA PLAN

FINAL REPORT

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Prepared for:

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Prepared by:

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In association with:

HadenStanziale
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1. EXECUTIVE SUMMARY

The White Knoll Area Planning Study builds upon previous planning efforts of the Central Midlands Council of Governments, Lexington County, the South Carolina Department of Transportation, the Central Midlands Regional Transit Authority and other agencies. These planning efforts include Lexington County's *Comprehensive Plan,* Lexington County's *Zoning Ordinance,* Central Midlands' *Long Range Transportation Plan,* the *Commuter Rail Feasibility Study*, and the *Bicycle and Pedestrian Pathways Plan.*

Study Area

The White Knoll Area is located southwest of the City of Columbia in Lexington County, South Carolina and consists of approximately 55 square miles within the Columbia Area Transportation Study.

The study area is bounded on the north by Interstate 20, the south by Boiling Springs Road and Norfolk Southern Railroad, the west by Calks Ferry Road, and the east by Emanuel Church Road and Pine Street.

Major transportation facilities within or adjacent to the White Knoll Area include Interstate 20 and Columbia Metropolitan Airport. Central Midlands Regional Transit Authority currently does not provide transit routes within the White Knoll Area. There are no significant existing bicycle and pedestrian facilities, though two major roadway widening projects along South Lake Drive (SC 6) and Platt Springs Road (SC 602) will include the construction of sidewalks and wide outside lanes for bikes.

The White Knoll Area population has been increasing at a faster rate than all of Lexington County. The population in White Knoll increased 40 percent between 1990 and 2000, and has been estimated by the Census Bureau to have grown by another 50 percent between 2000 and 2007 to approximately 38,400 residents. The median income in the White Knoll Area is approximately 13 percent lower than the median income of all Lexington County, but the White Knoll Area has a lower percentage of people living under the poverty line.

While the White Knoll Area is primarily rural in character, the increasing population has been driving typical single family residential development. In response to the increasing residential and student population, several new schools have been recently constructed in the White Knoll Area, and increasing commercial development is starting to occur.

Transportation Facilities

There are approximately 330 miles of roadways within the White Knoll Area. The majority of road miles are classified as local roads, which have the primary function of providing access to individual properties. The number of road miles classified as minor collectors, major collectors and minor arterials are roughly equivalent, but there are only several miles of roads classified as principal arterials.

Traffic in the White Knoll Area has been growing annually at a rate of about a 2.4 percent between 2000 and 2007.

There are currently 13 intersections that are controlled by traffic signals within the White Knoll Area.

The current travel demand model network shows existing areas of high congestion along Longs Pond Road between Sherwood Drive and I-20, South Lake Drive between Platt Springs Road and Edmund Highway, and Edmund Highway between South Lake Drive and Princeton Road.

Development Trends

By 2035, the White Knoll Area is projected to increase in population to approximately 65,700 residents from approximately 38,400 residents in 2007. This increase in population will result in increasing demand for services and infrastructure.

Residential development is scattered throughout the area, but has been concentrating in areas around or near White Knoll High School. Future residential development is expected to continue to be dispersed throughout the area, but will continue to move to the west of the areas near White Knoll High School.

Commercial development currently is focused on several nodes on the north and east edges of the White Knoll Area, with a more centralized node present at the intersection of South Lake Drive and Platt Springs Road.

Future Roadway Improvements

Several stretches of highways within the White Knoll Area are frequently named among South Carolina's most dangerous rural secondary roads, including portions of Old Barnwell Road, Longs Pond Road, Platt Springs Road and Emanuel Church Road. Safety and capacity improvements along these high speed rural roadways should be a priority.

The existing roadway network within the Area provides a foundation for creating a hierarchical grid network to assist in dispersing traffic within the area.

Continued high rates of population growth between 2005 and 2035will cause vehicle-miles and vehicle-hours traveled within the White Knoll Area to increase by approximately 90 percent and 93 percent respectively. Without additional capacity to accommodate these trips, congestion will nearly double.

In addition to the traffic congestion observed in the existing Travel Demand Model along Longs Pond Road between Sherwood Drive and I-20, South Lake Drive between Platt Springs Road and Edmund Highway, and Edmund Highway between South Lake Drive and Princeton Road, the 2035 travel demand model assignments indicate increasing congestion along Platt Springs Road between McLee Road/Kyzer Road and Willow Forks Road, Old Barnwell Road east of Old Orangeburg Road, and Calks Ferry Road from Pond Branch Road to Sherwood Drive.

Additional roadway improvement projects that would address the increased congestion along these roads include:

Widening from two to four lanes:

- South Lake Drive between Platt Springs Road and Edmund Highway
- Platt Springs Road between McLee Road/Kyzer Road and Willow Forks Road

- Old Barnwell Road between Old Orangeburg Road and Emanuel Church Road
- Longs Pond Road between Nazareth Road and Barr Road
- Calks Ferry Road from Pond Branch Road to Sherwood Drive
- Edmund Highway between South Lake Drive to Gator Road

The estimated construction cost to complete these widening projects is approximately $32.6 million in 2008 dollars.

Pedestrian and Bicycle Improvements

The recommended pedestrian and bicycle improvements are intended to provide a network that is accessible, benefits a large number of potential users and makes the decision to walk or bike easier, safer and more comfortable.

Pedestrian-only improvements consist of sidewalks with a minimum width of five feet. Sidewalks could be located on either or both sides of the street. Bicycle-only improvements consist of bike lanes that provide a minimum five-foot side striped lane on the outside of the roadway. Joint bicycle and pedestrian improvements include paved shoulders, sidepaths and greenway trails. Wider shoulders, with a minimum width of four feet, can be constructed along rural roadways with narrow or no paved shoulders to enhance pedestrian and bicycle use. Sidepaths are wider sidewalks or trails located within the roadway right-of-way, but are separate from the road itself. Greenway trails are ten foot wide paths located outside of the roadway right-of-way.

Pedestrian and bicycle improvement recommendations are divided into Immediate, Near-Term and Long-Term needs. These recommendations consist of improvements located throughout the study area as well as specific network improvements in specific areas.

The construction of the immediate pedestrian and bicycle facility improvements are estimated to cost approximately $2.7 million. Construction cost estimates for the near and long term improvements are estimated to cost approximately $6.5 million and $5.6 million respectively.

Transit Improvements

There is currently no fixed route transit service provided in the White Knoll Area. Increasing growth within the area will increase demand for transit services.

Currently, the most likely route in the White Knoll Area is nine miles long and is located along Platt Springs Road and South Lake Drive. This route would connect to the Columbia Metropolitan Airport and existing Route 28A, which runs through the Town of Cayce and ends at the CMRTA Transfer Center at the intersection of Laurel Street and Summit Street in downtown Columbia with five trips a day.

The annual cost to implement the fixed route transit service and Dial-A-Ride Transit would be approximately $102,000.

Land Use Development

The rate of projected population growth and the amount of undeveloped land in the White Knoll Area make it likely that commercial and residential growth will continue at a steady pace. As the White Knoll Area continues to develop, an opportunity arises for the

area to establish a sense of place and unique identity. The potential to mix a variety of uses, increase employment options, and provide for residential development exists in the underlying zoning within much of the area. By providing well-planned commercial, retail, office and other employment opportunities along with residential development within the area, the potential exists to shift travel to closer destinations and reduce the number and length of trips that are made in automobiles.

Residential development should be designed for connected street networks to provide various routes and potentially eliminate the need to travel on the major roadways for more locally oriented trips. These connections will also enhance pedestrian and bicycle travel; facilities to accommodate these trips should be provided within the roadway right-of-way.

Commercial development should provide a mix of uses, combining residential, retail, office, industrial and other uses. Attention should be given to the relationship between buildings and transportation facilities to create a sense of place. Circulation between adjacent commercial properties should be possible without having to re-enter the public street network, while still enhancing facilities to promote pedestrian and bicycle travel.

For example, these types of land use alternatives could be incorporated into the area around the intersection of Emanuel Church Road and Old Barnwell Road. The existing residential neighborhoods are poorly connected to each other and to the arterial roadways. As the area continues to develop and change over time, it may be possible to provide new roadway connections between existing neighborhoods and adjoining properties. Commercial development will remain centrally located, clustered around the intersection and could be flanked by office and civic land uses moving out from the intersection. These uses in turn would be buffered by denser single family or multi-family housing, which would then transition to less dense existing single family residential areas. Land could be set aside within the area for parks and open space, which would also protect natural features such as streams and creeks.

Total Estimate Project Costs

The total estimated construction costs for the recommended improvements are as follows:

Roadway Improvements	$32,640,000
Immediate Term Pedestrian and Bicycle Facilities	$ 2,690,000
Near Term Pedestrian and Bicycle Facilities	$ 6,530,000
Long Term Pedestrian and Bicycle Facilities	$ 5,610,000
Total Costs	$47,470,000

These **construction cost estimates** are in 2008 dollars, and do not include costs for right-of-way acquisition, environmental permitting and mitigation, drainage features, bridges and culverts and other items, and have not be adjusted to account for inflation and other effects that tend to increase construction costs over time.

Project Funding Options

SCDOT funds the majority of projects along roads that are part of the State Highway System, including the secondary roads within the White Knoll Area. Lexington County should work closely with SCDOT to fund as many of the recommended projects as possible. A joint Intergovernmental Agreement between the two agencies would outline the roles and responsibilities for implementation as well as define any joint financing agreements.

The South Carolina Transportation Infrastructure Bank funding would likely not be available for projects in the White Knoll Area. Eligible projects for SCTIB funding must cost more than $100 million and the total estimated construction cost of the immediate, near-term, and long term roadway, pedestrian and bicycle projects in the White Knoll Area is less than $30 million.

With the current one cent local option sales tax for school building and debt service in Lexington County, it is unlikely the county could impose a separate one cent sales tax for any other purposes. South Carolina state law essentially limits local sales taxes levied within a county to one-percent. Until the current local option sales tax expires or is repealed, the option appears closed to the county.

Lexington County has the ability to use Tax Increment Financing to pay for transportation infrastructure improvements as part of redevelopment plans and projects. South Carolina state law lists specific requirements that define redevelopment plans and projects and the use of Tax Increment Financing for paying debt service associated with those projects.

Lexington County could conceivably impose additional vehicle registration fees at the county level to generate additional money for transportation improvements. Two examples of fees collected are a road maintenance fee that generates funds to be used solely on road projects that could include maintenance and improvements and a transit fee to help pay for the operation of transit service.

COATS Transportation Enhancement Program (TEP) could be used to fund nontraditional projects, including landscaping and beautification, pedestrian and bicycle facilities, pedestrian and bicycle safety, and control of outdoor advertising. It is possible that some of the pedestrian and bicycle improvement alternatives could be constructed using this funding.

The most likely form that private financing of improvements would take in the White Knoll Area would be implementing provisions that make development approvals contingent on developers constructing or financing site specific transportation improvements.

It is unlikely that public-private partnerships between local government(s) and one or more private businesses could be used as a source for funding transportation improvements in the White Knoll Area. None of the recommended projects are large

enough or provide a mechanism, such as tolling, to recoup public and private money spent on developing and constructing the project.

2. DATA COLLECTION

Data, previous reports and studies, and other information were obtained from the Central Midlands Council of Governments (CMCOG), the South Carolina Department of Transportation (SCDOT), the Central Midlands Regional Transit Authority (CMRTA), Lexington County and other sources. This data was supplemented by field surveys and investigations.

2.1 Electronic Data Files

CMCOG provided recent files for the Columbia Area Transportation Study (COATS) regional travel demand model, as well as current Geographic Information Systems (GIS) files. The following list is a summary of GIS files received from Central Midlands COG and Lexington County:

- Centerline
- Parcels
- Aerials
- Municipalities
- County Boundary
- Zoning
- Landmarks
- Railroads
- Water Features
- Building Permits
- BRT Stops
- COATS 2025 Boundary
- COATS 2025 Committed
- COATS 2025 Lexington Alternatives
- COATS 2025 Projects
- COATS Network 2005
- Commuter Rail Routes
- Commuter Rail Stations
- Major Employers 2005
- RTA Bus Routes
- SCDOT Functional Class
- Bike Lanes
- Bridge Pedestrian Crossings
- Bridge Replacements
- CRISOS Projects
- Early Action Projects
- Existing Greenways
- Planned Greenways
- Palmetto Trail
- Pedestrian Crossing Improvements
- Retail Space 2004
- SCDOT Maintenance
- COATS TIP

2.2 Previous Plans and Studies

The White Knoll Area Plan makes use of previous plans and studies undertaken by CMCOG and Lexington County to ensure consistency with past planning activities and to guide in the development of recommendations.

2.2.1 Lexington County Comprehensive Plan and Zoning Ordinance

Lexington County's *Comprehensive Plan* (adopted in 2007) and *Zoning Ordinance* (2006) guide development within the unincorporated portions of the county, including the White Knoll Area. Through its goals and objectives, the *Comprehensive Plan* provides the backbone for the transportation and land use regulations included in the zoning ordinance. Lexington County uses performance-based zoning to guide development.

Performance-based zoning specifies the intensity of land use that is acceptable, whereas traditional land use zoning specifies what uses land can have within specified districts. Performance-based zoning allows and encourages the compatibility of different land use types, rather than segregating different uses from one another. The zoning ordinance also specifies the density of development allowed based on the classification of roadway it is on, establishing the connection between land use and transportation.

2.2.2 CMCOG Long Range Transportation Plan

Central Midlands Council of Governments (CMCOG), as the Metropolitan Planning Organization (MPO) for the region, conducts studies of transportation facilities and modes as part of its agency's responsibilities. The *Long Range Transportation Plan* (LRTP) is a fiscally-constrained plan that focuses on the future transportation needs of the region and establishes goals and objectives to ensure that those needs are met. The LRTP is used by the MPO's counties and municipalities to guide their respective comprehensive plans.

2.2.3 CMCOG Transportation Improvement Program

CMCOG develops a seven year Transportation Improvement Program (TIP) which lists specific projects that will include federal funding. The current TIP covers 2006-2012 and includes transportation capital projects and estimated transit capital and maintenance funding. The TIP identifies the criteria and process to prioritize projects and includes realistic cost estimates and revenue for all Federal Highway Administration and Federal Transit Administration projects in the CMCOG area.

The following projects within the White Knoll Area are currently listed in the 2006-2012 TIP. The current CMCOG LRTP is being revised so the priority of the projects and the amount of funding and/or the fiscal year of the funding allocations are subject to change.

Table 2.1 – TIP Projects in White Knoll Study Area

Project	Location/Termini	Pin #	Priority	Cost
Intersection Improvements	Old Orangeburg Road (S-244) at Old Barnwell Road (S-104) and Community Drive and YMCA Road (S-311)	99111	2	$5,130,000[1]
SC 602	Emanuel Church Road (S-168) to past Old Orangeburg Road (S-1459)	22875	3	$22,425,000
SC 302 (Edmunds Highway)	Church Street (S-32-415) to Gator Road (S-32-647)	22879	4	$3,825,000
SC 6	I-20 to Platt Springs Road (SC 602)	-	8	$22,200,000
Total				**$53,580,000[1]**

[1] – Cost includes some intersection improvement projects in Richland County.

2.2.4 *Commuter Rail Feasibility Study for* the Central Midlands Region of South Carolina

The CMCOG conducted a feasibility study to assess the need for various forms of high-capacity transit services, including commuter rail and bus rapid transit, within the Central Midlands Area of South Carolina. The study, completed in July 2006, focused on three transit corridors around Columbia. The corridor of interest for the White Knoll Area Plan was referred to as the Batesburg-Leesville to Columbia Corridor. This corridor loosely follows Interstate 20 and US Highway 1 from Columbia southwest to Batesburg-Leesville. The closest station to the White Knoll Area outlined is located at Railroad Avenue and Lake Drive on the north side of I-20.

The *Commuter Rail Feasibility Study* outlined a variety of mass transit options and presented the population densities necessary to sustain such transit services. Although most modes of transit require high population densities (three or more dwelling units per acre), both commuter rail and bus rapid transit work in areas of lower population densities (one to two dwelling units per acre) similar to those found within the White Knoll Area. These services are able to sustain themselves due to their long distance of operation (commuter rail service generally running between 10 and 50 miles and bus rapid transit running between five and 15 miles), limited number of stops and ability to pull potential riders from a larger area.

Response from area stakeholders and the public during interviews and forums was mixed. Most acknowledge the need for a reliable form of transit within the area, but believe the expense of a commuter rail outweighs the need for such a service within the near future. Those who commented did see the need for the service to be easily accessible and convenient for those who currently drive to work. They also realize that a greater network of bus routes and pedestrian facilities are necessary to sustain such a service. Most believe few commuters who currently drive themselves to work would park and ride a train or bus. The largest barrier perceived by those polled is funding. Many said they believed that without major state and local funding through taxes and other means that the commuter rail would not survive. Most importantly, many replied that they would not ride a commuter rail or bus rapid transit, though reasons for their responses varied.

The *Commuter Rail Feasibility Study* concludes that the Batesburg-Leesville to Columbia corridor ranks third out of the three corridors. Factors that contributed to this outcome include the lowest current population (38,000) and projected population (67,000 in 2025), lowest public participation, lukewarm reactions from local officials, and average to low rankings in land use opportunities around station sites.

2.2.5 *Bicycle and Pedestrian Pathways Plan*

In 2005, CMCOG conducted an assessment of existing pedestrian and bicycle facilities and proposed strategies to increase the number of these facilities for the COATS region. The vision of the *Bicycle and Pedestrian Pathways Plan* was to create a network of pedestrian and bicycling facilities that will allow those who reside within the region to

make biking and walking a part of their daily lives. Much of this plan focuses on areas of the region with greater populations and density (areas closer to downtown Columbia), but the goals and general recommendations are applicable to the White Knoll Area and will be of value as the area continues to see increased development. Five goals were established for the study:

1. To provide a safe, efficient and accessible transportation system
2. To encourage and promote pedestrian and bicycle facilities in all transportation and community development
3. To support land uses that allow walking and biking to become a viable transportation option
4. To encourage active, healthy and environmentally friendly lifestyles
5. To identify opportunities, funding sources and agencies that will continue to encourage and promote pedestrian and bicycle facilities

The study reviewed and assessed numerous South Carolina Department of Transportation (SCDOT) projects within the COATS region. The following SCDOT projects in the White Knoll Area were in the planning or design phase during the development of the *Bicycle and Pedestrian Pathways Plan*:

- SC Highway 6 (South Lake Drive) Road Widening
- SC Highway 602 (Platt Springs Road) Road Widening
- SC Highway 302 (Edmund Highway/Main Street) Road Widening
- Two Notch Road Crash Reduction (increasing roadway shoulders)
- Old Barnwell Road Crash Reduction (increasing roadway shoulder)

The *Bicycle and Pedestrian Pathways Plan* includes recommendations for 26 early action projects and for the preliminary routing for pedestrian and bicycle improvements. The early action projects are easy to implement, fill critical gaps in existing pedestrian and bicycle facilities, build public interest in these types of facilities and create momentum for future pedestrian and bicycle improvement projects. Unfortunately, none of the 26 recommended projects are located within the White Knoll Area. The recommendations for preliminary routing for pedestrian and bicycle facility improvements were made throughout the COATS region. These improvements were distributed into Short Term (0 to 5 years), Medium Term (5 to 10 years), and Long Term (10 to 20 years) phases. The study also recommended the types of pedestrian and bicycle facility improvements to be implemented at each location. These improvements are categorized as follows:

- Pedestrian Improvements
  - Pedestrian Crossing Facilities: crosswalks, pedestrian crossing signals and ADA accessible ramps at major intersections
  - Sidewalks: Minimum five feet wide sidewalks on one or both sides of the street
  - Sidepaths: Wide sidewalks or trails located within the road right-of-way (used as pedestrian and bicycle facility)
  - Paved Shoulders: Minimum four feet wide paved area along rural roads (used as pedestrian and bicycle facility)

- Bicycle Improvements
  - Bike Lanes: Minimum five feet wide striped lane on the outside travel lane of a road
  - Sidepaths: Wide sidewalks or trails located within the road right-of-way (used as pedestrian and bicycle facility)
  - Paved Shoulders: Minimum four feet wide paved area along rural roads (used as pedestrian and bicycle facility)
  - Connectors: Roads with low traffic volumes or located in rural areas that are wide enough to accommodate on-road bicycle users

Table 2.2 outlines the recommendations for pedestrian facility improvements in the White Knoll Area. Table 2.3 outlines the bicycle facility improvements.

Table 2.2 – Pedestrian Facility Improvements

Short Term (0 to 5 Years)

Road	Beginning	End	Facility
Platt Springs Road (SC 602)	Emanuel Church Road	South Lake Drive (SC 6)	Sidewalks/Sidepaths
South Lake Drive (SC 6)	Interstate 20	Platt Springs Road (SC 602)	Sidewalks/Sidepaths
Edmund Highway/Main Street (SC 302)	Pine Street	Colonial Drive	Sidewalks/Sidepaths
Two Notch Road	South Lake Drive (SC 6)	Interstate 20	Shoulders

Medium Term (5 to 10 Years)

Road	Beginning	End	Facility
Edmund Highway/Main Street (SC 302)	Colonial Avenue	Landfill Lane	Sidewalks/Sidepaths
Emanuel Church Road/Pine Street	Two Notch Road	Ramblin Road	Shoulders
Old Barnwell Road	Emanuel Church Road	Steele Road	Shoulders
Old Orangeburg Road	Two Notch Road	Edmund Highway (SC 302)	Shoulders
Platt Springs Road (SC 602)	South Lake Drive (SC 6)	Boiling Springs Road	Shoulders
Calks Ferry Road	Interstate 20	Boiling Springs Road	Shoulders
South Lake Drive (SC 6)	New Orangeburg Road	Platt Springs Road (SC 602)	Shoulders

Long Term (10 to 20 Years)

Road	Beginning	End	Facility
Old Barnwell Road	Steele Road	Old Orangeburg Road	Shoulders
Two Notch Road	Emanuel Church Road	South Lake Drive (SC 6)	Shoulders

Crossing Improvements

Old Barnwell Road at Emanuel Church Road

Table 2.3 – Bicycle Facility Improvements

Short Term (0 to 5 Years)

Road	Beginning	End	Facility
South Lake Drive (SC 6)	Interstate 20	Platt Springs Road (SC 602)	Bike Lanes/Sidepaths
Platt Springs Road (SC 602)	Emanuel Church Road	South Lake Drive (SC 6)	Bike Lanes/Sidepaths
Two Notch Road	South Lake Drive (SC 6)	Interstate 20	Shoulders

Medium Term (5 to 10 Years)

Road	Beginning	End	Facility
Emanuel Church Road/Pine Street	Two Notch Road	Ramblin Road	Shoulders
Old Barnwell Road	Emanuel Church Road	Steele Road	Shoulders
	Old Orangeburg Road	South Lake Drive (SC 6)	Shoulders
Old Orangeburg Road	Two Notch Road	Edmund Highway (SC 302)	Shoulders
Edmund Highway/Main Street (SC 302)	Pine Street	Landfill Lane	Bike Lanes/Sidepaths
South Lake Drive (SC 6)	New Orangeburg Road	Platt Springs Road (SC 602)	Bike Lanes/Sidepaths
Platt Springs Road (SC 602)	South Lake Drive (SC 6)	Boiling Springs Road	Shoulders
Calks Ferry Road	Interstate 20	Boiling Springs Road	Shoulders

Long Term (10 to 20 Years)

Road	Beginning	End	Facility
Two Notch Road	Emanuel Church Road	South Lake Drive (SC 6)	Shoulders
Old Barnwell Road	Steele Road	Old Orangeburg Road	Shoulders

2.3 Transit Operations

Discussions were held with CMRTA staff to discuss the past, present and future of transit operations within the study area. CMRTA, like other transit systems throughout the United States, is seeking a dedicated source of revenue to fund its operations. CMRTA has no routes within Lexington County and test routes that have been run in the past had very low ridership.

2.4 Field Surveys

Field surveys were performed to inventory existing roadway and land use conditions within the White Knoll Area. The field surveys included identifying the number of travel lanes along roadways, the locations of intersections with turn lanes and the type of turn lane present, and the locations of signalized intersections. The field surveys were also used to identify opportunities to enhance connectivity and apply access management principles.

2.5 Lexington County Planning Department

Discussions were held with representatives of the Lexington County Planning Department to identify proposed developments and future land use changes that could affect the area's traffic and volumes and transportation networks. These discussions led to the development of three alternative land use scenarios to evaluate how development

following these scenarios would affect the White Knoll Area. These scenarios included an office development scenario, a retail development scenario and an industrial development scenario.

The discussions were also helpful in understanding and incorporating the county's approach to and implementation of diverse planning elements such as context sensitive design, pedestrian and bicycle modes, access management, traffic calming and travel demand management.

2.6 Lexington County Schools (District One)

The White Knoll Area is part of Lexington County School District One. In June 2008, the District One Board of Trustees of approved a five-year building plan that includes the construction of one new elementary school in the White Knoll Attendance Area. This plan, which will be part of the 2008 Bond Referendum, includes an estimated $30.9 million to construct the new elementary school for 800 students for the 2014-2015 school year.

2.7 Measures of Effectiveness

A range of Measures of Effectiveness (MOE) were considered for use in evaluating and assessing the operations of transportation facilities within the White Knoll Area. The primary MOE selected for use in assessing the ability to enhance the transportation facilities will be based on the level of service and volume-capacity ratios obtained from the COATS regional travel demand model. Other MOE that can be calculated from the model assignments and network information include vehicle-miles of travel (VMT) and vehicle-hours of travel (VHT).

2.8 Public Meetings

Two public meetings were held to present project information and to survey the public on important issues within the White Knoll Area. The initial public workshop was held from 5:30 to 7:30 pm February 7, 2008 at White Knoll High School. Attendees had the opportunity to discuss their views and concerns and were encouraged to complete surveys and write additional comments on display boards. The information obtained from the initial public meeting are summarized in the Technical Report which as attached as an addendum to this report.

Attendees at the meeting indicated they travel predominantly by automobile, view travel time and difficulty in travel as the greatest travel problem and congestion as the region's most important transportation issue. Attendees also ranked maintaining and improving existing roads and adding lanes and/or building new roads as the most favorable way to improve traffic conditions.

A second public meeting was held at White Knoll High School on Thursday, May 8, 2008. At this meeting, progress on the project and presentation of preliminary recommendations were presented to gauge public feedback.

A third and final public meeting was held at White Knoll High School on Monday, October 20, 2008. The draft final recommendations were presented to the public, and comments were received concerning the proposed roadway, bicycle and pedestrian improvements.

3. EXISTING STUDY AREA CHARACTERISTICS

The characteristics of the White Knoll Area were reviewed and inventoried to establish existing transportation facilities, population, land use and zoning conditions.

3.1 STUDY AREA

The White Knoll Study Area consists of approximately fifty-five square miles located in Lexington County, southwest of the City of Columbia, South Carolina. The study area is bound on the north by Interstate 20, the south by Boiling Springs Road and Norfolk Southern Railroad, the west by Calks Ferry Road, and the east by Emanuel Church Road and Pine Street. It is within the Columbia Area Transportation Study (COATS), the Metropolitan Planning Organization (MPO) for the Central Midlands region. The location of the study area and its boundaries are shown in Figure 3-1.

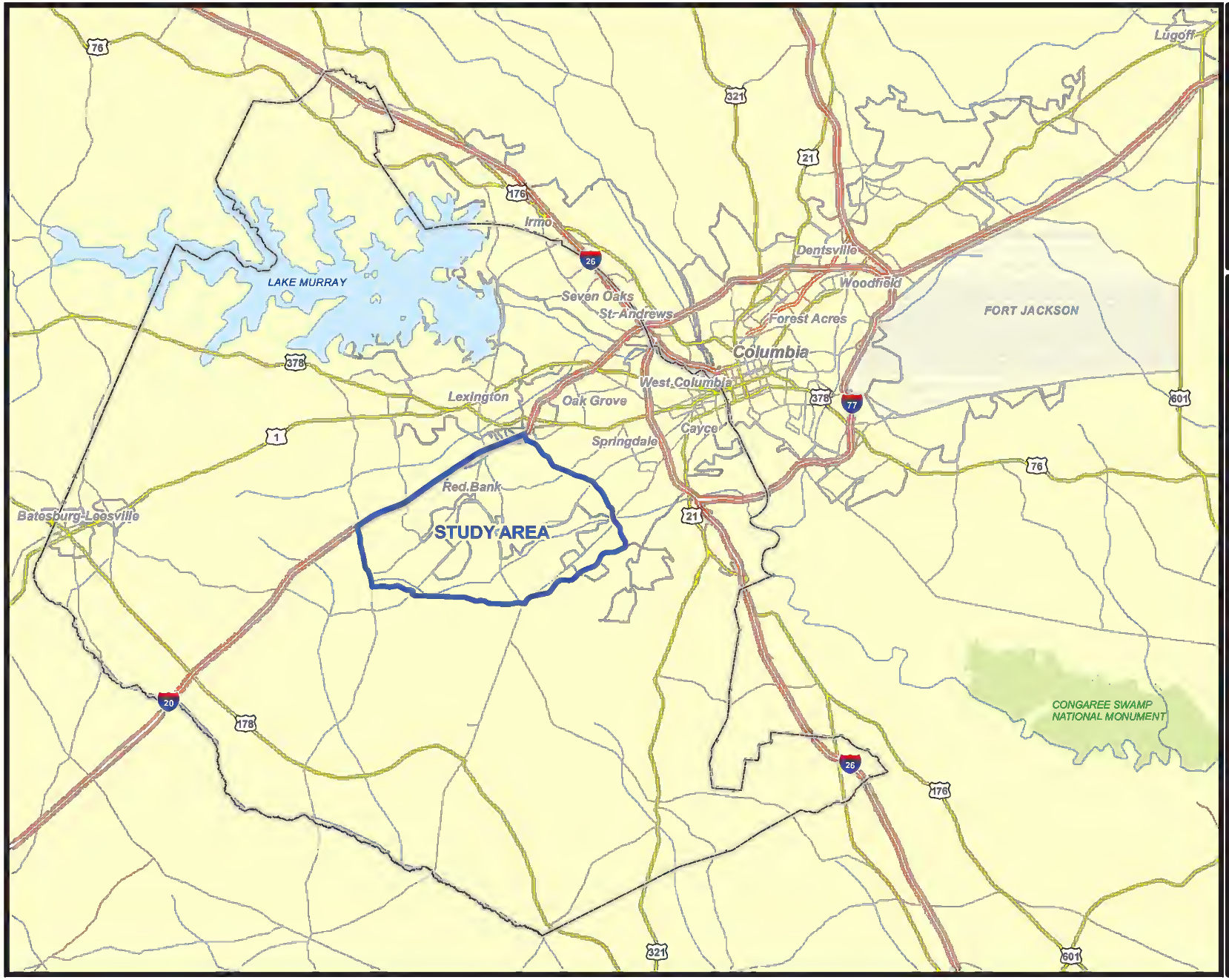
3.2 MAJOR TRANSPORTATION FACILITIES AND SERVICES

Major transportation facilities in the White Knoll Area include Interstate 20 and Columbia Metropolitan Airport. Interstate 20 begins at I-95 near Florence, South Carolina, and runs to the west to its terminus at I-10 in western Texas. In South Carolina, I-20 runs for 141 miles from west of Florence to the state line near Augusta, Georgia. Within the Central Midlands area, I-20 runs along the north side of Columbia to its junction with I-26 west of the city. From this junction, I-20 continues to the south and west, passing along the north side of the White Knoll Area on its way to Augusta, Georgia. Within the White Knoll Area, interchanges with I-20 are located at Longs Pond Road (Exit 51) and SC 6 (Exit 55).

Columbia Metropolitan Airport (CAE) is located to the northeast of the White Knoll Area in West Columbia. CAE is currently served by seven commercial carriers: American Eagle, Continental, Delta, Northwest, Spirit, United, and US Airways, and provides connections to fourteen airline hub cities including Atlanta, Charlotte, Chicago, Cincinnati, Dallas-Detroit, Fort Worth, Houston, Memphis, New York, Philadelphia, and Washington, D.C.. Passengers, employees and freight/cargo can access CAE from either Airport Boulevard/Edmunds Highway (SC 302) or Platt Springs Road.

The CMRTA does not offer any transit routes or stops within the White Knoll Area. The closest route to the study area is Route 28A, which connects Columbia Metropolitan Airport and the Town of Cayce to the CMRTA Transfer Center located at the intersection of Laurel Street and Sumter Streets in Columbia. This route has four daily stops during each weekday with no weekend service. This route may be abandoned if funding is not provided by Lexington County in the future. There are currently no plans to extend transit service to the White Knoll Area.

There are no significant networks of pedestrian and bicycle facilities within the White Knoll Area, and those facilities that do exist are limited to short, unconnected lengths.



White Knoll Sub-Area

Figure 3-1 Study Area Map

CENTRAL MIDLANDS Council of Governments

LEGEND

- Interstate
- Limited Access Highway
- Highway
- Major Road
- Military Installation
- National Forest
- Study Area Boundary
- Water

Source: Lexington County and Central Midlands COG
Map Created: 3/24/2008

N

0 4 8 Miles

Table 3.1 summarizes the existing pedestrian and bicycle facilities within the White Knoll Sub-Area.

Table 3.1 – Existing Pedestrian and Bicycle Facilities

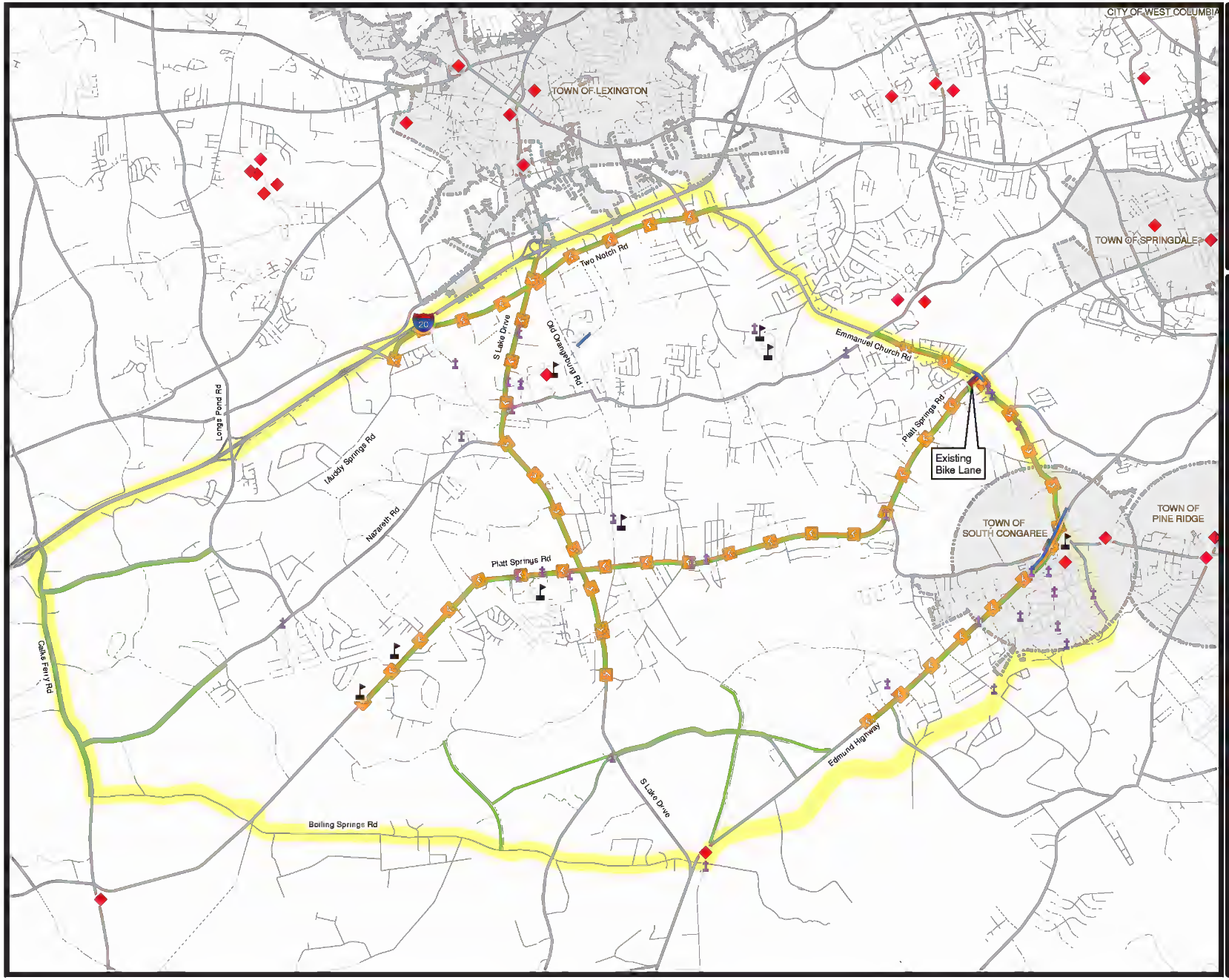
Road/Location	Facility Type	Approximate Distance (Feet)	Description
YMCA Road	Sidewalk	1,050	Sidewalk was installed along YMCA Road along the frontage of a new home development.
Emanuel Church Road	Sidewalk	925	Sidewalk located at Platt Springs Road (SC 602) intersection
Platt Springs Road	Sidewalk and Bike Lanes	700	Sidewalk and bike lanes cross Emanuel Church Road and end at Divinci Road
Edmund Highway/Main Street (SC 302)	Sidewalk	3,950	Sidewalk is centered around the intersections with Ramblin Road and Pine Street
Saxe Gotha Elementary School	Sidewalk	200	Connects existing crosswalk with walkway to school

Two major roadway projects are currently planned within the White Knoll Area to accommodate increased traffic. Platt Springs Road (SC 602) is anticipated to be widened from a two-lane road to a five-lane facility between Emanuel Church Road past Old Orangeburg Road. The roadway improvements will include sidewalks and a 14 foot outside lane to accommodate bicyclists. The widening of South Lake Drive (SC 6) from a two lane to a five lane facility between I-20 and Platt Springs Road is currently under construction with portions already completed. This widening project includes the installation of sidewalks and a dedicated, striped bike lane for cyclists. These new and planned pedestrian and bicycle facilities are summarized in Table 3.2.

Table 3.2 – New and Planned Pedestrian and Bicycle Facilities

Project	Approximate Distance (Miles)	Description
South Lake Drive (SC 6)	3.1	Add sidewalks and wide outside lanes for bicyclists as part of the widening from 2 to 5 lanes.
Platt Springs Road (SC 602)	4.6	Add sidewalks and wide outside lanes for bicyclists as part of the widening from 2 to 5 lanes.

Figure 3-2 illustrates the locations of the pedestrian and bicycle facilities in Tables 3.1 and 3.2.



White Knoll Sub-Area

Figure 3-2: Existing and Planned Bike Lanes

CENTRAL MIDLANDS Council of Governments

LEGEND

- Existing Bike Lane
- Planned Bike Lane
- Existing Sidewalk
- Proposed Sidewalk
- Major Road
- Minor Road
- White Knoll Area
- Municipal Boundary
- Park
- School
- Church

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

3.3 POPULATION

The population is generally dispersed within the White Knoll Area, with more recent residential development taken place in the central and western portions of the study area along Platt Springs Road and Nazareth Road near White Knoll High School, Carolina Springs Elementary School and Carolina Springs Middle School. Smaller areas of development are located near the town of South Congaree and along Emanuel Church Road.

