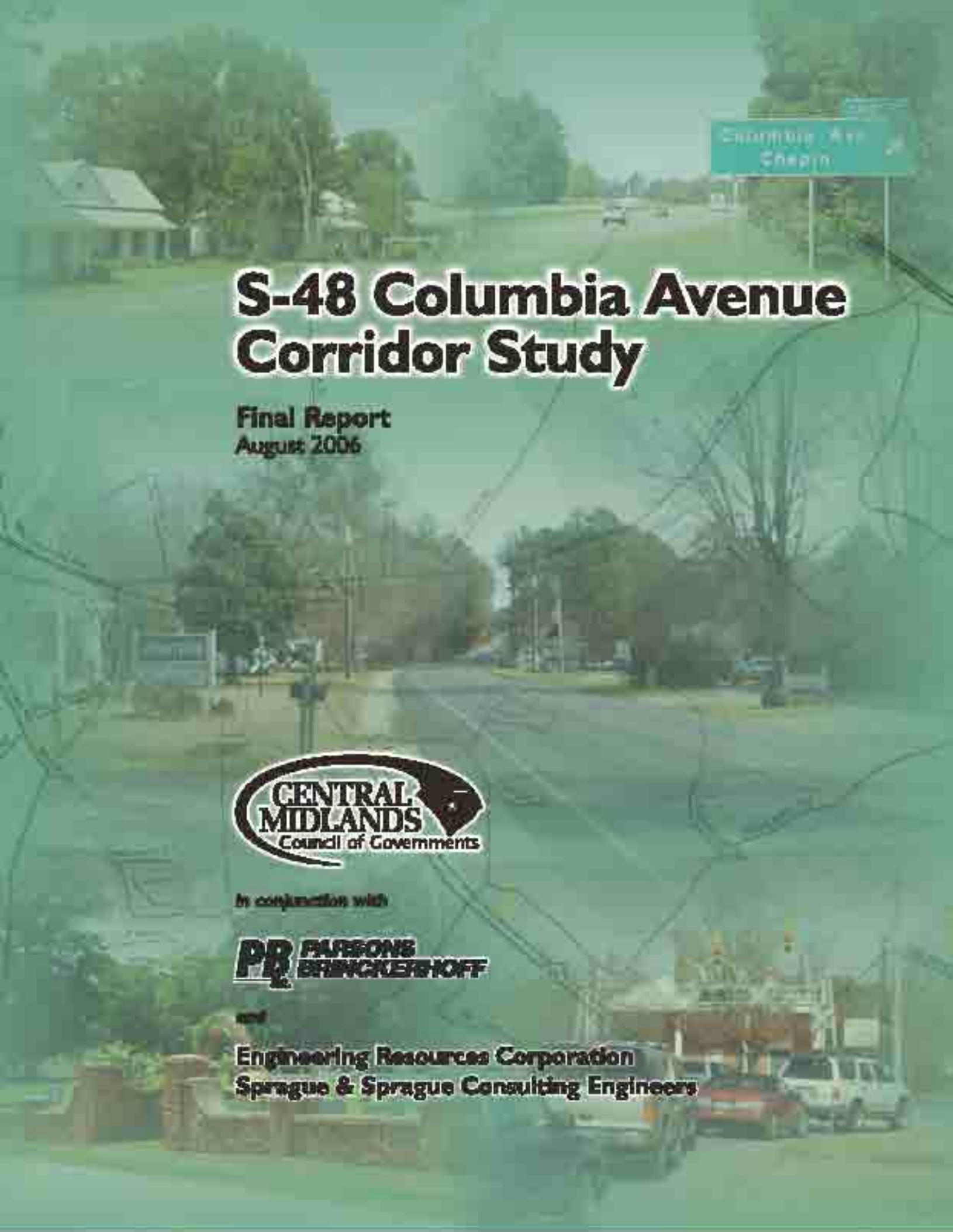

S-48 Columbia Avenue Corridor Study

Final Report
August 2006

CENTRAL MIDLANDS Council of Governments

In conjunction with

PB PARSONS BRINCKERHOFF

and

Engineering Resources Corporation
Sprague & Sprague Consulting Engineers

S-48 Columbia Avenue Corridor Study

Final Report

August 2006

Submitted to

CENTRAL MIDLANDS Council of Governments

Submitted by

PB PARSONS BRINCKERHOFF 100 YEARS

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ES. EXECUTIVE SUMMARY

This study examines transportation and land use concerns in and around the S-48 Columbia Avenue Corridor, and identifies what actions can be taken to make the most efficient use of the existing transportation system's finite capacity and capitalize on the corridor's unique qualities, in order to preserve, enhance, and focus community character in both the short- and long-term.

S-48 Columbia Avenue Corridor

The S-48 Columbia Avenue Corridor serves as the principle link between the Town of Chapin and Interstate 26 (I-26). It is currently a two-lane (i.e., one travel lane in each direction) roadway with paved shoulders, limited sidewalks along its western end, and a center turn lane in the vicinity of Chapin High School. The study area boundary runs the length of S-48 Columbia Avenue for approximately 2 miles from I-26 to the east to US 76 (Chapin Road) to the west.

Public involvement was essential to the success of the study; therefore, communication between the Project Team and the public was ongoing in the form of a Public Involvement Plan (PIP). This PIP consisted of three major parts: establishing a Study Steering Committee (SSC) to provide overall policy and technical guidance to the plan; coordination with interested stakeholders; and informing and soliciting comments/suggestions from the general public.

ES.1 Existing Conditions

To gain a complete understanding of the corridor, existing conditions data was collected. This information was derived primarily through the use of secondary data. This was supplemented with information obtained through searches of the Central Midlands Council of Government (CMCOG) databases, and contacts with Lexington County, the Town of Chapin, as well as other project stakeholders involved in the study. Existing conditions data was collected, examined, and compiled into the following categories:

<u>Land Use Characteristics and Regulations</u>

- Existing Land Use Patterns – development types, density of development, and vacant land;

- Existing Development Character – definable groupings or concentrations of uses;
- Planned Development;
- Development Regulations, Plans, and Policies – zoning, comprehensive plans, and future plans and standards.

Transportation Network

- Local Street Network – characteristics, conditions, parking, curb cuts, lighting, signage, traffic conditions, and planned improvements;
- Interstate 26;
- Pedestrian and Bicycle Facilities – bike amenities, sidewalks, and crosswalks;
- Public Transit – SmartRide commuter service and associated park-and-ride lot; and
- Railroad Corridor.

ES.2 Transportation and Land Use Issues

Through the course of gathering existing conditions data, comments received from the public, and discussions of the SSC, a number of transportation and land use issues within the S-48 Columbia Avenue Corridor were identified. These issues are presented in detail along with possible opportunities and constraints in Chapter 3 of the S-48 Columbia Avenue Corridor Study Final Report and are generally described as follows:

- Vehicular Travel Issues – congestion in the corridor during peak commuter hours, a lack of parallel routes and connections between S-48 and other roadways, "bottleneck" conditions, the projection that all intersections will fail (i.e., delays at intersections will be beyond acceptable levels) by the year 2025, geometric design challenges, increased through traffic at Chapin's town center due to vehicular traffic avoiding the intersection of S-48 and US 76, and difficult truck ingress and egress to key land uses;
- Pedestrian and Bicycle Travel Issues – excessive travel speeds (particularly east of Chapin High School), lack of sidewalks and associated ADA curb ramps, nonexistence of general connections between land uses, no controlled pedestrian crossings

due to the absence of signalized intersections east of Chapin Road, vehicular disregard for pedestrian and bicycle right-of-way and safety, and a lack of elements to designate a bicycle-friendly environment (e.g., bike lanes, "share the road" signage, etc.);

- Transit Issues – limited size and perceived safety of the Smart-Ride park-and-ride lot, lack of pedestrian and bicycle connections to the park-and-ride lot, and the absence of transit service to the majority of the corridor;
- Railroad Corridor Issues – perpendicular intersection of S-48 and the railroad through a ninety-degree turn, significant queuing of westbound traffic that is waiting for trains to clear, difficult left turn movements for those wishing to access properties along Northwest Columbia Avenue, numerous at-grade railroad crossings that increase the potential for modal conflicts, and the railroad's limiting of potential alternate routes and fragmenting of the community; and
- Land Use Issues – large amounts of land zoned general commercial (GC) and intensive development (ID) with the potential to build out in a low density, "sprawl-like" pattern (e.g., large residential lot sizes, limited mix of uses, etc.), incompatible land uses, eroding community character, and the proximity of existing land uses to the roadway increasing the impacts of potential future widening.

ES.3 Preliminary Alternative Solutions

From an examination of baseline information, public comments, and identified issues, preliminary alternatives were developed. Each alternative was evaluated against performance criteria that included ability to: improve the safety and security of the transportation system for vehicular and non-vehicular users; facilitate integration and connectivity among various modes of transportation; improve the experience, access, and mobility of pedestrians and bicyclists; improve the experience, access, and mobility of transit users; maintain adequate traffic mobility for vehicular users; enhance and preserve community character; be reasonably implemented; be reasonably maintained or enforced; and contribute to the meeting of future growth expectations for the year 2025.

Preliminary alternatives that met these criteria were carried forward for further refinement, development, and analysis in the rec-

ommendations phase of the study. In many cases, given the presence of closely related issues, the evaluation indicated that aspects of individual alternatives should be merged into more comprehensive proposals for key areas along the corridor.

A comprehensive listing of preliminary alternatives along with performance criteria evaluation are included in Chapter 4 of the S-48 Columbia Avenue Corridor Study Final Report. The listing of preliminary alternatives was not intended to represent an exhaustive compilation of fully developed designs or approaches for improvements within the S-48 Columbia Avenue Corridor; in contrast, it was intended to serve as a starting point for discussion regarding overall reasonableness of design concepts and possible courses of action for improvements.