The White Knoll area population increased from approximately 40 percent from 18,500 people in 1990 to approximately 25,700 in 2000. The population in the White Knoll Area grew at a faster rate during that period than the population of Lexington County, which grew approximately 30 percent from about 167,600 to 216,000 people.

The 2007 population estimate for the area was approximately 38,400 residents, an increase of about 50 percent since 2000. By 2012, the White Knoll area population is projected to increase to approximately 44,000 residents.

A significant majority of the White Knoll Area population classified themselves as white in the 1990 and 2000 census (about 94.4 percent and 90.7 percent respectively). The next largest group was classified as Black (about 4.7 percent in 1990 and 5.7 percent in 2000). In that time period, the population of people classified as White increased by a third, while the population of people classified as Black increased by nearly 70 percent.

The median income in the White Knoll Area increased from approximately $30,800 in 1990 to about $39,700 in 2000. By comparison, the median household income in Lexington County was about 13 percent higher (approximately $44,700) than the White Knoll Area in 2000. The median income in the White Knoll Area in 2000 was about seven percent higher than the statewide median income (about $37,100).

The number of people living below the poverty level increased slightly, from about 1650 people to 1900 people between 1990 and 2000, but the percentage of people living below the poverty level decreased from about 8.9 percent to 7.4 percent over the same period. The percentage of people living under the poverty level in all of Lexington County increased slightly from about 8.4 percent in 1989 to 9.0 percent in 1999.

The population data within the study area indicates that the White Knoll Area has been increasing its population at a faster rate than Lexington County as a whole and is expected to see increasing rates of growth in the future. Without careful planning, this projected population growth has the potential to significantly impact the White Knoll Area's infrastructure and transportation facilities.

3.4 LAND USE AND ZONING

The White Knoll Sub-Area is a primarily rural part of Lexington County that is currently experiencing suburban growth. The growth consists of residential development, which is being followed by new commercial development and the construction of schools to accommodate an increasing student population. This growth is occurring within the confines of significant natural features that cross the White Knoll Area. A small number of major employers are located within the White Knoll Area, but the number of major employers is currently limited.

Residential Development

Residential development is scattered throughout the White Knoll Area. The White Knoll Area is attracting additional residential development because of its relatively easy access to employment, shopping and educational opportunities throughout the Central Midlands Area via Interstate 20. Platt Springs Road also provides easy access to Columbia Metropolitan Airport, the City of Columbia and the University of South Carolina.

Single family residential subdivisions are being built in areas along Platt Springs Road, Nazareth Road, Longs Pond Road, and South Lake Drive. A large linear pocket of recent development is located just south of Platt Springs Road within close proximity to White Knoll High School. Another nearby pocket of residential development is located between Nazareth Road and Platt Springs Road. This area is situated around the two newest area schools, Carolina Springs Elementary School and Carolina Springs Middle School. For this area, access to Interstate 20 is also available via Longs Pond Road. Other new residential units are spread throughout the study area, with smaller areas of focused residential development occurring near the Town of South Congaree and along Emanuel Church Road near its intersection with Platt Springs Road.

Schools

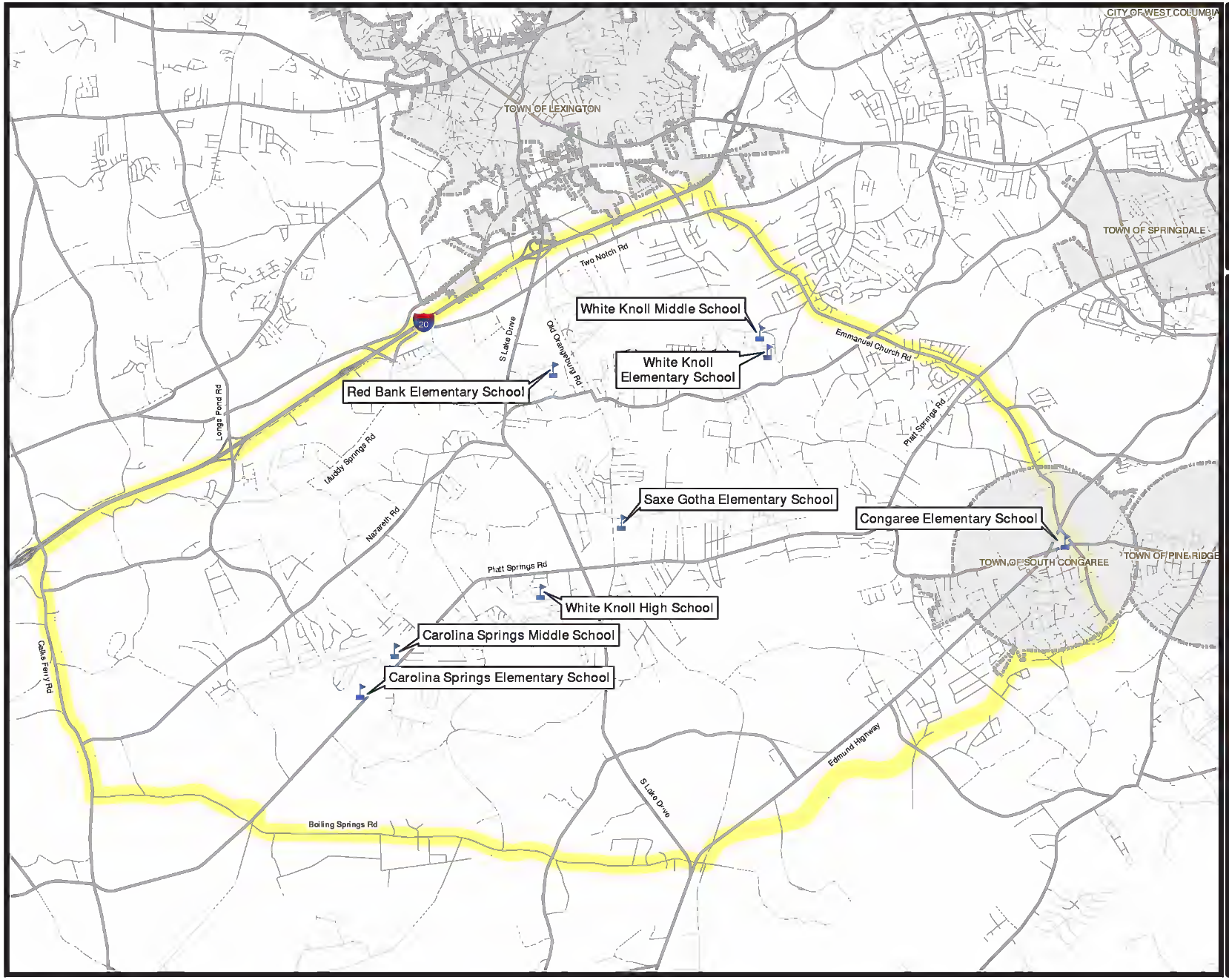
In response to the increasing student population that is part of the increased residential development, new schools have recently been constructed in the White Knoll Area in addition to the older schools that had been serving the area. The following Lexington School District 1 and 2 schools are located within the White Knoll Area:

- Carolina Springs Elementary School
- Carolina Springs Middle School
- Congaree Elementary School (District 2)
- Red Bank Elementary School
- Saxe Gotha Elementary School
- White Knoll Elementary School
- White Knoll High School
- White Knoll Middle School

Figure 3.3 illustrates the location of the existing schools within the White Knoll Area.

Commercial Development

Commercial development has been occurring within existing commercial areas, with an increased concentration taking place along South Lake Drive near I-20. The most developed commercial area within the White Knoll Area, this commercial area consists largely of businesses oriented towards travelers on I-20, and includes restaurants, service stations, grocery stores, retail stores and financial institutions. A smaller highway-oriented commercial development area, consisting of a service station, is located along Longs Pond Road at the Interstate 20 interchange. However, there is available developable land in the area that could result in an increase in highway-oriented businesses in the future.



White Knoll Sub-Area

Figure 3-3: Existing School Locations

CENTRAL MIDLANDS Council of Governments

LEGEND

- School
- Major Road
- Minor Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

A number of neighborhood-oriented commercial developments are located within the White Knoll Area along arterial roads, collector roads and/or at the intersections of these two types of roads. These include:

- Sandy Ridge Square, located at the intersection of Old Barnwell Road and Emanuel Church Road,
- Carolina Square (and other businesses), located at the intersection of Platt Springs Road and Emanuel Church Road, and
- Springs Crossing, located at the intersection of Platt Springs Road and South Lake Drive.

Sandy Ridge Square includes a grocery store, a service station, drug stores and a hardware/home improvement store. Carolina Square includes a grocery store, service stations, restaurants and various retail outlets along with other businesses located on adjacent properties. Springs Crossing includes a grocery store, large retail store, restaurants and various other retail outlets along with other businesses located nearby.

Several other commercial sites are under construction near the intersection of Platt Springs Road and Emanuel Church Road. These sites will house a range of uses, including a large hardware/home improvement center, a drug store, a movie theater and medical offices. The areas of significant commercial development are shown in Figure 3-4.

Major Employers

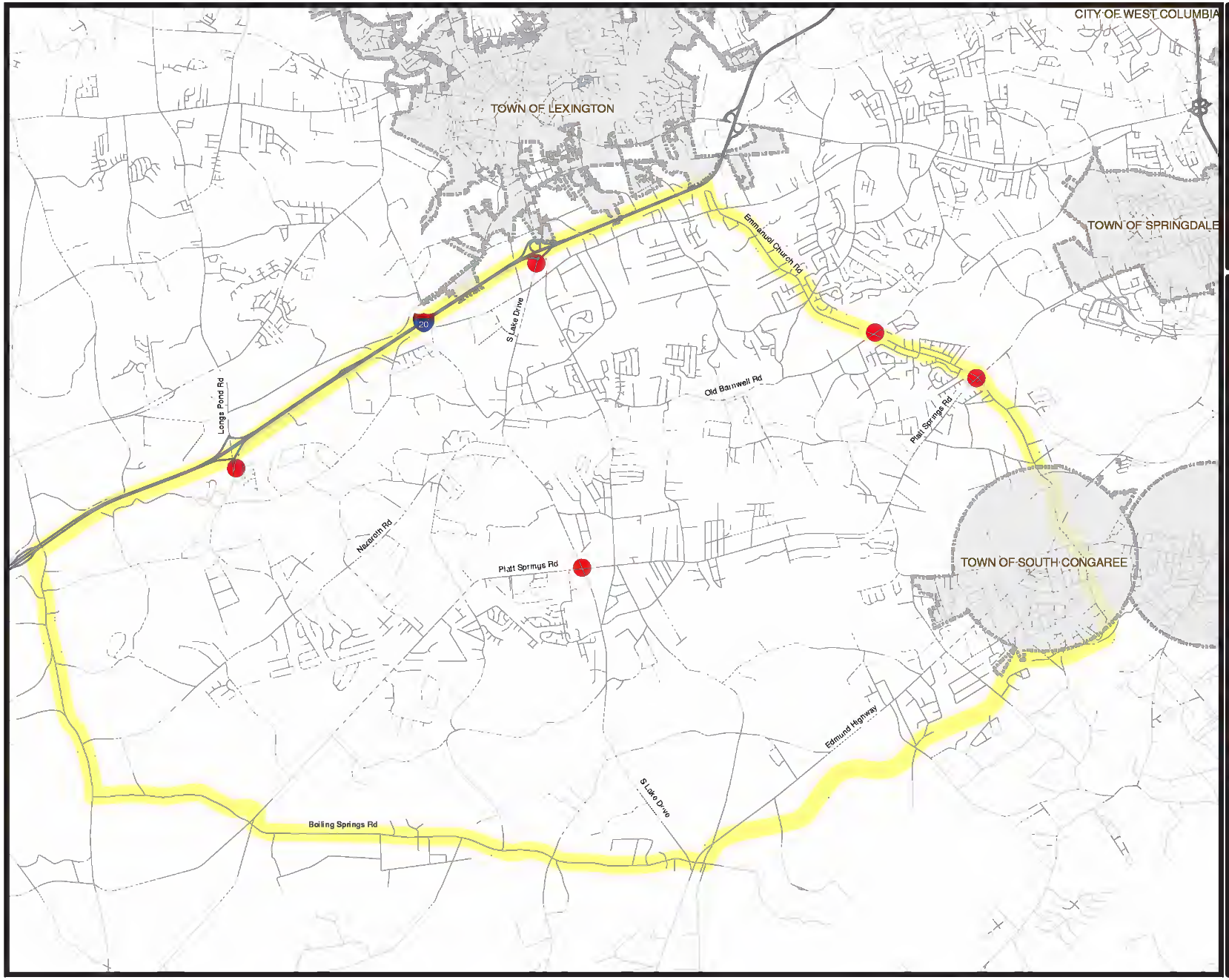
The White Knoll Area is home to several major employers. The following companies located within the White Knoll Area had at least fifty employees as of 2005:

- Nu-Way Industrial Services
- Food Lion
- Columbia Baseball Umpire Association
- Sea Hunt Boat Manufacturing Co.
- BiLo
- Piggly Wiggly
- Hoover Building Systems

The recent opening of the Walmart store located at the intersection of South Lake Drive and Platt Springs Road is a major retail destination as well as a major employer in the White Knoll Area.

Natural Features

The residential and commercial developments are influenced by the natural features in the White Knoll Area. Red Bank Creek and Congaree Creek flow from west to east through the White Knoll Area, dividing it into three sections. The floodplains and wetlands associated with these creeks affect the location and alignment of roadways as well as development and settlement patterns because of topographic changes that occur along the slopes created by these creeks. Figure 3-5 shows the location of these creeks and their tributaries within the White Knoll Area.



White Knoll Sub-Area

Figure 3-4: Areas of Commercial Development

CENTRAL MIDLANDS Council of Governments

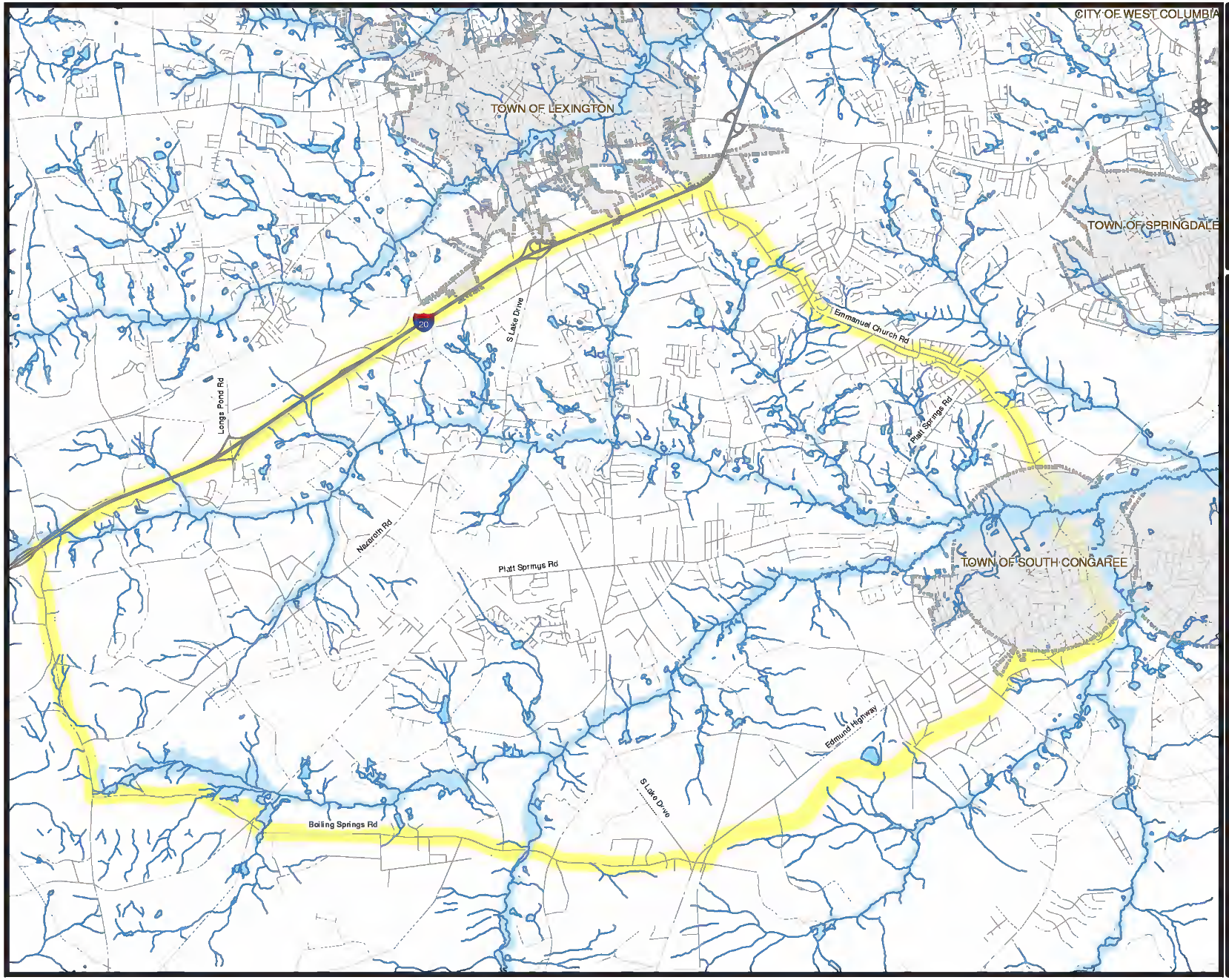
LEGEND

- Road
- Commercial Development Area
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles



White Knoll Sub-Area

Figure 3-5: Natural Features

CENTRAL MIDLANDS Council of Governments

LEGEND

- Road
- Stream
- FEMA 100-year Floodplain
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

4. EXISTING TRANSPORTATION FACILITIES

The existing transportation facilities in the White Knoll Area were inventoried and examined. Existing and future operating conditions were evaluated based on traffic assignments created using the COATS regional travel demand model.

4.1 Functional Classification

There are approximately 330 miles of roadways within the White Knoll Area. These roadways are classified into one of several categories according to their primary function within the total roadway network. SCDOT classifies roadways as either Interstates/Freeways, Arterials, Collectors and Local Roads.

Freeways/Interstates are multi-lane, divided, limited-access roadways that carry traffic over long distances at high speed. Within the study area, I-20 is the only roadway within the White Knoll Area with this functional classification.

Arterials can be classified as either major/principal or minor arterials. Principal arterials move higher volumes of traffic for longer distances at higher speeds than minor arterials. Arterials also provide access to adjacent properties, with principal arterials generally providing less frequent, more widely separated intersections and driveways than minor arterials.

Collectors are roadways that connect local roads to arterials and provide more extensive access to adjacent properties. Collectors, which are also classified as either major or minor collectors, generally carry less traffic at lower speeds than arterials.

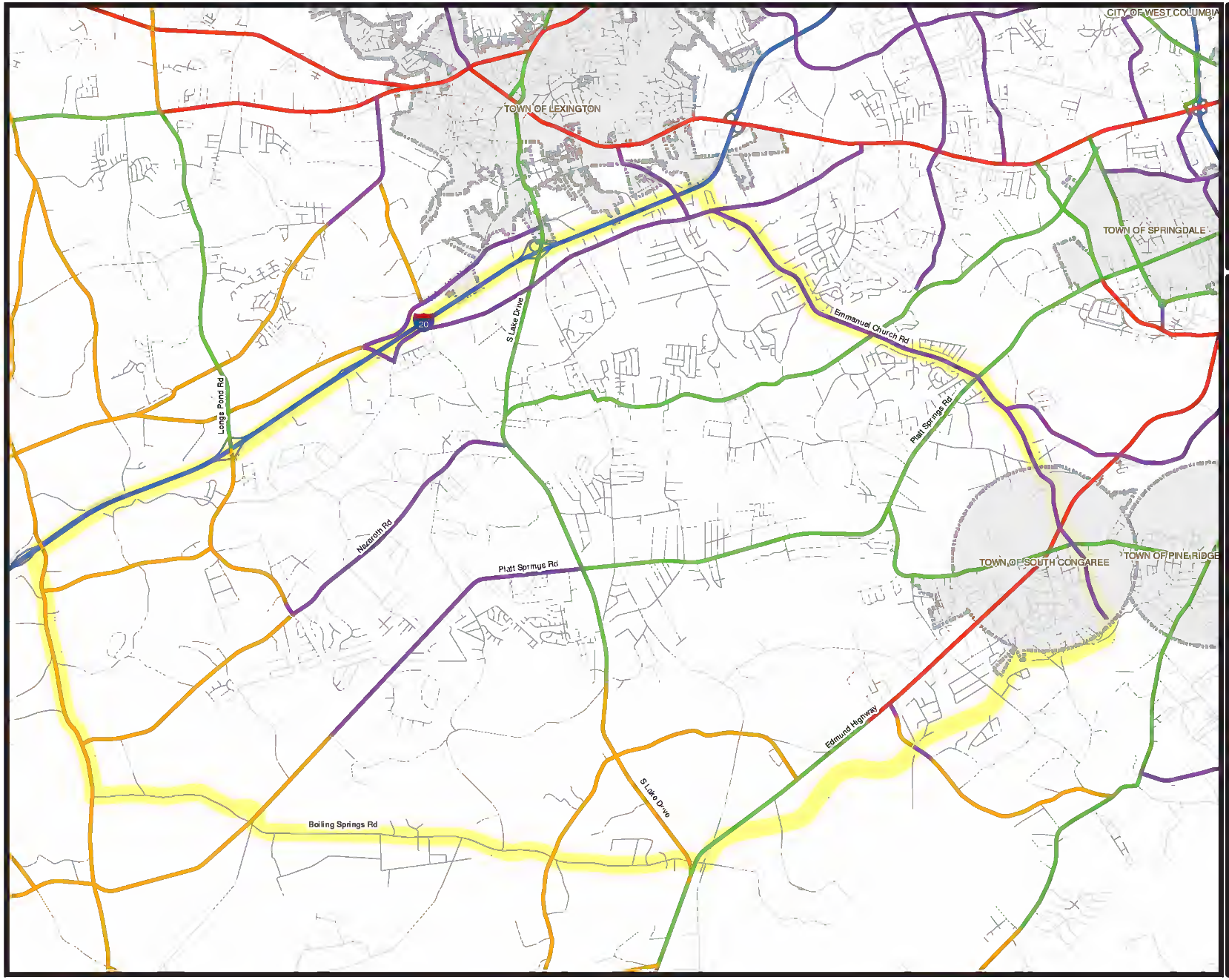
Local roads have the primary function of providing access to individual properties. Local roads are generally lower speed, lower volume roadways and have frequent intersections and curb cuts.

Table 4.1 summarizes the road miles for each functional classification in the White Knoll Area. The road miles for the functional classifications except local roads were obtained from the COATS model network data.

Table 4.1 – Road Miles by Functional Classification

Functional Classification	Total Road Miles
Interstates/Freeways	17.9
Principal/Major Arterials	3.6
Minor Arterials	21.8
Major Collector	18.4
Minor Collector	21.6
Local Roads	246.0

The Functional Classification of Roadways in the White Knoll Area are shown in Figure 4-1.



White Knoll Sub-Area

Figure 4-1: Functional Classification

CENTRAL MIDLANDS Council of Governments

LEGEND

- Interstate
- Principal Arterial
- Minor Arterial
- Major Collector
- Collector
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

Roadway Characteristics

With the exception of portions of South Lake Drive and Edmund Highway, roads within the study area are two-lane facilities. Edmund Highway was recently widened within the study area to a five-lane facility between Ramblin Road and Scenic Drive. South Lake Drive is currently being widened between Platt Springs Road and Two Notch Road. At key intersections, the number of lanes increases to accommodate turning movements, increasing to either two or three lanes, depending on whether there are separate lanes provided for left, through, and right turn movements. Speed limits along major roadways within the White Knoll Area vary between thirty-five miles per hour and fifty-five miles per hour.

4.2 Traffic Volumes

The South Carolina Department of Transportation (SCDOT) maintains an extensive database of Average Annual Daily Traffic Volumes (AADT) for each federal and state highway in each county within the state. The current (2007) AADT for the roadways within the White Knoll Area are shown in Figure 4-2.

Recent traffic growth along interstates and principal arterials within the White Knoll Area was calculated by comparing the changes between the 2000 and 2007 AADT. In general, traffic within the study area grew at approximately 2.4 percent per year between 2000 and 2007, with different routes experiencing different rates of growth. The difference between the 2007 and 2000 AADT, and the annual percentage rate of change is shown in Figure 4-3.

Turning movement volume data was also obtained from SCDOT. Turning movement counts are performed at intersections and summarize the volume of traffic turning left or right or traveling through each intersection approach. Turning movement count data is generally provided in 15-minute increments to facilitate the identification of peak hour time periods and for use in performing operational capacity analyses at intersections. The locations at which turning movement data was available are shown in Figure 4-4.

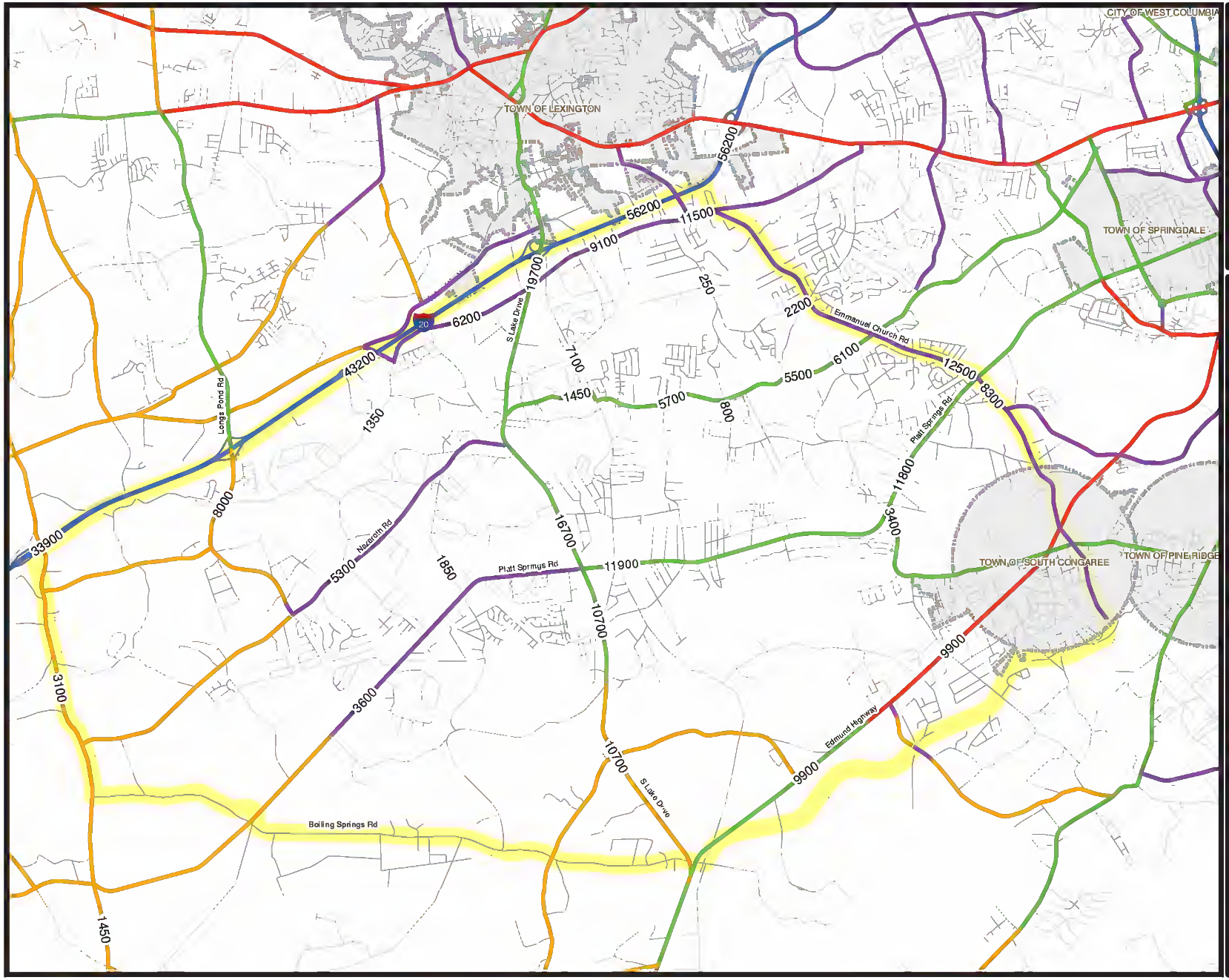
4.3 Signalized Intersections

Traffic signals are generally installed at locations where other less restrictive traffic control measures, such as stop sign control, are not able to safely or efficiently accommodate the volume of traffic traveling through the intersection. Thirteen intersections within the White Knoll Area are controlled by traffic signals. These intersections are:

- Emanuel Church Road at Two Notch Road
- Emanuel Church Road at Old Barnwell Road
- Two Notch Road at Cedarcrest Drive
- Two Notch Road at Old Orangeburg Road
- Two Notch Road at South Lake Drive
- Nazareth Road at South Lake Drive
- South Lake Drive at Eastbound I-20 Ramp
- South Lake Drive at WalMart Driveway
- South Lake Drive at Platt Springs Road
- Platt Springs Road at Lowes Driveway

- Platt Springs Road at New Orangeburg Road
- Platt Springs Road at Old Orangeburg Road
- Platt Springs Road at Emanuel Church Road
- Old Orangeburg Road at Old Barnwell Road
- Ramblin Road/Pine Ridge Drive at Edmund Highway

The locations of the signalized intersections are illustrated in Figure 4-5.



White Knoll Sub-Area

Figure 4-2: 2007 AADT

CENTRAL MIDLANDS Council of Governments

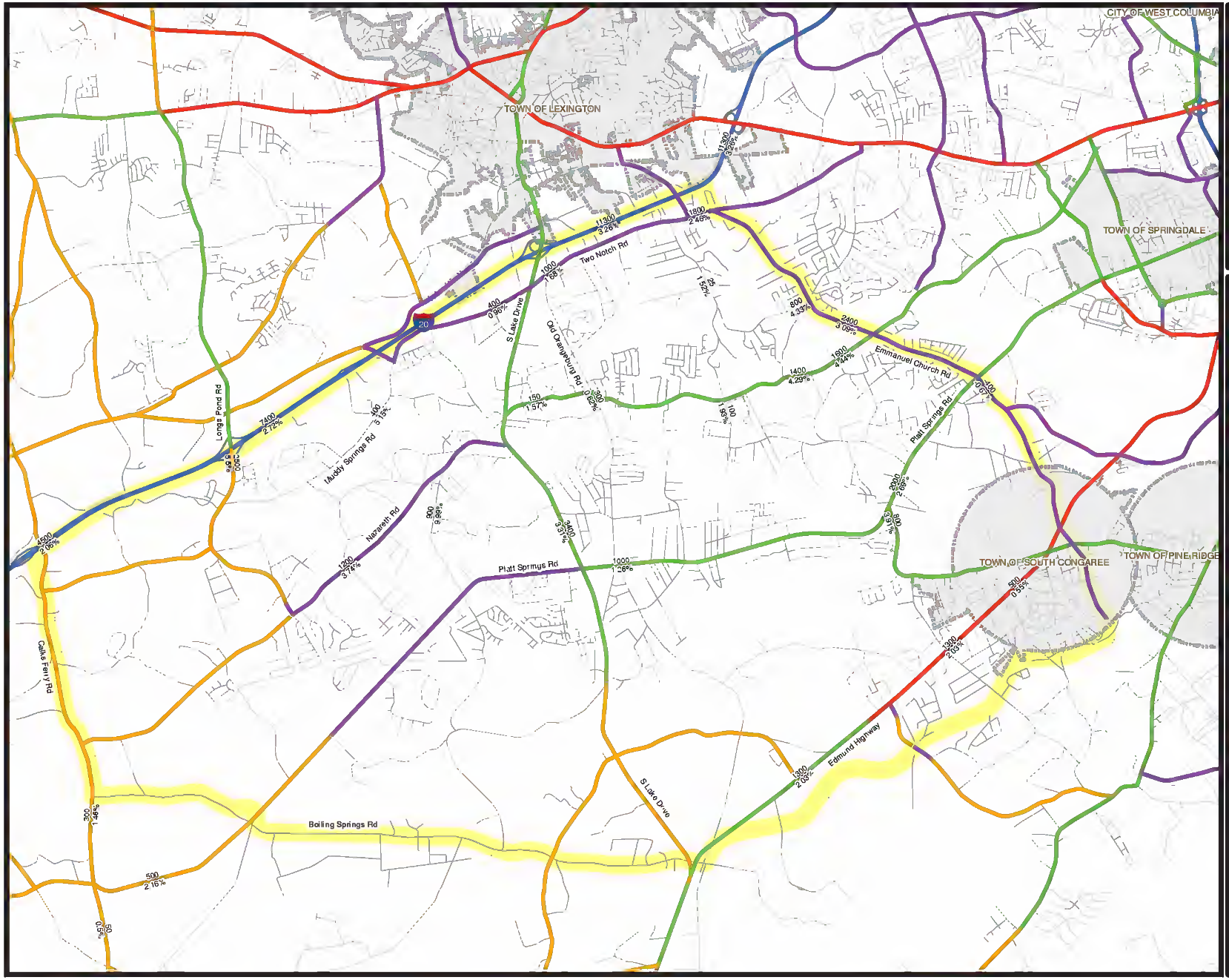
LEGEND

- Interstate
- Principal Arterial
- Minor Arterial
- Major Collector
- Collector
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles



White Knoll Sub-Area

Figure 4-3: 2000 to 2007 Change in AADT

CENTRAL MIDLANDS Council of Governments

LEGEND

- Interstate
- Principal Arterial
- Minor Arterial
- Major Collector
- Collector
- White Knoll Area
- Municipal Boundary

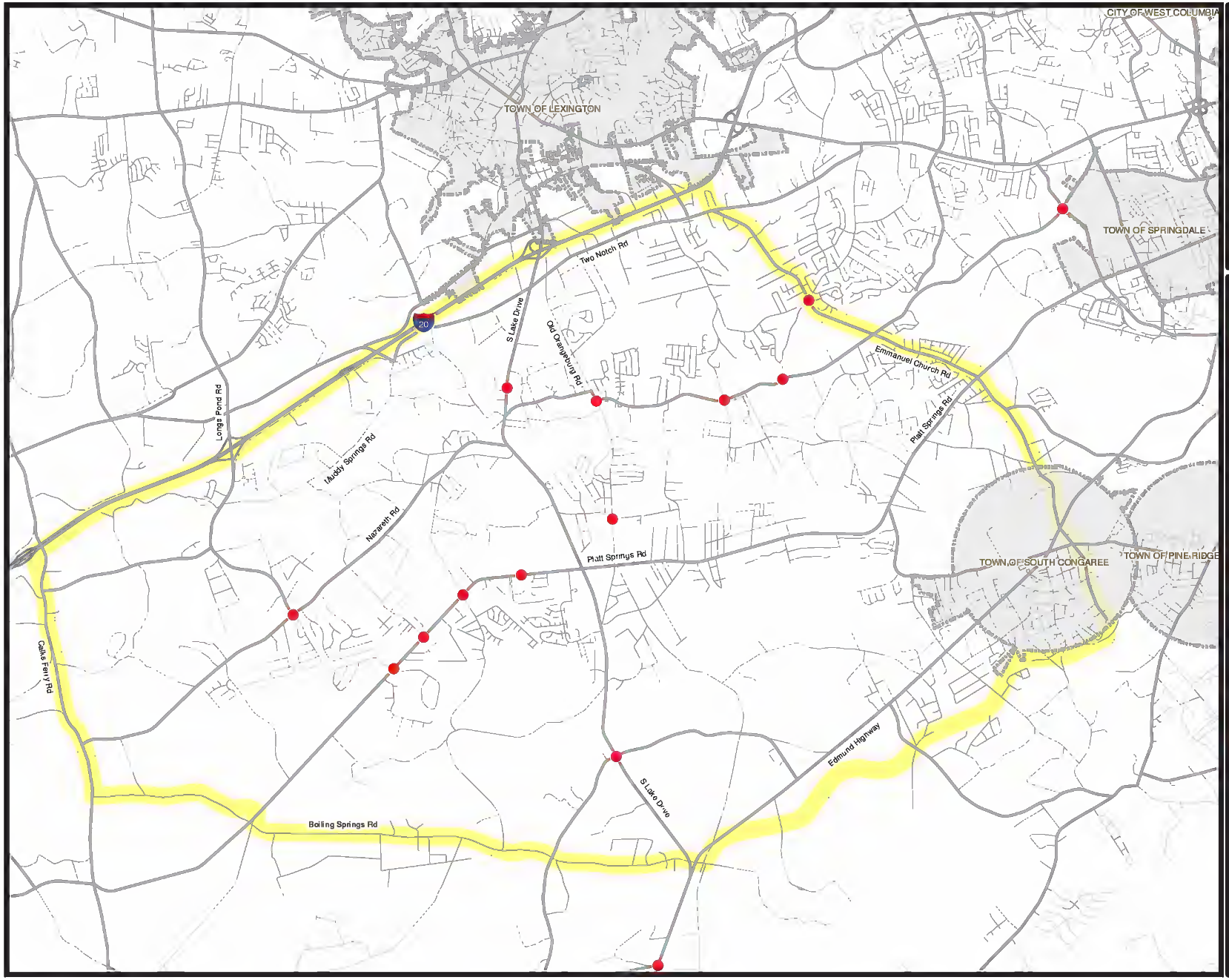
LABEL FORMAT

Volume Change - 0
Annual
Percent Change - 0%

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles



White Knoll Sub-Area

Figure 4-4: Turning Movement Data Locations

CENTRAL MIDLANDS Council of Governments

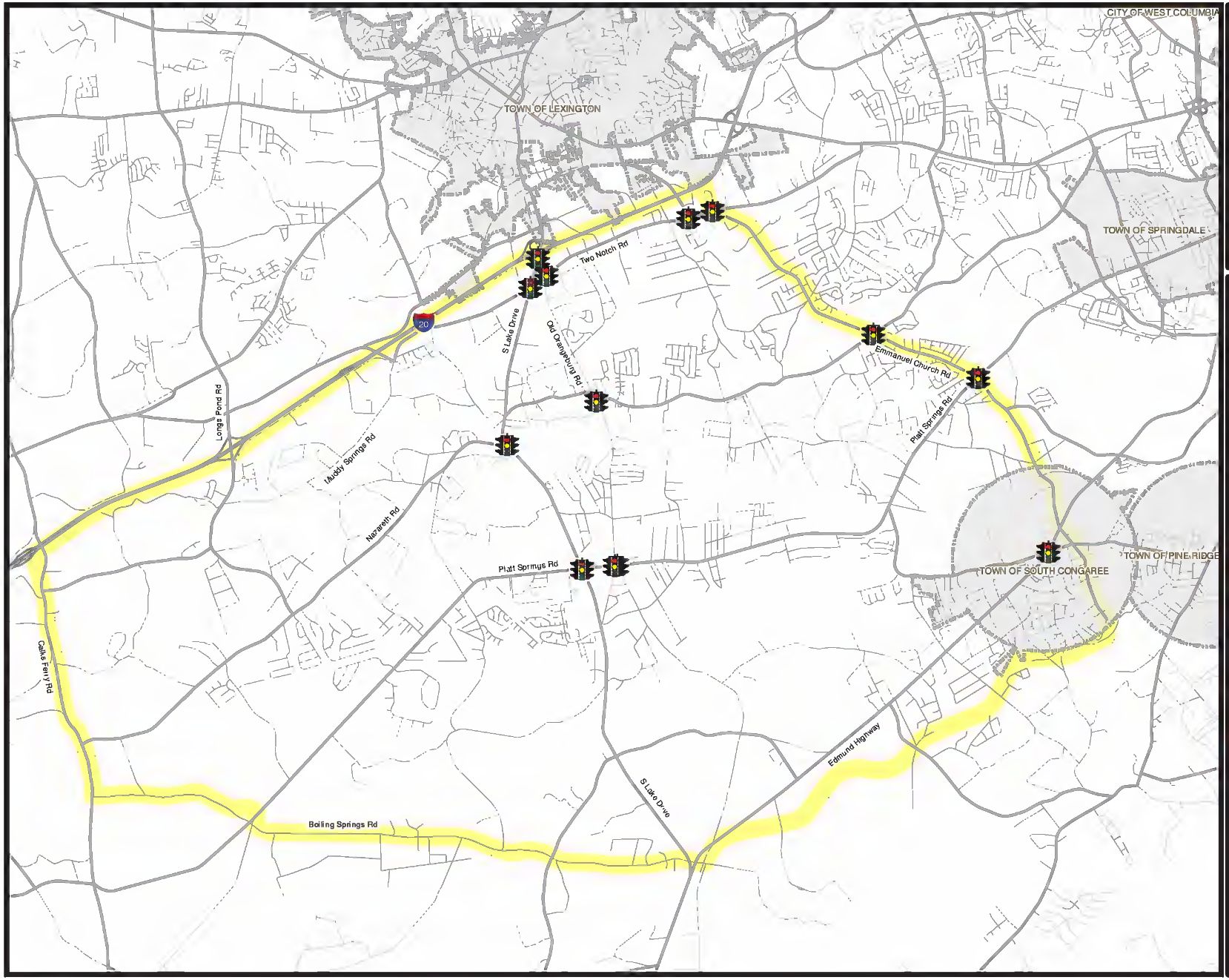
LEGEND

- Data Collection Location
- Major Road
- Minor Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles



White Knoll Sub-Area

Figure 4-5: Signalized Intersection Locations

CENTRAL MIDLANDS Council of Governments

LEGEND

- Signalized Intersection
- Major Road
- Minor Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

4.4 Levels of Service

The existing roadway levels of service (LOS) within the White Knoll Area can be estimated using the roadway link volume to capacity ratios (V/C) obtained from the COATS regional travel demand model. SCDOT has established a range of LOS, ranging from LOS A, the best, to LOS F, the worst. LOS A represents generally free flow conditions where traffic volumes are low and able to move at or near the posted speed limit. LOS F represents congested flow conditions, where traffic is heavy and travels well below the posted speed limit in often gridlocked or stop-and-go conditions. LOS C generally represents acceptable operating conditions, though LOS D is frequently adopted as the target operating condition in urban areas. The SCDOT V/C ratios and corresponding LOS are summarized in Table 4.2

Table 4.2 – Levels of Service by Volume/Capacity Ratio

LOS	Range of V/C
A	$0.00 \leq V/C < 0.50$
B	$0.50 \leq V/C < 0.75$
C	$0.75 \leq V/C < 1.00$
D	$1.00 \leq V/C < 1.15$
E	$1.15 \leq V/C < 1.35$
F	$V/C \geq 1.35$

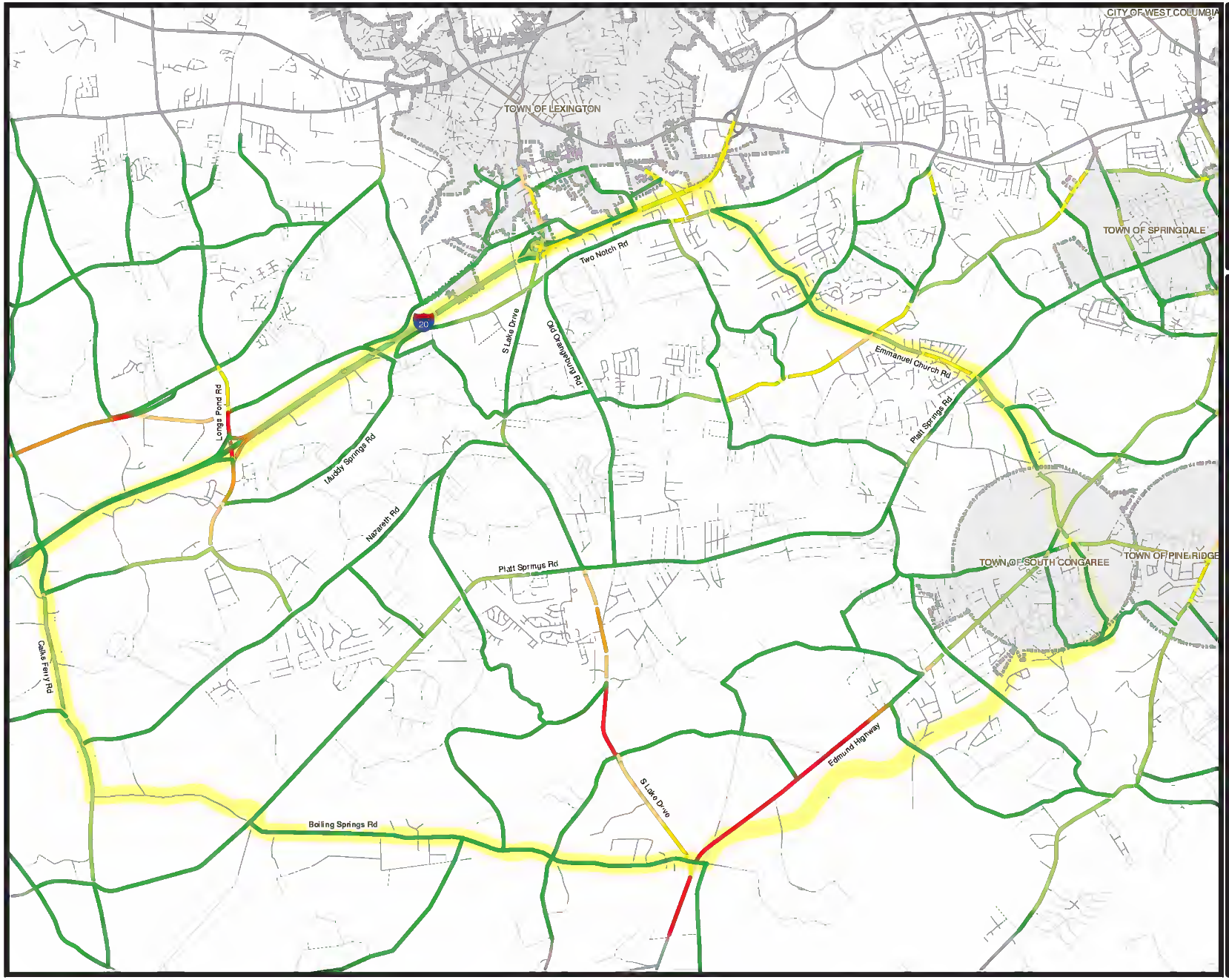
The existing network V/C and LOS within the White Knoll Area is illustrated in Figure 4-6.

4.5 Vehicle Miles and Vehicle Hours Traveled

Vehicle-Miles Traveled (VMT) and Vehicle-Hours Traveled (VHT) are measures of effectiveness that are frequently used to determine the level of traffic congestion within a network. VMT and VHT for roadways in the White Knoll Area are calculated by functional class using the results of the COATS Travel Demand Model.

VMT is the product of the volume of traffic traveling along a roadway link and the length of the roadway link. VHT is the product of the volume of traffic traveling along a roadway link and the travel time (converted to hours) along the link. In travel demand models, the uncongested travel time is based on the coded free-flow link speed. During the assignment process, congested travel times and/or speeds are estimated during the iterative calculations made with each step in the traffic assignments. The difference between the uncongested VHT and the congested VHT can also aid in determining where congestion is being encountered in the network.

Existing and future VMT and VHT are often compared to determine how effective proposed transportation network improvements are in addressing congestion and improving travel speeds. A traditional way of assessing the effectiveness of various sets



White Knoll Sub-Area

Figure 4-6: Existing LOS and V-C

CENTRAL MIDLANDS Council of Governments

LEGEND

Existing LOS

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

- Major Road
- Minor Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

of future network improvement alternatives is to compare the VMT and VHT for the respective assignments.

VMT increases usually result when traffic volumes increase along the same size network, while higher VHT generally results from both increases in traffic volumes or reductions in travel times resulting from increased congestion.

The existing VMT, VHT, free-flow and congested speeds in the White Knoll Area for each roadway functional classification are summarized in Table 4.3.

Table 4.3 – Link Length, VMT, and VHT by Functional Classification

Functional Classification	Length	VMT	VHT
Freeway	17.9	327,842	4,371
Principal Arterial	3.6	63,234	1,356
Minor Arterial	21.8	184,848	3,794
Major Collector	18.4	73,993	1,334
Collector	21.6	73,082	1,520
Total (With I-20)	83.3	722,999	12,375
Total (Without I-20)	65.4	395,157	8,004

When I-20 is included as part of the White Knoll Area roadway network, approximately 45 percent of all vehicle-miles and 35 percent of all vehicle hours take place along I-20.

Since I-20 is on the northern edge of the White Knoll Area, the VMT was also examined for the roadways without the effects of I-20. The remainder of the network mileage is somewhat evenly divided among the roadways classified as minor arterials (33 percent), major collectors (28 percent) and collectors (33 percent). However, the minor arterials carry most of the VMT (about 47 percent) in the White Knoll Area and more of the area VMT than the major collector and collector roadways combined. This information shows that the minor arterials are carrying most of the traffic burden in the White Knoll Area and are likely to be the types of routes that will need to be upgraded to principal arterials as population increases.

5. DEVELOPMENT TRENDS

The population of the White Knoll Area is expected to continue to increase. The 2007 population estimate for the area was approximately 38,400 residents, an increase of about 50 percent since 2000. By 2012, the White Knoll Area population is projected to increase to approximately 44,000 residents.

5.1 Population

As pointed out in Section 3.3, the population of the White Knoll Area is expected to increase from approximately 38,400 residents in 2007 to approximately 44,000 residents in 2012. By 2035, the White Knoll Area is projected to contain approximately 65,700 residents. This increase in population will be accompanied by additional growth in commercial, office and institutional land uses to provide services and employment opportunities to the residents of the White Knoll Area.

5.2 Lexington County Zoning Ordinance

The zoning ordinance addresses specific permitted and prohibited land uses, exterior features, and roadway access and design within Lexington County. The following items summarized from the Zoning Ordinance are applicable to the White Knoll Area.

- The Lexington County Zoning GIS file classifies parcels within the White Knoll Area as either restrictive development (residential) or intensive development (commercial). The intensive development is along major corridors in the area: Two Notch Road, Nazareth Road, Old Barnwell Road, South Lake Drive, Platt Springs Road, and Old Orangeburg Road.
- Roadways are classified as arterials, collectors, or local roads.
- Local roads are further classified as:
    - Residential Local Six (RL6)- to accommodate residential activities at six units per acre
    - Residential Local Five (RL5)- to accommodate residential activities at five units per acre
    - Residential Local Four (RL4)- to accommodate residential activities at four units per acre
    - Limited Local (LL)- for residential activities equal to or less than four units per acre
- Lexington County Subdivision Regulations do not require the installation of sidewalks within subdivisions, nor are sidewalks required along the perimeter of subdivisions.
- Parking lot connectivity is required and has been successfully implemented where it is physically possible to make the connections.
- Traffic impact studies are generally not required since the zoning ordinance effectively results in coordination between SCDOT and county engineering staffs to ensure effective and safe access and traffic control are provided. Developers retain the option to submit a traffic impact study to present a better access plan.

5.3 Lexington County Comprehensive Plan

The following transportation and/or land use related goals from the Lexington County Comprehensive Plan are applicable to the White Knoll Area:

- Ensure the efficient and safe use of existing and proposed transportation facilities.
- Promote the compatibility of different land uses as an alternative to completely segregating residential, commercial, industrial, agricultural and other uses from one another.
- Encourage the development of a variety of housing types to meet the needs of the population of Lexington County.
- As the governing authority for the "municipality" of the land that is left over in the unincorporated portion of the county, it is important to Lexington County that more logical and realistic municipal boundaries be sought.
- Position Lexington County to take advantage of any workable solutions to the negative effects of the most common patterns of suburban and urban development in the greater metropolitan area - a pattern becoming known as "sprawl".
- Work within the Central Midlands Council of Governments to ensure that the Columbia Area Transportation Plan (COATS) does all it can to assist in the possible reversal of the "sprawl" development pattern.
- Seek to have the best locations possible for all public facilities in Lexington County.
- Maintain stringent regulations on the types of development considered to have potential negative impacts.
- Aspire to have the cleanest and most visually pleasing county in South Carolina.

5.4 New Development

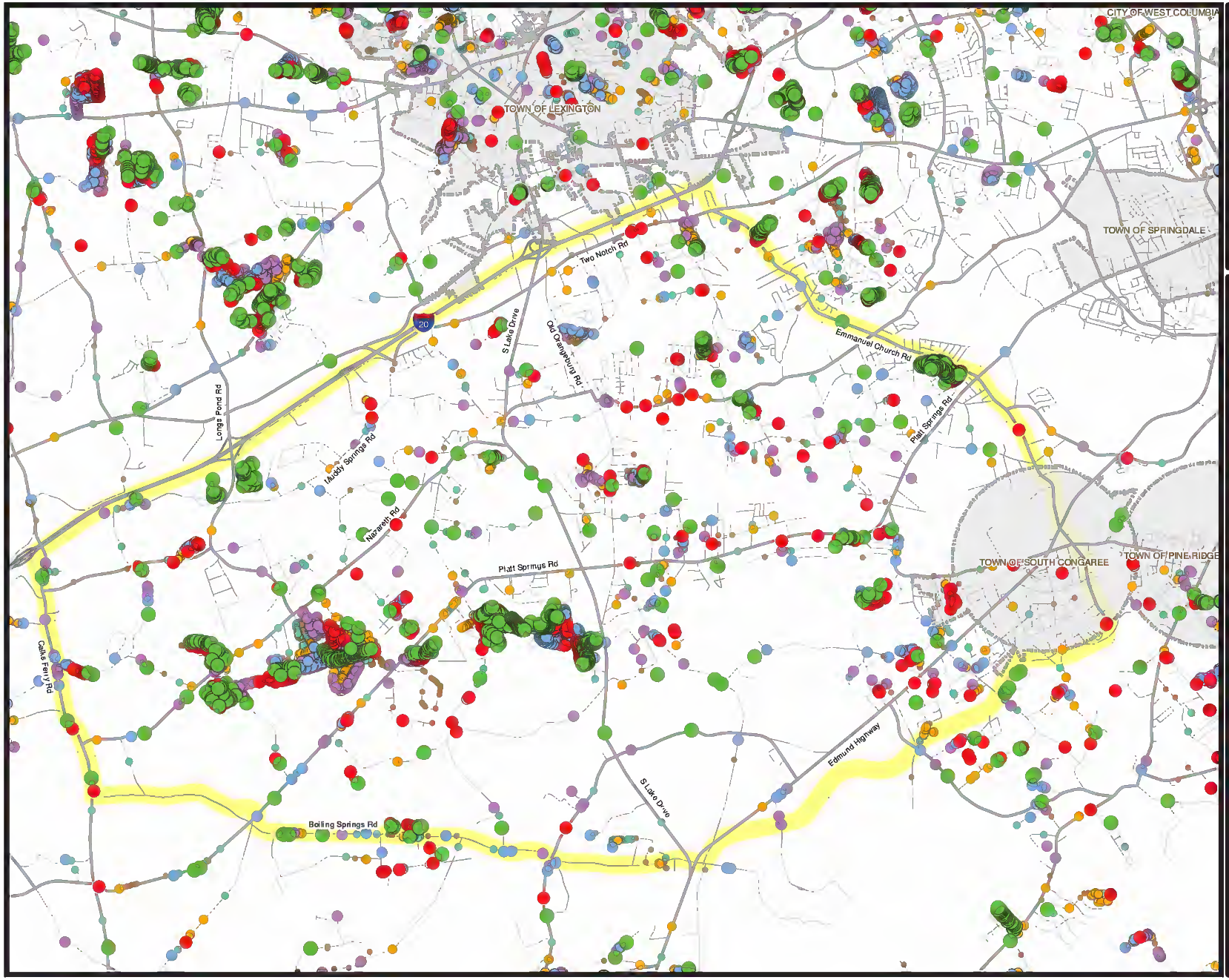
Residential Development

Analysis of building permits pulled between the year 2000 and 2006 reveal an increase in the development of larger single family home subdivisions. Within this timeframe, only 300 residential building permits were pulled in 2001, compared to 594 permits pulled in 2006. The location of the residential permits pulled in this time period is illustrated in Figure 5-1.

A large linear pocket of development is located just south of Platt Springs Road within close proximity of White Knoll High School. The Lexington County Joint Municipal Water and Sewer Commission provides both water and sewer to these developments. Another nearby pocket of development is located between Nazareth Road and Platt Springs Road. This area is situated around the two newest area schools, Carolina Springs Elementary School and Carolina Springs Middle School. The entire area is serviced by water provided by the Lexington County Joint Municipal Water and Sewer Commission, but only the schools here have sewer service. Permit analysis also indicates a number of new residential units spread throughout the study area, with other smaller areas of focused development located near the town of South Congaree and along Emanuel Church Road near its intersection with Platt Springs Road.

Commercial Development

The White Knoll Area is home to a handful of concentrated commercial areas. These areas are located at intersections of highly traveled roads and are characterized by a dense mix of commercial businesses including grocery stores, restaurants, retail stores, hardware stores and banks. The concentrated commercial areas depicted in the Figure 5-2 are located near the following intersections:



White Knoll Sub-Area

Figure 5-1: Residential Permit Analysis

CENTRAL MIDLANDS Council of Governments

LEGEND

Residential Permits

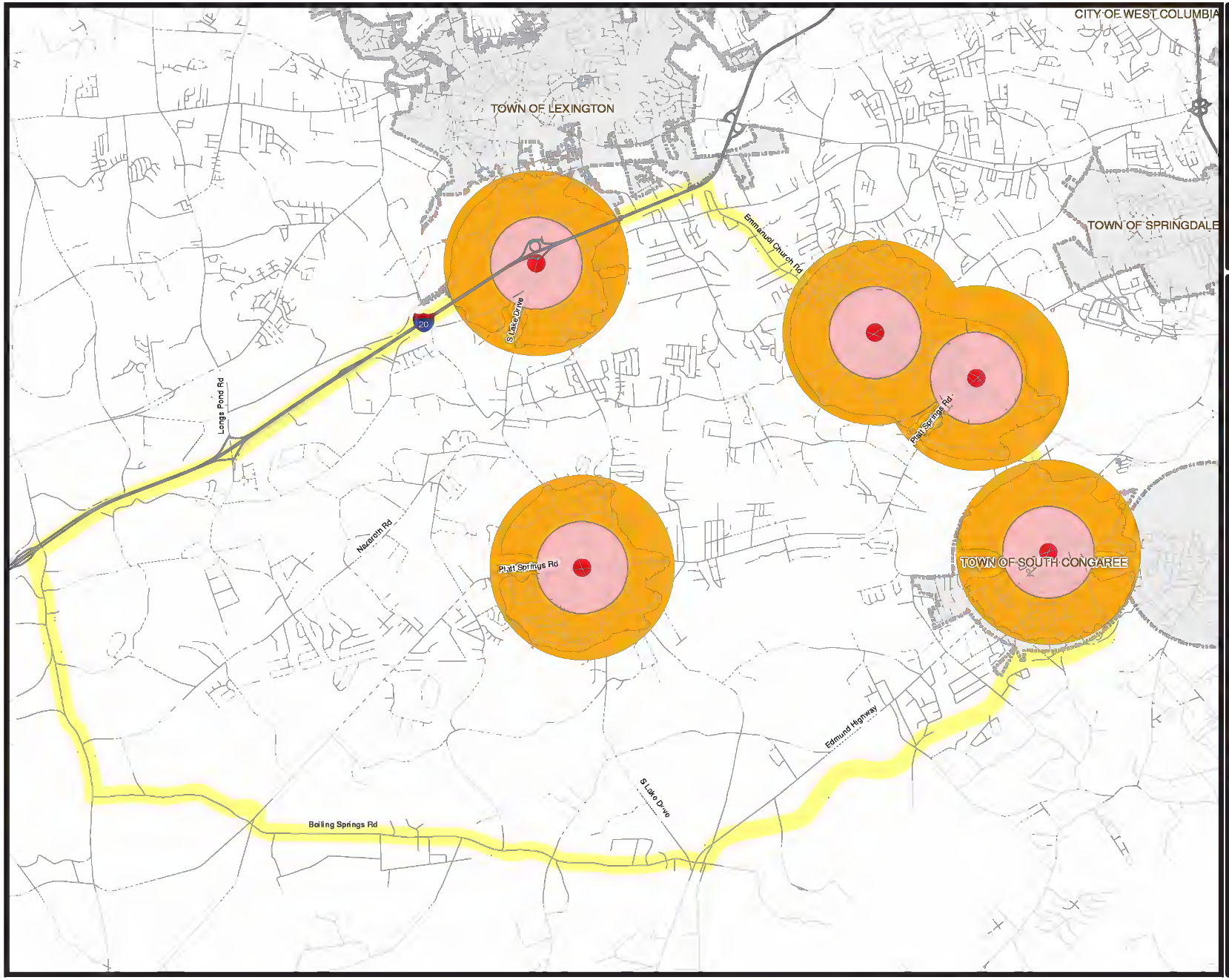
- 2006 Permit
- 2005 Permit
- 2004 Permit
- 2003 Permit
- 2002 Permit
- 2001 Permit
- 2000 Permit

- Major Road
- Minor Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles



White Knoll Sub-Area

Figure 5-2: Concentrated Commercial Areas

CENTRAL MIDLANDS Council of Governments

LEGEND

- Road
- Commercial Development Center
- 0.5 Miles from Commercial Development Center
- Within 1.0 Miles of Commercial Development Center
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

- Interstate 20 and South Lake Drive (SC Highway 6)
- South Lake Drive (SC Highway 6) and Platt Springs Road (SC Highway 602)
- Platt Springs Road (SC Highway 602) and Emanuel Church Road
- Emanuel Church Road and Old Barnwell Road
- Pine Street and Main Street/Edmund Highway (SC Highway 302)

These commercial nodes represent an opportunity to reduce localized traffic by creating links to residential areas with bicycle and pedestrian facilities. This potential is illustrated by the number of residential areas located within a 10-minute and 20-minute walk from the commercial nodes. However, while some residential areas are located within a twenty minute walk from the concentrated commercial areas, most of the residential development in the area lies further away.

Four of the five concentrated commercial areas are located along the borders of the White Knoll Area. Only one commercial node, located at the intersection of South Lake Drive (SC Highway 6) and Platt Springs Road (SC Highway 602), is centrally located within the study area. Compared to the other areas, this commercial area is relatively new and continues to grow at a rapid pace. It may be possible to take advantage of the continued commercial development at this node to further enhance connectivity to residential areas and evolve into an area center for commercial activity.

Future Growth

The White Knoll Area possesses numerous acres of undeveloped land, primed to respond to an ever-growing market in and around Columbia, South Carolina. Based on recent growth patterns in other area corridors that feed into the state capital, both commercial and residential growth are likely to continue at a steady pace. Schools within the local district have reacted positively to recent and planned for future growth, by constructing three new schools in the last eight years (Carolina Springs Elementary School, Carolina Springs Middle School and White Knoll High School). SCDOT road improvement projects are underway along South Lake Drive and Platt Springs Road in an effort to accommodate an increase in daily traffic volume generated by the additional development.

Traditionally, areas such as the White Knoll Area are developed quickly, with attention focused only on those parcels which are being currently developed rather than considering how new development fits with the existing land uses. In order to create a unique community that possesses a sense of place and identity, a larger plan needs to be established and followed. Large scale mixed-use developments follow this vision, growing one parcel at a time while constantly considering a larger master plan. These same principles can be applied to certain focused areas within the White Knoll Area.

No one development or land use measure can create an ideal growth situation. Responsible and intelligent growth requires a set of interwoven parts to foster the evolution of growth in the area into a form that area residents will find desirable. The elements necessary to produce a viable, mixed-use community with multiple transportation options within the White Knoll Area should include:

- Flexible development options
- Dedicated network(s) of pedestrian, bicycle & transit facilities
- Connected roadway network
- Concentrations of mixed-use
- Desirable community and public facilities
- Developable land
- Availability of utilities
- Multi-modal transportation facilities within right-of-way

5.5 Flexible Development Options

Figure 5-3 shows anticipated new growth in the White Knoll Area through 2035. Almost all portions of the area are expected to see new residential growth in the coming years, but the map illustrates more concentrations of development in some parts of the area than others.

5.6 Analysis of Development Trends

Three land use alternatives were developed to determine if transportation issues within the White Knoll Study Area could be improved by changing traditional development trends. The three land use alternatives examined were neighborhood retail, office, and industrial development. To examine these alternatives, the socio-economic inputs for industrial, retail, highway retail, office, and service employment were adjusted to reflect changes resulting from each of the individual alternatives.

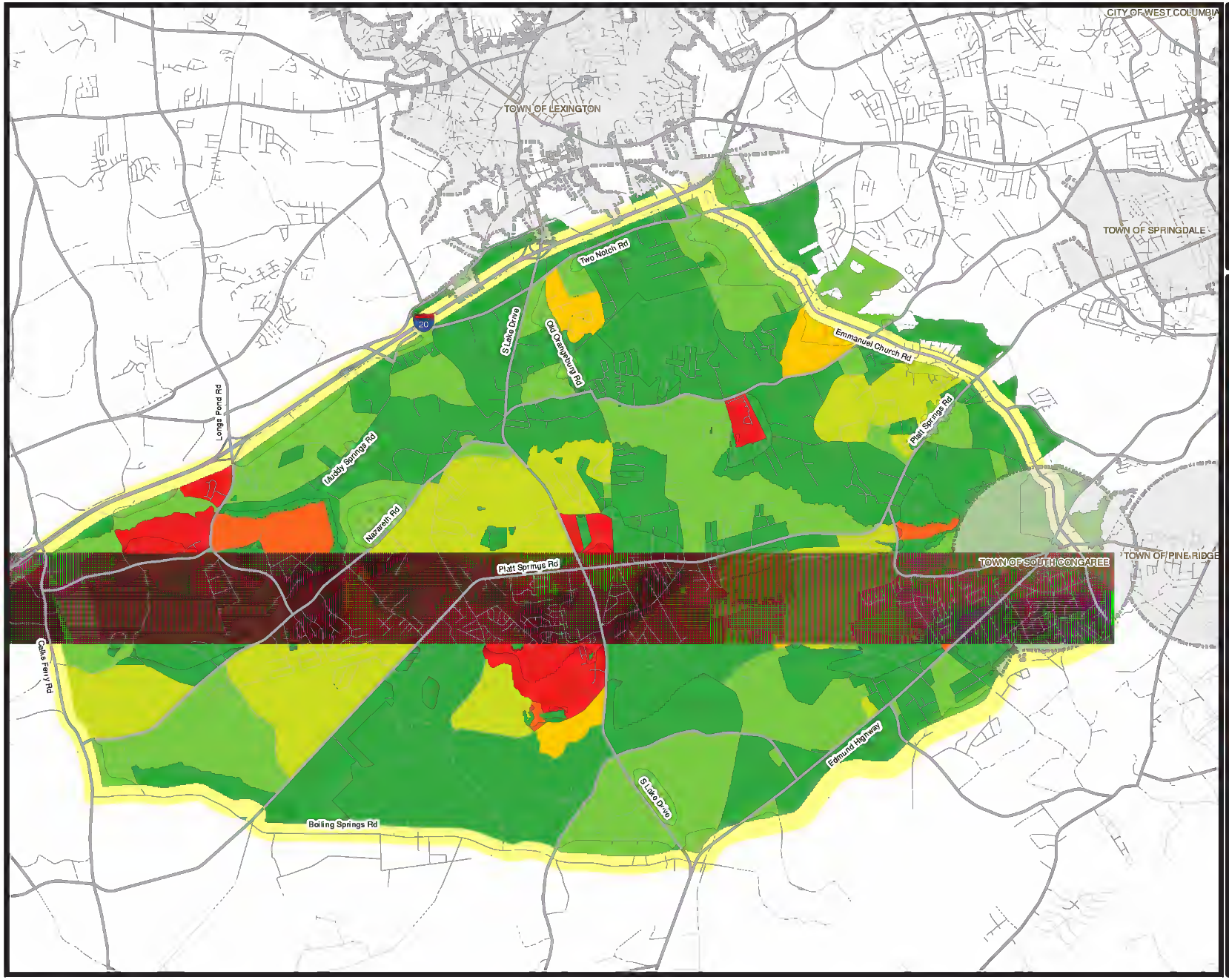
5.6.1 Neighborhood Retail Development Scenario

The neighborhood retail land use alternative examined the effect of a development trend that encourages neighborhood retail centers at three key locations within the White Knoll Area. These three locations are focused around the intersections of Nazareth Road with Longs Pond Road, Boiling Springs Road at Edmund Highway (SC 302) and South Lake Drive south of Platt Springs Road. The types of development that would be considered Neighborhood Retail would include banks, dry cleaners, pharmacies and other similar retail establishments.

To examine the affect of the neighborhood retail development pattern, the amount of employment in the retail and highway retail socio economic data were changed in the traffic analysis zones in which the neighborhood retail development would be desirable. Table 5.1 summarizes the retail employment changes.

Table 5.1 – Neighborhood Retail Employment Changes by Zone

Zone	2035 Highway Retail Employment	Revised 2035 Highway Retail Employment	2035 Retail Employment	Revised 2035 Retail Employment
687	8	30	50	100
695	10	30	15	50
761	10	30	25	100
Total	28	90	90	250



White Knoll Sub-Area

Figure 5-3: Residential Permit Analysis

CENTRAL MIDLANDS Council of Governments

LEGEND

Density of New Housing Units (Housing per Square Mile)

- 0 - 200
- 200 - 400
- 400 - 600
- 600 - 800
- 800 - 1000
- 1000 - 2100

Major Road

Minor Road

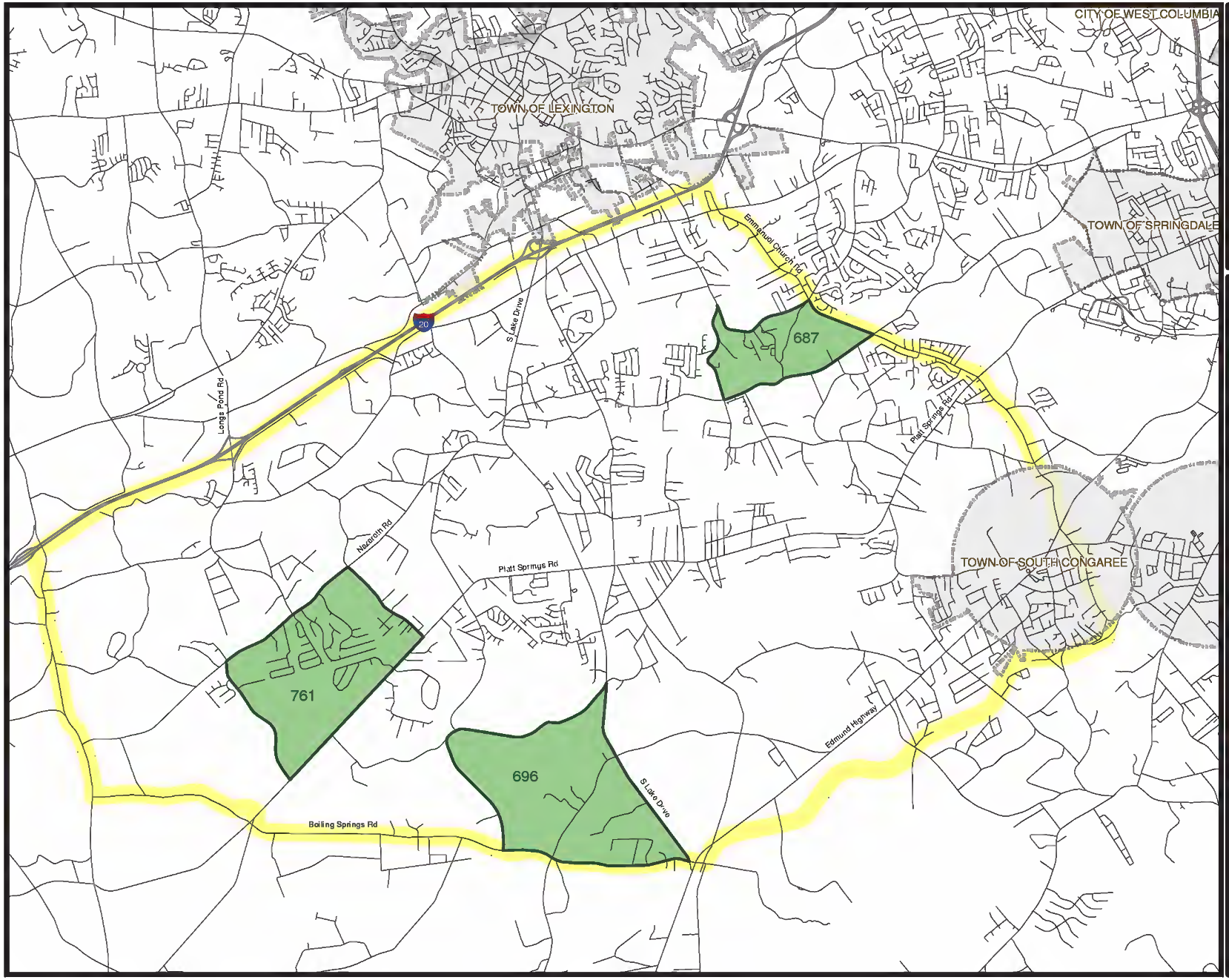
White Knoll Area

Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles



White Knoll Sub-Area

Figure 5-4: Zones with Adjusted Neighborhood Retail Employment

CENTRAL MIDLANDS Council of Governments

LEGEND

- Road
- Zones with Modified Employment
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

The traffic analysis zones in which the retail employment adjustments were made within the COATS travel demand model are shown in Figure 5.4.

5.6.2 Office Employment Development Scenario

The office land use alternative examined the effect of attracting increased office employment at key locations. By providing quality office development, it is hoped that more regionally oriented trips taken by White Knoll Area residents could be kept within the area, reducing regional travel demand, VMT, VHT and congestion. By improving the local jobs/housing balance will also permit some trips to shift modes from automobile to walking or biking. Table 5.2 summarizes the office employment changes.

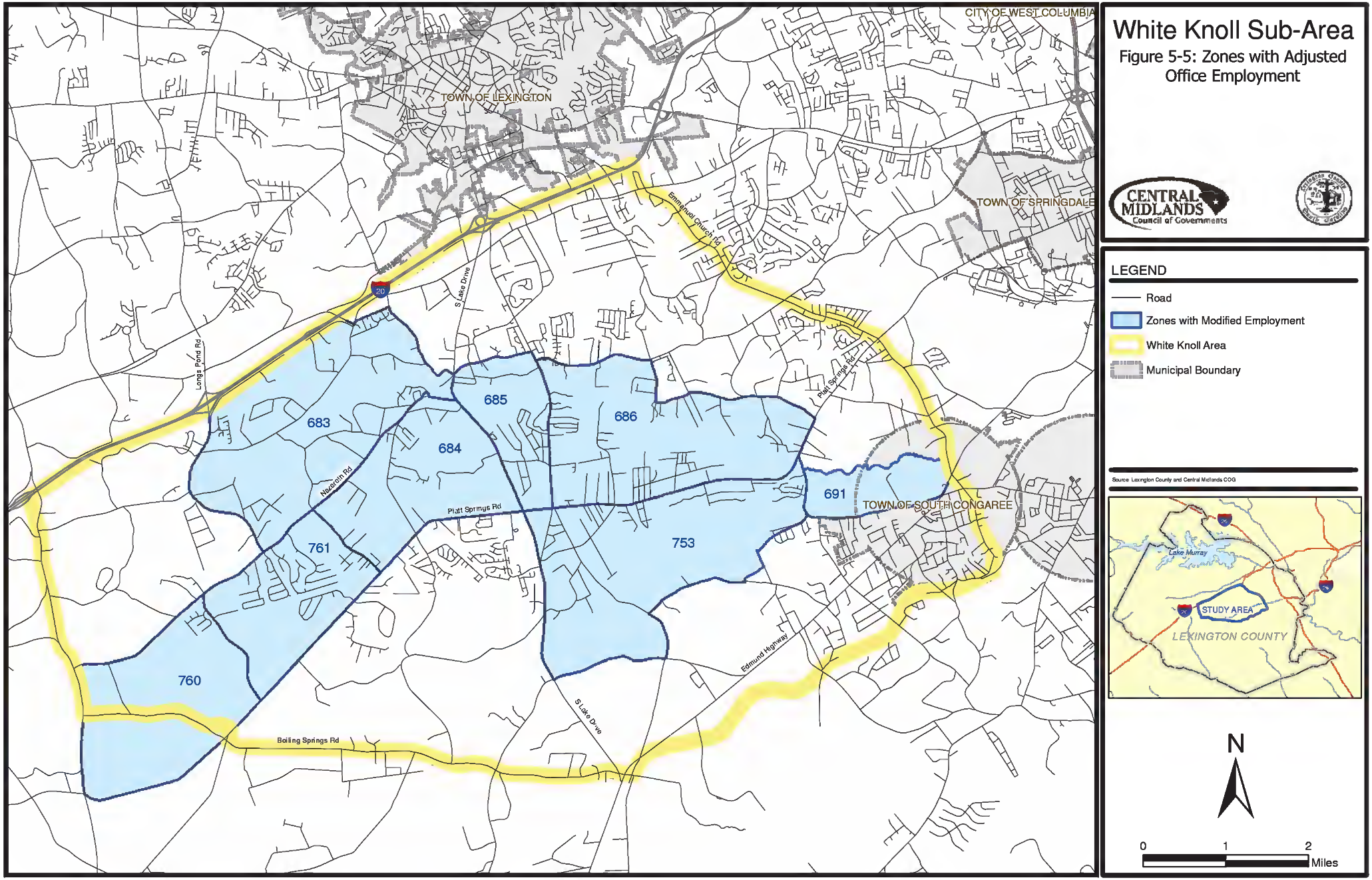
Table 5.2 – Office Employment Changes by Zone

Zone	2035 Office Employment	Revised 2035 Office Employment
683	10	100
684	30	100
685	30	100
686	60	400
691	10	200
753	10	200
760	10	200
761	10	200
Total	170	1500

The traffic analysis zones in which the office employment adjustments were made within the COATS travel demand model are shown in Figure 5-5.