ES.4 Recommendations

Preliminary alternatives were presented to and reviewed by the SSC and the general public. Once comments were received from these groups, recommendations were developed. Recommendations were grouped by geographic impact, level of detail, and capital cost necessary to implement as follows:

- **Corridor-wide Recommendations –** included land use and access management recommendations (i.e., increased coordination between Town of Chapin and Lexington County, adoption of an official map, creation of zoning overlay districts, and consideration of impact fees for new development); and capital improvement recommendations (i.e., widening of S-48 and targeted pedestrian and streetscape improvements).
- **Site-Specific Recommendations –** included access and circulation improvements at Chapin High School (i.e., improvement to rear entry and parent drop-off/pick-up entrance); extension of Bennington Court; construction of the Southern Connector, a new east-west linkage; intersection improvements; replacement of the S-48/I-26 Interchange; western extension of S-48 with railroad grade separation; and new interchange on I-26 between existing exits 91 and 97.

A complete listing of recommendations for the corridor, along with graphic depictions, is included in Chapter 5 of the S-48 Columbia Avenue Corridor Study Final Report.

ES.5 Preliminary Implementation Plan

A preliminary plan of implementation for recommended improvements was developed and is presented in Table ES-1. Where applicable, an estimated order-of-magnitude cost is presented.

The COATS TIP 2006-2011 includes improvements to S-48 Columbia Avenue. Funding has been allocated for design with $400,000 in FY 2008 and $400,000 in FY 2009. Additional funding will need to be allocated in the TIP or secured from other sources to realize construction of improvements recommended in the S-48 Columbia Avenue Corridor Study Final Report.

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Table ES-1
Preliminary Implementation Plan

Action	Estimated Order-of-Magnitude Cost[1]	Potential Responsible Agencies	Target Start Date[2]	Target Completion Date	Comments
Short-Term (0 to 5 years)					
Increased Coordination Between Town of Chapin and Lexington County	N/A	Town of Chapin; Lexington County	Immediately	Continuous and On-going	• Begin increased coordination immediately to ensure effectiveness of other recommendations.
Official Map	$40,000 - $75,000[3]	Town of Chapin; Lexington County; CMCOG	August 2006	January 2007	• Adoption of an official map should be the highest priority "product" recommendation to ensure that right-of-ways are preserved (e.g., Bennington Court Extension, Southern Connector, etc.). • Town/County staff or CMCOG staff could produce the official map, or, if needed to expedite development and adoption, a consultant could perform these services.
Zoning Overlay Districts	$50,000 - $80,000[3]	Town of Chapin; CMCOG	November 2006	March 2007	• Need to be adopted prior to new development occurring on the eastern end of the corridor. • Town or CMCOG staff could develop overlay districts, or, if needed to expedite development and adoption, a consultant could perform these services
Consideration of Impact Fees	N/A	Town of Chapin; CMCOG	August 2006	TBD	• Town of Chapin planning commission should review the cost/benefit of impact fees and determine if such should be pursued and on what timeframe.
Chapin High School Parent Drop-off/Pick-up Right Turn Lane	$103,000[4]	Lexington-Richland School District 5; SCDOT	October 2006	August 2007	• To increase the immediate safety and functionality of this intersection, implementation of this right turn lane should be of the highest priority to Lexington-Richland School District 5. • Partnering between Lexington-Richland School District 5 and SCDOT will be essential.
Chapin High School Rear Entry Improvements	$522,000[4]	Lexington-Richland School District 5	January 2008	August 2008	• Partnering between Lexington-Richland School District 5 and SCDOT will be essential.
Targeted Pedestrian Improvements	$60 per linear foot[3]	SCDOT; Town of Chapin; Private Property Owners	As needed	TBD	• Prior to the widening of S-48, targeted improvements to pedestrian facilities should be undertaken by the Town of Chapin (e.g., spot sidewalk replacement, establishment of key connections, installation of ADA curb ramps, etc.). • Private property owners should be encouraged to establish pedestrian connections within their properties and to adjacent properties.
Targeted Streetscape Improvements	No more than $5,000 per location[3]	Town of Chapin; Private Property Owners	As needed	TBD	• Prior to the widening of S-48, targeted streetscape improvements should be undertaken by the Town of Chapin (e.g., gateway treatments, intersection beautification, etc.). • Private property owners should be encouraged to participate either through beautification of their own properties or sponsorship of public projects. • Any treatments should be low cost, reasonable applications intended to only fill the gap between today and when full streetscapes will be implemented as part of the S-48 widening.
Southern Connector Initial 2-Lane Section (Amick's Ferry Rd. to Old Lexington Hwy.)	$2,415,000[4]	Town of Chapin; Lexington County; SCDOT	January 2007	July 2009	• This section of the Southern Connector should be implemented soon, as it will immediately deliver tangible traffic flow improvements at a reasonable cost in today's financial climate. • It may not be necessary to implement this project and the Bennington Court Extension – this project should take priority over the Bennington Court Extension, if funding is adequate. • While a 2-lane section would be initially implemented, right-of-way for a 5-lane section should be acquired.

Table ES-1
Preliminary Implementation Plan

Action	Estimated Order-of-Magnitude Cost[1]	Potential Responsible Agencies	Target Start Date[2]	Target Completion Date	Comments
Bennington Court Extension	$824,000[4]	Town of Chapin; Lexington County	January 2007	July 2009	• It is recommended that the Town of Chapin and Lexington County partner to fund the design, construction, and maintenance of this project in order to expedite the new street's implementation and present a good faith effort to be "team players" in alleviating traffic congestion in the Town of Chapin. • It may not be necessary to implement this project and the initial 2-lane section of the Southern Connector – the initial 2-lane section of the Southern Connector should take priority over this project, if funding is adequate.
S-48 Widening 3-Lane Section	$4,326,000[4]	SCDOT	July 2007	June 2011	• The widening of this section of S-48 should be implemented soon, as it will immediately deliver tangible traffic flow improvements at a reasonable cost in today's financial climate. • If the widening of this section of S-48 is delayed, then independent improvement of intersections along this section must be undertaken to preserve level of service.
Medium-Term (5 to10 years)					
Chapin High School Parent Drop-off/Pick-up Alternate Access	$1,424,000[4]	Lexington-Richland School District 5; SCDOT	January 2009	July 2012	• Partnering between Lexington-Richland School District 5 and SCDOT will be essential.
Southern Connector (Amick's Ferry Rd. to S-48 Columbia Ave.)	$17,991,000[4]	SCDOT	June 2009	January 2014	• If full funding is not available, the Southern Connector could be initially constructed as a 3-lane section (with right-of-way acquisition for a 5-lane section) and still retain an appropriate level of service in 2025.
Southern Connector (Amick's Ferry Rd. to St. Peter's Church Rd.)	$4,864,000[4]	SCDOT	January 2013	June 2015	• If full funding is not available, the Southern Connector could be initially constructed as a 3-lane section (with right-of-way acquisition for a 5-lane section) and still retain an appropriate level of service in 2025.
Long-Term (10 to 20 years)					
S-48 Widening 5-Lane Section	$10,080,000[4]	SCDOT	January 2014	June 2017	• If the widening of this section of S-48 is delayed, then independent improvement of intersections along this section must be undertaken to preserve level of service.
Replacement of S-48/I-26 Interchange	$20,000,000 - $24,000,000[3]	SCDOT	July 2014	June 2019	• The bridge of this interchange currently has a structural rating of "fair," and based on traffic volume projections will become functionally obsolete in the near future.
S-48 Columbia Avenue Extension and Railroad Grade Separation	$5,368,000[4]	SCDOT	January 2020	December 2024	• Once this new grade separation is constructed, the existing at-grade crossing at Amick's Ferry Road and Chapin Road would be closed; therefore, this recommendation cannot be implemented until an alternative route from Amick's Ferry Road to the eastern end of S-48 is provided (i.e., the Southern Connector).
Extended-Term (20+ years)					
New I-26 Interchange	TBD	SCDOT	TBD	TBD	• To determine need and timing, this new interchange should be regionally evaluated once the new COATS Travel Demand Model is available.

[1] Cost estimates are in 2006 dollars.

[2] Assumes funding availability.

[3] Derived from experience on prior, similarly scoped efforts.

[4] Itemized order-of-magnitude cost estimate is included in Appendix G of the S-48 Columbia Avenue Corridor Study Final Report.

1. INTRODUCTION

1.1 Background

The S-48 Columbia Avenue Corridor serves as the principle link between the Town of Chapin and Interstate 26 (I-26). It is currently a two-lane (i.e., one travel lane in each direction) roadway with paved shoulders, limited sidewalks along its western end, and a center turn lane in the vicinity of Chapin High School.

Over the past 10-15 years, residential development south of the Town of Chapin has resulted in S-48 experiencing increased traffic volumes as residents travel between their homes and I-26 and points beyond (e.g., Columbia, Newberry, etc.). Presently, most delays along the corridor are limited to peak hours and are of a short duration. However, modeling of future traffic conditions along S-48 Columbia Avenue has demonstrated that the present two-lane configuration will be grossly inadequate to meet future volume demands. Therefore, it has become apparent that an increase in the capacity of S-48, the creation of optional east-west linkages, or a combination of the two will be necessary to accommodate expected growth in the area. Additionally, while improvement of the functionality of S-48 and the entire transportation network in and around Chapin is important, preservation and enhancement of the community's character is paramount.

This document presents a multimodal and land use plan to improve transportation conditions along the S-48 Columbia Avenue Corridor in a context sensitive manner that retains and enhances the character that is the Town of Chapin.

1.2 Statement of Purpose

The purpose of the study is to examine transportation and land use concerns in and around the S-48 Columbia Avenue Corridor, and identify what actions can be taken to make the most efficient use of the existing transportation system's finite capacity and capitalize on the corridor's unique qualities, in order to preserve, enhance, and focus community character in both the short- and long-term.

1.3 Goals and Objectives

Based on the statement of purpose above, the following goals and associated objectives were formulated for this corridor study.

Goal 1: Improve Transportation Service, Performance, and Efficiency

Objectives:

- Advance solutions that provide adequate service for local, commuter, and commercial traffic in and around the corridor, while eliminating local bottlenecks and other transportation problems.
- Develop recommendations that enhance access and mobility for all modes including automobiles, transit, bicycles, and pedestrians.
- Explore options to maximize the performance of the existing transportation network and delay/regulate costly infrastructure improvements.
- Examine appropriate transportation components that are balanced with land use desires for the corridor.
- Focus specific attention on the analysis and evaluation of innovative development controls to encourage projects that reduce modal conflicts.