5.6.3 Industrial Employment within an Enterprise Zone

The industrial land use alternative is predicated on developing an Enterprise Zone for primarily industrial development along I-20 west of the Longs Pond Road exit. To achieve this, it is assumed that some of the industrial jobs in the that were projected to occur in the zones on either side of Longs Pond Road to the south of I-20 would be relocated further west to the zones in the northeast, northwest and southwest quadrants of the US 278 crossing of I-20. Employment within Enterprise Zone along I-20 from Longs Pond Rd westward—The Enterprise Zone of Industrial Development was mentioned by County Council during their strategic planning session last fall. See what impact such development would have. Again, by providing the industrial development in this area, it is hoped that residents of the White Knoll Area would be employed in these industrial jobs rather than comparable jobs elsewhere in the region, reducing regional travel demand, VMT, VHT and congestion. Table 5.3 summarizes the industrial employment changes.



White Knoll Sub-Area

Figure 5-5: Zones with Adjusted Office Employment

CENTRAL MIDLANDS Council of Governments

LEGEND

- Road
- Zones with Modified Employment
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

Table 5.3 – Industrial Employment Changes by Zone		
Zone	**2035 Industrial Employment**	**Revised 2035 Industrial Employment**
682	750	100
683	1500	100
803	50	550
811	10	750
813	5	750
Total	2315	2250

The traffic analysis zones in which the industrial employment adjustments were made within the COATS travel demand model are shown in Figure 5-6.

The resulting model assignments for these alternative development scenarios can be compared to the 2035 assignments that represent development within the White Knoll Area continuing along the more recent development trends.

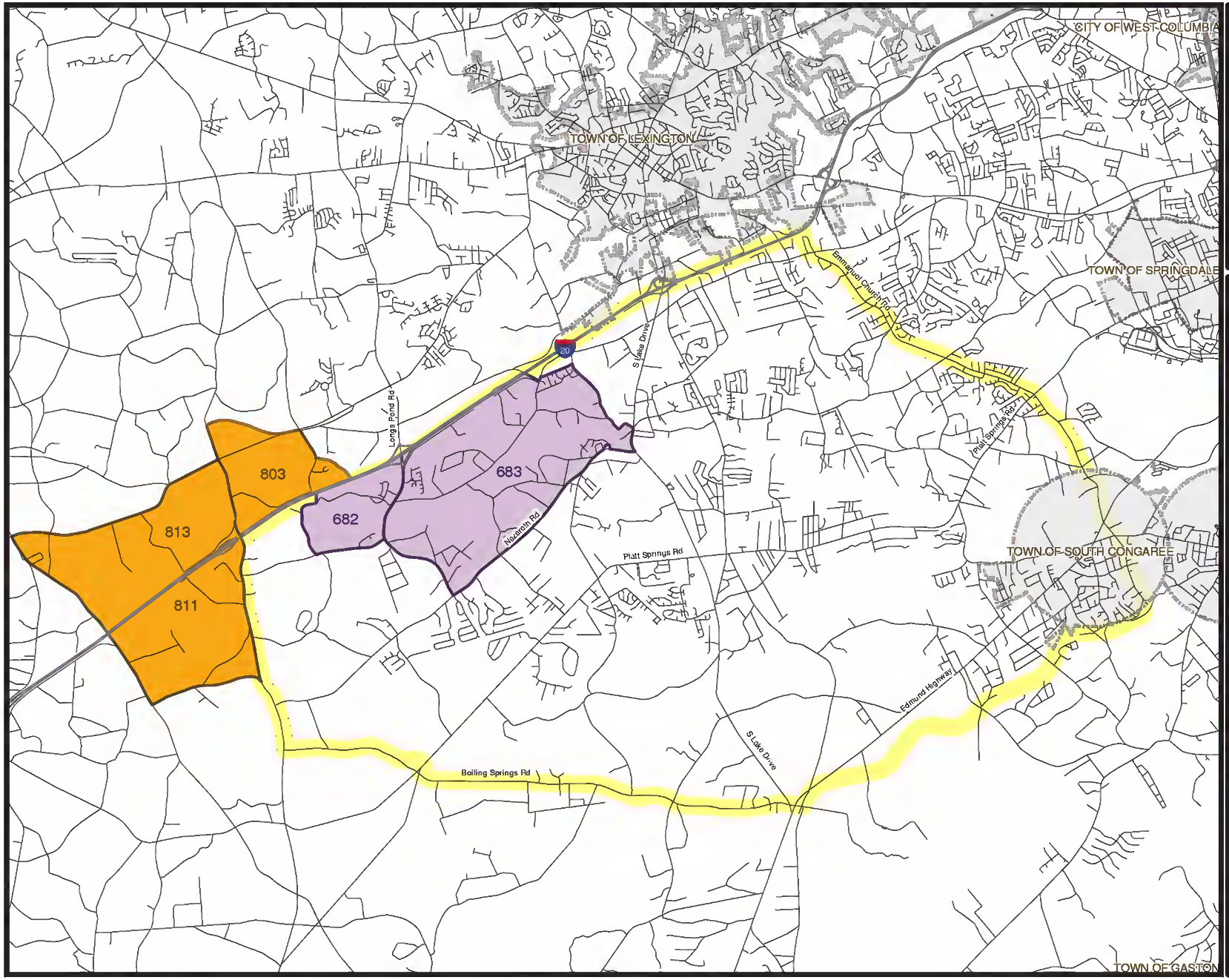
The neighborhood retail development in zone 761 in the western White Knoll Area results in about a ten percent reduction in traffic along adjacent segments of Platt Springs Road (SC 602) and about a five percent reduction in traffic along adjacent segments of Longs Pond Road. This is an indication that the proposed increase in retail employment, representing the development of neighborhood retail development, shows that a small reduction in trips with retail destinations originating in and near zone 761.

Implementing neighborhood retail development in zone 695 in the southern White Knoll Area results in about a seven percent reduction in traffic along Edmund Highway (SC 302) and some minor reductions along other adjacent links. In zone 687 in the northeastern part of the White Knoll Area, adjusting the retail employment to reflection neighborhood retail development did not appear to affect traffic assignments on the adjacent roadway network.

Similar comparisons can be made using the 2035 traffic assignments for the Office Development and Industrial Development scenarios and currently modeled land use scenarios.

The office development employment adjustments in the zones in the heart of the White Knoll Area result in comparable reductions and shifts in traffic that occurred in the neighborhood retail scenario. Traffic is reduced approximately ten percent along segments of Platt Springs Road (SC 602) west of South Lake Drive (SC 6) and by five to seven percent along Edmund Highway (SC 302) east of South Lake Drive. The industrial development scenario results in comparable traffic reductions along Platt Springs Road (SC 602) and Edmund Highway (SC 302) as occurred in the other two scenarios.

The individual development scenarios appear to indicate that modest reductions in traffic may be possible and that the proposed scenarios may be able to reduce travel demand, VMT and VHT in portions of the White Knoll Area network.



White Knoll Sub-Area

Figure 5-6: Zones with Adjusted Industrial Employment

CENTRAL MIDLANDS Council of Governments

LEGEND

- Road
- Zones with Reduced Employment
- Zones with Increased Employment
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

6. FUTURE ROADWAY IMPROVEMENTS

For most drivers commuting from or within the White Knoll Area, congestion and safety are the major issues of area roads. South Lake Drive and Longs Pond Road have interchanges with Interstate 20, a route many commuters take to their places of employment throughout the Central Midlands Area and Platt Springs Road provides a direct route to downtown Columbia. During peak hours, these routes become congested because of the lack of alternative routes and the additional local traffic traveling to area schools, retail, and employment centers.

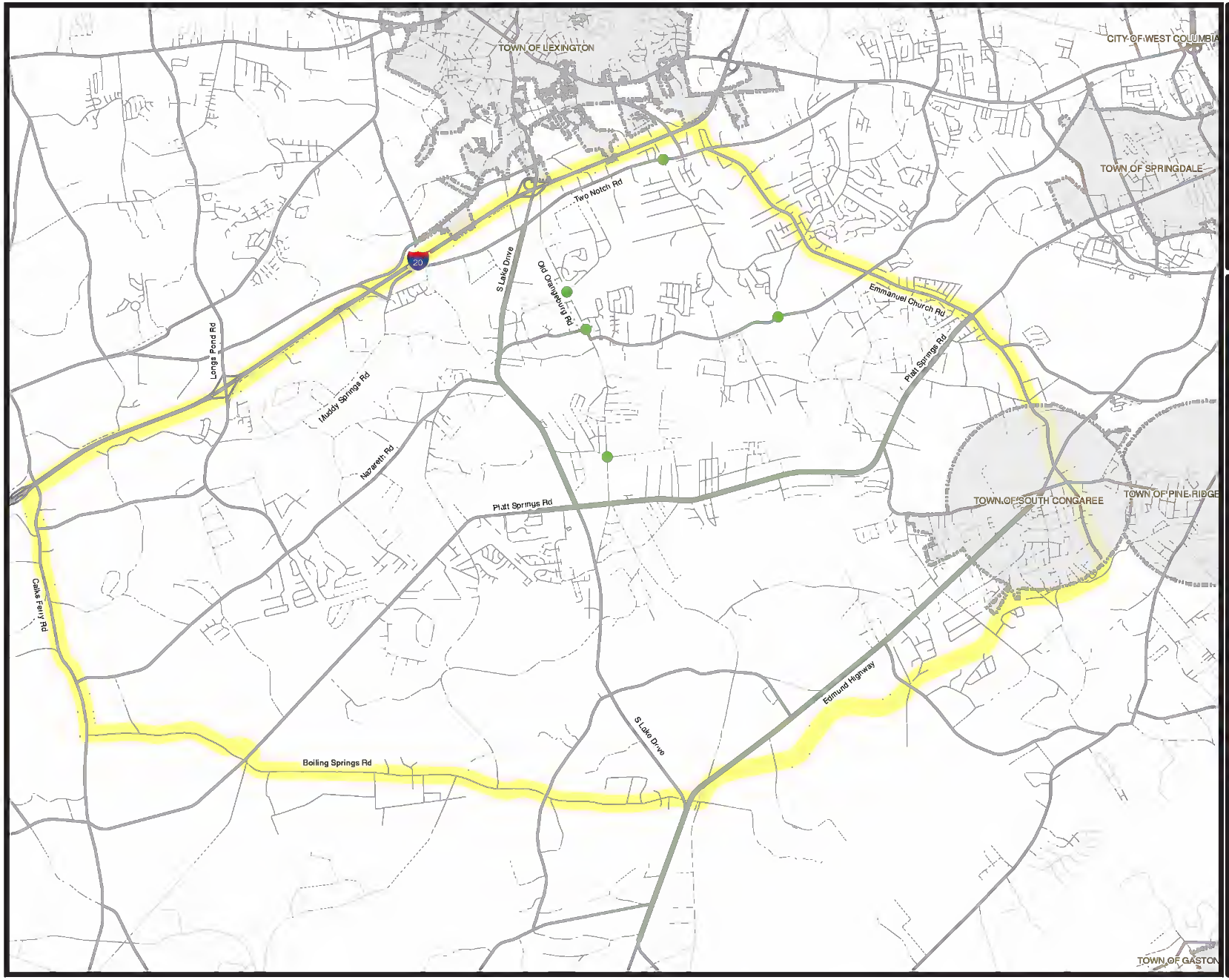
Roads and intersections within the study area frequently named among South Carolina's most dangerous rural secondary roads for injuries and fatalities. Portions of four of the roads named in a February 13, 2008 article in *The State* are located within the White Knoll Area. Old Barnwell Road, Longs Pond Road, Platt Springs Road, and Emanuel Church Road listed in South Carolina's 100 rural secondary roads with the highest rates of serious accidents. High speeds and rural design features, such as narrow shoulders or the lack of curb and gutter contribute to the frequency and severity of these crashes. As the area population and traffic increases, the frequency of accidents along these roads will likely increase as well. Constructing appropriate safety and capacity improvements would help reduce the frequency and severity of accidents in the area.

The White Knoll Area already has the foundation to create a hierarchical type of a grid road network to better disperse various types of trips occurring within the area. Emanuel Church Road, Old Orangeburg Road, South Lake Drive and Calks Ferry provide the backbone of the north-south grid connections, while Two Notch Road, Old Barnwell Road, Nazareth Road, Platt Springs Road and Edmund Highway provide east-west connections. Speeds along these facilities range from thirty-five miles per hour to fifty-five miles per hour and should ideally carry longer distance trips. Some facilities, such as YMCA Road and Cannon Trail, carry vehicles seeking alternative routes to avoid congestion on the main roads, but their design, operating speed, and adjacent land use makes the use of these roads in this manner unappealing to the local residents living on those streets.

Roadway improvements are either underway or planned for the near future along South Lake Drive and Platt Springs Road. The improvement projects, which are part of the Central Midlands Transportation Improvement Program, were necessary since South Lake Drive and Platt Springs Road, along with recently widened portions of Edmund Highway, carry much of the vehicular traffic to, from and within the White Knoll Area. Other improvements include intersection improvements at

- Two Notch Road/Shirway Road
- Old Orangeburg Road/YMCA Road
- Old Orangeburg Road/Old Barnwell Road
- Old Barnwell Road/White Knoll Road
- Old Orangeburg Road/Southwood Drive

Figure 6-1 shows the location of these roadway and intersection improvement projects.



White Knoll Sub-Area

Figure 6-1: Committed Projects in the 2025 LRTP

CENTRAL MIDLANDS Council of Governments

LEGEND

- Intersection Improvement
- Road Improvements
- Major Road
- Minor Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

Residential development in recent years has been concentrated west of South Lake Drive. The future growth in residential development is expected to continue in the areas west of South Lake Drive, resulting in additional area roadways carrying commuting traffic. Even with the roadway and intersection improvements that are planned or currently underway, the increasing residential development will ultimately result in the need to provide additional capacity improvements within the White Knoll Area. Figure 6-2 shows the 2035 V/C and LOS for the White Knoll Area.

The 2035 model assignments show that a number of sections of network roadways will operate at either LOS E or F. These roads include:

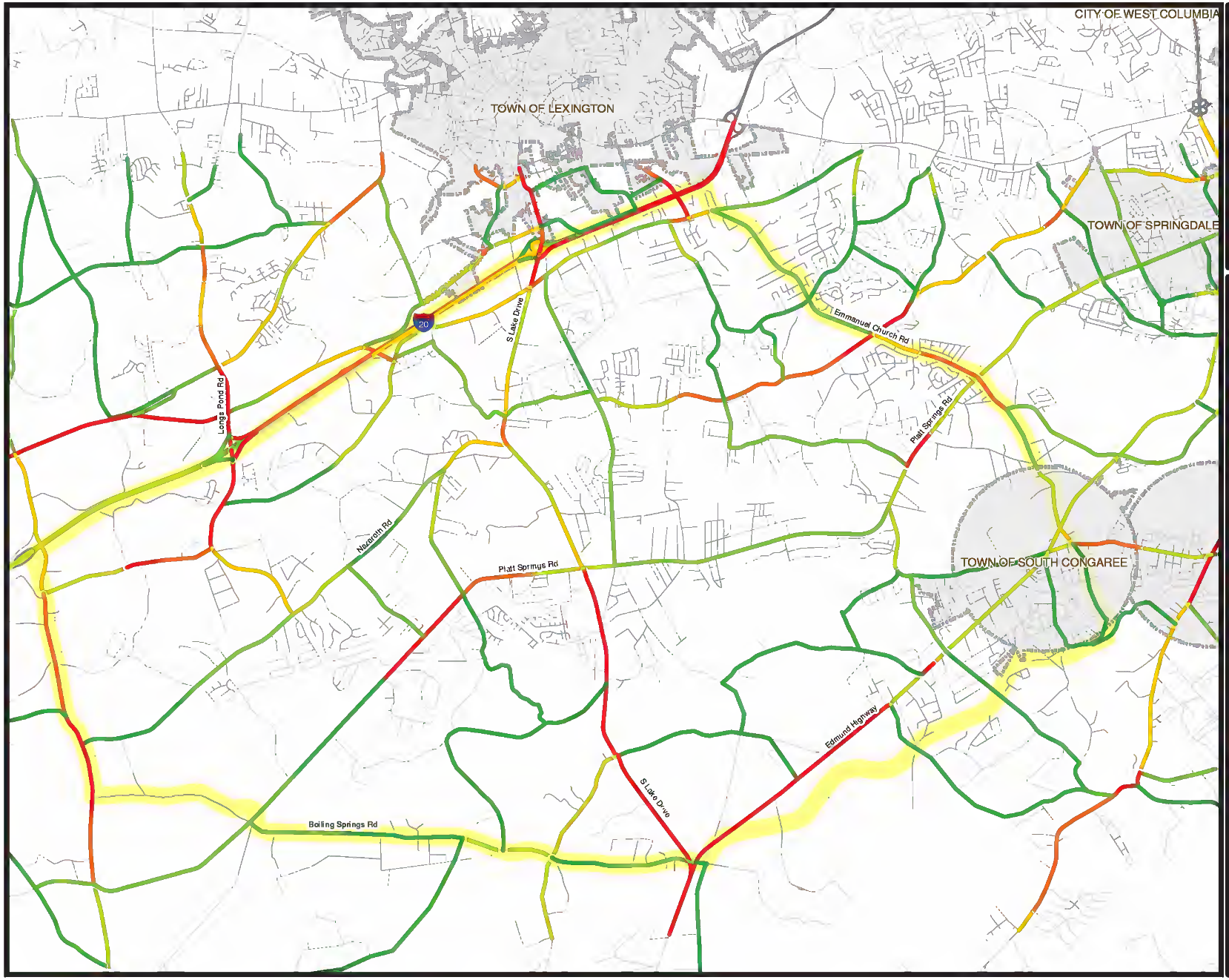
- South Lake Drive between Platt Springs Road and Edmund Highway
- Edmund Highway between South Lake Drive and Gator Road
- Platt Springs Road between McLee Road/Kyzer Road and Willow Forks Road
- Old Barnwell Road east of Old Orangeburg Road
- Longs Pond Road north of Nazareth Road
- Calks Ferry Road from Pond Branch Road to Sherwood Drive

The 2035 VMT, VHT, Free-Flow and Congested Speeds in the White Knoll Area for each roadway functional classification are summarized in Table 6.1.

Table 6.1 – Link Length, VMT, and VHT by Functional Classification for 2035

Functional Classification	Length	VMT	VHT
Freeway	17.9	575,495	7,673
Principal Arterial	3.6	103,795	2,224
Minor Arterial	21.8	373,574	7,759
Major Collector	18.4	167,460	3,027
Collector	21.6	154,527	3,184
Total (With I-20)	83.3	1,374,851	23,867
Total (Without I-20)	65.4	799,356	16,194

The VMT in the White Knoll Area is projected to increase by about 90 percent (from 722,999 to 1,374,851) by 2035, with the VHT increasing by about 93 percent (from 12,375 to 23,867). With continued high rates of projected population growth and no significant increase in roadway capacity by 2035, it is not surprising to see more roadways are likely to be operating at increasing poorer levels of service. Congestion throughout the White Knoll Area, as indicated by the projected VMT, will nearly double by 2035.



White Knoll Sub-Area

Figure 6-2: 2035 Level of Service

CENTRAL MIDLANDS Council of Governments

LEGEND

2035 Level of Service

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

Road

White Knoll Area

Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

Roadway improvement projects intended to alleviate the congestion resulting from the increased population and VMT growth were identified and provided to CMCOG to model. These improvements consist of the following projects:

- Widening from two to three lanes
  - South Lake Drive between Platt Springs Road and Edmund Highway
  - Platt Springs Road between McLee Road/Kyzer Road and Willow Forks Road
  - Old Barnwell Road between Old Orangeburg Road and Emanuel Church Road
  - Longs Pond Road between Nazareth Road and Barr Road
  - Calks Ferry Road from Pond Branch Road to Sherwood Drive
- Widening from two to four lanes
  - Edmund Highway between South Lake Drive to Gator Road

The locations of the roadway improvement projects are shown in Figure 6-3. Figure 6-3 also illustrates the location of several potential intersection improvements. These improvements include:

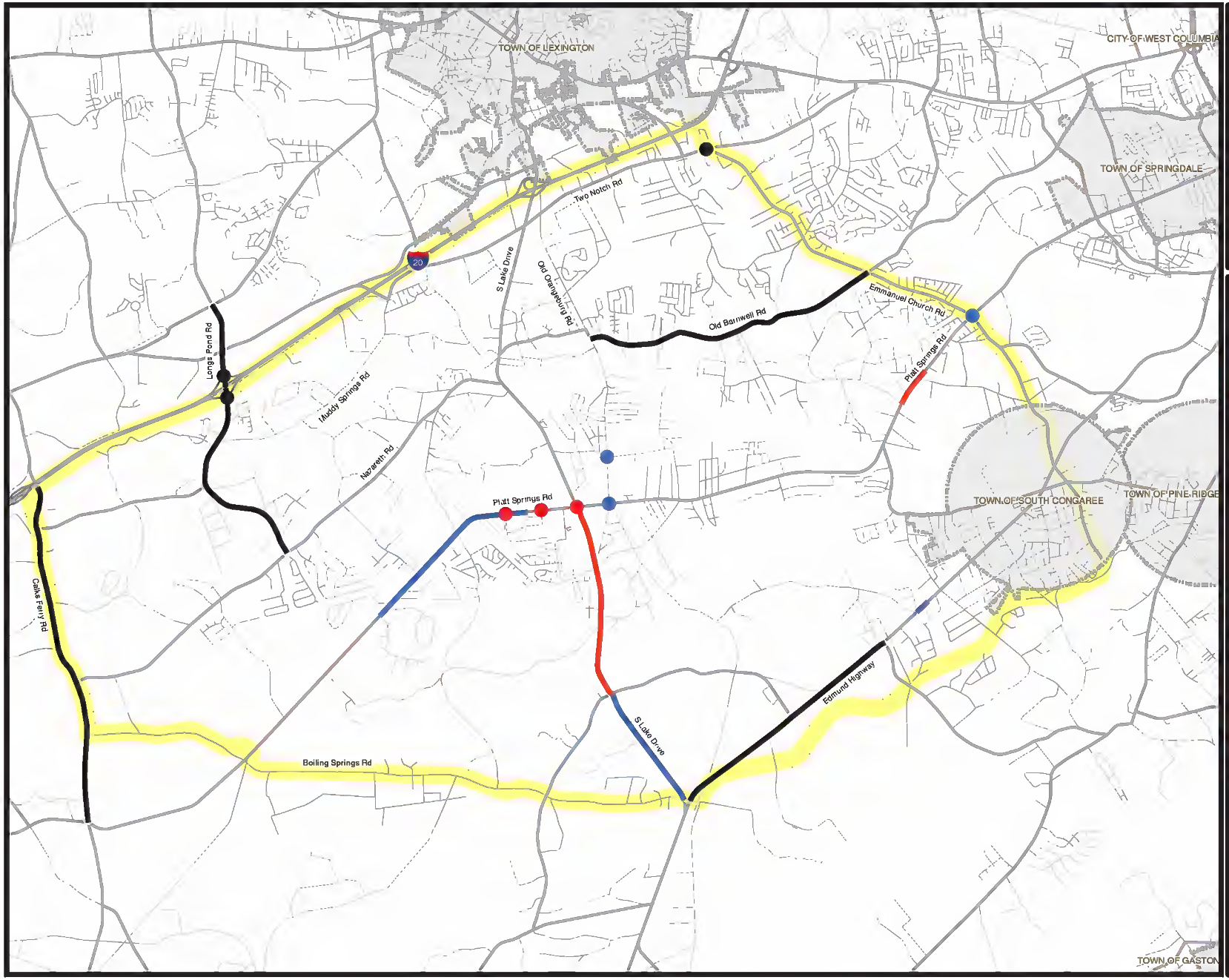
- Installing a traffic signal at White Knoll High School and Platt Springs Road
- Eliminating the abrupt crest within the intersection of South Lake Drive and Platt Springs Road
- Combining the offset intersection of Platt Springs Road with Orangeburg Road and Old Orangeburg Road
- Adding turn lanes at the intersection of Platt Springs Road and Emanuel Church Road
- Improving the visibility of the approaches to the intersection of Two Notch Road and Emanuel Church Road
- Installing traffic signals at the I-20 interchange ramps at Longs Pond Road

The resulting LOS associated with these roadway improvement projects is shown in Figure 6-4. The resulting LOS indicates that widening the roads from two to three lanes will not be sufficient to provide acceptable operations in 2035. Widening of Edmund Highway to four lanes reduces the 2035 V/C to levels below the 2005 V/C. These types of widening are likely to be required on the other routes as well, converting them from functioning as minor arterials to principal arterials.

An additional set of traffic assignments were prepared where all of the proposed improvement projects were widened from two to four lanes. The resulting LOS, shown in Figure 6-5, indicates that the additional capacity improvements should provide acceptable operations throughout nearly all the 2035 network.

Comments received from the public ranked congestion as the most important issue within the White Knoll Area, and identified adding lanes and/or building new roads and maintaining or improving existing roads as the most important way to improve traffic conditions. In addition to the projects already evaluated, some of the additional projects suggested by the public include:

- Realigning the intersection of Longs Pond Road and Younginer Drive
- Realigning the intersection of Platt Springs Road with Old Orangeburg Road
- Extending Cross Road to create a connector west of South Lake Drive to White Knoll High School.



White Knoll Sub-Area

Figure 6-3: Proposed Roadway Improvements

CENTRAL MIDLANDS Council of Governments

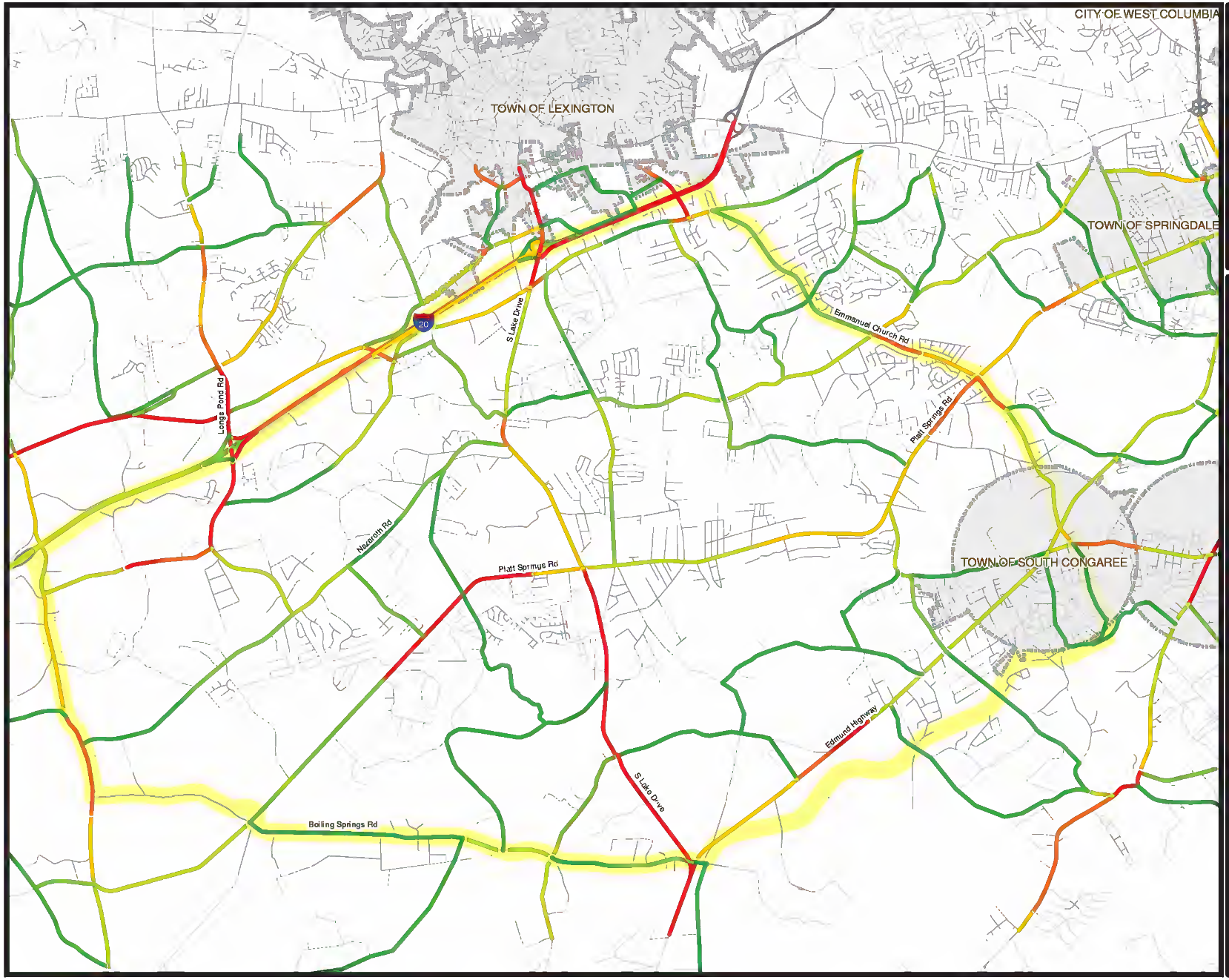
LEGEND

- Long Term Improvements
- Medium Term Improvements
- Short Term Improvements
- Major Road
- Minor Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles



White Knoll Sub-Area

Figure 6-4: Additional Long-term Improvements

CENTRAL MIDLANDS Council of Governments

LEGEND

2035 Level of Service

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

Road

White Knoll Area

Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

White Knoll Sub-Area

Figure 6-5: Long-term Improvements

CENTRAL MIDLANDS Council of Governments

LEGEND

2035 Level of Service

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

Road

White Knoll Area

Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

- Improving the following intersections
  - Old Orangeburg Road and Bill Williamson Court
  - Old Orangeburg Road and Old Barnwell Road
  - South Lake Drive and Nazareth Road
  - South Lake Drive and Community Drive
- Enhancing safety at the following intersection
  - Nazareth Road and Longs Pond Road
  - Bethany Church Road and South Lake Road
  - Platt Springs Road and Rowland Pines Road
  - Old Barnwell and Shirway Road
  - Two Notch Road and Shirway Road
- Installing traffic signals at the following intersections
  - Cannon Trail and Platt Springs Road
  - White Knoll High School Entrance and Platt Springs Road
  - Fire Department Signal on South Lake Drive
  - South Lake Drive and the Recycling Center
  - Carolina Springs Elementary School Entrance and Platt Springs Road
- Constructing turn lanes at the following locations
  - A right turn lane on Old Orangeburg Road at Platt Springs Road
- Constructing Sidewalk at the following locations
  - For at least a mile on each approach of the intersection of Highway 6 and Platt Springs Road

These improvements should be evaluated by the county to determine if they should be incorporated into either the county public works program or the CMCOG LRTP.

7. PEDESTRIAN AND BICYCLE IMPROVEMENT RECOMMENDATIONS

The following recommendations provide guidance in the planning, implementation, policy creation, and maintenance of pedestrian and bicycle facilities within the White Knoll Area. These recommendations are based on a number of factors and sources of input, which include:

- Bicycle and Pedestrians Pathways Plan
- Crash Reduction by Improvements on Secondaries (CRISOS)
- Transportation Improvement Program (TIP)
- SCDOT road improvement and widening projects
- Input from public meetings
- Local government feedback
- Relationships between residential areas and destinations

The goal of these recommendations is to provide a network of safe, connected pedestrian and bicycle facilities within the White Knoll Area that are easily accessible, benefit a large number of potential users and make the decision to walk or bike easier, safer and more comfortable.

Successful pedestrian and bicycle networks, like any transportation facility, take people from where they are to where they want to go. The approach to achieve this with bicycle and pedestrian facilities is simple: to create useful connections between destinations. This can be accomplished by connecting residential areas to commercial, retail, office, school and recreational facilities.

The measure used in planning pedestrian-scaled facilities is based on the average walking speed of an adult (four feet per second, recommended by the *Manual on Uniform Traffic Control Devices*) and time necessary to travel to the destination. Most individuals are willing to walk between five to 20 minutes to reach their destination. This corresponds to a distance of between ¼-mile to 1-mile from the point of beginning to point of the arrival.

It is impossible to connect every residential neighborhood to every destination within the White Knoll Area within a 20-minute walk. Additional modes of travel are necessary to extend pedestrian accessibility beyond the 20 minute travel time barrier without the need to use an automobile. For example, properly planned transit routes and stops located within pedestrian and bicycle facility networks can extend the accessibility of pedestrians and cyclists beyond the 20-minute barrier.

Facilities

The *Bicycle and Pedestrian Pathways Plan*, completed in 2006, conducted an assessment of existing pedestrian and bicycle facilities and proposed strategies to increase the number of facilities for the Columbia Area Transportation Study (COATS) region. The recommendations for pedestrian and bicycle facilities in the White Knoll Area are based on the facility descriptions established in this previous planning effort. These facilities are categorized as follows:

- Pedestrian Improvements
  - Sidewalks: Sidewalks with a minimum width of five feet on one or both sides of the street
  - Sidepaths: Eight to ten feet wide sidewalks or trails located within the road right-of-way (used as both a pedestrian and a bicycle facility)
  - Greenway Trail: Ten feet wide shared use path located outside of the road right of-way
- Bicycle Improvements
  - Bike Lanes: Minimum five feet wide striped lane on the outside travel lane of a road
  - Sidepaths: Eight to ten feet wide sidewalks or trails located within the road right-of-way (used as both a pedestrian and a bicycle facility)
  - Paved Shoulders: Minimum four feet wide paved area along rural roads (used as both pedestrian and a bicycle facility)
  - Greenway Trail: Ten feet wide shared use path located outside of the road right-of-way

The pedestrian and bicycle facility improvements recommended in The *Bicycle and Pedestrian Pathways Plan* were adapted and applied to both urban and rural road types within the White Knoll Area. Many roads within the area are rural in nature, providing narrow lanes with little to no paved shoulder. Current and planned roadway widening projects include the installation of curb and gutter along either side of the roadway, resulting in a more urban cross-section. All of the recommend or desired pedestrian and bicycle facility improvements will take years to fund, plan and construct. The pedestrian and bicycle facility details on the following pages provide a clear representation of potential improvements that can be incorporated over time into the planning and construction of roadway improvements.

Some facility types have not been included in the following details. These facilities include the use of paved shoulders as pedestrian or bicycle facilities, connectors and linkages. Greenway trails have been included as part of the following details. For example, an off-road connection along Congaree Creek would provide needed connectivity through an area where right-of-way is currently not available to construct improvements adjacent to the roadway.

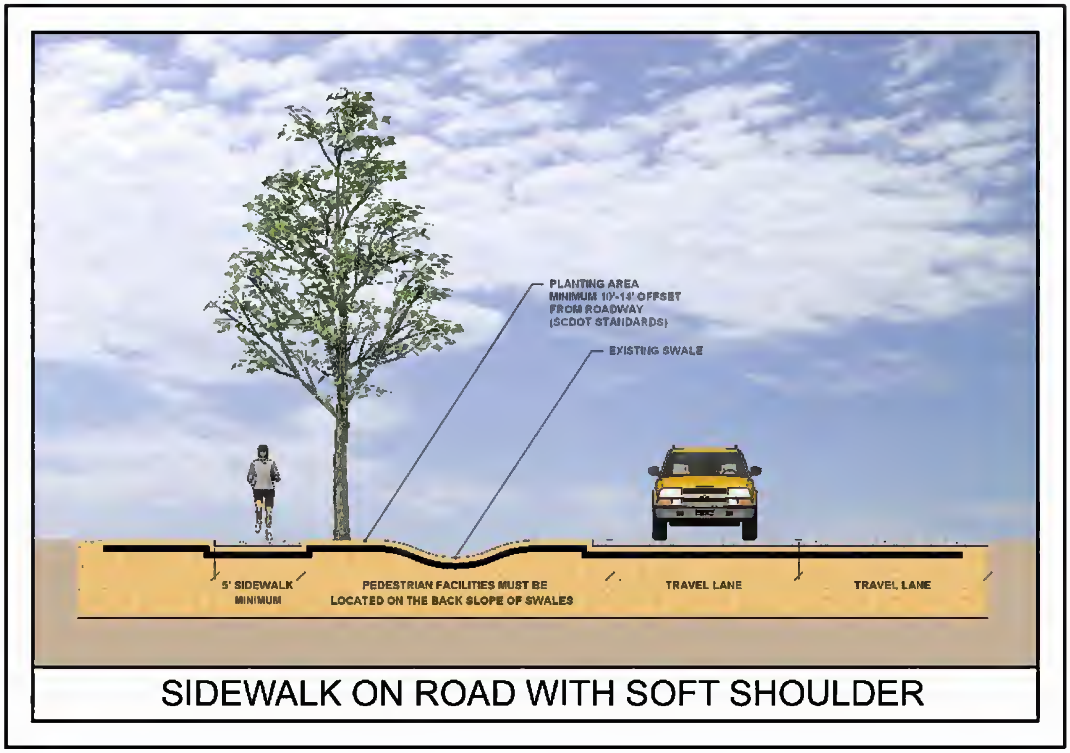


Figure 7.1: Sidewalk on Road with Soft Shoulder
Sidewalks along roads without barriers (curbs or guardrails) must be located on the opposite side of a ditch or swale from the travel lane. Existing road right-of-way must be larger to accommodate this facility.

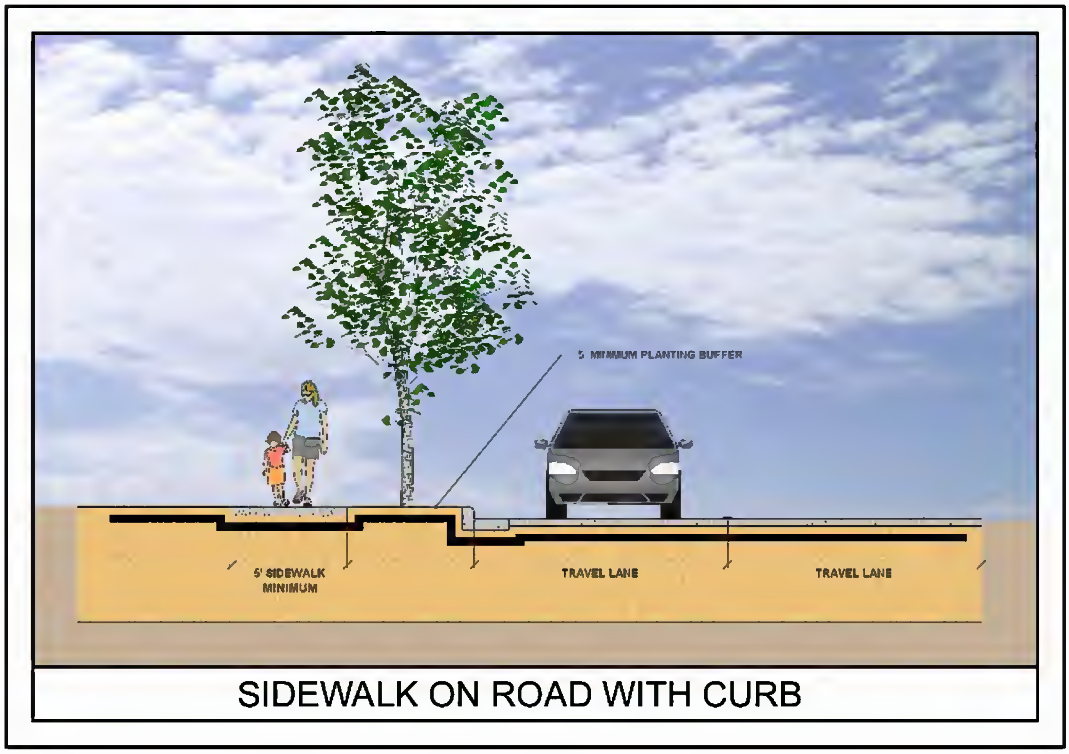


Figure 7.2: Sidewalk on Road with Curb
Sidewalks along roads with barriers (curbs or guardrails) may be located more close to the adjacent road, thus using the existing road right-of-way more efficiently.