Goal 2: Preserve and Enhance Community Character

Objectives:

- Discover the distinct character that exists within the corridor through interaction with the Study Steering Committee, workshops with the general public, and observation of the corridor.
- Capitalize on the corridor's unique qualities through appropriate transportation improvement scenarios, land use recommendations, and urban design plans.
- Develop plans that preserve, enhance, and focus community character, while eliminating confusion and contradiction.

Goal 3: Create a Vision that Fits and is Feasible

Objectives:

- Provide a plan that balances desires for transportation and future land use with the realities of implementation.

- Identify "best practices" of non-traditional, innovative, and flexible funding mechanisms for transportation projects.
- Develop a concise implementation plan that equitably distributes costs and benefits and includes recommended actions, cost estimates, and potential responsible agencies.

Goal 4: Facilitate and Engage an Effective Public Involvement Program

Objectives:

- Collaborate agencies through the regular meeting of a Study Steering Committee, which will act as the major ongoing link to the public.
- Provide key stakeholders in and around the S-48 Columbia Avenue Corridor with project updates and methods for expressing comment through a series of stakeholder meetings.
- Invite the public to communicate their needs, wants, desires and concerns by holding public meetings.
- Accurately communicate to the public what is needed, desired, and/or required from them with regard to involvement.

1.4 Report Format

The information presented in this final report is derived from four technical memoranda prepared during the course of the project, and further refined based upon feedback from the general public, stakeholders, and agencies having jurisdiction over transportation and land use conditions directly relevant to the S-48 Columbia Avenue Corridor.

This final report is divided into six chapters. This introduction provides background information pertaining to the study, the limits of the study area, and an overview of the public involvement plan. Chapter 2 presents information on the corridor's existing conditions with respect to land use characteristics, development regulations, and the transportation network. A summary of transportation and land use issues identified during the study process are presented in Chapter 3, while Chapter 4 presents a range of potential alternative solutions that were considered and evaluated. Final study recommendations composed Chapter 5, with a preliminary implementation plan for recommendations outlined in Chapter 6.

1.5 Previous Planning Documents

As a first step in familiarization of the project, a number of related reports, plans, and studies were examined as follows:

- *One Day Assessment Report*, October 13, 1992, South Carolina Downtown Development Association;
- *Chapin: A Vision for Tomorrow*, November, 1992, Clemson University Planning Studies Department;
- *Long-Range Intermodal Transportation Plan 2025*, September 25, 2003, CMCOG;
- *Columbia Area Transportation Study: Transportation Improvement Program Fiscal Year 2006 – 2011*, June 22, 2006, CMCOG in coordination with SCDOT;
- *Bike and Pedestrian Pathways Plan for the Columbia Area Transportation Study*, March 2006, CMCOG; and
- *Chapin Community Master Plan Charrette Report*, Clemson Institute for Economic & Community Development, January 17-19, 2006

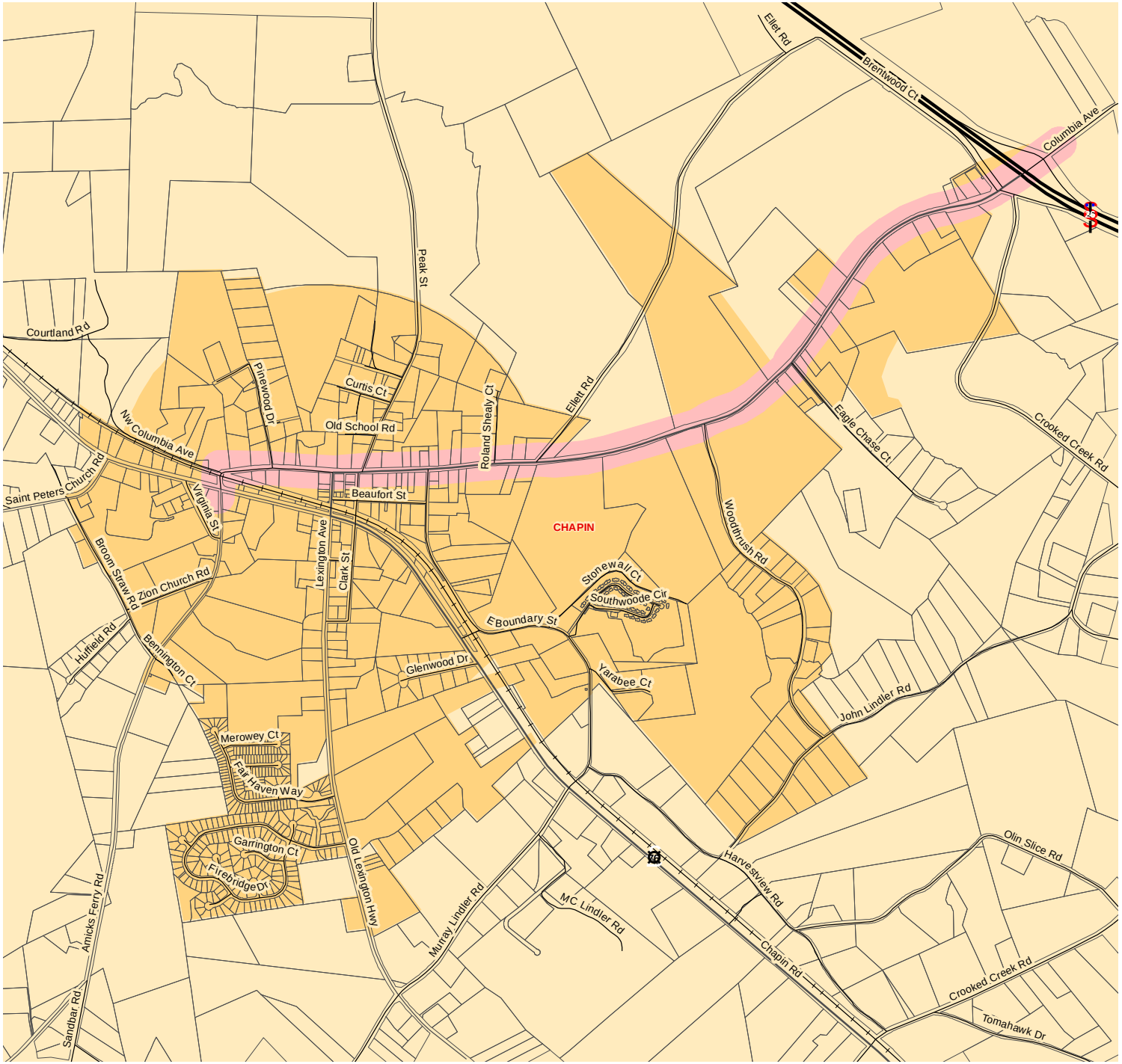
Content was reviewed to minimize redundant data collection, provide insight into the workings of the corridor and its surrounding area, and gain understanding as to previous recommendations rationale. These documents are summarized Appendix A.

1.6 Study Area

The study area boundary runs the length of S-48 Columbia Avenue for approximately 2 miles from I-26 to the east to US 76 (Chapin Road) to the west. **Figure 1.6-1** graphically depicts the study area.

1.7 Public Involvement Plan

Public involvement was essential to the success of this study; therefore, communication between the Project Team and the public was ongoing in the form of a Public Involvement Plan (PIP). This PIP consisted of three major parts: establishing a Study Steering Committee (SSC) to provide overall policy and technical guidance to the plan; coordination with interested stakeholders; and informing and soliciting comments/suggestions from the general public.



S-48 Columbia Avenue Corridor Study

LEGEND

- Town of Chapin
- Study Area

Source: CMCOG 2005; Parsons Brinckerhoff 2005
Map Created: 08/25/05

This map is for conceptual presentation purposes only, and is believed to be fundamentaly accurate; however, no guarantees as to its accuracy or completeness are expressed or implied.

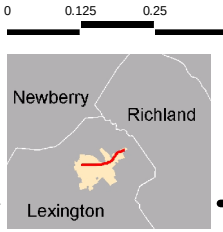


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Figure 1.6-1
Study Area

1.7.1 Study Steering Committee

The SSC was formed to oversee and guide the study process. The members of the SSC were selected given their particular expertise and involvement in the provision of the various modes of transportation services and/or the guidance and regulation of development activities in the corridor. Representatives from the following groups comprised the SSC:

- CMCOG;
- Central Midlands Regional Transit Authority (CMRTA);
- Lexington County;
- Local business leaders;
- School District Five of Lexington and Richland Counties;
- South Carolina Department of Transportation (SCDOT); and
- Town of Chapin.

Five separate SSC meetings were held. The purpose of these meetings was to focus the major objectives of the project, identify data needs, review work products, and discuss potential strategies, recommendations, and implementation plans.

1.7.2 Project Stakeholders

In addition to the SSC, a series of stakeholder meetings were held to gain direct feedback from groups with significant interest in or influence over corridor issues. Summaries of these meetings are included in Appendix B.

1.7.3 Opportunities for Public Comment

In order to solicit comments and ensure public acceptance of the alternatives presented in the S-48 Columbia Avenue Corridor Study, three public meetings were held. The first public meeting was held on Tuesday, November 15, 2005 from 5:00 p.m. to 7:00 p.m. This meeting provided the opportunity to formally present the study to the public. Topics such as the study purpose, goals/objectives, and existing conditions were discussed. The meeting was conducted in charrette format to provide an interactive environment in which participants could easily express issues and concerns. The charrette consisted of a drop-in

The first public meeting utilized a charrette format to provide an interactive environment in which participants could easily express issues and concerns.

meeting featuring three facilitated planning focus groups. The planning focus groups concentrated on land use, traffic/transportation, and community character and operated as roundtable discussions where feedback was received and recorded on large easel pads. Additionally, display boards were set up at each focus group containing existing conditions information relevant to that group's topic.

The second public meeting was held on Thursday, February 23, 2006 from 5:00 p.m. to 7:00 p.m. Issues identified and preliminary alternatives evaluated were presented. Alternatives concentrated on the following elements: vehicular travel; pedestrian and bicycle travel; transit; railroad corridor; and land use.