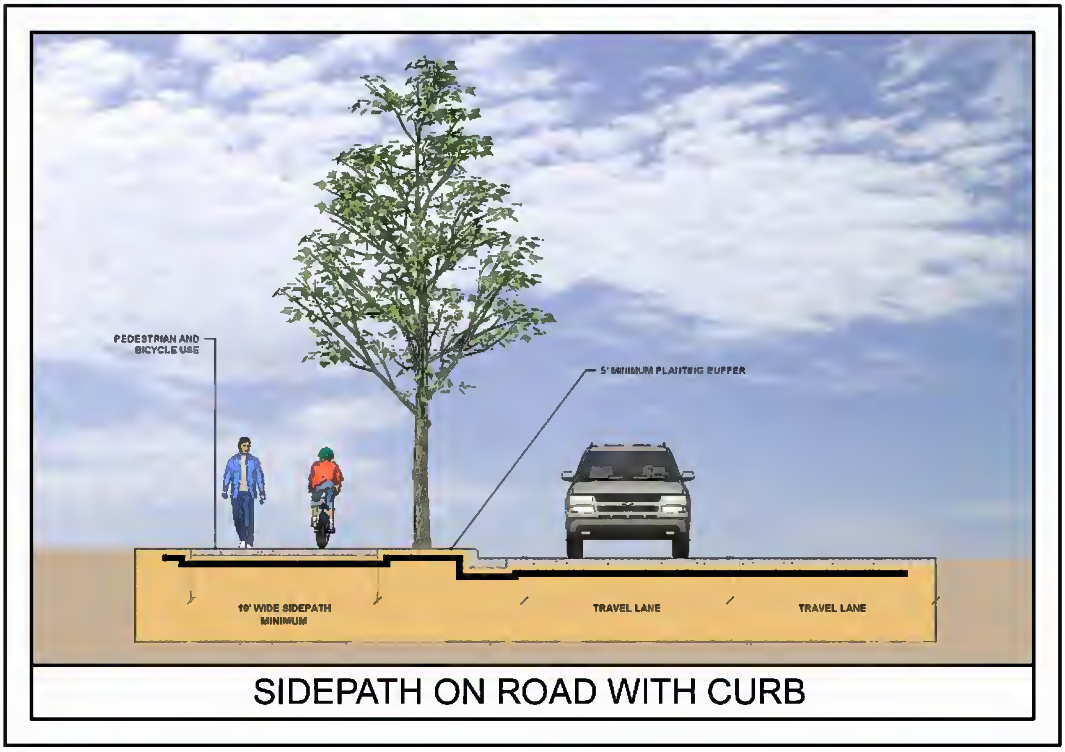


Figure 7.3: Sidepath on Road with Curb
Sidepaths must be at least 10'-wide in order to accommodate multiple user groups, which include pedestrians and cyclists.

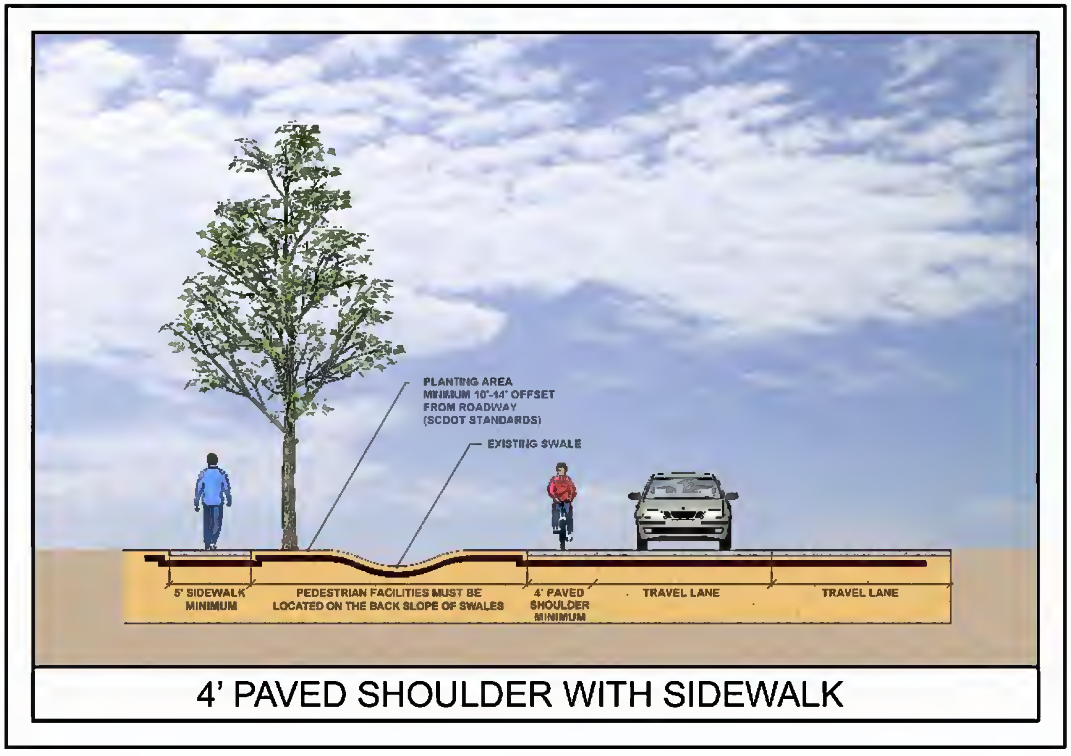


Figure 7.4: 4' Paved Shoulder with Sidewalk
Bikes lanes and paved shoulders must be at least 4'-wide and located on both sides of the road. These facilities are meant to serve a transportation purpose.

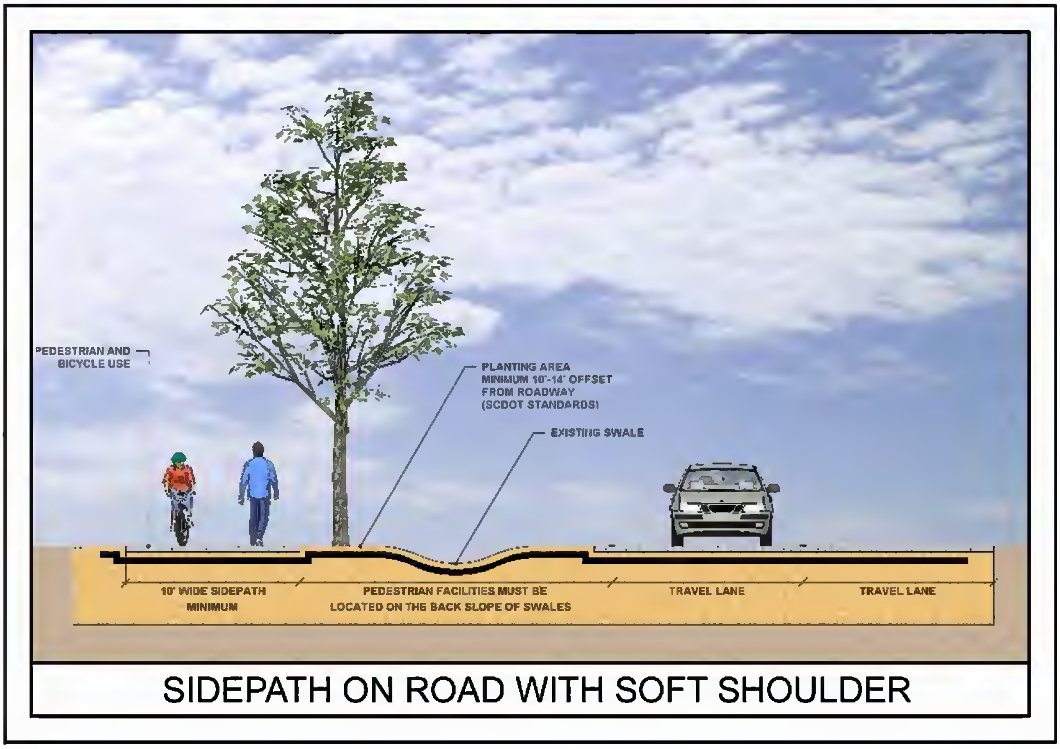


Figure 7.5: Sidepath on Road with Soft Shoulder
Sidepaths must be at least 10'-wide in order to accommodate multiple user groups, which include pedestrians and cyclists. These facilities, like sidewalks, must be located on the opposite side of a ditch or swale from the travel lane when other barriers (curbs or guardrails) do not exist.

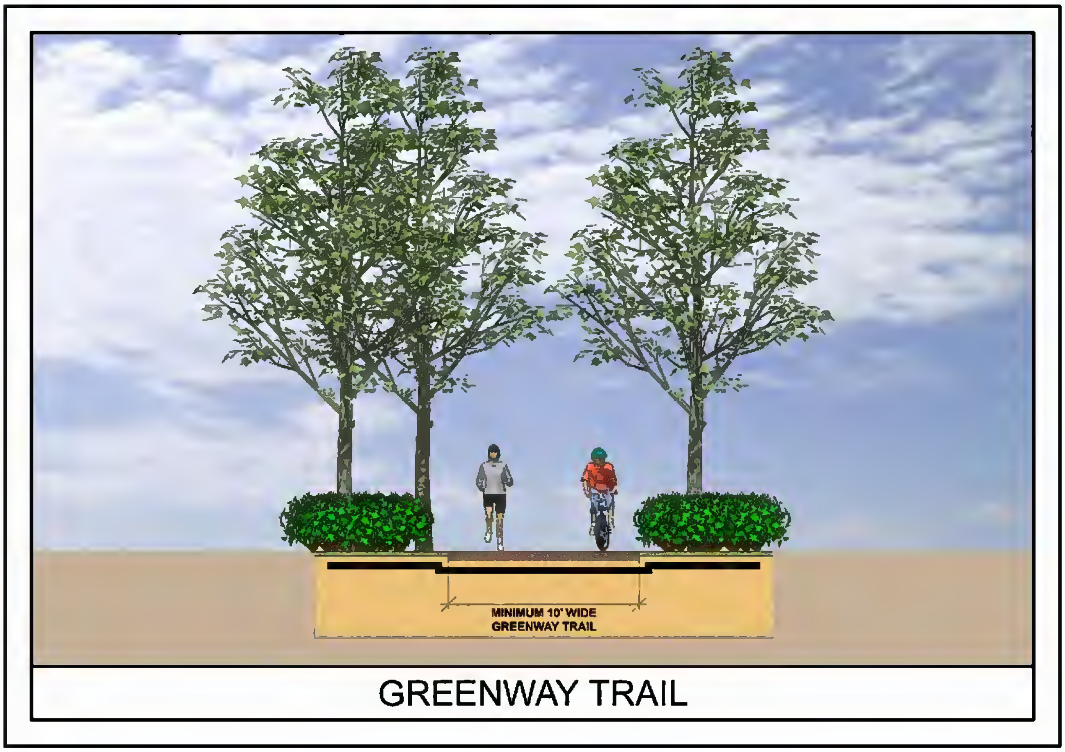


Figure 7.6: Greenway Trail
Greenway trails must be at least 10'-wide to accommodate multiple user groups, which include pedestrians and cyclists. Thought similar to Sidepaths, greenway trails are not located within the road right-of-way.

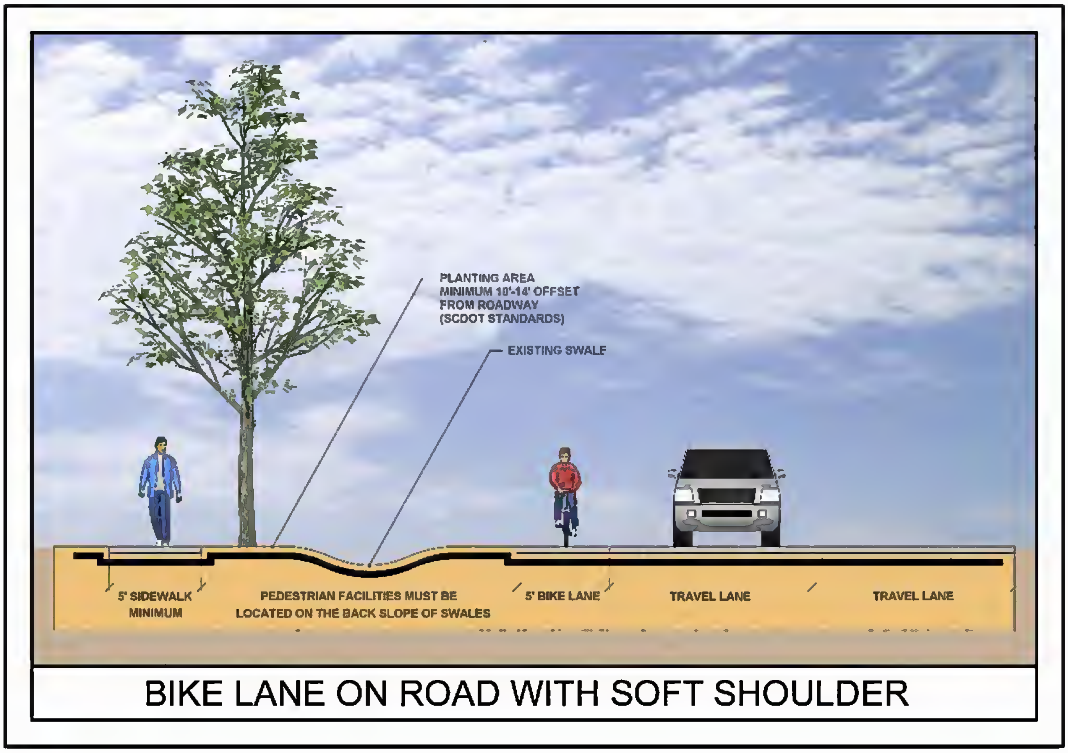


Figure 7.7: Bike Lane on Road with Soft Shoulder
Bike lanes must be at least 5'-wide and should be located on both sides of the road. These facilities are meant to serve a transportation purpose. The lack of curbs along a road has no effect on bike lanes.

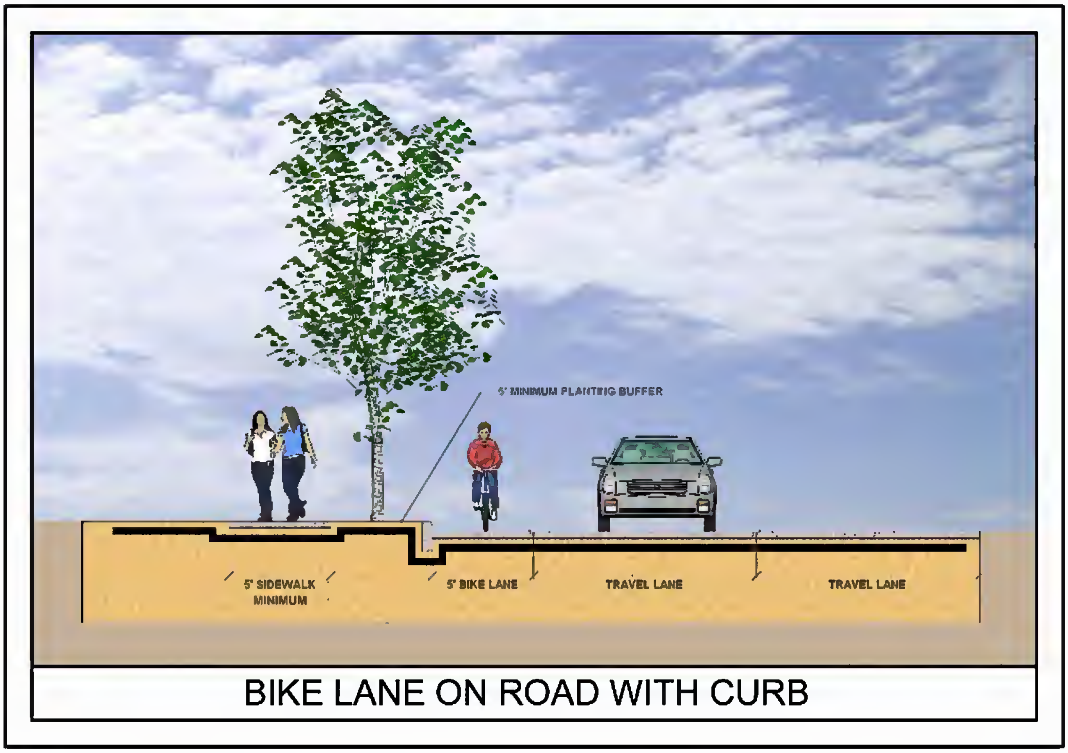


Figure 7.8: Bike Lane on Road with Curb
Bike lanes must be at least 5'-wide and should be located on both sides of the road. These facilities are meant to serve a transportation purpose. The presence of curbs along a road has no effect on bike lanes.

SCDOT Engineering Directive Number 22 states that bicycle facilities shall become "a routine part of the department's planning, design, construction and operating activities".

The directive provides a description and design guidance for shared roadways and bike lanes/paved shoulders. *SCDOT Engineering Directive Number 22* has been included within the Appendix of this document.

In addition, SCDOT's website provides a number of helpful hints for South Carolina municipalities and counties within the state who are interested in developing pedestrian and bicycle facilities within the state's road right-of-way. Their suggestions, listed below, have been incorporated into the pedestrian and bicycle facility details where applicable.

Helpful Hints for Pedestrian Facilities

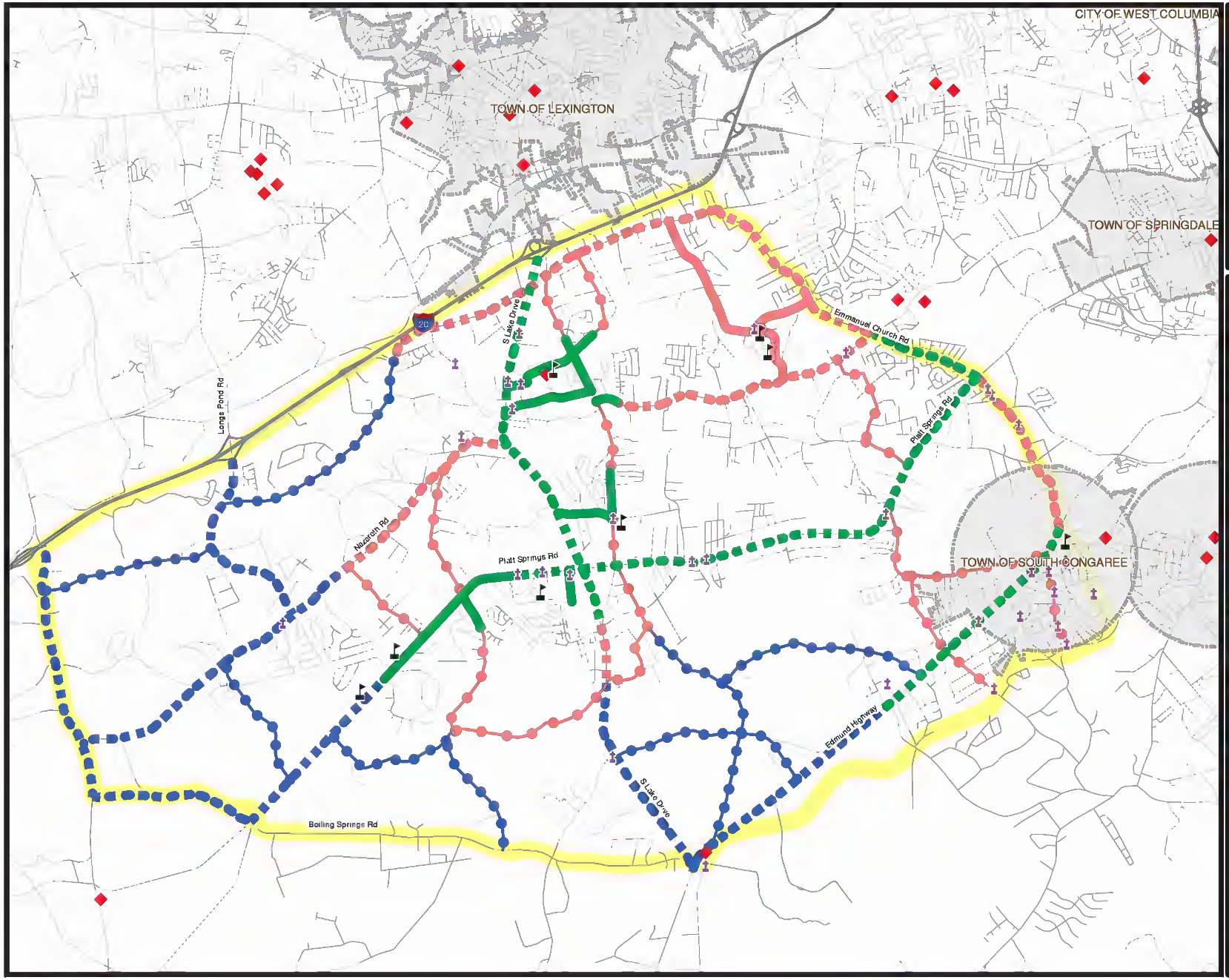
- For sidewalks located within the state highway system right-of-way, sidewalks must be placed either on the back slope of an open drainage ditch or behind curb/gutter. Be aware that on many state streets with curb/gutter, the state right-of-way may only extend to the back of the curb/gutter (this relates to available public right-of-way).
- The minimum sidewalk width must be at least five feet.
- An encroachment agreement will be required for all sidewalks constructed within the state highway system.
- Sidewalk designs must be consistent with the SCDOT "Roadway Standard Drawings" and the "Standard Specifications".

Helpful Hints for Bicycle Facilities

- Bike paths must be at least ten feet in width.
- Bike paths must have an established design speed.
- Bike paths must connect to logical, accessible termini.
- Bike path surfaces typically include concrete or asphalt; however, other materials may be acceptable (as long as they meet ADA standards).
- Paved shoulders/bike lanes must be at least four feet in width and located on both sides of the road.
- Bicycle facilities must primarily serve a transportation purpose--not a recreational purpose.
- Bicycle designs must be consistent with the SCDOT "Roadway Standard Drawings" and the "Standard Specifications", and the "South Carolina Bicycle Facilities Planning and Design Guidelines" publication.

Recommendations and Phasing

The pedestrian and bicycle recommendations have been divided into three phases: Immediate, Near-Term, and Long-Term facility needs. Recommended routes for pedestrian and bicycle facilities and the recommended facility types are detailed within each of three phases, and divided into two categories: pedestrian and bicycle connectors, and small area pedestrian and bicycle networks and routes. The complete Pedestrian and Bicycle Facility Recommendations are shown in Figure 7-9.



White Knoll Sub-Area

Figure 7-9: Pedestrian and Bicycle Facility Recommendations

CENTRAL MIDLANDS Council of Governments

LEGEND

Immediate Term
- Connectors
- Networks

Near Term
- Connectors
- Networks
- Routes

Long Term
- Connectors
- Routes

- Park
- School
- Church
- Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

Short Term Facility Needs (0 to 5 years)

Immediate facility needs represent projects that will immediately begin to create small area connections using pedestrian and bicycle facilities. These types of networks are not presently found within the study area. The facility recommendations include a mix of pedestrian and bicycle connectors, and small area pedestrian and bicycle networks and routes in areas of past, recent and current development. The connectors will create designated facilities for pedestrians and cyclists along some of the most highly traveled roads where many area destinations are found. The small area network and route recommendations create links between neighborhoods and nearby destinations. The small area networks and routes recommended in this phase also provide links to the connectors recommended in this phase. A handful of these projects are currently underway or have been planned. Other pedestrian and bicycle facility recommendations solve connectivity problems in areas brought to light through the public involvement process.

Pedestrian and Bicycle Facility Recommendations

Short Term Needs (0 to 5 Years)

Pedestrian and Bicycle Connectors

Road	Beginning	End	Pedestrian Facility Improvements	Bicycle Facility Improvements	Total Distance (Approximate)			
Edmund Highway/Main Street (SC 302)	Pine Street	Norman Dr	Sidewalks*	Wide Outside Lane*	14,851	Linear Feet	2.81	Miles
Emanuel Church Road	Old Barnwell Road	Platt Springs Road	Sidepath	Sidepath	6,505	Linear Feet	1.23	Miles
Platt Springs Road (SC 602)*	Emanuel Church Road	Maria Lane	Sidewalks*	Wide Outside Lane*	31,925	Linear Feet	6.05	Miles
South Lake Drive (SC 6)*	Interstate 20	New Orangeburg Road	Sidewalks*	Wide Outside Lane*	22805	Linear Feet	4 32	Miles

*Planned Improvements through current SCDOT Projects

Small Area Pedestrian and Bicycle Networks

Red Bank Network

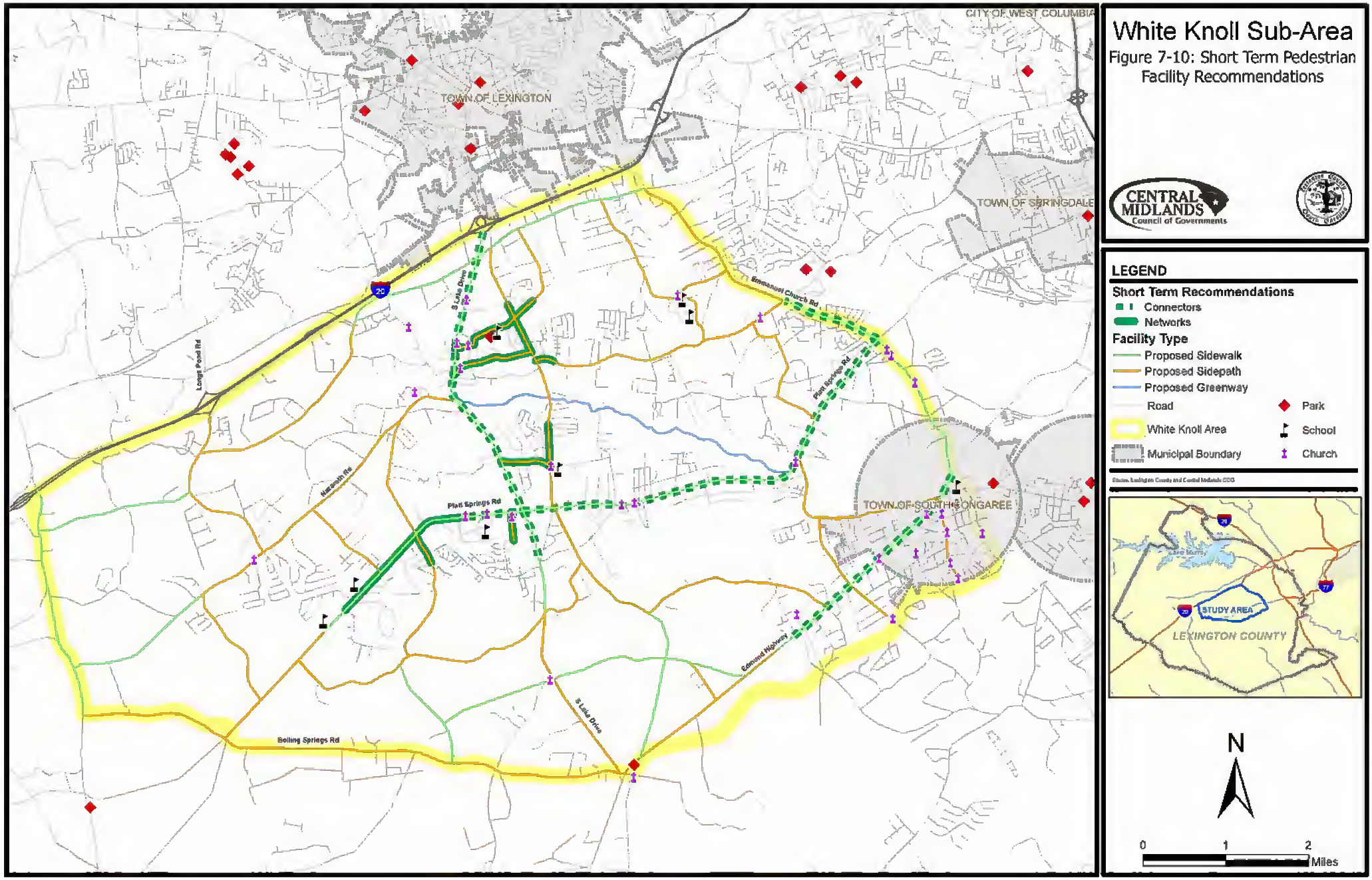
Road	Beginning	End	Pedestrian Facility Improvements	Bicycle Facility Improvements	Total Distance (Approximate)			
Community Drive	Old Orangeburg Road	South Lake Drive (SC 6)	Sidepath	Sidepath	4,522	Linear Feet	0.86	Miles
Old Barnwell Road	Old Orangeburg Road	South Lake Drive (SC 6)	Sidepath	Sidepath	5,312	Linear Feet	1.01	Miles
Old Barnwell Road	Garden Pond Drive/Walnut Creek Court	Old Orangeburg Road	Sidepath	Sidepath	1,181	Linear Feet	0.22	Miles
Old Orangeburg Road	Amberchase Lane	Old Barnwell Road	Sidepath	Sidepath	3,331	Linear Feet	0.63	Miles
YMCA Road	Colony Lakes Court	Old Orangeburg Road	Sidewalks	Bike Lane/Shoulder	1,581	Linear Feet	0.30	Miles

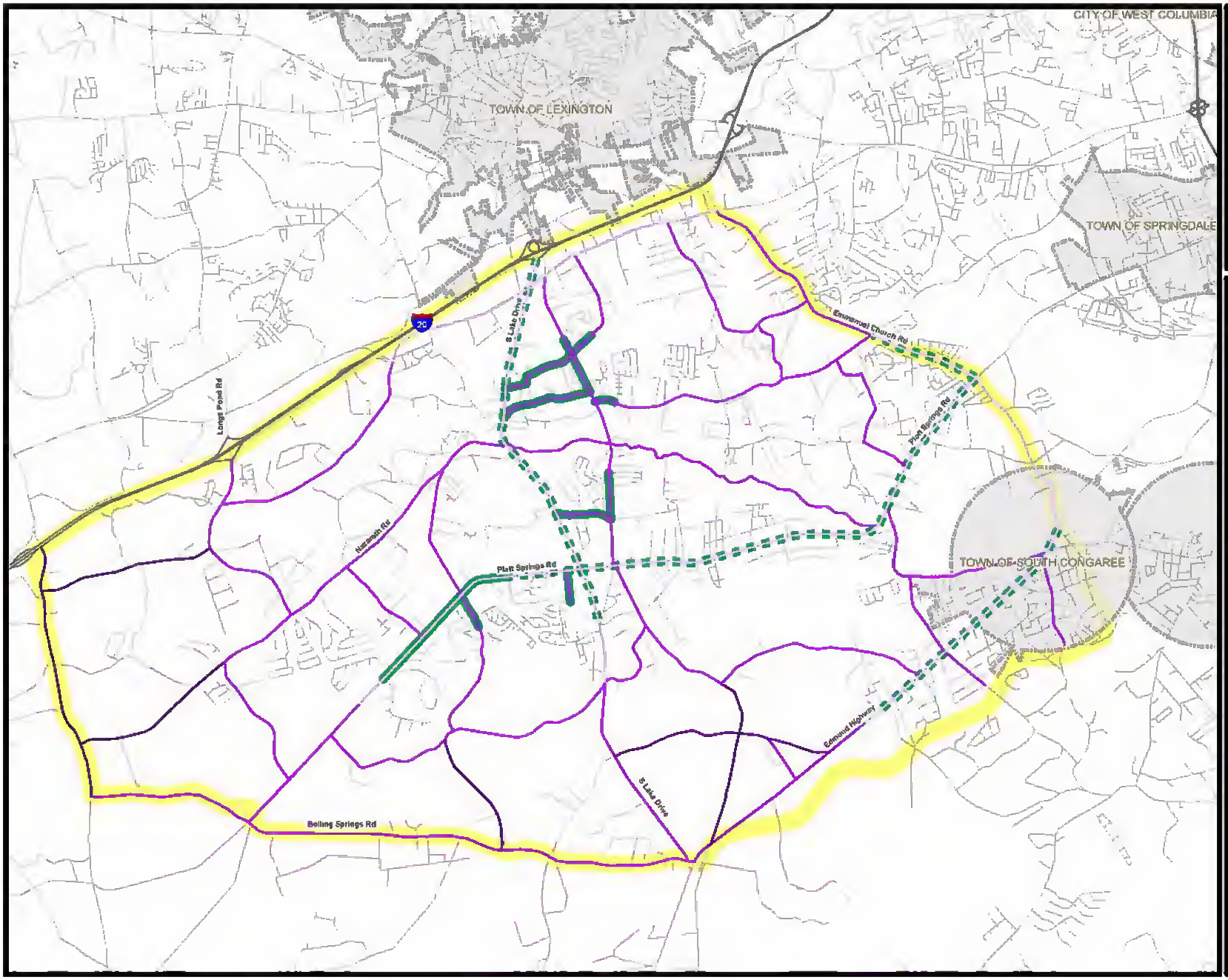
Central Network

Road	Beginning	End	Pedestrian Facility Improvements	Bicycle Facility Improvements	Total Distance (Approximate)			
Brevard Parkway/Lexington Hills Parkway	Platt Springs Road (SC 602)	Riglaw Circle	Sidepath	Sidepath	1,827	Linear Feet	0.35	Miles
McLee Road	Platt Springs Road (SC 602)	Timberchase Lane	Sidepath	Sidepath	2,068	Linear Feet	0.39	Miles
Old Orangeburg Road	Emma Drive	Southwood Drive	Sidepath	Sidepath	2,665	Linear Feet	0.50	Miles
Southwood Drive	Old Orangeburg Road	South Lake Drive (SC 6)	Sidepath	Sidepath	3,219	Linear Feet	0 61	Miles

Carolina Springs Network

Road	Beginning	End	Pedestrian Facility Improvements	Bicycle Facility Improvements	Total Distance (Approximate)			
Platt Springs Road (SC 602)	Maria Lane	Willow Fork Rd	Sidewalks	Bike Lanes	9,579	Linear Feet	1 81	Miles


CITY OF WEST COLUMBIA
TOWN OF LEXINGTON
TOWN OF SPRINGDALE
TOWN OF SOUTH CONGAREE
Longs Pond Rd
S Lake Drive
Emmanuel Church Rd
Plant Springs Rd
Hilarah Rd
Edmund Highway
Boiling Springs Rd
White Knoll Sub-Area
Figure 7-10: Short Term Pedestrian Facility Recommendations
CENTRAL MIDLANDS
Council of Governments
LEGEND
Short Term Recommendations
Connectors
Networks
Facility Type
Proposed Sidewalk
Proposed Sidepath
Proposed Greenway
Road
White Knoll Area
Municipal Boundary
Park
School
Church
STUDY AREA
LEXINGTON COUNTY
N
0
1
2
Miles



White Knoll Sub-Area

Figure 7-11: Short Term Bicycle Facility Recommendations

CENTRAL MIDLANDS Council of Governments

LEGEND

Short Term Recommendations

- Connectors
- Networks

Facility Type

- Proposed Bike Shoulders
- Proposed Bike Lanes
- Proposed Bike Sidepaths & Greenway
- Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

Three small area pedestrian and bicycle networks are included within the immediate facility needs recommendations. Plans of these three areas were created to illustrate the effect that small area networks of pedestrian and bicycle facilities can have within the White Knoll Area. Future phases of facility recommendations will expand counectivity from these initial small area networks.

Red Bank Network

The goal of the Red Bank network plan is to provide connectivity between the YMCA, Red Bank Elementary School and the surrounding neighborhoods. The proposed pedestrian and bicycle facilities also connect to those uses located along South Lake Drive (this SCDOT widening/improvement project is under construction). The plan depicts 11 neighborhood connections using approximately 2.2 miles of sidewalk and/or sidepath, creating a safe pedestrian and bicycle network for approximately 800 existing dwelling units. Also shown on the plan, are ½-mile and 1-mile radii, which represent the 10 and 20-minute walks from Red Bank Elementary School. The Red Bank Network Plan is shown in Figure 7-12.

Central Network

The Central network plan connects Saxe Gotha Elementary School, White Knoll High School, a thriving commercial area, and numerous residential neighborhoods. The planned pedestrian and bicycle facilities associated with the widening/improvement projects along South Lake Drive and Platt Springs Road are included within the small area network. The plan illustrates the network created by approximately 2.8 miles of sidewalks, sidepaths and/or bike lanes, and includes 15 residential neighborhood connections impacting approximately 1,400 existing dwelling units. Also shown on the plan are ½-mile and 1-mile radii, which represent the 10 and 20-minute walks from Saxe Gotha Elementary and White Knoll High Schools. The Central network plan is shown in Figure 7-13.

Carolina Springs Network

The Carolina Springs network plan focuses on providing safe connections between two new area schools, Carolina Springs Elementary School and Carolina Springs Middle School, and several nearby residential neighborhoods. Several of these neighborhoods are located across Platt Springs Road from the schools. Many of the neighborhoods that are located on the same side of Platt Springs Road as the schools are not connected to the school sites with existing roads, unnecessarily increasing vehicle-miles traveled on major routes. The plan depicts approximately 4.2 miles of sidewalks, sidepaths and bike lanes, four designated crosswalks on Platt Springs Road and four neighborhood pedestrian connections. The small area network provides connectivity to nine nearby residential neighborhoods and impacts approximately 1,100 existing residential units. Also shown on the plan are ½-mile and 1-mile radii, which represent the 10 and 20-minute walks from Carolina Springs Elementary and Carolina Springs Middle Schools. The Carolina Springs Network is shown in Figure 7-14.