The third and final public meeting was held on Thursday, June 15, 2006 from 5:00 p.m. to 7:00 p.m. Preliminary recommendations and the implementation plan were presented.

While the first public meeting was conducted in a charrette format, the second and third meetings were conducted in an open-house format with display boards presenting key project components. Additionally, a formal presentation was made at each of these meetings.

All public meetings were held at Chapin High School at 300 Columbia Avenue and provided the opportunity for the public to offer feedback by submitting written comments via comment sheets. The option was provided for the comment sheet to be completed during the meeting, or participants were welcome to take a comment sheet with them and return it via mail, email, or fax. Input obtained from each public meeting was considered throughout the remaining stages of the planning process and was factored into subsequent project efforts including the recommendations presented in this final report.

Along with these meetings, other public information materials were prepared in the form of flyers, fact sheets, and press releases to ensure that the general public was informed of various phases of the planning process.

2. EXISTING CONDITIONS

This chapter presents information on the existing land use characteristics in the corridor, pertinent development regulations, and currently planned development in the corridor. In addition, it presents the existing components of transportation systems, including local street network, I-26, public transit, pedestrian/bicycle facilities, and the railroad corridor.

Information included in this chapter is intended to summarize the basic characteristics of development and transportation facilities in the corridor that established the context that allowed the following to occur:

- Setting the basis and goals for soliciting comment through the public involvement process;
- Identifying major issues and problems that need to be addressed in the corridor; and
- Formulating recommendations for corridor improvements/programs.

The information included in this chapter was derived primarily through the use of secondary data. This was supplemented with in-field data collection and information obtained through searches of the CMCOG databases, and contacts with Lexington County, the Town of Chapin, as well as other project stakeholders involved in the study.

2.1 Land Use Characteristics and Regulations

2.1.1 Existing Land Use Patterns

Figure 2.1-1 depicts existing land use patterns along the S-48 Columbia Avenue Corridor. Overall, land use patterns vary significantly along the corridor, and include development types such as:

- Various types of commercial development including general, office, and interstate commercial;
- Rural-scale residential development;
- Public and institutional developments including government, religious, and cemetery uses;

- Light industrial development including utility and warehouse distribution uses; and
- Large, contiguous tracts of vacant land.

In general, land use patterns decrease in density from west to east along the corridor, with the majority of existing development occurring west of Woodthrush Road. East of Woodthrush Road, existing development exhibits a marked decrease in both occurrence and density.

2.1.2 Existing Development Character

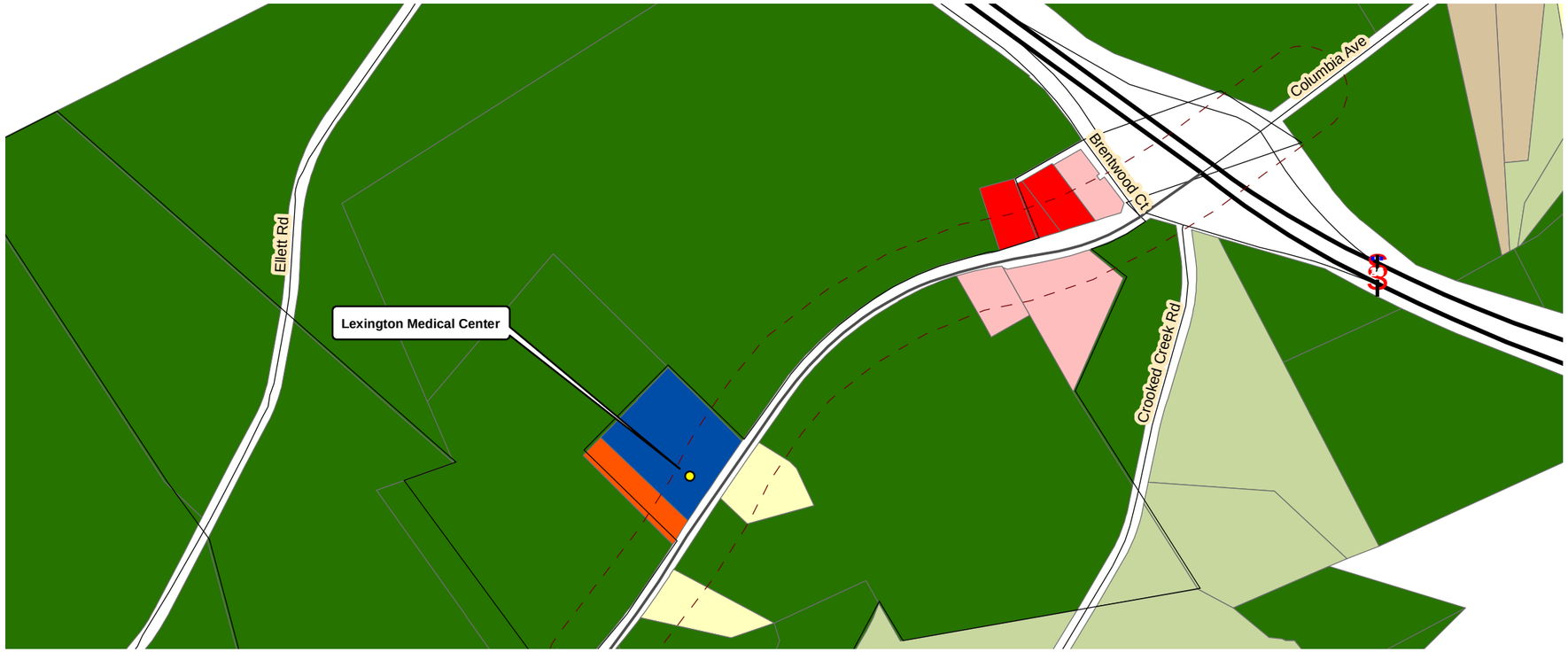
The S-48 Columbia Avenue Corridor and its associated development character have evolved with changes in the overall development of the surrounding area. Section 2.1.1 indicates a somewhat disjointed land use context along the corridor. However, while fragmented, a close examination of land use characteristics indicates that the corridor contains definable groupings or concentrations of uses.

Figure 2.1-2 depicts a conceptual diagram of the current generalized development character along the S-48 Columbia Avenue Corridor. The following are brief descriptions of each of the four generalized development character areas:

A mixture of residential and commercial uses (both conventional commercial buildings and residential conversions) characterizes the western end of the corridor.

- **Mixed Residential/Commercial** – Early in its development, the western portion of the corridor was dominated by single-family residential development situated just off of the downtown area. As residential uses expanded out from the town center, many of these residential structures converted to commercial uses. Today, conventional single-family residential development, interspersed with commercial uses, (varying from converted residential structures to newer, conventional commercial buildings) characterize this area.
- **Transitional** – As the population of the surrounding region increased through suburbanization in the 1970s, 80s, and 90s, the corridor progressed into a main automobile commuting route between residential developments surrounding Chapin and the City of Columbia. At the same time, development along the corridor steadily progressed to the east where va-

S-48 Columbia Avenue Corridor Study



LEGEND

- Agricultural
- Commercial
- Forest
- Gas/Convenience/AutoRepair
- Light Industrial
- ManufacturedHomes
- Office/Commercial
- Public/Institutional
- SingleFamilyDetached
- Utility
- Vacant

- Study Area
- Community Resources

Source: Lexington County 2005
Map Created: 08/25/05

This map is for conceptual presentation purposes only, and is believed to be fundamentaly accurate; however, no guarantees as to its accuracy or completeness are expressed or implied.

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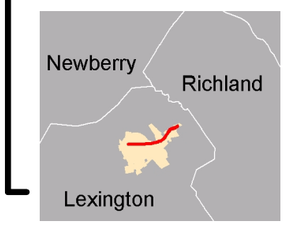

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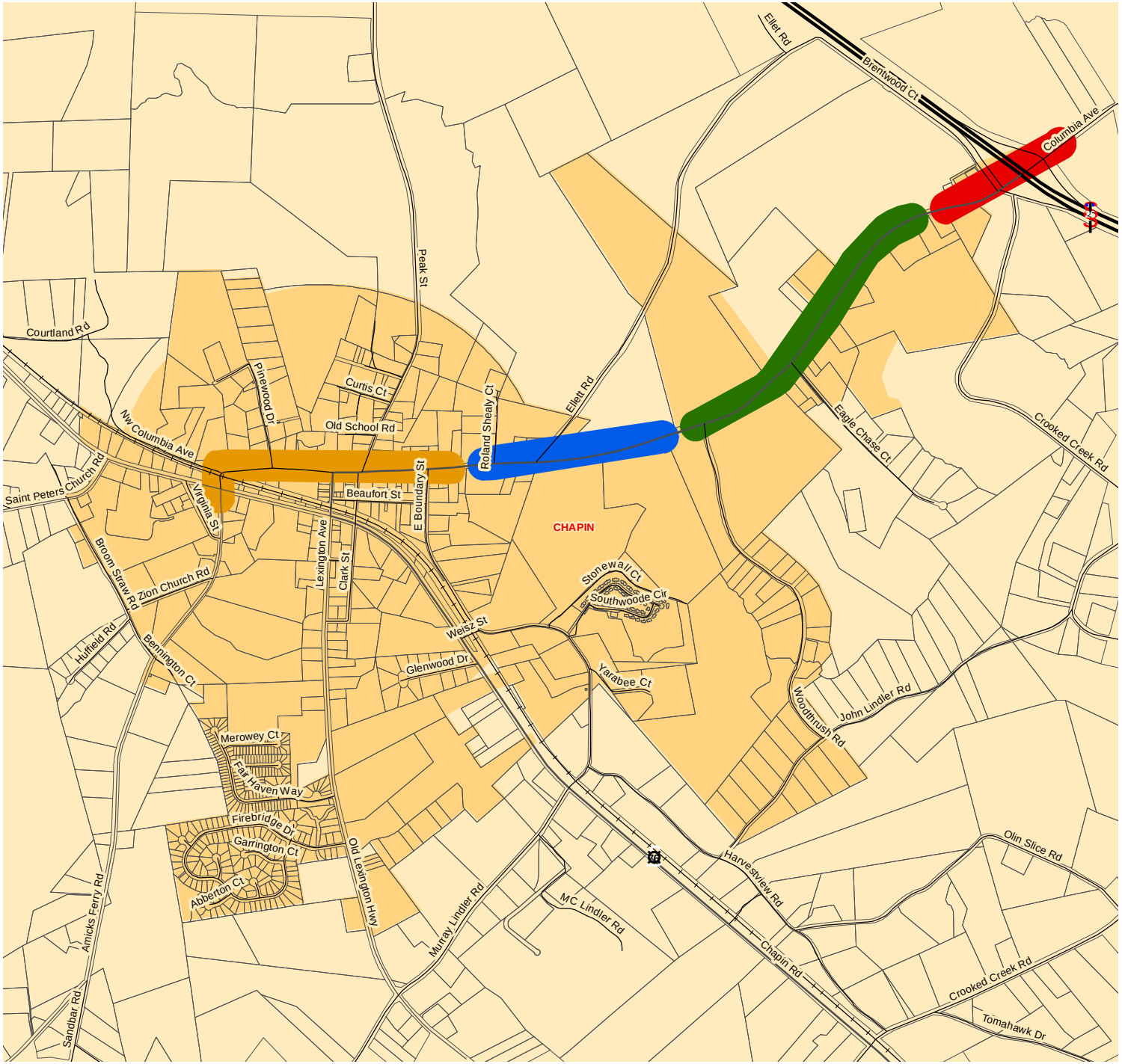
Figure 2.1-1
Existing Land Use



S-48 Columbia Avenue Corridor Study

LEGEND

Generalized Development Character

- Mixed Residential/Commercial
- Transitional
- Rural
- Interstate Commercial

- Town of Chapin

Source: Lexington County 2005; Parsons Brinckerhoff 2005
Map Created: 08/25/05

This map is for conceptual presentation purposes only, and is believed to be fundamentaly accurate; however, no guarantees as to its accuracy or completeness are expressed or implied.

0 0.125 0.25 0.5 Miles

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Figure 2.1-2
Generalized Development Character

cant land was available. This initial eastward expansion came at a time when few development regulations were in place, resulting in a variety of incompatible and contradictory uses being located adjacent to one another. Today, this portion of the corridor continues to struggle to find an identity, with educational, light industrial, single-family residential, cemetery, and general commercial uses characterizing the area.

- **Rural** – The western end of the corridor has yet to experience significant development and has retained much of its rural character. With the exception of limited residential, institutional, and office commercial uses, very large, contiguous tracts of vacant, heavily wooded land characterize this area.
- **Interstate Commercial** – At about the same time that development began to move eastward along the corridor, vacant land surrounding the interchange of S-48 and I-26 began to develop. With commuters realizing that Columbia Avenue and I-26 provided a more direct route to/from Columbia than US 76, interstate commercial development found a market at the far eastern end of the corridor. Today, interstate-oriented uses, including gas stations, convenience stores, and fast food restaurants, provide quick "in-and-out" services to Chapin commuters and I-26 travelers alike.

Interstate-oriented uses characterize the eastern end of the corridor.

It is important to note that the above categories are general in nature. They are intended to depict the *predominant development character* of each portion of the corridor, not be all-inclusive of all development types (See Figure 2.1-1, Existing Land Use, for a depiction of all development types). For example, even though the area that is categorized as "Rural" includes several residences, a real estate office, and a medical complex, it is dominated by large, vacant tracts of land; therefore, the character (i.e., overall "feel") of this area is "Rural."

2.1.3 Planned Development

An inventory of planned development has been completed through discussions with the Town of Chapin zoning administrator. **Table 2.1-1** and **Figure 2.1-3** present currently planned developments along the corridor.

Table 2.1-1
Planned Development

Property Owner	Proposed Land Use	Status
Farm Boys BBQ	Restaurant	Under Construction
Virginia Meehan	Shopping Center	Preliminary Approval
Fire Department	Institutional	Planning Stages
Harrell/Meetze	Residential	Subdivision Approved

2.1.4 Development Regulations, Plans, and Policies

2.1.4.1 Zoning Regulations

Zoning regulations govern what land uses are permitted by municipal law to be developed on a particular parcel of land. They also govern various physical development characteristics such as bulk requirements (e.g., minimum lot size, building coverage, building height, minimum setbacks/yards) and often density of development (e.g., dwelling units per acre, floor area ratio). Whereas policy documents such as comprehensive plans establish a local community's overall goals, objectives, and intents for future development and community character; zoning regulations are one of the primary measures used to implement such land use policies.

Figure 2.1-4 depicts the existing zoning map for the corridor, derived from the zoning ordinances of the Town of Chapin and Lexington County.

Only three Town of Chapin zoning categories exist along the S-48 Columbia Avenue Corridor: general commercial, office commercial, and single family residential. The most predominant of these three is general commercial with approximately one-half of the corridor's frontage being comprised of this category. Only one Lexington County zoning classification fronts along the corridor, that being intensive development.

Permitted uses for each zoning classification found along the S-48 Columbia Avenue Corridor are:

- **General Commercial (Town of Chapin) -** These areas are intended for businesses located along outlying traffic arteries

S-48 Columbia Avenue Corridor Study

LEGEND

- Proposed Development
- Town of Chapin
- Study Area

Source: Town of Chapin 2006
Map Created: 07/17/056

This map is for conceptual presentation purposes only, and is believed to be fundamentaly accurate; however, no guarantees as to its accuracy or completeness are expressed or implied.

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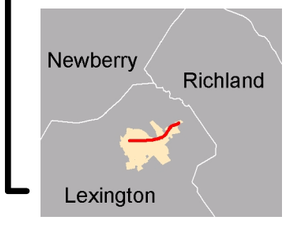

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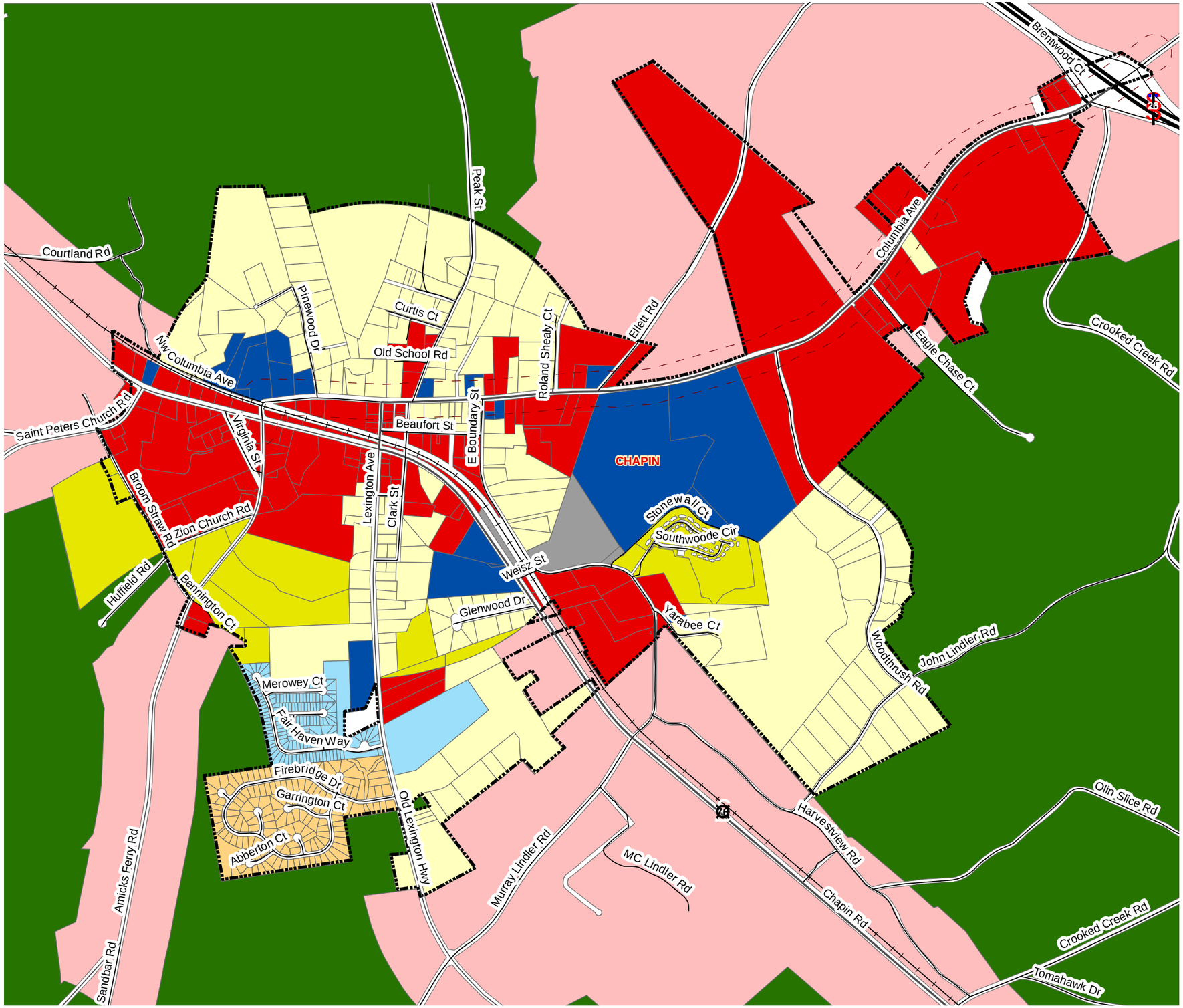
Figure 2.1-3
Planned Development

S-48 Columbia Avenue Corridor Study



LEGEND

Town of Chapin Zoning

- General Commercial (GC)
- Office Commercial (OC)
- Industrial (I)
- Planned Unit Development (PUD)
- General Residential (RG)
- Single Family Residential (RS-1)
- Single Family Residential (RS-2)

Lexington County Zoning

- Intensive Development (ID)
- Restrictive Development (RD)

- Town of Chapin
- Study Area

Source: CMCOG 2005; Lexington County 2005
Map Created: 08/25/05

This map is for conceptual presentation purposes only, and is believed to be fundamentaly accurate; however, no guarantees as to its accuracy or completeness are expressed or implied.