White Knoll Sub-Area

Figure 7-12: Red Bank Network Study Map

CENTRAL MIDLANDS Council of Governments

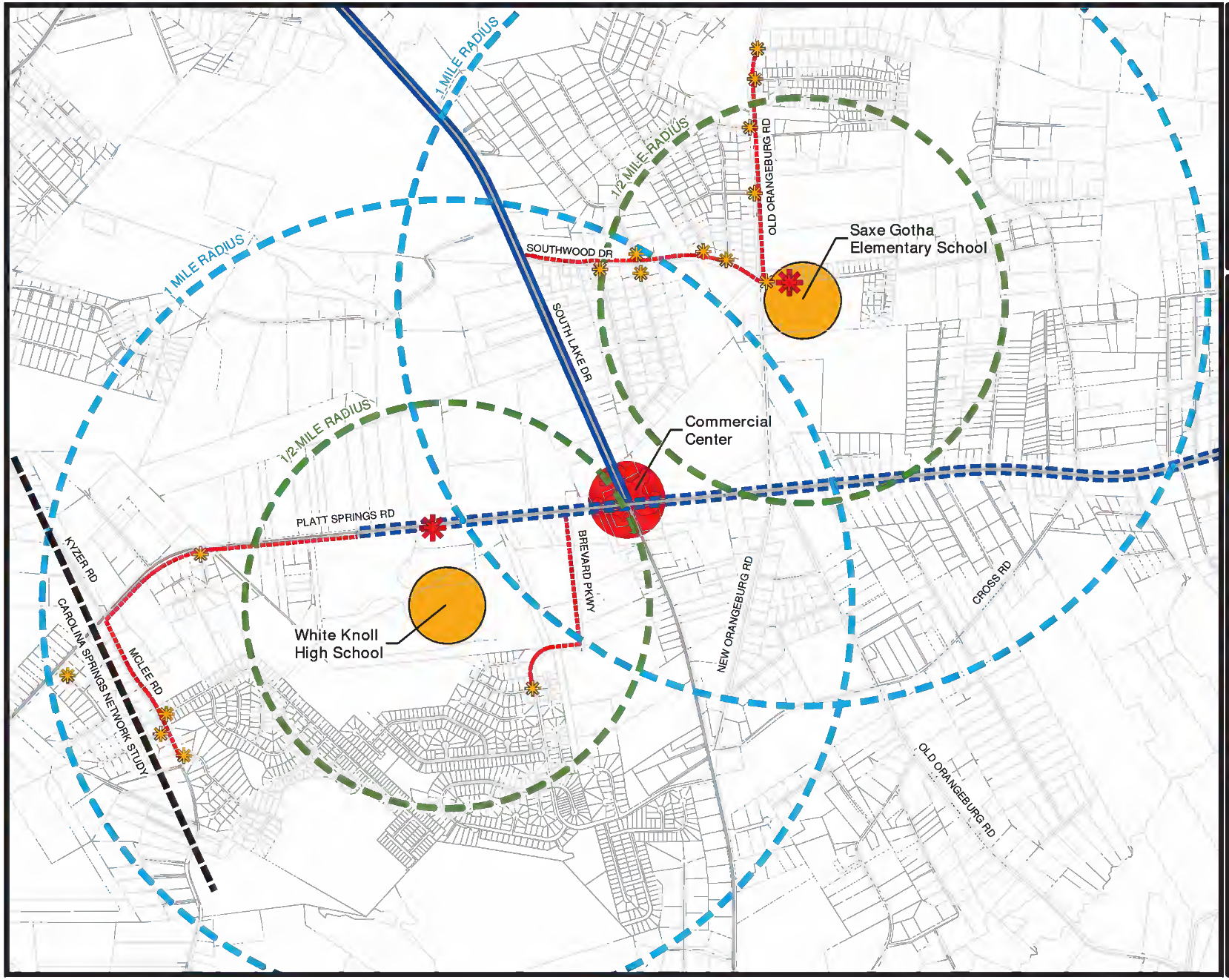
LEGEND

- Neighborhood Connection
- Destinations
- School
- YMCA
- Sidewalk Connection
- SCDOT Planned Widening Project/Sidewalk

Source: Lexington County and Central Midlands COG

N

0 1,000 2,000 Feet



White Knoll Sub-Area

Figure 7-13: Central Network Study Map

CENTRAL MIDLANDS Council of Governments

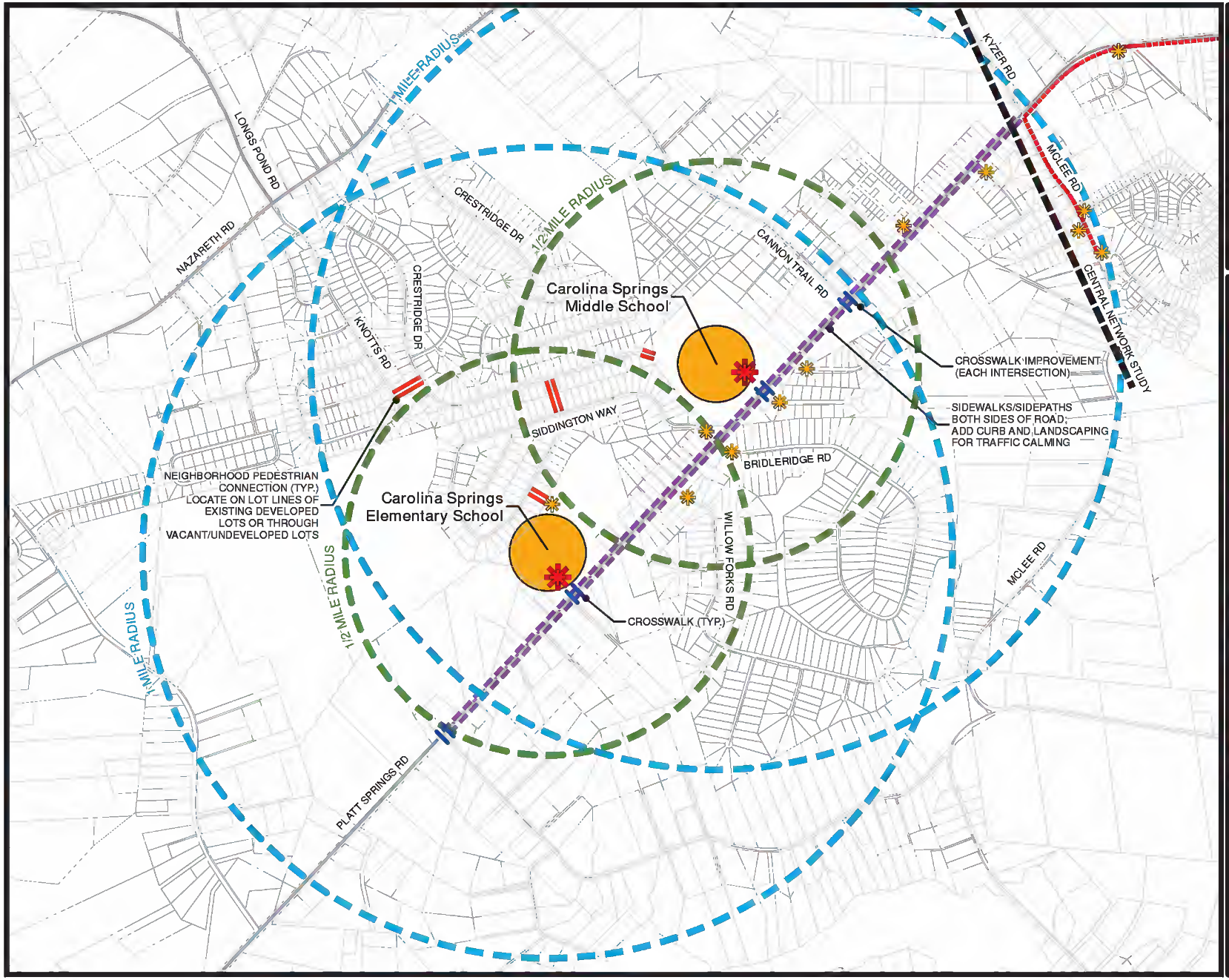
LEGEND

- Neighborhood Connection
- Destinations
- School
- Commercial Center
- Sidewalk Connection
- SCDOT Planned Widening Project/Sidewalk

Source: Lexington County and Central Midlands COG

N

0 1,200 2,400 Feet



White Knoll Sub-Area

Figure 7-14: Carolina Springs Network Study Map

CENTRAL MIDLANDS Council of Governments

LEGEND

- Neighborhood Connection
- Destinations
- School
- Commercial Center
- Sidewalk Connection
- Neighborhood Pedestrian Connection
- Sidewalk / Sidepath
- Crosswalk

Source: Lexington County and Central Midlands COG

N

0 1,200 2,400 Feet

Medium Term Facility Needs (5 to 15 years)

Near term facility needs represent projects that will expand upon the improvements recommended during the immediate facility needs phase. The pedestrian and bicycle connector recommendations focus improvements along other highly traveled roads. These facilities will create links and loops with the improvements outlined in the previous phase. The small area pedestrian and bicycle network and routes improvements recommended in this phase further expand the network of connectivity. Additional residential neighborhoods and destinations are linked and further connectivity is provided between pedestrian and bicycle connectors. These improvements are focused in areas of previous and recent development. Improvements to areas of future development are also included in this phase. Policy recommendations within this study will provide more detail about the role developers may play in expanding the pedestrian and bicycle facilities in the study area.

Medium Term Needs (5 to 15 Years)

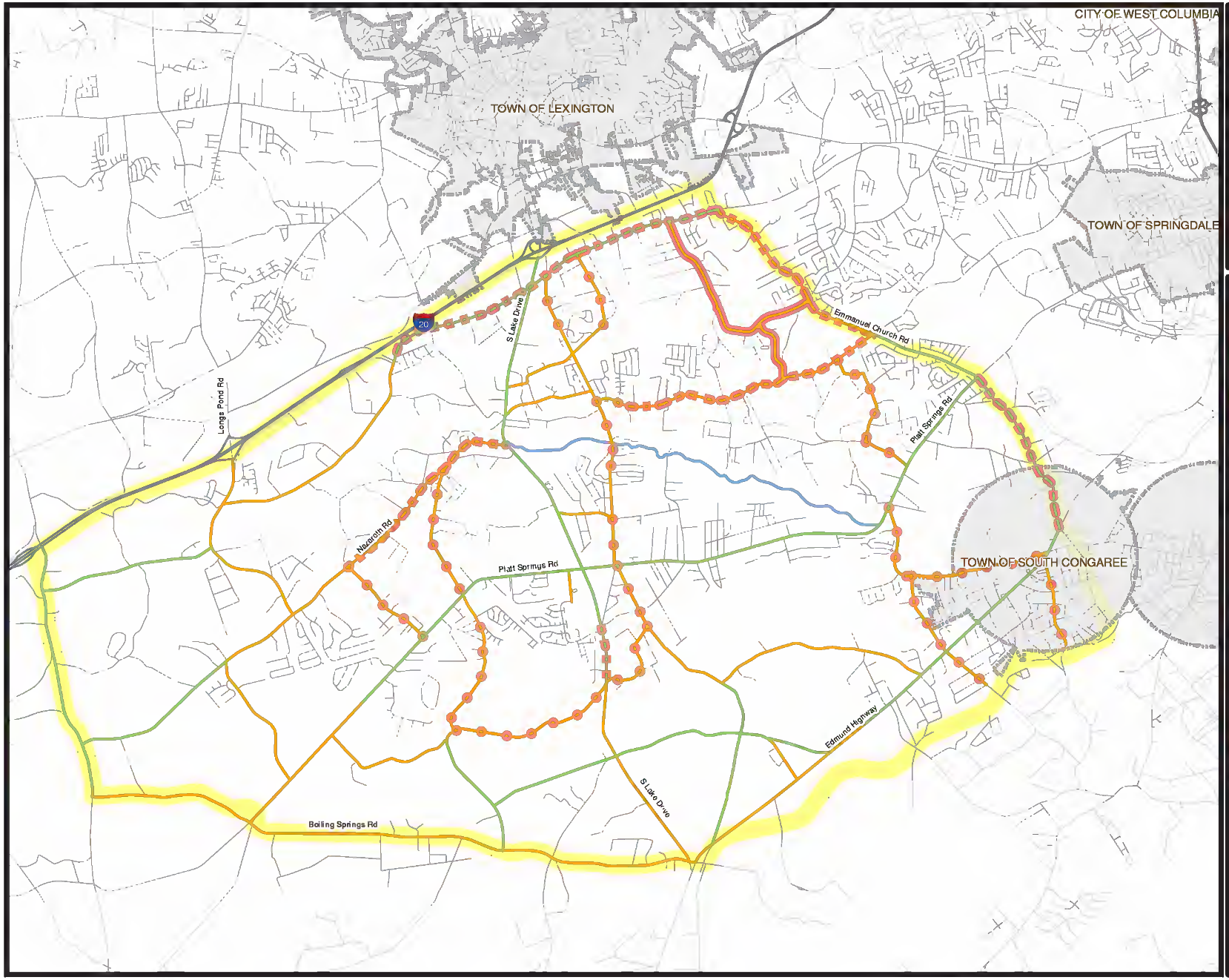
Pedestrian and Bicycle Connectors

Road	Beginning	End	Pedestrian Facility Improvements	Bicycle Facility Improvements	Total Distance (Approximate)		
Bluefield Road	Old Orangeburg Road	McLee Road	Sidepath	Shoulder	9,852	Linear Feet	1.87 Miles
Cannon Trail Road	Nazareth Road	Platt Springs Road (SC 602)	Sidepath	Sidepath	5,974	Linear Feet	1.13 Miles
Chruch Street	Edmund Highway/Main Street(SC 302)	Pine Street	Sidepath	Sidepath	5,131	Linear Feet	0.97 Miles
Emanuel Church Road	Platt Springs Road (SC 602)	Edmund Highway/Main Street(SC 302)	Sidewalks	Bike Lanes	10,153	Linear Feet	1.92 Miles
Emanuel Church Road	Two Notch Road	Old Barnwell Road	Sidepath	Sidepath	11,923	Linear Feet	2.26 Miles
Kyzer Road	Nazareth Road	Platt Springs Road (SC 602)	Sidepath	Sidepath	16,603	Linear Feet	3.14 Miles
McLee Road	Platt Springs Road (SC 602)	Bluefield Road	Sidepath	Sidepath	8,819	Linear Feet	1.67 Miles
Nazareth Road	South Lake Drive (SC 6)	Cannon Trail Road	Sidepath	Sidepath	12,209	Linear Feet	2.31 Miles
Old Barnwell Road	Emanuel Church Road	Garden Pond Drive/Walnut Creek Court	Sidepath	Sidepath	13,306	Linear Feet	2.52 Miles
Old Orangeburg Road	Old Barnwell Road	Emma Drive	Sidepath	Sidepath	3,871	Linear Feet	0.73 Miles
Old Orangeburg Road	Southwood Drive	Bluefield Road	Sidepath	Sidepath	6,546	Linear Feet	1.24 Miles
Old Orangeburg Road	Two Notch Road	Amberchase Lane	Sidepath	Sidepath	3,924	Linear Feet	0.74 Miles
Princeton Road	Ramblin Road	Howe Street	Sidepath	Sidepath	7,935	Linear Feet	1.50 Miles
Ramblin Road	Platt Springs Road (SC 602)	Princeton Road	Sidepath	Sidepath	4,670	Linear Feet	0.88 Miles
Shelton Road	Old Barnwell Road	Steel Road	Sidepath	Sidepath	6,188	Linear Feet	1.17 Miles
South Lake Drive (SC 6)	New Orangeburg Road	Bluefield Road	Sidewalks	Bike Lanes	3,387	Linear Feet	0.64 Miles
Steele Road	Shelton Road	Platt Springs Road (SC 602)	Sidepath	Sidepath	2,777	Linear Feet	0.53 Miles
Two Notch Road	Emanuel Church Road	Muddy Springs Road	Sidewalks	Bike Lanes	21,107	Linear Feet	4.00 Miles
YMCA Road	Two Notch Road	Colony Lakes Court	Sidepath	Sidepath	5,259	Linear Feet	1.00 Miles

Small Area Pedestrian and Bicycle Networks

White Knoll Schools Network

Road	Beginning	End	Pedestrian Facility Improvements	Bicycle Facility Improvements	Total Distance (Approximate)		
Kitti Wake Drive	Two Notch Road	Emanuel Church Road	Sidepath	Sidepath	12,410	Linear Feet	2.35 Miles
White Knoll Road	White Knoll Way	Old Barnwell Road	Sidepath	Sidepath	975	Linear Feet	0.18 Miles
White Knoll Way	Kitti Wake Drive	White Knoll Road	Sidepath	Sidepath	2,788	Linear Feet	0.53 Miles



White Knoll Sub-Area

Figure 7-15: Medium Term Pedestrian Facility Recommendations

CENTRAL MIDLANDS Council of Governments

LEGEND

Medium Term Recommendations

Connectors

Networks

Routes

Facility Type

Proposed Sidewalk

Proposed Sidepath

Proposed Greenway

Road

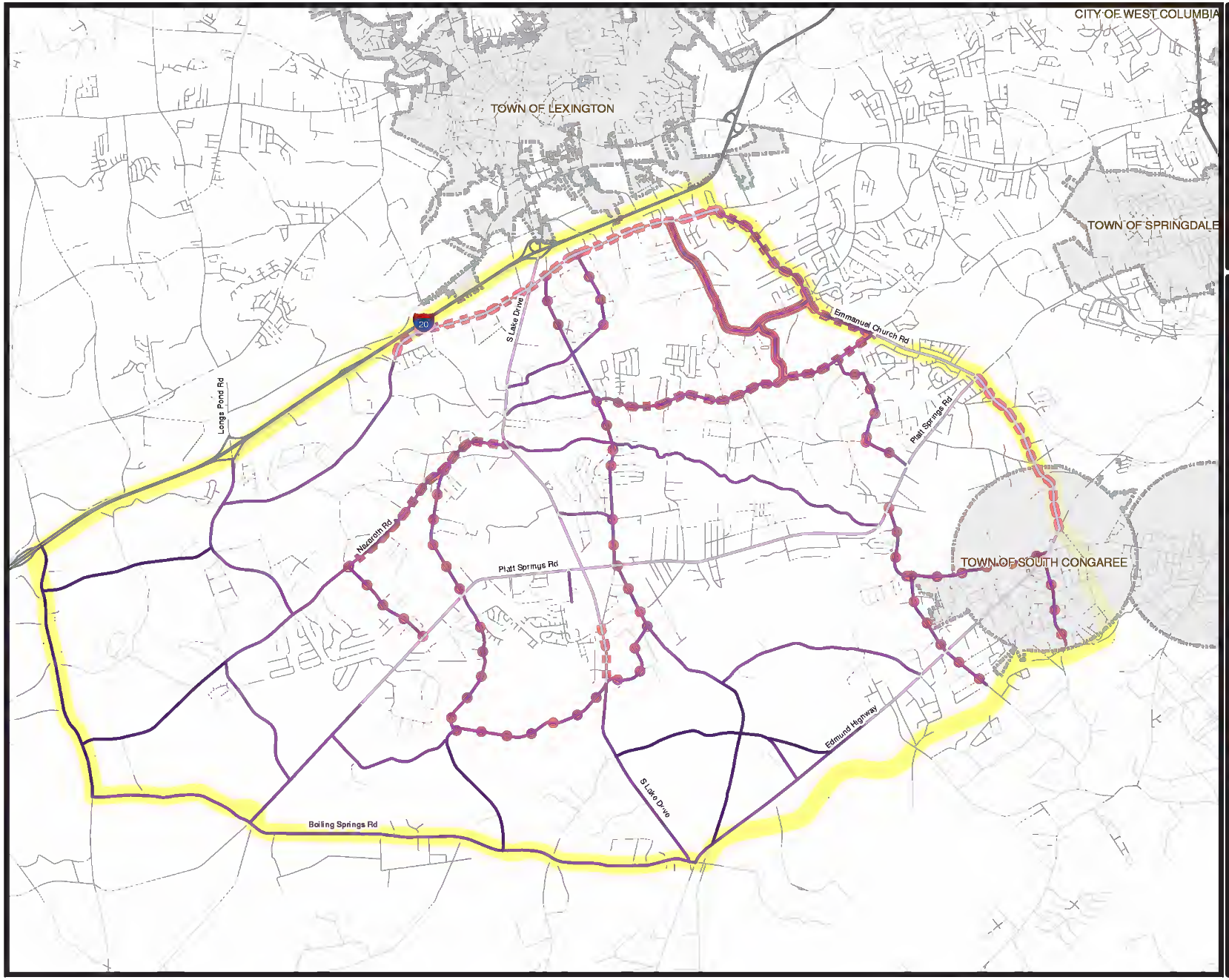
White Knoll Area

Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles



White Knoll Sub-Area

Figure 7-16: Medium Term Bicycle Facility Recommendations

CENTRAL MIDLANDS Council of Governments

LEGEND

Medium Term Recommendations

Connectors

Networks

Routes

Facility Type

Proposed Bike Shoulders

Proposed Bike Lanes

Proposed Bike Sidepaths & Greenway

Road

White Knoll Area

Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

Long Term Facility Needs (15 to 30 years)

Long term facility needs represent projects that will complete the pedestrian and bicycle improvements necessary to create a safe, connected network within the White Knoll Area. The pedestrian and bicycle connector and route recommendations extend improvements to the boundaries of the study area, connecting the study area to other regional pedestrian and bicycle facilities. The small area pedestrian and bicycle network recommendations solidify connections between pedestrian and bicycle connectors within the study area. Many of these recommendations are located in currently undeveloped or sparsely developed areas of the study area. Policy recommendations outlined further in this study will provide more detail about the role developers may play in expanding the pedestrian and bicycle facilities in the study area within the final phase of facility development.

Long Term Needs (15 to 30 Years)

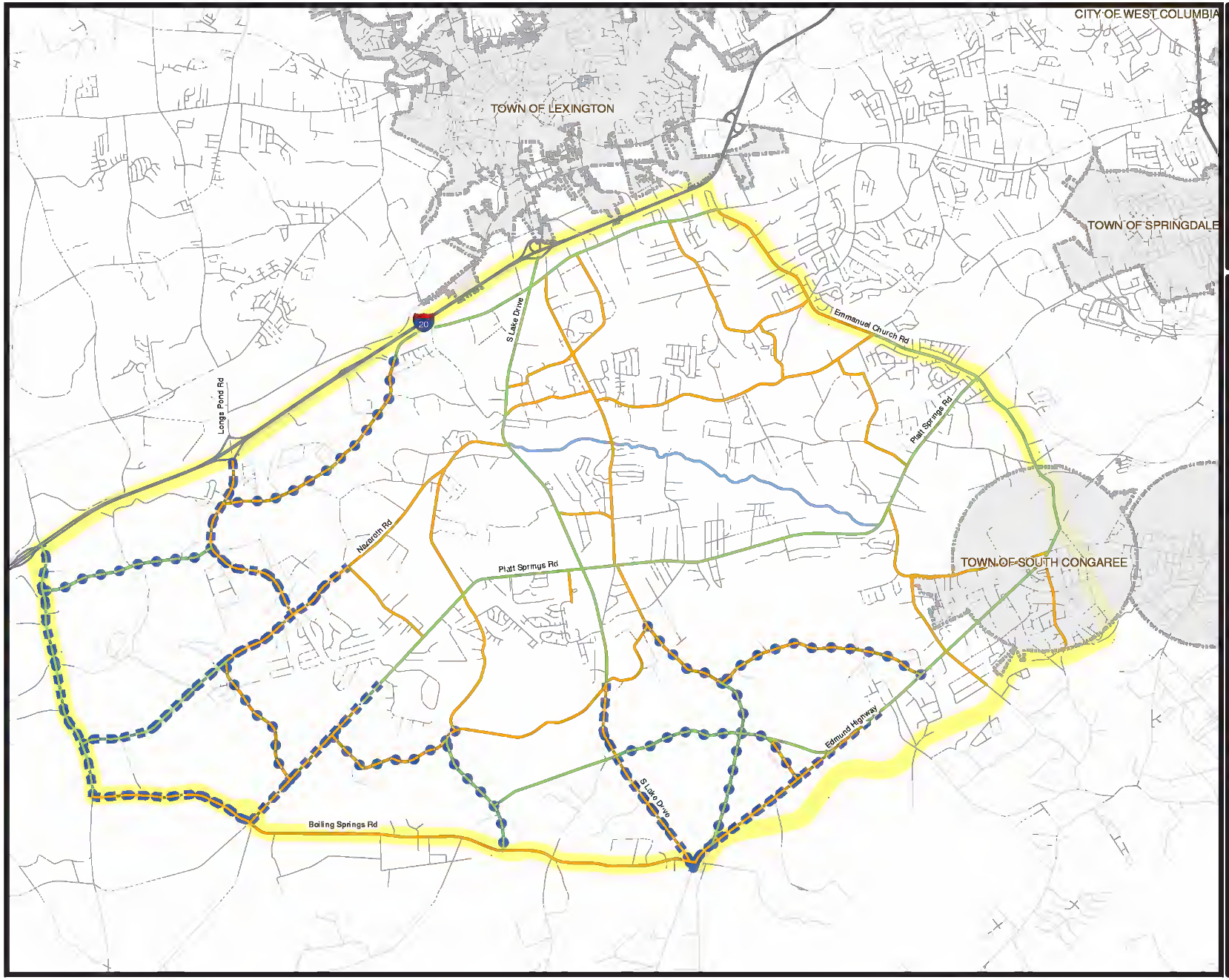
Pedestrian and Bicycle Connectors

Road	Beginning	End	Pedestrian Facility Improvements	Bicycle Facility Improvements	Total Distance (Approximate)			
Beckman Road	Old Orangeburg Road	Edmund Highway/Main Street(SC 302)	Sidepath	Sidepath	12,525	Linear Feet	2.37	Miles
Bluefield Road	McLee Road	Boiling Springs Road	Sidewalks	Shoulder	8,207	Linear Feet	1.55	Miles
Boiling Springs Road	Rlatt Springs Road (SC 602)	Calks Ferry Road	Sidepath	Sidepath	9,466	Linear Feet	1.79	Miles
Calks Ferry Road	Interstate 20	Boiling Springs Road	Sidewalks	Shoulder	14,921	Linear Feet	2.83	Miles
Clermont Lakes Drive	Rlatt Springs Road (SC 602)	Bluefield Road	Sidepath	Sidepath	7,881	Linear Feet	1.49	Miles
Edmund Highway/Main Street(SC 302)	Norman Dr	South Lake Drive (SC 6)	Sidepath	Sidepath	14,183	Linear Feet	2.69	Miles
Longs Pond Road	Interstate 20	Nazareth Road	Sidepath	Sidepath	11,750	Linear Feet	2.23	Miles
McCartha Road	Nazareth Road	Rlatt Springs Road (SC 602)	Sidepath	Sidepath	8,064	Linear Feet	1.53	Miles
Muddy Springs Road	Two Notch Road	Longs Pond Road	Sidepath	Sidepath	14,100	Linear Feet	2.67	Miles
Nazareth Road	Cannon Trail Road	McCartha Rd	Sidepath	Sidepath	9,005	Linear Feet	1.71	Miles
Nazareth Road	McCartha Rd	Calks Ferry Road	Sidewalks	Shoulder	9,838	Linear Feet	1.86	Miles
Old Orangeburg Road	Bluefield Road	Beckman Rd	Sidepath	Sidepath	5,580	Linear Feet	1.06	Miles
Old Orangeburg Road	Beckman Rd	Edmund Highway/Main Street(SC 302)	Sidewalks	Shoulder	9,936	Linear Feet	1.88	Miles
Rlatt Springs Road (SC 602)	Willow Fork Rd	Boiling Springs Road	Sidepath	Sidepath	6,880	Linear Feet	1.30	Miles
Rleasant View Drive	South Lake Drive (SC 6)	Edmund Highway/Main Street(SC 302)	Sidewalks	Shoulder	16,374	Linear Feet	3.10	Miles
Sherwood Drive	Longs Rond Road	Calks Ferry Road	Sidewalks	Shoulder	10,140	Linear Feet	1.92	Miles
South Lake Drive (SC 6)	Bluefield Road	Edmund Highway/Main Street(SC 302)	Sidepath	Sidepath	12,321	Linear Feet	2.33	Miles

Small Area Pedestrian and Bicycle Networks

Red Bank Creek Greenway Trail

Alignment	Beginning	End	Pedestrian Facility Improvements	Bicycle Facility Improvements	Total Distance (Approximate)			
Red Bank Creek	South Lake Drive	Rlatt Springs Road	Greenway Trail	Greenway Trail		Linear Feet		Miles



White Knoll Sub-Area

Figure 7-17: Long Term Pedestrian Facility Recommendations

CENTRAL MIDLANDS Council of Governments

LEGEND

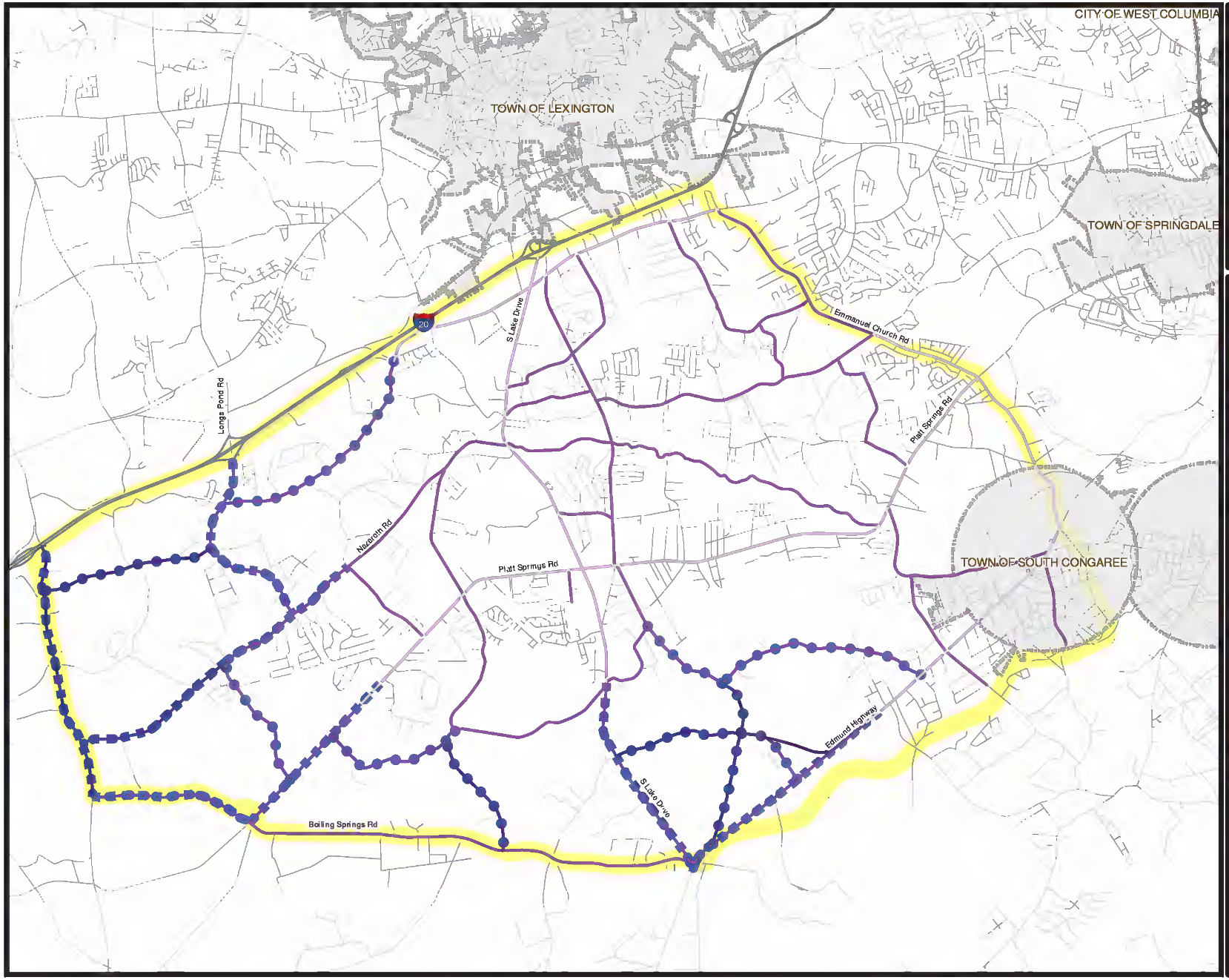
Long Term Recommendations
- Connectors
- Routes

Facility Type
- Proposed Sidewalk
- Proposed Sidepath
- Proposed Greenway
- Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles



White Knoll Sub-Area

Figure 7-18: Long Term Bicycle Facility Recommendations

CENTRAL MIDLANDS Council of Governments

LEGEND

Long Term Recommendations

- Connectors
- Routes

Facility Type

- Proposed Bike Shoulders
- Proposed Bike Lanes
- Proposed Bike Sidepaths & Greenway
- Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

Both the recommended pedestrian and bicycle facility improvements should be constructed simultaneously. Simultaneous construction of these facilities, whether the facilities will ultimately be shared by pedestrians and bicyclists (such as with sidepath or greenway facilities) or be separately-used facilities (sidewalks with bike lanes on the roadway) will be less costly, than constructing bicycle facilities separate from pedestrian facilities. This approach ensures that the needs of both pedestrians and cyclists are being met for each individual project.

The pedestrian and bicycle facility details provide guidance for the construction of each facility type. These details will be helpful during the planning, design and construction cost estimation phases of each individual improvement project. Though the implementation timeline of the different types of pedestrian and bicycle facilities will be recommended, other factors that cannot be predicted in this study may influence the implementation of these projects. These factors include:

- Road Improvement Programs: What road improvement projects are planned for this area?
- Scope of Improvement Project: Does the scope of the improvement project need to be extended to construct connections that serve additional destinations and residential neighborhoods?
- Budget: Is the public funding available and is the recommended improvement the most cost effective for the specific project?
- Developer-Funded or Constructed Improvements: What improvements will developers be required to make in the project area?

The recommended pedestrian and bicycle facility types should be revisited prior to detailed planning and construction of each individual project. It may be necessary to amend the recommended facility type based on these or other factors.

Policy

As the White Knoll Area continues to grow through development, infrastructure supporting that development will need to grow as well. The existing state and county policies regarding pedestrian and bicycle facilities development are outlined below. Recommended policy revisions and enhancements will enable the local government to take advantage of opportunities to provide pedestrian and bicycle facilities to residents of the study area.

South Carolina Department of Transportation

The South Carolina Department of Transportation (SCDOT) has worked in recent years to expand pedestrian and bicycle facilities within South Carolina. In 2002, SCODT formed the Bicycle and Pedestrian Infrastructure Advisory Council, which is comprised of representatives from the private sector, the General Assembly, other government officials and pedestrian and bicycle advocacy groups. The Council has since been shifted under the Transportation Enhancements Program umbrella. This program collaborates with local governments around the state to plan and fund what is described as non-traditional transportation related activities and facilities.

SCDOT Engineering Directive Number 22 was circulated to the Preconstruction, Traffic Engineering, Construction and Maintenance Departments regarding the consideration for bicycle facilities. The directive states that bicycle facilities shall become "a routine part of the department's planning, design, construction and operating activities". The directive continues to describe shared roadways and bike lanes/paved shoulders in greater detail and provided guidance in the design considerations of those facilities.

Three recent SCDOT projects within the White Knoll Area have been enhanced to include bicycle facilities since the acceptance of *SCDOT Engineering Directive Number 22* in February 2003: Edmunds Highway/Main Street (SC 302), Platt Springs Road (SC 602) and South Lake Drive (SC 6). The details of these enhancement projects are outlined in the Analysis section of this study.

These examples within the study area are proof that *SCDOT Engineering Directive Number 22* is working. The first major bicycle facilities within the White Knoll Area will be constructed as part of the aforementioned road improvement projects. It is imperative that communication between SCDOT, CMCOG and Lexington County remains open and frequent to ensure that future road improvement projects include both pedestrian and bicycle facilities. It is also crucial that any facilities included within road improvement projects reflect and/or enhance the overall pedestrian and bicycle facilities network as recommended in this study.

Lexington County

The White Knoll Area is primarily served by the Lexington County government. As such, the codes, ordinances and regulations of Lexington County apply to the large majority of the study area. The Lexington County Subdivision Regulations (June 30, 2005) contains a handful of references to pedestrian and bicycle facilities. The following text references noted sections of those regulations:

Section 5- General Requirements of the Subdivision
5.60- Improvements
5.64- Optional Improvement
5.642- Sidewalks

> *Sidewalks may be installed by the subdivider within the subdivision, provided they meet published standards. Engineered drawings submitted as part of the review process must include any proposed sidewalks. The location of sidewalks with respect to the right-of-way and the perpetual maintenance of sidewalks shall be in accordance with county policy.*

Section 5- General Requirements of the Subdivision
5.60- Improvements
5.64- Optional Improvement
5.647 Bike Trails and Pedestrian Ways

> *The subdivider may wish to delineate trails and paths through the subdivision for bicyclists or pedestrians. Such trails shall be perpetually maintained by the subdivider or a form of homeowners associations. These proposed trails and paths must be indicated on the preliminary plat.*

Current regulations do not require the inclusion of sidewalks within subdivisions within the White Knoll Area. This is not an uncommon practice for similar municipalities and counties around the state that have experienced steady growth over the last 30 years, but have not experienced extraordinarily rapid growth within the last five to ten years. Many municipalities and counties that have experienced rapid growth in recent years have revised and updated their ordinances and regulations to accommodate bicycle and pedestrian facilities as part of on-going development. As growth continues within the White Knoll Area, it is recommended that the applicable codes and regulations be updated to include text aimed at providing safe, adequate facilities for pedestrians and bicyclists. The following recommended revisions for new subdivision and commercial development should be considered:

Single Family Home Subdivisions

Mandate that, as part of individual development projects, pedestrian and bicycle facilities are constructed along routes where pedestrian and bicycle improvements are planned;
Mandate pedestrian and bicycle connectivity within subdivisions through the construction of sidewalks, trails, and paths and by incorporating them in the roadway layout;
Mandate pedestrian and bicycle connectivity between subdivisions and surrounding developments;
Mandate construction of sidewalks on one or both sides of the road within new subdivisions.

Commercial Development

Mandate that, as part of individual development projects, pedestrian and bicycle facilities are constructed along routes where pedestrian and bicycle improvements are planned;
Mandate dedicated pedestrian and bicycle connections are constructed from the roadway to shops, businesses, offices, etc.
Mandate dedicated pedestrian and bicycle connections between developments
Mandate the inclusion of bicycle parking areas within commercial and office developments

Maintenance

Maintenance of pedestrian and bicycle facilities serves to protect both the facility users and the jurisdiction in which the facilities are located. Well-maintained facilities will provide a safe, consistent experience for users for many years to come. Proper maintenance also provides a better return on the taxpayers' investment by increasing the facility's longevity.

Improper maintenance of pedestrian and bicycle facilities, along with defects to the facilities caused by natural wear and other unique circumstances, have the potential to create hazardous conditions. Facilities that are not properly inspected, cleaned and repaired can cause injury to users. These situations can expose municipalities, counties, states and possibly individuals to litigation brought on by the injured party.

Patricia Fickling vs. City of Charleston, South Carolina is one such case. Fickling stepped in a hole, fell and sustained injuries while walking down the sidewalk on Meeting Street in October of 1999. Though the right-of-way is owned by the state, the suit contended the city had an obligation to repair the sidewalk. The city's policy for

repairs to sidewalks on state highways was as follows: once a complaint is filed with the city, the city contacts the state, informs them of the defect, the state would reply with a memorandum stating that they lacked sufficient funds to make the repair and then the city would repair the sidewalk. No such complaint had been filed for the defective sidewalk in question. The trial court ruled and denied the motion.

The City of Lodi, California, uses a different approach towards the issue of maintenance of pedestrian and bicycle facilities. Currently there is no California State Law that addresses sidewalk liability. Therefore, the City of Lodi wrote into law what had been a long held position regarding the city's sidewalks: the sidewalks abutting private property are the responsibility of that property owner. This responsibility includes inspecting and repairing the sidewalks. A similar situation exists in San Jose, California, where a property owner was found liable after a pedestrian on the sidewalk abutting his property tripped and fell.

Some cities, such as Phoenix, Arizona, have included text within their ordinances and regulations protecting the municipality from liability lawsuits.

City of Phoenix, Arizona City Code:

Sec. 31-20. Liability of city for damages or injuries arising out of defective or obstructive highways or sidewalks.

> *The city shall not be liable nor shall any action be maintained against it for damages for injuries to person or property sustained in consequence of any street, highway, parkway, bridge, culvert, sidewalk or crosswalk being defective, out of repair, unsafe, dangerous or obstructive unless written notice of the defective, dangerous, unsafe, obstructive or unrepaired condition, specifying the particular place, has been given to the Director of Public Works and there has been a failure or neglect to remedy, repair or remove such defect, danger or obstruction complained of within a reasonable time after such notice has been given.*

A review of the Code of Laws of South Carolina did not reveal any text regarding sidewalks and liabilities.