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CENTRAL MIDLANDS Council of Governments

Figure 2.1-4
Zoning

that primarily engage in the sale of durable goods, equipment, services, and recreation. Multifamily dwellings are also permitted. Providing specific conditions are met, the zoning board of appeals may approve additional uses including automobile service stations, communication towers, and tattoo parlors.

- **Office Commercial (Town of Chapin) -** These areas permit a variety of uses including retail, wholesale, office, government, and service establishments outside of the central business or core commercial area. Additionally, general residential uses are also permitted, including single-family, two-family, and multifamily dwellings. Other uses that are permitted, if approved by the zoning board of appeals, include eating/drinking establishments, automobile service stations, and transportation terminals for bus and railroad services.

- **Single Family Residential (Town of Chapin) -** These areas are intended for detached single-family uses with medium population density. Limited nonresidential uses, such as governmental, recreational, and religious uses are permitted if they maintain the character of the district. The zoning board of appeals may approve additional uses if certain specified conditions are met, including daycare centers, cluster single-family development, colleges and universities, and adult care facilities (e.g., nursing homes, etc.).

- **Intensive Development (Lexington County) –** All uses are permitted in these areas, including uses that range from single-family and multifamily residential, to professional services, shopping centers, churches, and hospitals, to detention centers, landfills, and power plants.

It should be noted that the Town of Chapin Zoning Ordinance does include an "interstate commercial" zoning designation and defines this category as being intended to provide businesses to cater to the needs of those traveling along I-26, including uses such as restaurants, automobile service stations, hotels, and large scale retail and service establishments. However, this designation is not utilized in the vicinity of the S-48/I-26 Interchange, which is the only portion of the Town of Chapin that abuts I-26.

Ranges of required bulk regulations for Town of Chapin general commercial and office commercial districts include:

- Minimum lot size: 0 square feet (i.e., no minimum size) with the exception of single-family (6,000 square feet), two-family (9,000 square feet), and multifamily (6,000 square feet for the first unit and 3,000 square feet for each additional unit) residential uses in office commercial and general commercial districts (i.e., general commercial only permits multifamily residential);
- Maximum lot coverage: no minimum coverage except as needed to meet other bulk regulations; and
- Maximum building height: 40 feet for office commercial and 60 feet for general commercial.

Lexington County's zoning ordinance establishes bulk regulations that are tailored to specific activities within specific districts. For intensive development districts no minimum lot size is specified, while maximum lot coverage is indirectly addressed through a "sliding scale" of buffers, setbacks, and screening that vary depending upon the activity of the parcel in question and the land uses of adjacent properties. Height requirements are based on a height control slope that fluctuates between 1:1 (i.e., no more than 1 foot of building height for each foot of setback from a lot line) and 4:1 (i.e., no more than 4 feet of building height for each foot of setback from a lot line) depending upon the activity. In all cases, an initial 20-foot rise from the property line is permitted from which the height control slope is measured.

Overall, zoning regulations along the corridor encourage a mix of uses. However, by allowing various uses to coexist in numerous districts through the use of "scalable" setback, height, and buffer restrictions depending on adjacent land uses, Lexington County's ordinance provides a more progressive mixed-use approach than that of the Town of Chapin. Additionally, Lexington County's ordinance includes performance standards to prevent nuisances or health threats to adjoining properties, particularly adjacent residential uses. These include standards to prevent such occurrences as excessive noise, vibration, smoke, odors, dust, glare, etc.

Both ordinances include signage (e.g., billboards, business signs, temporary signs, etc.) and parking requirements (e.g., number of spaces by activity square footage). The Town of Chapin ordinance contains landscape requirements including submission of a landscaping plan as part of the site plan approval process (see Section

2.1.4.2), landscaped street and side yards, parking lot landscape, ownership and maintenance of landscape, and buffer yards between unlike uses.

It should be noted that all parcels fronting along the S-48 Corridor that are presently outside the municipal boundaries of the Town of Chapin are vacant and potential candidates for annexation by the Town. In the event that these properties desire to tap into the Town's sewer system, annexation would be a condition of such use. The Lexington County zoning designation of areas to be annexed into the Town would be subject to review by the Town of Chapin Planning Commission who would establish the appropriate Town zoning classification for the annexed area.

2.1.4.2 Land Development Regulations

The Town of Chapin Land Development Regulations serve as a means to ensure the progressive development of land while preserving the basic health, safety, and general welfare of the public. The Land Development Regulations serve five major purposes: encourage development that creates an economically sound and stable community; provide infrastructure and services to new land development in a timely manner; ensure safe and convenient traffic access and circulation for both vehicles and pedestrians to new development; provide both public open space and building sites in new land development through the dedication of land for public purposes; and promote new land development and redevelopment efforts that are in concert with the adopted Town of Chapin Land Development Plan. The Land Development Regulations cover traditional subdivisions, group developments, planned developments, and conservation subdivisions.

A basic, three-step development review process is required for the subdivision of property: submittal of sketch plan; preliminary plat; and final plat. The first two steps must be completed prior to making any infrastructure improvements, while the final plat is submitted once streets and utilities are in place, but before any lots are sold or building permits are issued. Group developments such as shopping centers, office parks, and apartment complexes require submittal of a site plan (in accordance with improvements outlined in the zoning ordinance).

When subdividing land, the Land Development Regulations set forth design standards that establish the minimum acceptable

specifications for various "public" elements of new developments including right-of-way and pavement widths, block and lot dimensions, easement placement, and dedication and/or sale of space for necessary community facilities. In addition, the regulations also require that certain improvements be made by the developer including:

- Curb and Gutter – concrete curbs or valley-type gutters must be installed.
- Sidewalks – a five-foot wide sidewalk on one side of the street is required for local streets, while five-foot wide sidewalks are required on both sides of collectors and major thoroughfares.
- Trees – street trees must be planted at 40-foot intervals within five feet of the street right-of-way on both sides of the street but outside of the right-of-way. Additionally, existing trees should be preserved in accordance with the Town of Chapin Tree Protection Ordinance (i.e., establishes special protection for trees of a circumference of 75 inches or more).
- Open Space – the degree of dedicated open space required is based on a sliding scale that roughly equates to three acres for every 100 dwelling units.
- Street Lighting – lighting should be installed at a rate of one fixture per six lots (the Town will take over operation and maintenance).

2.1.4.3 Land Development Plan

For all intents and purposes, the Town of Chapin Land Development Plan serves as the Comprehensive Plan for the Town. Comprehensive plans are broad municipal policy documents that include future land use plans establishing the basis for development regulations, as well as other municipal policy directions such as expenditures on public infrastructure. The following elements of the Land Development Plan have specific relevance to the S-48 Columbia Avenue Corridor:

- **Infrastructure -** S-48 was annexed by the Town of Chapin to accommodate future growth in the area. When the plan was amended in 2002, Columbia Avenue was classified as a collector road, operating at an acceptable level of service (i.e., LOS C). S-48 Columbia Avenue is now considered a minor arterial. Highway 76 was considered the major arterial and means of

access from Chapin to the greater Columbia metropolitan area.

- **Land Use -** The plan identifies a commercial business district from Boundary Street to St. Peter's Church Road, along with a historic commercial district between Beaufort Street and Columbia Avenue. Two of the Town's major employers, Ellett Brothers, a sporting goods distributor, and Chapin High School are located across from one another on Columbia Avenue. The plan looks at undeveloped property in the town and suggests that these areas be protected as sensitive areas; however, if development does occur in these areas, the plan suggests that proper land use controls, such as buffers and landscaping requirements should be put into place (such are now in place – see Section 2.1.4.2). A future land use plan is not included in the plan, but one is currently in development (see Section 2.1.4.4).

Key issue areas for the Town of Chapin are identified in the Land Development Plan as follows: aesthetics, transportation, growth and development, infrastructure, conservation, and land use.

2.1.4.4 Future Regulations, Plans and Policies

The Town of Chapin continues to create and adopt additional development regulations and plans to direct the future character of its community. Two such documents, the Future Land Use Plan and Site Design Standards Overlay District, are currently in process and are expected to be adopted in the near-term. They are depicted in **Figure 2.1-5** and outlined below.

Future Land Use Plan

The Town of Chapin Future Land Use Plan depicts the vision for what the Town will become over the next 10-20 years. Included in the Future Land Use Plan are areas that are presently outside the incorporated limits of the Town, which could lead one to infer that this may also serve as an annexation plan of sorts. It is assumed that, when adopted, this plan will become the future land use piece for the Town of Chapin Land Development Plan (see Section 2.1.4.3).

The predominate future land use along the S-48 Columbia Avenue Corridor is general commercial, stretching almost continuously from the west side of I-26 to Boundary Street (with the exception

of Chapin High School). On the east end of the corridor, interstate commercial uses are envisioned for all four corners of the S-48/I-26 Interchange, with some industrial uses on the northern side of the corridor. The west end of Columbia Avenue has primarily neighborhood commercial uses flanking its northern side (with the exception of two low-density residential parcels) and town center uses fronting the southern side in the area that is traditionally known as downtown Chapin.

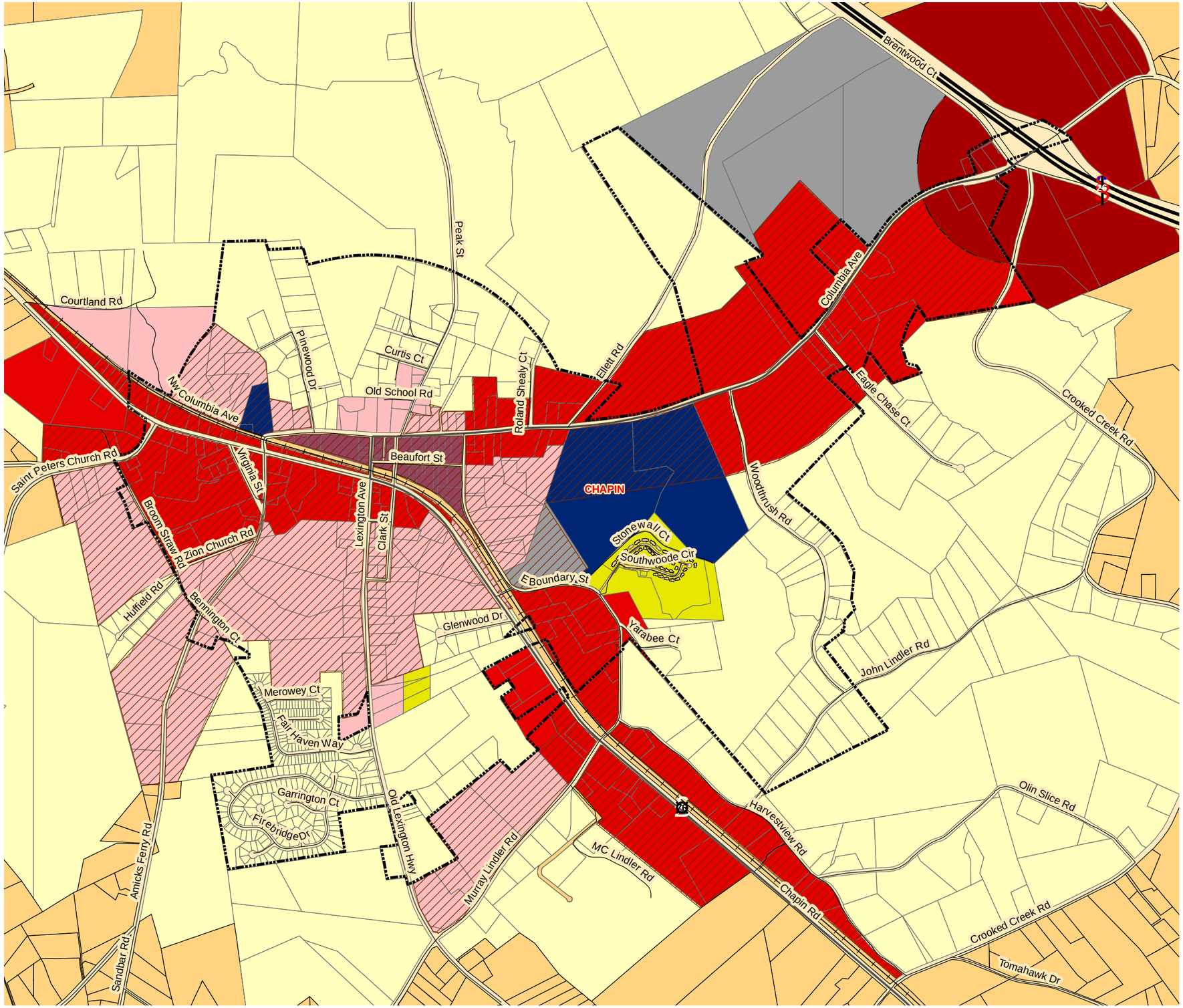
Two of the future classifications, neighborhood commercial and town center, do not currently exist along the corridor as zoning districts; however, they are current classifications in the Town of Chapin Zoning Ordinance. The Future Land Use Plan almost completely phases out exclusive single-family residential uses on the corridor by reducing the number of single-family detached parcels to two located on the western end of Columbia Avenue adjacent to Pinewood Drive. This is probably due to the fact that most of the residential structures that front directly on Columbia Avenue have already been converted to non-residential uses (although a large area of single-family homes exist just north of Columbia Avenue). The neighborhood commercial parcels that surround these two single-family lots will provide a gentle transition from the town center on the southern side of Columbia Avenue, an area of high-density commercial activity, to the single-family residential areas on the northern side, by including a lower density commercial area that provides neighborhood convenience services and goods.

In contrast to the fragmentation of the current land uses along the S-48 Columbia Avenue Corridor (see Section 2.1.1), the Future Land Use Plan presents a more orderly vision, while, at the same time, it appears to also present somewhat of a dichotomy. On the one hand, it presents a stronger central core of town center surrounded by general and neighborhood commercial uses, which would support higher densities and a mixture of uses. However, on the other hand, it shows both Columbia Avenue and Chapin Road developing into commercial "spines" surrounded by low-density residential subdivisions that stretch out from the town center in a very "sprawl-like" fashion.

Site Design Standards Overlay District

With the assistance of CMCOG staff, the Town of Chapin is in the process of drafting and adopting building design standards in the

S-48 Columbia Avenue Corridor Study



LEGEND

Town of Chapin Future Land Use

- Town Center (TC)
- General Commercial (GC)
- Interstate Commercial (IC)
- Neighborhood Commercial / Mixed-Use (NC)
- Low-Density Residential (R)
- Multi-Family Residential (MF)
- Industrial (I)
- Public/Institutional (P)
- Lexington County

- Design_Overlay_District
- Town of Chapin

Source: CMCOG 2005
Map Created: 08/25/05

This map is for conceptual presentation purposes only, and is believed to be fundamentaly accurate; however, no guarantees as to its accuracy or completeness are expressed or implied.

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Figure 2.1-5
Future Land Use & Design Overlay District

form of an overlay district. Town Council is expected to adopt the overlay district in the near-term. The intent of the design standards is to ensure a high quality of development in the Town of Chapin, while also minimizing adverse effects of development on surrounding properties and the general public. An Architectural Review Board will be established to review building and site plans for conformance with the design standards of the overlay district.

The design standards apply to all new non-residential uses to be built within the overlay district. Existing structures that undergo a 20 percent or greater expansion or improvement are also regulated by the design standards, including residential structures that that are converted to non-residential uses. Future development along the S-48 Columbia Avenue Corridor will be influenced by the design standards, as the majority of nonresidential parcels along the corridor are included in the overlay district, including some parcels that presently are outside the town limits.

Key elements of the design standards are:

- Horizontal and vertical articulation to result in the "breakup" and/or "stepping" of continuous building facades;
- Elements that promote a human scale to the built environment including awnings, canopies, windows, recessed entrances, and pillar posts;
- Similar design themes and exterior materials throughout development projects, including outparcels sharing the design scheme of the primary project and secondary facades incorporating similar exterior materials where they join primary facades;
- Pedestrian accommodations as part of buildings exceeding 60,000 square feet in size, including patio areas that incorporate seating, landscaping, and shading, pedestrian routes between parking areas and buildings, and sidewalks along all main street frontages; and
- Sufficient outdoor lighting to ensure safety when using roads, driveways, sidewalks, and parking lots associated with development projects.

2.2 Transportation Network

A variety of facilities to support various transportation modes exist within the study area. These include the local street network, Interstate 26, bicycle/pedestrian facilities, public transit, and a railroad corridor.

2.2.1 Local Street Network

2.2.1.1 Characteristics and Conditions

Typical roadway section along the corridor.

The S-48 Columbia Avenue Corridor is a rural roadway. Right-of-way width varies throughout the length of the corridor ranging from a minimum of 50 feet from US 76 to East Boundary Street to 66 feet from the west side of Ellett Road to I-26 to a maximum of 93 feet in front of Chapin High School. For the majority of its length, the roadway consists of two 11-foot travel lanes, one lane in each direction (i.e., east and west). A two-foot paved shoulder runs the length of the corridor on both sides of the road except for short distances of curb and gutter along the eastbound lane from Ellett Road to Roland Shealy Court and also from Clark Street to Lexington Avenue. In areas where a sidewalk is present (see Section 2.2.3.1), a four-foot paved shoulder exists between the travel lane and the sidewalk. Pavement and striping are in relatively good condition throughout the length of the corridor.

The roadway widens out in front of Chapin High School to provide a dedicated center turn lane for left turns into and out of the school's property. Dedicated left-turn lanes exist at Columbia Avenue's intersection with Chapin Road on the western end and the westbound ramp to I-26 on the eastern end.

With speed limits of 35 mph between Chapin Road and just east of Chapin High School, and 45 mph from there to I-26, the corridor is intended to function as a principal arterial. However, since Columbia Avenue serves as the primary connection between Chapin and I-26, speeds frequently are in excess of these posted speed limits.

There are a total of nine intersections along the corridor, most of which are T-intersections with the exception of an angled intersec-

tion at Ellett Road, a four-way intersection as the Corridor meets US 76, and an offset intersection at Peak and Clark Streets.

2.2.1.2 Parking

Parking along the corridor is primarily in the form of private surface lots. Commercial development within the corridor is automobile-oriented with a suburban-style parking system having buildings set back from property frontage behind medium to large surface parking lots. As an evolving rural roadway, formalized on-street parking is not present, but some shoulder areas are being utilized as "improvised" parking areas.

This "improvised" parking area is located directly across from the intersection of Columbia Avenue and Northwest Columbia Avenue.

2.2.1.3 Curb Cuts and Parcel Interconnectivity

Curb cuts allow access to adjoining streets and properties and are necessary elements of the corridor. However, when constructed in large numbers, in close proximity to each other and major street intersections, or allowed to exist along an entire property frontage, curb cuts become inhibitors to vehicular, pedestrian, and bicycle traffic flows. In addition, consecutive curb cuts can create "darting" traffic in and out of corridor travel lanes, which can become a very real safety issue for both vehicles and pedestrians.

Curb cuts are moderate throughout the corridor. As is to be expected, the frequency of curb cuts along the corridor increases as the density of development increases, resulting in more curb cuts on the western end of the corridor than on the eastern. In most instances where new developments are adjacent to one another, it is not possible to move from one property to the next adjacent property without the utilization of Columbia Avenue. Therefore, in order to gain such access, curb cuts at each property are necessary. Very few properties along the corridor provide internal roadway systems or linkages to allow for adjacent parcel or parking lot interconnectivity (i.e., ability for vehicles to travel between properties without reentering the main corridor roadway).

2.2.1.4 Lighting

High-mast vehicular/street lighting exists periodically throughout the corridor. No pedestrian-scale lighting is present.

2.2.1.5 Signage

Signage is found in several shapes and styles throughout the S-48 Columbia Avenue Corridor. Types of signs include traffic, way-finding, place-making, commercial, and billboards.