The Central Midlands Council of Governments (CMCOG) can assist area municipal and county governments by helping each entity draft a pedestrian and bicycle maintenance policy. These policies enable the provision for safe pedestrian and bicycle facilities within the White Knoll Area while protecting pedestrians and cyclists, preserving the taxpayers' investment and providing direction to municipal and county governments. Such policies may include:

- Schedules for the inspection of pedestrian and bicycle facilities
- Procedures for the inspection of pedestrian and bicycle facilities
- Steps for rating existing conditions of pedestrian and bicycle facilities
- Guidance in determining the proper course of action (repair, replacements, etc.) and the prioritization of the prescribed action
- Guidance for receiving and responding to pedestrian and bicycle facility complaints
- Directions for inspecting pedestrian and bicycle facilities while other work is being performed
- Provisions for recovering costs of repair and replacement

- Provisions for the adjustment, not elimination, of inspections and maintenance action of defective facilities during times of limited resources
- Procedures for maintenance action if an injury occurs as a result of a facility defect

8. TRANSIT RECOMMENDATIONS

As residential and commercial growth within the study area continues, the need for public transportation will increase. Future transit routes will need to be located along corridors that are easily accessible from nearby residential areas, connect to areas within and beyond the White Knoll Area and include a variety of activity centers and destinations (commercial areas, parks, churches, schools, etc.). Planning for these facilities will need to ensure that current and projected populations will support the transit service and demand for the service exists.

No transit service is provided within the White Knoll Area and previous test routes in Lexington County had low ridership. Current funding available to provide transit services is limited. Because of these conditions, it is difficult to justify planning for a massive expansion of transit services in the White Knoll Area.

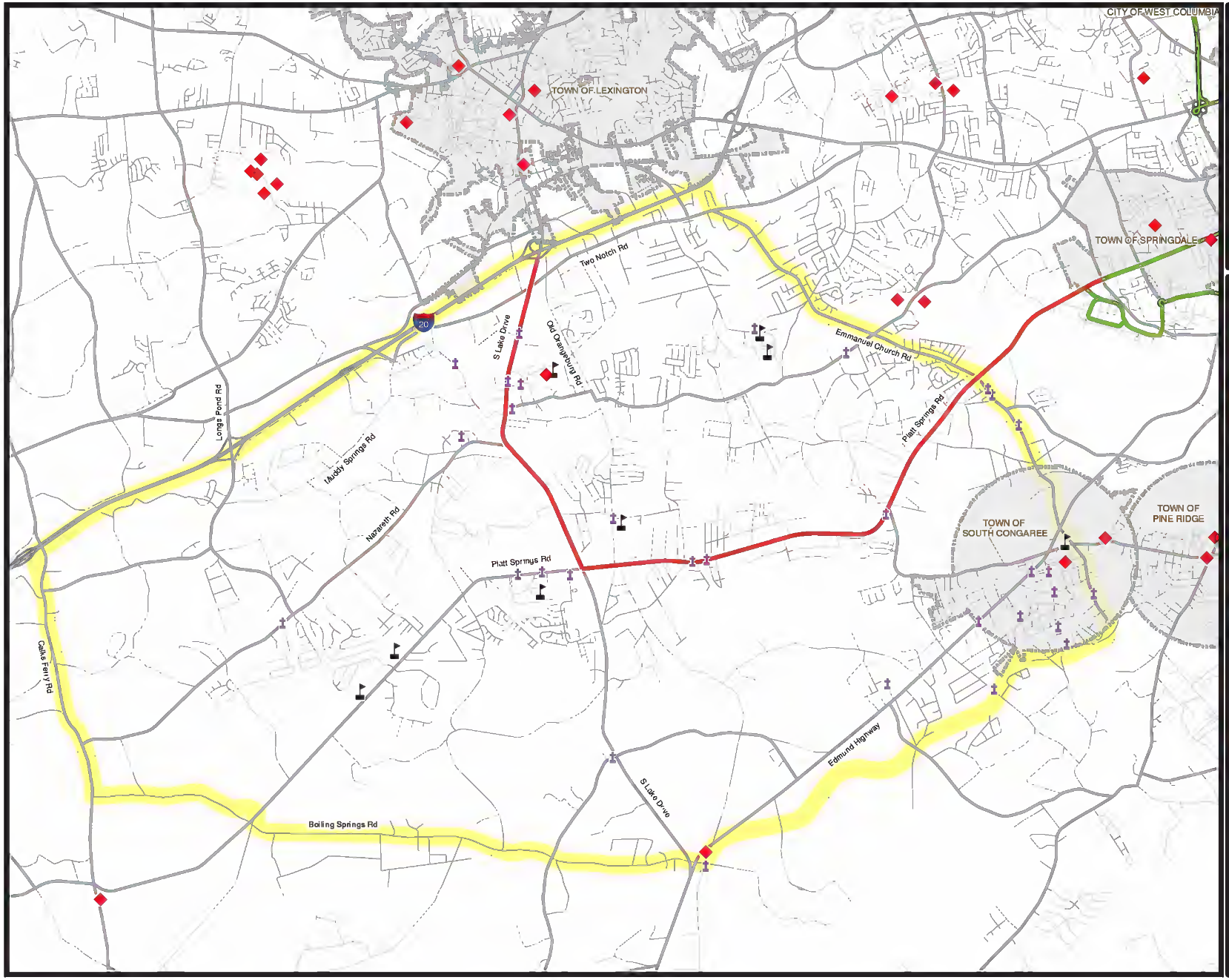
The few existing routes near the White Knoll Area were examined to determine which routes could feasibly be extended into the area. The most likely route is approximately nine-miles in length located along Platt Springs Road and South Lake Drive. Platt Springs Road provides connectivity to the Columbia Metropolitan Airport and would link-up with the existing Route 28A, which connects the Airport and the Town of Cayce to the CMRTA Transfer Center at the intersection of Laurel Street and Summit Street in Columbia. South Lake Drive provides access to Interstate 20 and downtown Lexington.

When planning for future transit routes, CMRTA uses a figure of $4.66 per mile to estimate costs for fixed-route transit service. This number is derived from last year's total fixed expenses of operation divided by the total fixed route miles traveled. CMRTA provides the Dial-A-Ride Transit (DART) service for those who have disabilities preventing them from using the fixed route transit system, meeting the transit requirements set forth by the Americans with Disabilities Act. This service must be provided within a ¾-mile radius of any fixed route transit service. The cost of the DART service, which was also derived from last year's total expenses of operation divided by the total miles traveled, is estimated at $2.52 per mile. Using these figures, it would cost approximately $76,500 to operate a fixed transit route making five trips on the route per day, each day of the week for one year. DART service would cost approximately $24,800 to operate an average of three trips per day along the route for one year.

To assess whether or not this route is easily accessible from residential areas, the project team identified the number of existing parcels located within a 10-minute and a 20-minute walk from the proposed route. These walking times represent the thresholds that most pedestrians are willing to walk to access a fixed transit route. The assessment found that approximately 2,560 existing land parcels lie within a 10-minute walk from the proposed transit route and approximately 5,163 existing land parcels lie within a 20-minute walk from the proposed transit route.

Many transit providers analyze the current and proposed densities of households and jobs within a measured area to determine whether or not the level of ridership will support a fixed transit route. The *Transit Capacity and Quality of Service Manual* establishes that three households per acre and four jobs per acre are appropriate transit supportive densities. Projected socio-economic data provided by CMCOG shows that no areas

within the White Knoll Area are projected to have more than one job per acre and that only two areas within the study area are projected to have more than three households per acre. This data indicated that the projected densities within the study area may not support fixed transit routes.



White Knoll Sub-Area

Figure 8-1: Existing and Proposed Transit Routes

CENTRAL MIDLANDS Council of Governments

LEGEND

- Park
- Church
- School
- Existing Transit Route
- Proposed Transit Route
- Major Road
- Minor Road
- White Knoll Area
- Municipal Boundary

Source: Lexington County and Central Midlands COG

N

0 1 2 Miles

9. LAND USE AND DEVELOPMENT RECOMMENDATIONS

The White Knoll Area possesses numerous acres of undeveloped land, primed to respond to an ever-growing market in and around Columbia, South Carolina. Based on recent growth patterns in other area corridors that feed into the state capital, both commercial and residential growth will continue at a steady pace. Schools within the local district have reacted positively to recent and forecasted growth by constructing three new schools in the last eight years (Carolina Springs Elementary School, Carolina Springs Middle School and White Knoll High School). SCDOT road improvement projects are underway along South Lake Drive and Platt Springs Road in an effort to accommodate an increase in daily traffic volume.

Traditionally, areas such as the White Knoll Area are developed quickly, focusing only on parcels which are being developed. In order to create a unique community that possesses a sense of place and identity, a larger plan needs to be implemented. Large scale mixed-use developments follow this vision, growing one parcel at a time while constantly considering a larger master plan. These same principles can be applied to certain focused locations within the White Knoll Area to create dense, accessible and vibrant cores.

The underlying zoning within much of the White Knoll Area allows for a variety of land uses and densities without the need for rezoning hearings. These zoning designations give developers the flexibility to create a very dense, mixed-use project or a less dense, large lot residential project on the same land. This flexibility of land use set forth through the zoning ordinance is very attractive to developers of commercial, residential and mixed-use projects. The zoning ordinance, as it currently stands, allows for the mix of uses within a small area necessary to create more pedestrian and bicycle friendly developments.

However, available densities have not been fully realized on numerous recent development projects. Continuance along this path will result in developments spread across the study area which will require an increased number of vehicular trips between homes, employment, commercial and retail areas, and other destinations. Conversely, if zoning mandated dense developments of mixed uses within certain areas of the White Knoll Area and homes, commercial and retail areas, offices and other destinations were just a 10-minute walk away, many new vehicular trips would not be necessary. These scenarios begin to illustrate the relationship between land use and transportation and how one influences the other.

Many communities have revised or updated their zoning ordinances to promote mixed-use development, encouraging developers to create communities that provide realistic transportation options and opportunities. The strategies listed below reflect the types of items that need to be considered when revising a zoning ordinance or considering special use districts in areas where higher density and mixed-use development are appropriate and desirable.

Residential Development

- Street Network: Street networks should provide connections within the community, giving pedestrians, cyclists and motorists various routes through the neighborhood.

Street networks should also provide connections to areas adjacent to the neighborhood. Street extensions should be provided where future development of adjacent parcels is likely to occur to allow for a system of secondary streets to develop over time.

- Neighborhood Connectivity: Cul-de-sacs succeed in limiting vehicular traffic along residential roads, but they also can impede pedestrian and bicycle travel between adjacent properties. Access trails should be provided where cul-de-sacs are planned to allow pedestrian and bicycle circulation through the community.
- Facilities: Appropriate facilities for pedestrians and cyclists should be mandated within street rights-of-way. Streets should be designed to include narrow travel lanes to discourage excessive speed, provide for designated pedestrian and bicycle facilities, include landscape buffers with street trees and street and pedestrian scaled lighting. The goal is to provide a comfortable, safe and engaging facility for pedestrian and bicycle use.

Commercial Development

- Mix of Uses: Mixed-use developments exhibit various land uses within a building or group of buildings within a small developed area. These developments consist of some combination of single and multi-family residential, retail, office, industrial, civic and other uses.
- Buildings: The relationship between buildings and major roadways powerfully impact the context of a site. Buildings in urban areas sit closely to roadways, connect directly with pedestrian facilities and have a larger scale that defines the space along the roadway. The architectural design of built structures may be the most important component in creating context within a place. The size of a building, its relationship with other buildings and with the roadway are each important elements necessary to create a powerful context. Building entrance locations create real connections to the surrounding environment. Variety in the design of the buildings and the materials on each building's facade help create a more authentic urban place.
- Parking: Parking plays a very important role in today's society due to the dependence on the automobile. Developments must provide a certain number of parking spaces based on the size of the buildings and uses within those structures. Urban areas provide parallel parking along both major and local roadways and parking lots tend to be smaller and scattered throughout the area. Alleys may be used to connect one parking area to the next or a parking area to businesses. Parking and vehicular circulation areas are not located between the street and businesses. Instead, such areas provide pedestrian and bicycle connections and landscape buffers. Bicycle parking should be required in all development.
- Circulation: Circulation systems allow people to move from place to place and include roads, driveways, sidewalks, bike lanes and transit stops. Designated pedestrian facilities should be provided between adjacent businesses, creating a network of safe pedestrian connectivity. Where possible, connections should be made between businesses to reduce or eliminate the need to re-enter the public street network to access an adjoining business.

Case Study - Birkdale Village, Huntersville, North Carolina

Birkdale Village is a 52-acre mixed-use development located in Huntersville, North Carolina within walking distance of Lake Norman. This type of development was encouraged by the town of Huntersville through the town's adapting their ordinances to permit new urban development and was facilitated by having a large parcel, good design, and a market that was supportive of the concept.

Birkdale Village has a gross density of 6.2 units per acre; however, the development's net density is 7.2 units per acre since 7.4 acres are dedicated to a floodplain, and will not be developed. The following diagrams were created to illustrate the relationship between the commercial, retail, office and condominium residential units within Birkdale Village with the surrounding single-family residential area to provide an example of how similar developments may be possible in the White Knoll Area. An aerial photograph of Birkdale Village is shown in Figure 9-1.

Figure 9-1: Aerial View of Birkdale Village

Commercial

The location of the commercial and retail land uses within Birkdale Village has a dual benefit. Traffic from the nearby arterial road, which connects to the local interstate, can easily access shops and restaurants. The surrounding land uses, which include office and residential, are located within comfortable walking distance to the commercial area. This strategic commercial location allows shops and restaurants to serve both local residents and passers by. Figure 9-2 illustrates this combination of conditions.

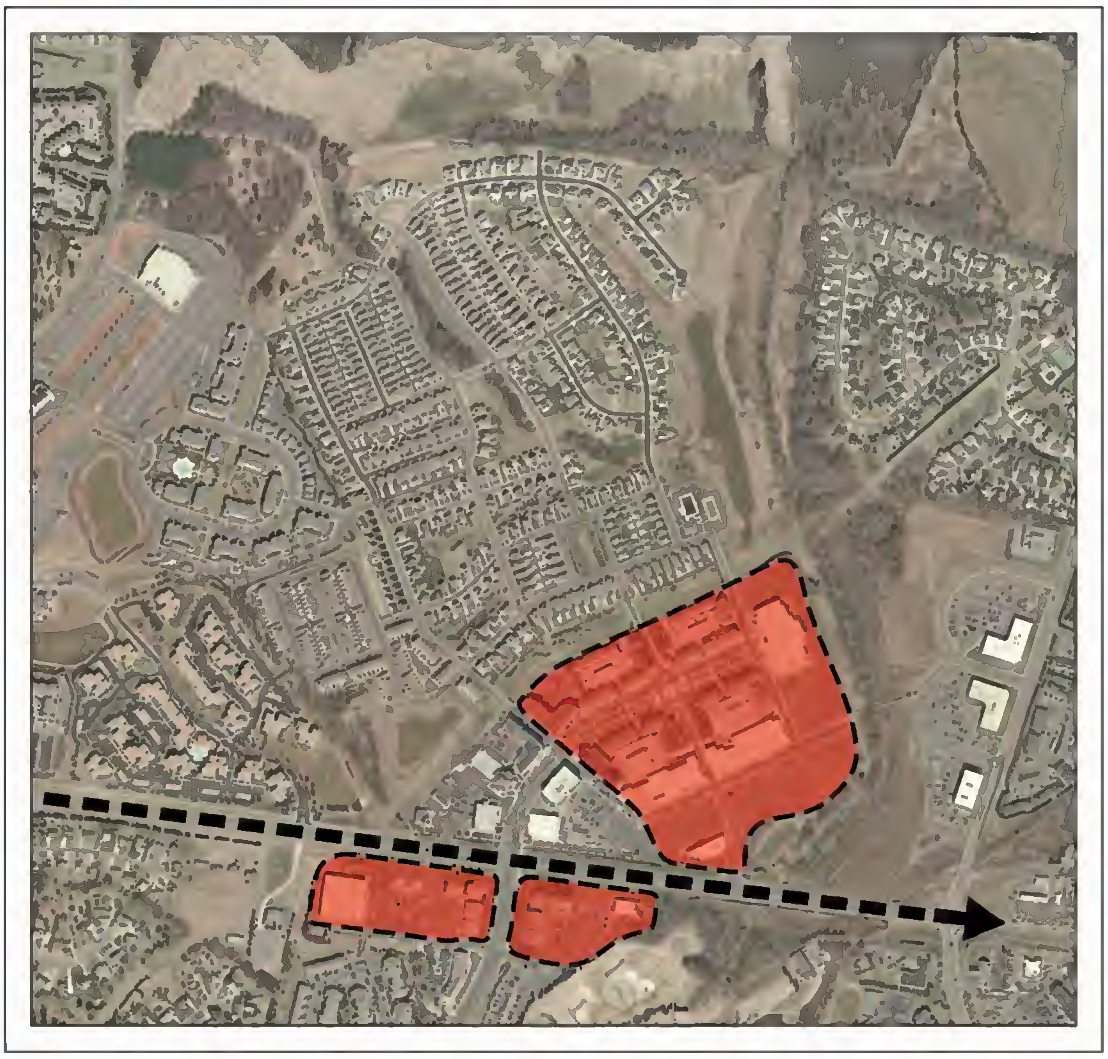


Figure 9-2: Birkdale Village Commercial Areas

Office

Offices within Birkdale Village and adjacent developments are easily accessible to employees, customers and clients. The offices are located along the arterial street, which limits the impact that peak hour traffic might have on other adjacent land uses. The proximity from the offices to commercial and retail areas provide a desirable convenience to office employees. Figure 9.3 depicts the locations of office development.

Figure 9-3: Birkdale Village Office Areas

Multi-family Residential

A mix of residential uses exists within Birkdale Village. Multi-family housing, which includes apartments, condominiums and townhomes, provide more affordable housing alternatives for young adults and empty nesters. Those employed at local commercial outlets and offices have the ability to live where they can walk to work, limiting the number of vehicular trips and promoting a more active lifestyle. Figure 9-4 illustrates this location of multi-family residential areas.

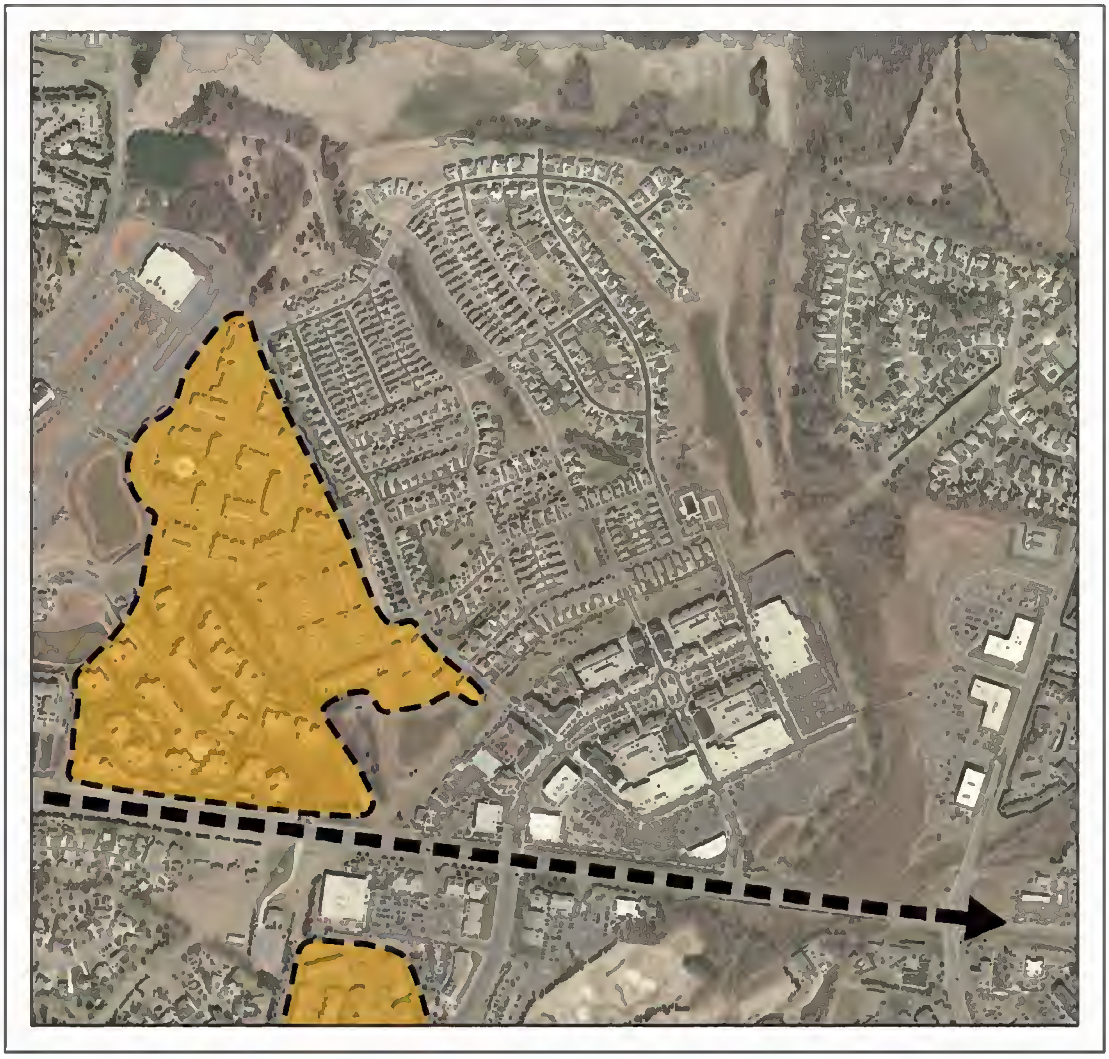


Figure 9-4: Birkdale Village Multi-Family Residential Areas

Single Family Residential

In addition to the multi-family residential uses, single family residences exist near Birkdale Village. Families in need of a larger home or those interested in their own property may choose to purchase a single family home. These homes provide comparable benefits of proximity to the mix of commercial and office uses as available to multi-family residents. Figure 9-5 illustrates the location of single family residences.

Figure 9-5: Birkdale Village Single Family Residential Areas

Open Space

The open space and greenbelt areas in and around Birkdale Village serve a variety of functions. Several lawn areas provide locations for recreational activities for residents and employees. Other areas preserve existing land features and capture stormwater runoff. Still others provide connectivity within and beyond the community with multi-use greenway trails. Each area of open space is woven within the fabric of the development. Figure 9-6 illustrates the location of open space features.

Figure 9-6: Birkdale Village Open Space Areas

Roadway Network

The network of streets in and around Birkdale Village was designed to accommodate both vehicles and pedestrians. Each street connects to the next, providing pedestrians and motorists several route choices. Shorter block lengths accommodate pedestrian travel through the community. Cul-de-sacs are limited to areas where natural land features restrict future growth. Stub streets are provided along project boundaries to provide connections where future development is anticipated. The dense network of streets provides the connectivity within and outside the community that is necessary to accommodate a variety of modes of transportation. Figure 9-7 illustrates this highly connective network of streets.

Figure 9-7: Birkdale Village Roadway Network

Composite Land Use

Figure 9-8 depicts how the individual elements relate to other land uses within and around Birkdale Village. The careful selection and placement of land uses with other adjacent land uses within the street network is the primary reason for the projects success.

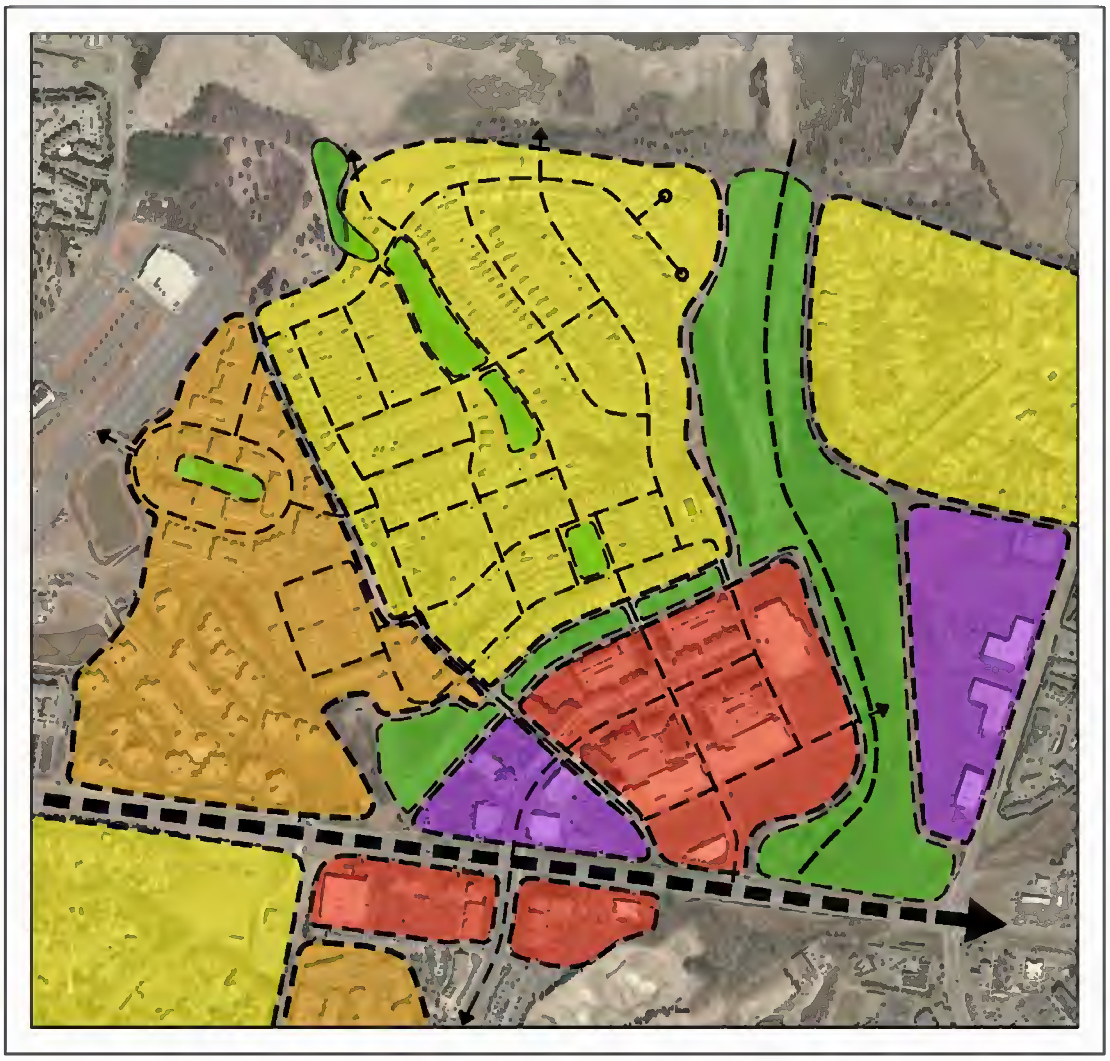


Figure 9-8: Birkdale Village Composite Land Use

Composite Land Use with Walking Distances

Figure 9-9 illustrates the relationship between each individual land use in the context of their walking distance from each another. The smaller circle in Figure 9.9 represents a 5-minute walk, while the larger circle represents a 10-minute walk. Birkdale Village provides access to commercial, office, multi-family residential, single family residential and open spaces all within a 10-minute walk from one point within the community to another.

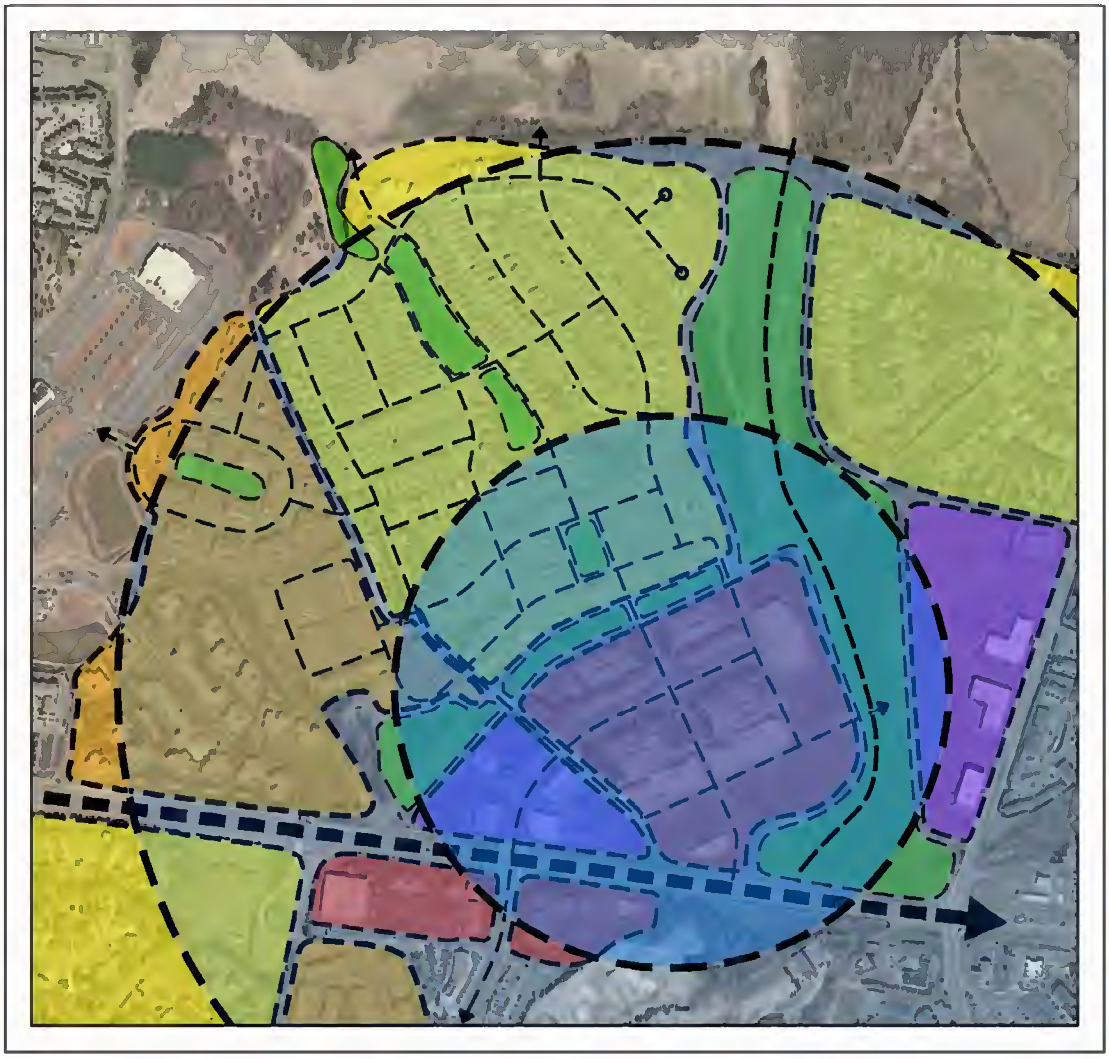


Figure 9-9: Birkdale Village Walking Distances

Areas within the White Knoll Area have the ability to provide such a densely woven mixed-use community by applying these same principles to future development projects. This type of mixed-use community can be developed in currently undeveloped land or worked into the existing fabric of developments to more closely connect existing residential and commercial areas.

White Knoll Mixed Use Development Study

The following study applies the basic principles of mixed use development, used to create Birkdale Village in Huntersville, North Carolina, to an area within the White Knoll Area. This study will focus on one of five areas of existing concentrated commercial and retail land uses. These commercial development areas are easily accessible, highly visible and located at intersections of two arterial or collector roads. Each commercial and retail development was strategically located to take advantage of high traffic counts along major roads and serve nearby residential neighborhoods without being located too closely to other competing commercial areas. Given the accessibility to the existing commercial and retail development areas and the existing mix of uses (commercial, residential), these areas serve as logical locations for future mixed use developments.

The area selected for the White Knoll Mixed Use Development Study surrounds the intersection of Emanuel Church Road and Old Barnwell Road, shown in Figure 9-10. The following exercise will analyze the existing land uses and roadway system, then, using the principles followed in the development of Birkdale Village, create a better connected neighborhood area with a greater mix of commercial, office, civic, multi and single family residential, parks and open space land uses. It should be noted that the White Knoll Mixed Use Development Study is conceptual in nature and not a recommendation to change existing developed or undeveloped land uses.

Figure 9-10: White Knoll Mixed Use Study Area

Existing Land Uses

Three of the four corners of the intersection of Emanuel Church Road and Old Barnwell Road consist of commercial businesses, including a grocery store, drug stores, a gas station and a hardware store. Large parcels of undeveloped land are located to the north and west of the intersection directly adjacent to the commercial areas. The remaining land consists of single family residential, both newer, denser neighborhoods and older, large parcel home sites. Figure 9.11 illustrates the existing land use configuration.

Figure 9.11: Existing Land Uses

Existing Roadway Network

The intersection of Emanuel Church Road and Old Barnwell Road is one of thirteen signalized intersections within the White Knoll Area. Emanuel Church Road is classified as a minor arterial and Old Barnwell Road is classified as a collector.

The commercial areas are easily accessible from both of Emanuel Church Road and Old Barnwell Road, while limited access exists from these roads to the single family residential neighborhoods nearby. Many neighborhoods have only one point of entry and exit, forcing each car that enters or exits that neighborhood to use of Emanuel Church Road and/or Old Barnwell Road. The driveways of a number of single family residential homes are accessed directly from these two roads.

Figure 9-12 depicts how many cul-de-sacs are utilized within the area's residential neighborhoods. The result is poor connectivity from one street to another and from one neighborhood to the next. Vehicles are forced to use the local arterial and collector for every trip, whether it be a quick drive to the grocery store or a long commute to work. Poor roadway connectivity makes the decision to walk or bike more difficult. Most people are willing to walk no more than 10 to 20 minutes to reach their destination. If it takes twenty minutes of walking to get out of the neighborhood, chances are people will not walk to the grocery store or any other destination when they can drive.

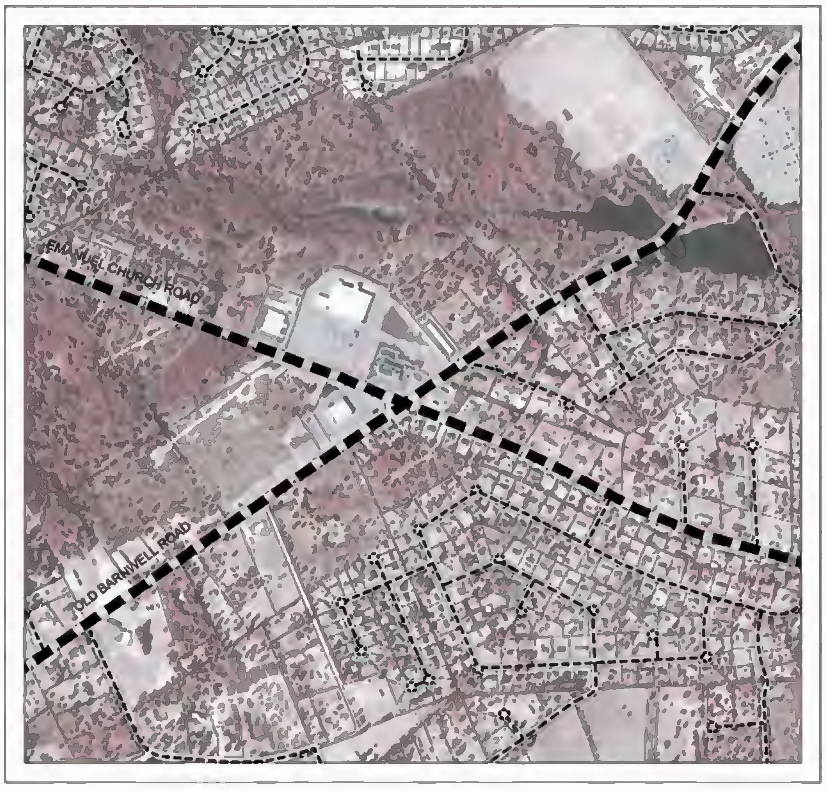


Figure 9-12: Existing Roadway Network

Roadway Network Study

A well connected roadway network is the most important aspect of creating a successful mixed use area or community. Ideal roadway networks offer choices to a driver, pedestrian or cyclist, allowing them to choose the route they want to take. New streets added within currently undeveloped or underdeveloped land create more direct connections between existing residential neighborhoods and their adjacent areas. These new connections disperse traffic that was once forced through the intersection of Emanuel Church Road and Old Barnwell Road through the area. Minor extensions of existing roads provide connectivity between one neighborhood and the next. Vehicles making local trips may choose to use area neighborhood roads, allowing the local arterial and collector to efficiently move traffic through the area. Pedestrians and cyclists have greater opportunities to travel throughout the area. The roads within this network are used as buffers between one land use and the next. Figure 9-13 details the expanded and highly connected roadway network.

Figure 9-13: Existing Network with Additional Connectivity

Commercial Land Uses Study

Commercial land uses seek out highly visible and easily accessible locations. Three of the four corners of the intersection of Emanuel Church Road and Old Barnwell Road are existing commercial areas. Figure 9-14 depicts replacing the existing residential land use on the fourth corner with additional commercial land. These locations are easily accessible from nearby neighborhoods via the proposed street connections. Traffic from outside the area is able to access the commercial land uses via the local arterial and collector. The location of the commercial land uses effectively serves both local and area residents.

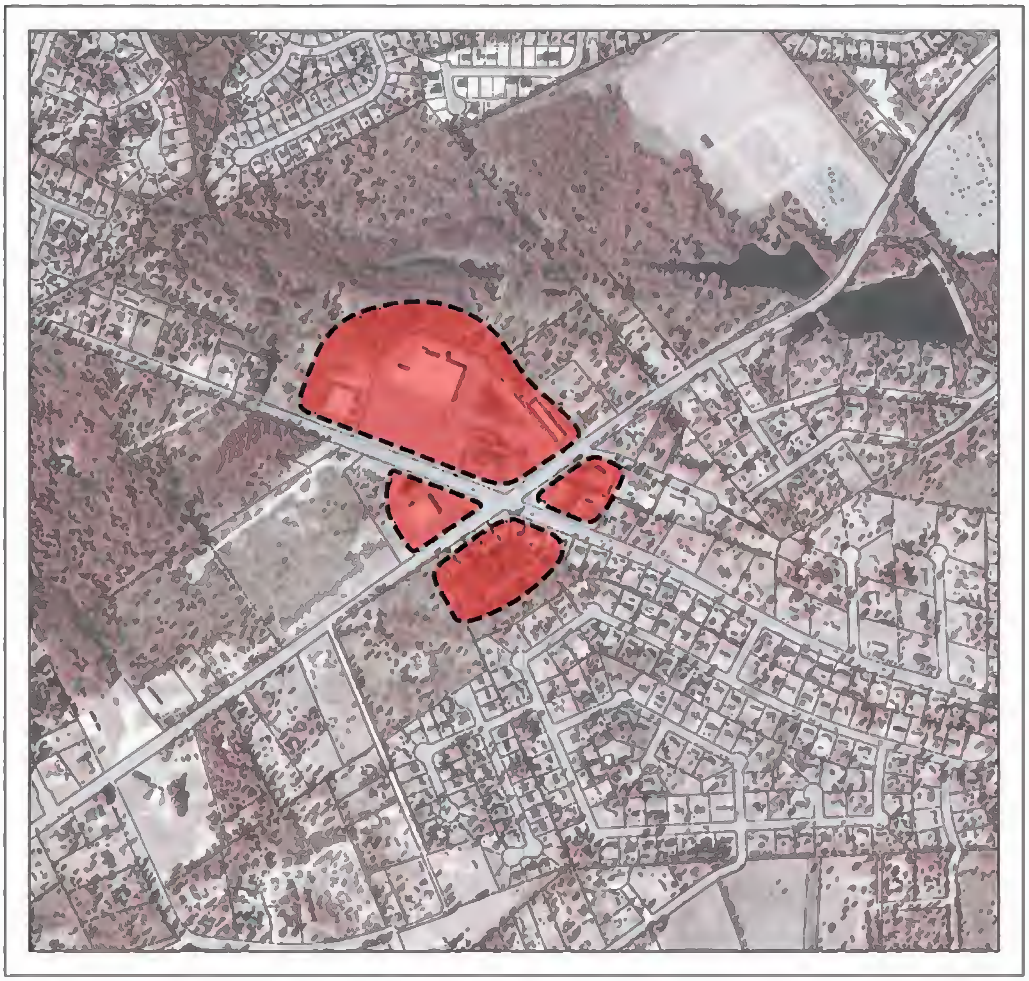


Figure 9-14: Commercial Land Uses

Office and Civic Land Use Study

Office and civic land uses may include banks, insurance agencies, doctors' offices, general offices, libraries and county offices. Much of the traffic generated by these facilities is limited to work day hours. Office and civic facilities are located close to Emanuel Church Road and Old Barnwell Road to allow employees and their clients quick and direct access while limiting the impact additional traffic might have through nearby residential areas. Figure 9-15 illustrates the addition of office and civic land uses within the area.

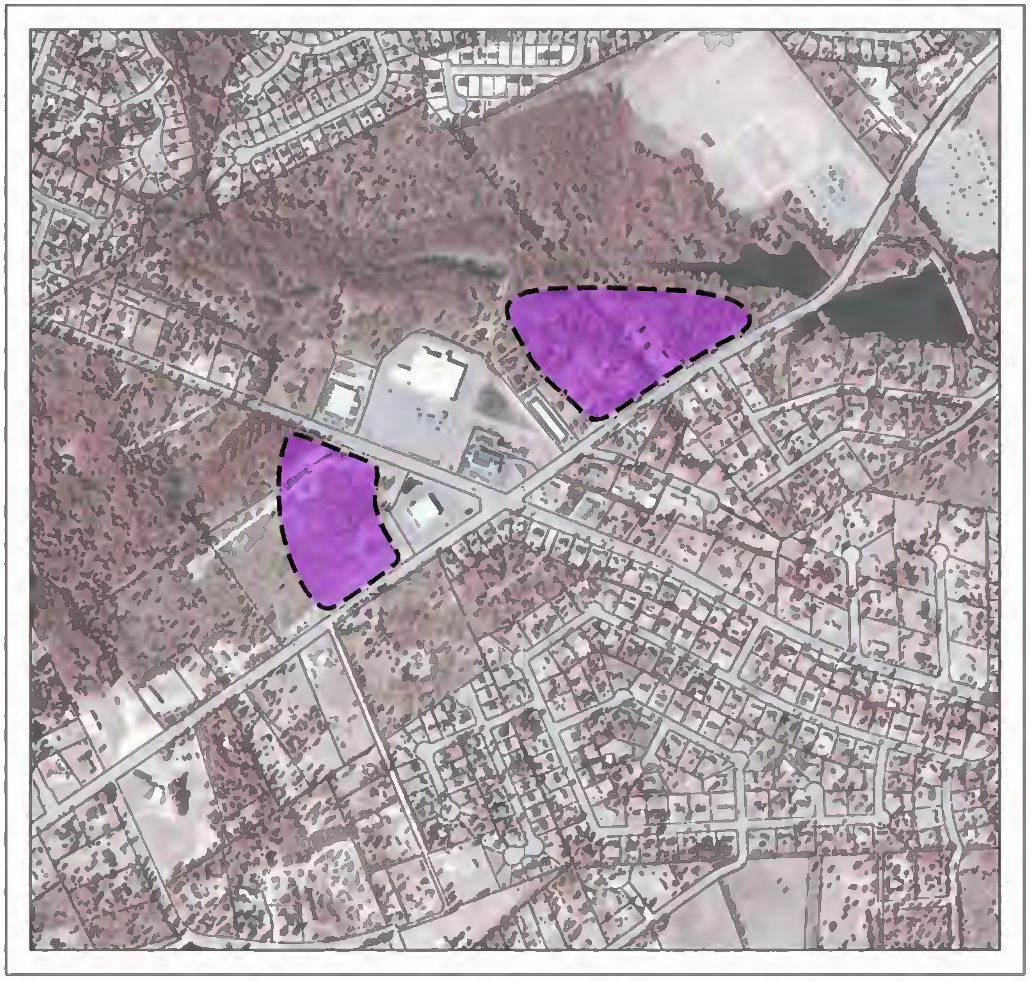


Figure 9-15: Office and Civic Land Uses

Multi-Family Residential Study

The addition of multi-family residential land uses within the area provides a much needed diversity of housing options. Multi-family residential housing includes condominiums, townhomes and apartments. The affordability and low maintenance housing options are attractive to young professionals and empty nesters alike.

Multi-family residential developments have a higher number of living units per acre than most single family residential areas. This density generates high traffic volumes. Like commercial, office and civic land uses, multi-family residential developments should be located near major roadways. Figure 9-16 illustrates how multi-family residential land uses can coexist within a mixed use development or community.

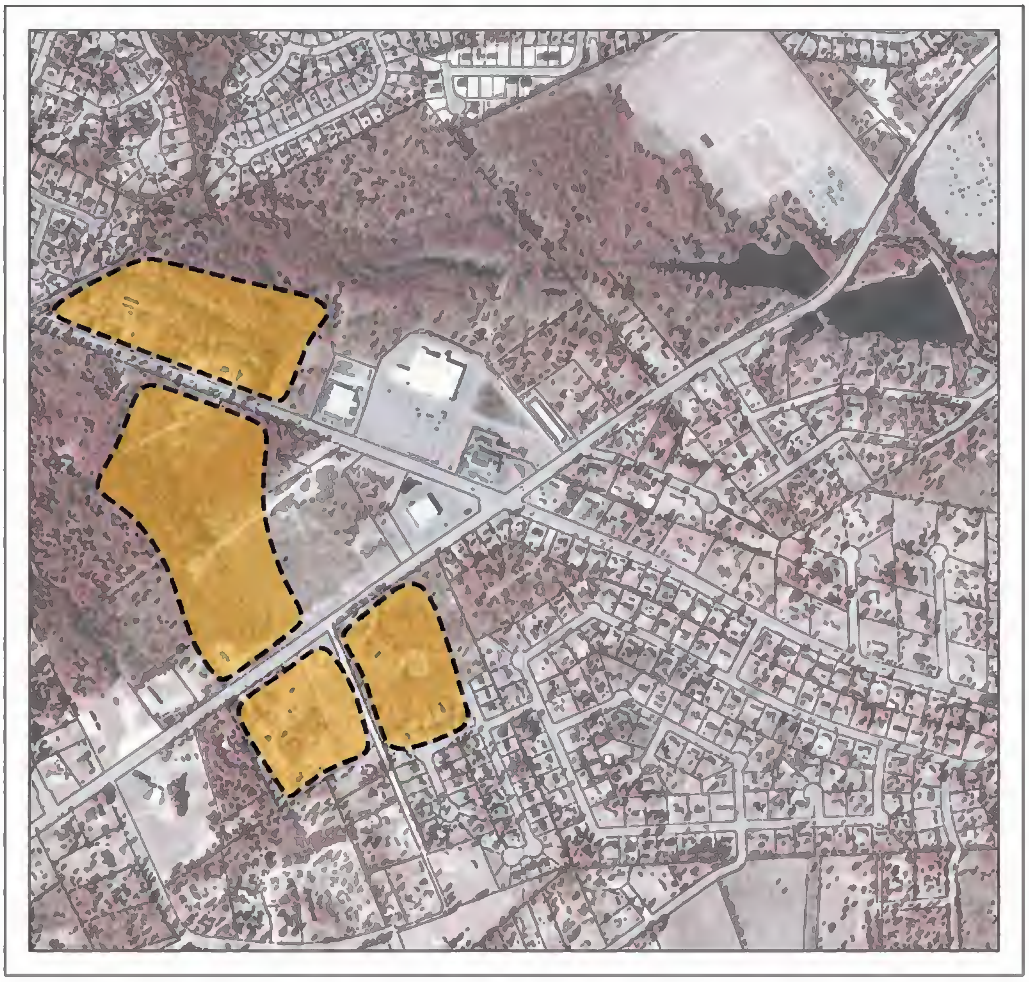


Figure 9-16: Multi-Family Land Uses

Single Family Residential Study

Single family residential currently dominates the area. A number of the existing developments use the land wisely, but provide very poor connectivity within each neighborhood. Other existing single family residential sits on large, underdeveloped tracts of land or front Emanuel Church Road and Old Barnwell Road. The proposed single family residential areas create clear and direct connections to existing neighborhoods and to other land use areas. The new single family neighborhoods also create transitions between existing single family homes and other proposed land uses. Figure 9-17 depicts where new single family residential neighborhoods can be situated among the existing single family neighborhoods.

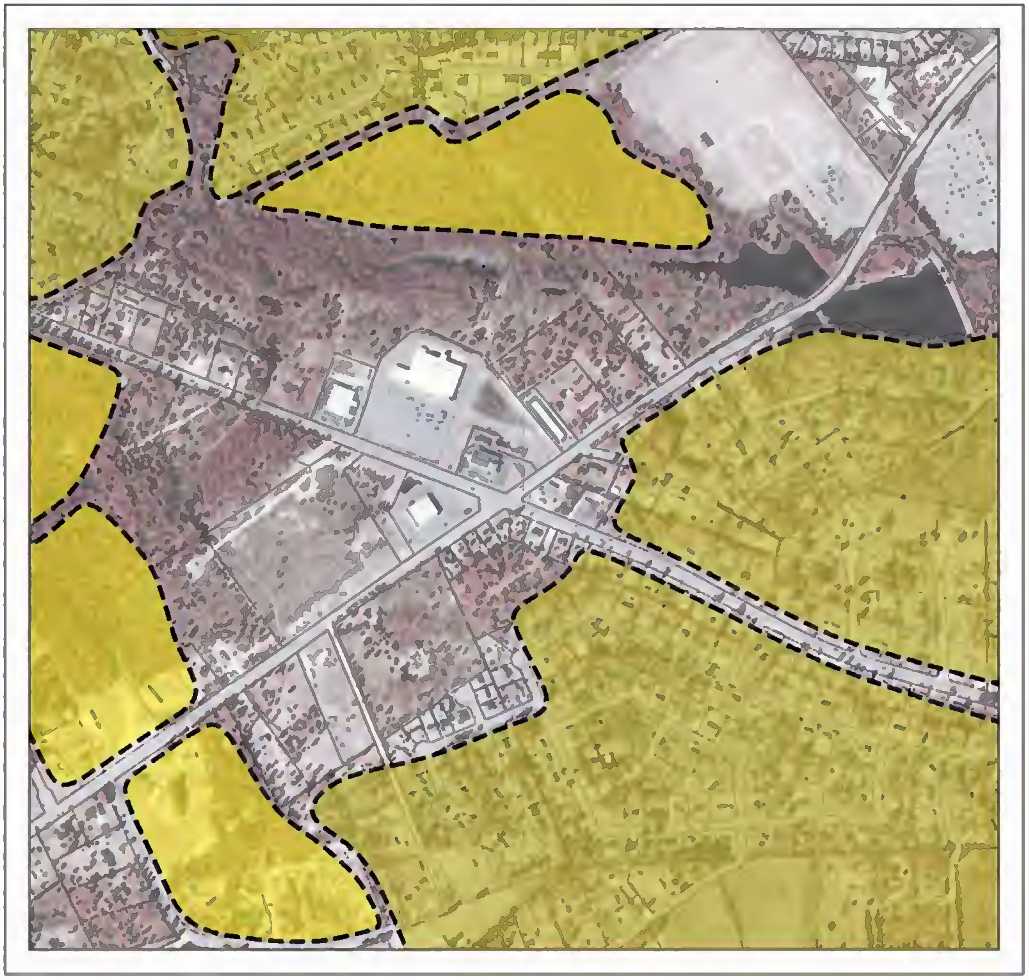


Figure 9-17: Single Family Land Uses

Parks and Open Space Study

Several large tracts of undeveloped land exist within the area, but none of that land has been set aside for public recreation use. The proposed plan takes advantage of an existing creek that moves through one of those undeveloped tracts of land for a park. Not only does this park have the potential to provide passive recreation activities to those in nearby neighborhoods, it also protects the integrity of the water quality within that stream by providing an undeveloped buffer. Figure 9-18 also shows that a small park was sited between one of the existing single family neighborhoods and proposed commercial and multi-family land uses.

Figure 9-18: Parks and Open Spaces

Composite Mixed Use Development Study

Figure 9-19 illustrates how each individual land use fits within and related to the area as a whole. The location of each land use has a clear and defined purpose. The roadway network creates direct connections throughout the area and provides alternative routes from one neighborhood to the next.

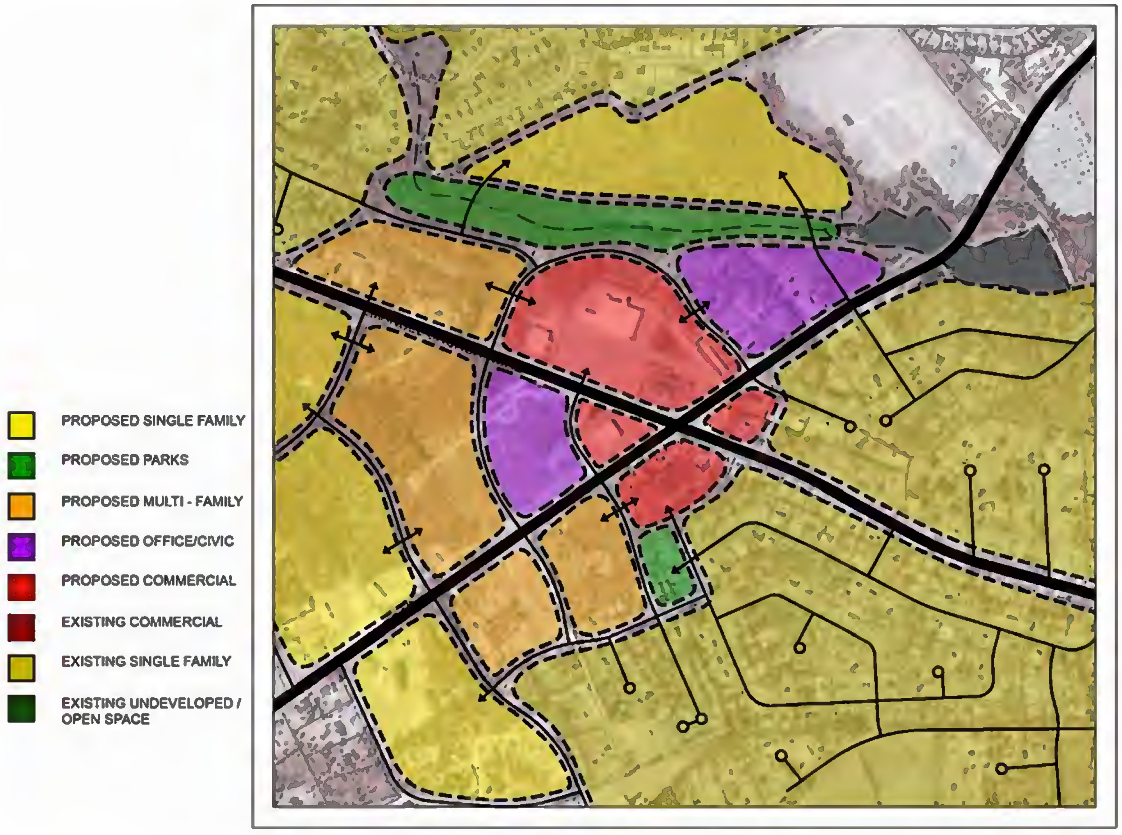


Figure 9-19: Composite Mixed Uses

Composite Mixed Use Development Study with Walking Distances

Figure 9-20 depicts each proposed land use within the context of an average pedestrian. The small circle represents a 5-minute walk from the center of the circle to the edge, while the large circle represents a 10-minute walk from the center of the circle to the edge. Take note of the numerous land uses available within such an accessible area. This dense diversity of land uses within a well connected network of streets illustrates how mixed-use development can really change the way a place is created and traversed.

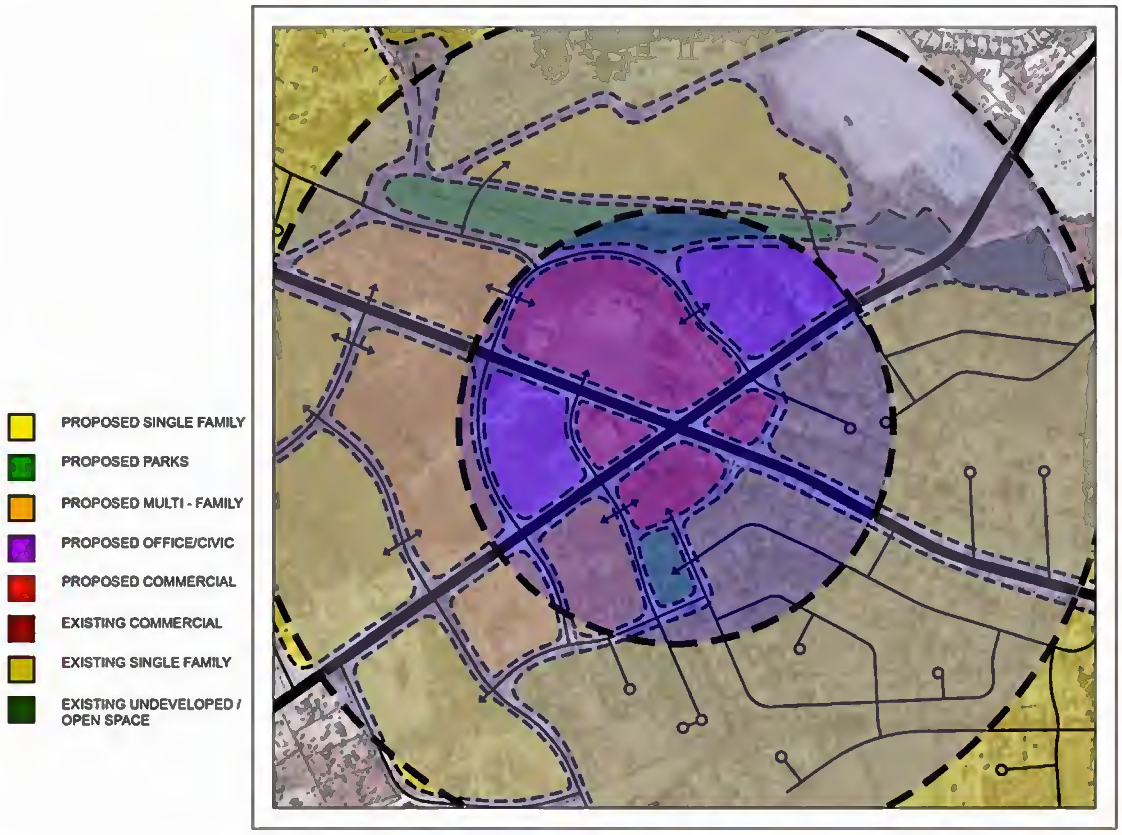


Figure 9-20: Mixed Uses with Walking Distances

10. ESTIMATED PROJECT COSTS

Estimated construction costs were prepared for the proposed pedestrian, bicycle, transit and roadway improvements recommended in the White Knoll Area. Table 10.1 summarizes the **construction cost estimates** for the individual Roadway Improvement Projects.

Table 10.1 Roadway Improvement Construction Cost Estimates

Road	Between	Improvement	Length	Cost
Short Term Roadway Improvements				
South Lake Drive	Platt Springs Road and Bethany Church Road	Widening from two to four lanes	2.1 miles	$3,570,000
Platt Springs Road	Steele Road and East Steele Road	Widening from two to four lanes	0.5 miles	$850,000
Subtotal				**$4,420,000**
Medium Term Roadway Improvements				
South Lake Drive	Bethany Road and Edmund Highway	Widening from two to four lanes	1.4 miles	$2,380,000
Platt Springs Road	McLee Road/Kyzer Road and Willow Forks Road	Widening from two to four lanes	2.1 miles	$3,570,000
Subtotal				**$5,950,000**
Long Term Roadway Improvements				
Old Barnwell Road	Old Orangeburg Road and Emanuel Church Road	Widening from two to four lanes	3.3 miles	$5,610,000
Longs Pond Road	Nazareth Road and Barr Road	Widening from two to four lanes	2.2 miles	$4,420,000
Calks Ferry Road	Pond Branch Road to Sherwood Drive	Widening from two to four lanes	3.8 miles	$6,460,000
Edmund Highway	South Lake Drive to Gator Road	Widening from two to four lanes	3.4 miles	$5,780,000
Subtotal				**$22,270,000**
Total				**$32,640,000**

The pedestrian and bicycle facility recommendations were discussed previously. The construction cost estimates for the immediate pedestrian and bicycle facilities are summarized in Table 10.2 and total $2,690,000.

The construction cost estimates for the various near term bicycle and pedestrian connectors are summarized in Table 10.3. The total estimated construction cost for these projects is $6,530,000.

The construction cost estimates for the various long term pedestrian and bicycle connectors are summarized in Table 10.4. The total estimated construction cost for these projects is $5,610,000.

The total estimated construction cost for all the roadway and bicycle/pedestrian facility improvement projects is approximately $47,470,000.

It should be noted that these construction cost estimates do not include the costs of right-of-way acquisition, environmental permitting and mitigation, additional drainage features, bridges and culverts and other construction costs associated with potential design features required to construct the facilities. All construction cost estimates are in 2008 dollars, and do not include adjustments for inflation or other effects that tend to increase construction costs over time.

As mentioned in Section 8, there is currently no CMRTA services provided within the White Knoll Area. It is estimated that it would cost approximately $102,000 annually to operate both a fixed transit route making five trips on a nine mile long route located along Platt Springs Road and South Lake Drive and Demand Responsive Service. This estimate also does not include capital costs and does not take into account inflation and other costs that would increase the annual operational costs over time.

Table 10.2 Short Term Pedestrian and Bicycle Facility Construction Cost Estimates

Road	Between	Improvement	Length	Cost
Edmund Highway/Main Street (SC 302)	Pine Street to Norman Drive	Sidewalks and Wide Outside Bike Lane	2.8 miles	$280,000
Emanuel Church Road	Old Barnwell Road and Platt Springs Road	Sidepath	1.2 miles	$240,000
Platt Springs Road (SC 602)	Emanuel Church Road and Maria Lane	Sidewalks and Wide Outside Bike Lane	6.1 miles	$610,000
South Lake Drive (SC 6)	Interstate 20 and New Orangeburg Road	Sidewalks and Wide Outside Bike Lane	4.3 miles	$430,000
Subtotal				**$1,560,000**
Red Bank Area Network				
Community Drive	Old Orangeburg Road to South Lake Drive (SC 6)	Sidepath	0.9 miles	$180,000
Old Barnwell Road	Old Orangeburg Road to South Lake Drive (SC 6)	Sidepath	1.0 miles	$200,000
Old Barnwell Road	Garden Pond Drive/Walnut Creek Court and Old Orangeburg Road	Sidepath	0.2 miles	$40,000
Old Orangeburg Road	Amberchase Lane and Old Barnwell Road	Sidepath	0.6 miles	$120,000
YMCA Road	Colony Lakes Court and Old Orangeburg Road	Sidewalks/Bike Lane/Shoulder	0.3 miles	$30,000
Subtotal				**$570,000**
Central Network				
Brevard Parkway/Lexington Hills Parkway	Platt Springs Road (SC 602) to Riglaw Circle	Sidepath	0.4 miles	$80,000
McLee Road	Platt Springs Road (SC 602) to Timberchase Lane	Sidepath	0.4 miles	$80,000
Old Orangeburg Road	Emma Drive to Southwood Drive	Sidepath	0.5 miles	$100.000
Southwood Drive	Old Orangeburg Road to South Lake Drive (SC 6)	Sidepath	0.6 miles	$120,000
Subtotal				**$380,000**
Carolina Springs Network				
Platt Springs Road (SC 602)	Maria Lane to Willow Fork Road	Sidewalks and Bike Lanes	1.8 miles	$180,000
Subtotal				**$180,000**
Total				**$2,690,000**

Table 10.3 Medium Term Pedestrian and Bicycle Facility Construction Cost Estimates				
Road	Between	Improvement	Length	Cost
Bluefield Road	Old Orangeburg Road to McLee Road	Sidepath	1.9 miles	$380,000
Cannon Trail Road	Nazareth Road to Platt Springs Road (SC 602)	Sidepath	1.2 miles	$240,000
Church Street	Edmund Highway/Main Street (SC 302) to Pine Street	Sidepath	1.0 miles	$200,000
Emanuel Church Road	Platt Springs Road (SC 602) to Edmund Highway/Main Street (SC 302)	Sidewalks and Bike Lanes	1.9 miles	$190,000
Emanuel Church Road	Two Notch Road to Old Barnwell Road	Sidepath	2.3 miles	$460,000
Kyzer Road	Nazareth Road to Platt Springs Road (SC 602)	Sidepath	3.1 miles	$620,000
McLee Road	Platt Springs Road (SC 602) to Bluefield Road	Sidepath	1.7 miles	$340,000
Nazareth Road	South Lake Drive (SC 6) to Cannon Trail Road	Sidepath	2.3 miles	$460,000
Old Barnwell Road	Emanuel Church Road to Garden Pond Drive/Walnut Creek Court	Sidepath	2.5 miles	$500,000
Old Orangeburg Road	Old Barnwell Road to Emma Drive	Sidepath	0.7 miles	$140,000
Old Orangeburg Road	Southwood Drive to Bluefield Road	Sidepath	1.3 miles	$260,000
Old Orangeburg Road	Two Notch Road to Amberchase Lane	Sidepath	0.8 miles	$160,000
Princeton Road	Ramblin Road to Howe Street	Sidepath	1.5 miles	$300,000
Ramblin Road	Platt Springs Road (SC 602) to Princeton Road	Sidepath	0.9 miles	$180,000
Shelton Road	Old Barnwell Road to Steele Road	Sidepath	1.2 miles	$240,000
South Lake Drive (SC 6)	New Orangeburg Road to Bluefield Road	Sidewalks	0.7 miles	$140,000
Steele Road	Shelton Road to Platt Springs Road (SC 602)	Sidepath	0.5 miles	$100,000
Two Notch Road	Emanuel Church Road to Muddy Springs Road	Sidewalks	4.0 miles	$800,000
YMCA Road	Two Notch Road to Colony Lakes Court	Sidepath	1.0 miles	$200,000
Subtotal				**$5,910,000**
White Knoll Schools Network				
Kitti Wake Drive	Two Notch Road to Emanuel Church Road	Sidepath	2.4 miles	$480,000
White Knoll Road	White Knoll Way to Old Barnwell Road	Sidepath	0.2 miles	$40,000
White Knoll Way	Kitti Wake Drive to White Knoll Road	Sidepath	0.5 miles	$100,000
Subtotal				**$620,000**
Total				**$6,530,000**

Table 10.4 Long Term Pedestrian and Bicycle Facility Construction Cost Estimates				
Road	Between	Improvement	Length	Cost
Beckman Road	Old Orangeburg Road to Edmund Highway/Main Street (SC 302)	Sidepath	2.4 miles	$480,000
Bluefield Road	McLee Road to Boiling Springs Road	Sidewalks and Shoulder Bike Lane	1.6 mile	$160,000
Boiling Springs Road	Platt Springs Road (SC 602) to Calks Ferry Road	Sidepath	1.8 miles	$390,000
Calks Ferry Road	Interstate 20 to Boling Springs Road	Sidewalks and Shoulder Bike Lane	2.8 miles	$280,000
Clermont Lakes Drive	Platt Springs Road (SC 602) to Bluefield Road	Sidepath	1.5 miles	$300,000
Edmund Highway/Main Street (SC 302)	Norman Drive to South Lake Drive (SC 6)	Sidepath	2.7 miles	$540,000
Longs Pond Road	Interstate 20 to Nazareth Road	Sidepath	2.3 miles	$460,000
McCartha Road	Nazareth Road to Platt Springs Road (SC 602)	Sidepath	1.5 miles	$300,000
Muddy Springs Road	Two Notch Road to Longs Pond Road	Sidepath	2.7 miles	$540,000
Nazareth Road	Cannon Trail Road to McCartha Road	Sidepath	1.7 miles	$340,000
Nazareth Road	McCartha Road to Calks Ferry Road	Sidewalks and Shoulder Bike Lane	1.9 miles	$190,000
Old Orangeburg Road	Bluefield Road to Beckman Road	Sidepath	1.1 miles	$220,000
Old Orangeburg Road	Beckman Road to Edmund Highway/Main Street (SC 302)	Sidewalks and Shoulder Bike Lane	1.9 miles	$190,000
Platt Springs Road	Willow Fork Road to Boiling Springs Road	Sidepath	1.3 miles	$260,000
Pleasant View Drive	South Lake Drive (SC 6) to Edmund Highway/Main Street (SC 302)	Sidewalks and Shoulder Bike Lane	3.1 miles	$310,000
Sherwood Drive	Longs Pond Road to Calks Ferry Road	Sidewalks and Shoulder Bike Lane	1.9 miles	$190,000
South Lake Drive (SC 6)	Bluefield Road to Edmund Highway/Main Street (SC 302)	Sidepath	2.3 miles	$460,000
Subtotal				**$5,610,000**
Red Bank Creek Greenway Trail				
Red Bank Creek	South Lake Drive to Platt Springs Road	Greenway Trail		
Total				**$5,610,000**

11. FUNDING OPTIONS

The final step in providing improvements in the White Knoll Area is to identify the sources of funding to implement and construct the recommendations. Since there are many agencies competing for scarce transportation improvement funds, the remaining question to be addressed is "Where will the money come from?"

The following information explores funding sources, both traditional and nontraditional, that may be available for use in the White Knoll Area to provide for transportation improvements that accommodate all users: pedestrians, bicyclists, transit riders, and motorists.

South Carolina Department of Transportation (SCDOT) funds the majority of projects along roads that are part of the State Highway System, including the secondary roads within the White Knoll Area. Lexington County should work closely with SCDOT to fund as many of the recommended projects as possible. A joint Intergovernmental Agreement between the two agencies would outline the roles and responsibilities for implementation as well as define any joint financing agreements.

South Carolina Transportation Infrastructure Bank (SCTIB) provides loans and other financial assistance for the construction and improvement of highways and other transportation facilities for public benefit, including economic development. Eligible projects for SCTIB funding must cost more than $100 million. The total estimated construction cost of the immediate, near-term, and long term roadway, bicycle and pedestrian projects in the White Knoll Area is less than $30 million and therefore would not be eligible for funding by the SCTIB.

Local Sales Tax – There has been some discussion in recent years over Lexington County's ability to pursue a local options sales tax for roadway improvements. South Carolina Counties are restricted by law so that only one of either "*...a capital project sales tax, a sales tax for transportation facilities...or any other sales tax enacted by local law of the General Assembly.*"

In 2004, the Legislature enacted the Lexington County School District Property Tax Relief Act, which allocates a one-cent local option sales tax for school building and debt service. This was approved by Lexington County voters in November 2004. Until the current local option sales tax is repealed or expires, it is unlikely that Lexington County would be able to impose a separate one cent sales tax for any other purposes, including the funding of transportation improvement projects.

Section 4-37-40 of the South Carolina Code states: "At no time may any portion of the county area be subject to more than one-percent sales tax levied pursuant to this chapter, Article 3, Chapter 10 of this title, or pursuant to any local legislation enacted by the General Assembly." All the legal interpretations discovered when researching this funding option indicate that Lexington County is limited to a one-percent local sales tax.

Tax Increment Financing for Counties (TIF) is authorized by the General Assembly for the purposes of redevelopment in areas that are considered predominantly slum or blighted. The incremental tax revenues obtained in redevelopment areas are used to pay debt service and project costs associated with redevelopment projects that remove blighted conditions. State law defines the areas and conditions under which TIF can be used.

State law also defines elements of the redevelopment plan, project, project area and project costs. Redevelopment costs are defined to include the cost of plans and professional services, property acquisition, construction, and financing. Tax revenues are placed within a special tax allocation fund are used for project costs.

Lexington County may be able to use TIF to generate funds to pay for transportation infrastructure improvements for redevelopment projects. However, no redevelopment plan, let alone targeted transportation infrastructure improvements have been identified within the White Knoll Area.

New Fees (Vehicle Registration) can be imposed on the county level to generate additional money for transportation programs. These fees are added as a flat rate to the annual vehicle registration fee that is administered at the county level. Fees are added with an end date in mind, or until the desired amount is collected, or are collected for the foreseeable future. Two examples of fees collected are a road maintenance fee that generates funds to be used solely on road projects that could include maintenance and improvements and a transit fee to help pay for the operation of transit service.

Transportation Enhancement Program (TEP) allows for the funding of nontraditional projects that provide education related to transportation activities as well as enhance transportation facilities and aesthetics along corridors. Eligible projects for the Transportation Enhancement Program include: Landscaping and Beautification, Bicycle and Pedestrian Facilities, Bicycle and Pedestrian Safety, and Control of Outdoor Advertising.

Because the White Knoll Area is within the COATS Metropolitan Planning Organization, applications for funding under the Transportation Enhancement Program are submitted directly to COATS because it is the local administrator of the Program for SCDOT.

To be eligible for TEP funding, a local 20% match is required and the applicant must be able to pay for project costs up front. As project phases are completed, invoices for reimbursement of the up-front project costs can be submitted.

Criteria for TEP-funded bicycle and pedestrian facility projects include providing connections between urban areas and neighborhoods, meeting AASHTO and FHWA design standards, and being consistent with COATS goals for the area. TEP funding can also be used for Extensive Landscaping and Beautification projects (provided these projects include irrigation), Bicycle and Pedestrian Safety (including bike route signage and bike route mapping), and Control of Outdoor Advertising, which involves the

removal of signage to improve the scenic nature of a roadway provided that ordinances are in place to ensure that billboard removal is allowed and enforceable.

Further information regarding eligible projects and the TEP application can be found at the South Carolina Department of Transportation's Transportation Enhancement Program's website:
http://www.scdot.org/community/tep.shtml

Private Financing is an option used to finance many different facility types using one of the following methods. In the White Knoll area, the most likely method of private financing for improvements, especially the bicycle and pedestrian facility improvements, is to make the approval of development and redevelopment projects contingent in part on the provision of these facilities or the payment of a fee to assist in funding the improvements. For example, Lexington County's ordinances could provide that a developer must agree to construct certain site specific improvements, such as sidewalks or turn lanes in order receive approval.

Public-Private Partnerships (PPP) are partnerships between local government(s) and one or more private businesses to achieve a desired goal that is out of reach of the individual partners due to cost concerns. Most road projects that are PPP are large-scale, new alignments that often are operated as a toll road. The White Knoll Area does not at this time appear to have any projects that have the potential to be funded under PPP.

12. CONCLUSIONS

Future Roadway Improvements

Safety and capacity improvements should be a priority along portions of Old Barnwell Road, Longs Pond Road, Platt Springs Road and Emanuel Church Road.

Vehicle-miles and vehicle-hours traveled within the White Knoll Area are expected to increase by approximately 90 percent and 93 percent respectively between 2005 and 2035.

In addition to the traffic congestion observed in the existing travel demand model along portions of Longs Pond Road, South Lake Drive and Edmund Highway, the 2035 travel demand model assignments indicate increasing congestion along Platt Springs Road, Old Barnwell Road, and Calks Ferry Road. Roadway improvement projects would be needed to address future congestion along these roads.

Pedestrian and Bicycle Improvements

The recommended pedestrian and bicycle improvements are intended to provide accessible facilities to make walking or biking easier, safer and more comfortable. This can be done by constructing sidewalks, on-road bike lanes, wider paved shoulders, sidepaths and greenway trails.

Transit Improvements

There is currently no fixed route transit service provided in the White Knoll area. Increasing growth within the area will increase demand for transit services, such as a potential nine mile long route along Platt Springs Road and South Lake Drive that would connect to the Columbia Metropolitan Airport and existing Route 28A.

Land Use Development

The rate of projected population growth and the amount of undeveloped land in the White Knoll Area makes it likely that commercial and residential growth will continue at a steady pace. Well-planned commercial, retail, office and other employment opportunities along with residential development within the area has the potential to shift travel to closer destinations and reduce the number and length of trips that are made in automobiles.

Residential development should provide for connected street networks to reduce the need to travel on the major roadways for more locally oriented trips and to enhance bicycle and pedestrian travel.

Mixed-use commercial and residential development can create a sense of place and be planned in a way that local residents could replace automobile trips with walking and biking. This type of development could be incorporated into the area around the intersection of Emanuel Church Road and Old Barnwell Road. While commercial development clustered around the intersection would be the central focus, new roadway connections could tie that core to the existing residential neighborhoods. Moving outward from the commercial core, land uses would transition to commercial, office and civic land uses, which would in turn be buffered by denser single family or multi-family housing, before transitioning to less dense single family residential areas

Total Estimate Project Costs

The total estimated construction costs for the recommended improvements are as follows:

Roadway Improvements	$32,640,000
Immediate Term Pedestrian and Bicycle Facilities	$ 2,690,000
Near Term Pedestrian and Bicycle Facilities	$ 6,530,000
Long Term Pedestrian and Bicycle Facilities	$ 5,610,000
Total Costs	$47,470,000

These cost estimates are in 2008 dollars, and do not include costs for right-of-way acquisition, environmental permitting and mitigation, drainage features, bridges and culverts and other items, and have not be adjusted to account for inflation and other effects that tend to increase construction costs over time.

Project Funding Options

SCDOT and Lexington County will continue to fund the majority of projects along roads that are part of the State Highway System, including the secondary roads within the White Knoll Area. Lexington County could possibly impose additional vehicle registration fees for transportation improvements, and require that developers construct site-specific transportation improvements as a condition of approval. Lexington County could also use Tax Increment Financing for paying for transportation infrastructure as part of redevelopment plans that meet the requirements of South Carolina State Law.

COATS Transportation Enhancement Program (TEP) could be used to fund nontraditional projects, including Landscaping and Beautification, Bicycle and Pedestrian Facilities, Bicycle and Pedestrian Safety, and Control of Outdoor Advertising. It is possible that some of the bicycle and pedestrian improvement alternatives could be constructed using this funding.

With the current one cent local option sales tax for school building and debt service in Lexington County, it appears the County is prohibited by state law to impose a separate one cent sales tax for any other purposes, including transportation improvements.

Transportation improvement projects within the White Knoll Area are not likely to be funded through the South Carolina Transportation Infrastructure Bank or Public-Private Partnerships since the cost requirements and/or nature of the projects make them unlikely to be approved or attractive to the sources.

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