Traffic signs in the corridor can be generally grouped into the following categories: street identification signs; speed limit signs; and other traffic signs. The majority of cross streets along the corridor are clearly marked with street identification signs at their intersecting corners. These are standard street identification signs with metallic green background and reflective white lettering. Speed limit signs are posted at regular intervals along the corridor. Other typical traffic signs found along the S-48 Columbia Avenue Corridor include stop, railroad crossing, "school bus stop ahead," and "bridge ices before road" signs.

Signage in the corridor comes in many shapes and sizes including place-making banners, billboards, and pole-mounted and monumental commercial signs.

As with most rural corridors, wayfinding devices are limited to reflective green highway-style directional signs. These include interstate and US route junction signs, destination directional signs, and "miles to" destination signs. No decorative or pedestrian wayfinding signs are located along the corridor.

Place-making signs are generally ornamental or decorative signs that designate parks, districts, or neighborhoods. One such sign is a gateway sign just west of the S-48/I-26 Interchange that welcomes motorists to Chapin, "Capital of Lake Murray." Other than this sign, several "character-setting" banners are attached to utility poles periodically throughout the corridor.

Commercial businesses along the corridor have identification signs. Most businesses have both street-side and building-mounted identification signs. Street-side signs are equally split between pole-mounted and monumental (i.e., low-level signs that have a continuous base from the ground to the sign) signs.

Billboards are found exclusively at the eastern end of the corridor in close proximity to I-26. All billboards are single-width (i.e., one billboard wide, as opposed to a side-by-side billboard), but several are double-faced (i.e., advertisements on both the east- and west-facing sides of the billboard).

2.2.1.6 Traffic Conditions

A traffic analysis was performed for the S-48 Columbia Avenue Corridor, which included existing conditions and future "no-build" conditions (i.e., if no improvements are made to the transportation network) for the design year 2025. This analysis is included in Appendix C of this document and the following summarizes its findings:

- All of the study intersections can operate acceptably under existing traffic volumes as signalized intersections, although some individual movements experience delay that is considered unacceptable.
- None of the study intersections can operate acceptably under 2025 traffic volumes as signalized intersections. Without major improvements in the corridor, delays will be high in 2025.
- Other traffic-related issues in the corridor must also be addressed:
  - Traffic associated with Chapin High School;
  - Ellett Brothers and other tractor-trailer trip generators in the corridor;
  - Geometric offset of Columbia Avenue's intersection with Peak Street and Clark Street;
  - Lack of a left turn lane on Columbia Avenue at Northwest Columbia Avenue and at other intersections on Columbia Avenue;
  - Coordination with the Clark Street streetscape, which is currently underway; and
  - Ninety degree turn on Columbia Avenue just north of Chapin Road.

2.2.1.7 Planned Improvements

The TIP has allocated funding for the S-48 Columbia Avenue Corridor (see Appendix A). The program calls for widening the roadway to five lanes (i.e., two travel lanes in each direction with a continuous center turn lane) from I-26 to US 76; however, the purpose of this study is to determine the most appropriate improvement scenario. Based on TIP funding allocations, design of any improvements is not expected to begin until 2008 at the earliest.

There are also planned improvements for Clark Street in the Chapin town center. These streetscape improvements are currently under construction and are scheduled to be completed in late 2006.

2.2.2 Interstate 26

I-26 serves as the primary connector between the Town of Chapin and Newberry (and points north) and the City of Columbia (and areas south). Columbia is a major employment center for many residents of Chapin and surrounding areas. Additionally, Columbia and Newberry offer many alternative amenities and leisure activities that are attractive to the residents of Chapin, such as shopping, dining, cultural arts, sporting events, and entertainment. I-26 provides a faster more efficient means of commuting into the Columbia area, as opposed to US 76, a two-lane rural highway. The S-48 Columbia Avenue Corridor is vital in connecting Chapin area residents to I-26; it is the only point of access to the interstate directly from the Town of Chapin. The corridor meets I-26 at exit 91. The nearest alternative exits are Little Mountain/Pomaria (exit 85) and Peak/Ballentine (exit 97), each approximately six miles from S-48's interchange with I-26.

Sidewalks are found on one side of the road between Ellett Road and Northwest Columbia Avenue.

2.2.3 Pedestrian & Bicycle Facilities

Existing pedestrian and bicycle facilities along the corridor were documented through site visits. It was observed that the corridor is not highly favorable to pedestrian or bicycle traffic. In addition to limited facilities, excessive vehicular travel speeds and the inability of the roadway to effectively service current peak hour traffic volumes contribute to a less than ideal environment for bicyclists and pedestrians.

2.2.3.1 Pedestrian Facilities

Traditional pedestrian facilities (e.g., sidewalks, crosswalks, etc.) are minimal along the corridor. Pedestrian facility location and condition are described in the following paragraphs and are depicted in **Figure 2.2-1**.

There are no sidewalks along the eastern limits of the corridor near I-26. Sidewalks begin across from Ellett Road just west of Chapin High School along the eastbound lane of Columbia Avenue and end at the intersection of Clark Street. The sidewalk then

S-48 Columbia Avenue Corridor Study

LEGEND

Sidewalk Condition

- Good
- Cracked
- Heaved

Study Area

Source: Lexington County 2005; Parsons Brinckerhoff 2005
Map Created: 08/25/05

This map is for conceptual presentation purposes only, and is believed to be fundamentaly accurate; however, no guarantees as to its accuracy or completeness are expressed or implied.

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Figure 2.2-1
Sidewalk Conditions

picks up on the opposite side of the street, adjacent to the west-bound lane, across from Clark Street until it reaches Northwest Columbia Avenue.

The majority of the sidewalks along the corridor are in good condition with the exception of a few four- to eight-foot sections that are either cracked or heaved. The sidewalks are typically 4 feet 6 inches in width, but at some points, such as the area between Pinewood Drive and Amick's Ferry Road, less than three feet of usable width is present due to overgrown grass, dirt, and natural debris. Sidewalks from Ellett Road to Roland Shealy Court and between Clark Street and Lexington Avenue are raised with curb and gutter. The remaining sidewalks are flush with the asphalt-paved shoulders of the roadway.

No pedestrian amenities such as crosswalks, street furniture, way-finding signage, or caution lights currently exist in the corridor. No definable streetscape plan is present along the corridor to provide the perception of a welcoming pedestrian environment. School speed zone signage (i.e., "25 mph when flashing") is posted in the vicinity of Chapin High School; however, there are no crosswalks or quality pedestrian linkages between the school and adjacent neighborhoods.

2.2.3.2 Bicycle Facilities

Traditional bicycle facilities (e.g., bicycle lanes, bike racks, etc.) do not exist along the corridor. However, an approximately two-foot wide shoulder is present along both sides of the roadway for the majority of the corridor, which does provide bicyclists some refuge from vehicular traffic. This shoulder is present from the eastern side of I-26 to Amick's Ferry Road, except for short distances of curb and gutter along the eastbound lane from Ellett Road to Roland Shealy Court and also from Clark Street to Lexington Avenue. Additionally, in areas where a sidewalk is present (see Section 3.3.1), the paved shoulder expands to four feet in width, but only on the side of the road where the sidewalk is located. Pavement and striping along the shoulders are in good condition along the entire length of the corridor.

The paved shoulder expands to four feet in width where sidewalks are present providing a buffer for pedestrians and refuge for bicyclists.

2.2.4 Public Transit

Public transit facilities were documented through site visits and discussions with the CMRTA, public transit provider for the Central Midlands region, which includes the Town of Chapin.

2.2.4.1 SmartRide

SmartRide provides a park-and-ride lot at the S-48/I-26 Interchange and commuter bus service between Newberry, Chapin, and Columbia.

The SmartRide program is the only public transit operation serving the Chapin area. SmartRide service between Newberry, Chapin, and Columbia is a public transit partnership between SCDOT and CMRTA that provides commuters a viable alternative to the single-occupant vehicle commute. According to the CMRTA, the service is affordable, provides a relief from the stress of the daily commute, and improves environmental quality by putting fewer vehicles on the road. A SmartRide pass costs $3 each way or $20 per week.

The Chapin SmartRide stop is located at the Rainbow Exxon Gas Garden at the interchange of S-48 and I-26. A park-and-ride lot provides approximately 25 spaces for commuters to leave their vehicles during the workday. No shelters or benches are present at this location.

Ridership statistics for boardings at the Chapin stop are available on a monthly basis from August 2004 to August 2005 and are presented in **Table 2.2-1**. There are two "runs" that operate twice daily: one trip each to Columbia and one trip each to Newberry. A complete SmartRide schedule is included in Appendix D. Of the two running lines, Run 2 (the later run) is most frequently used. A sharp increase in ridership was experienced in June 2005 when a promotional "fare-free" period was offered.

2.2.4.2 Planned Transit Improvements

At the present time the CMRTA does not have any plans to expand the SmartRide program or fixed-route service into the Chapin area. However, the CMCOG recently completed a study that evaluated the feasibility for commuter rail service along four corridors within the Central Midlands region. A rail corridor between Newberry and Columbia was one of the corridors that was evaluated. Although it was not ranked as the most favorable for com-

muter rail, this corridor does exhibit many characteristics that are favorable to commuter rail service.

Table 2.2-1
SmartRide Ridership - Chapin Boardings

	RUN 1	RUN 2	TOTAL
AUG 04	77	73	150
SEP 04	75	80	155
OCT 04	61	86	147
NOV 04	36	81	117
DEC 04	44	68	112
JAN 05	41	92	133
FEB 05	44	89	133
MAR 05	38	107	145
APR 05	42	78	120
MAY 05	43	102	145
JUN 05	136	86	222
JUL 05	84	55	139
AUG 05	72	44	116
TOTAL	793	1041	1357

2.2.5 Railroad Corridor

CSX Railroad owns a rail line that crosses the S-48 Columbia Avenue Corridor near its intersection with US 76 (Chapin Road). The line is referenced as the Columbia, Newberry, and Laurens (CN&L) Subdivision, which is part of the larger Florence Division or Florence "Service Lane" of CSX's Southern Region ("Service Lane" is a term generally assigned to lines containing key corridor routes). Norfolk Southern has "trackage rights" to the line, which allows them to run their trains on the line at the discretion of CSX officials.

The Federal Railroad Administration (FRA) lists the Columbia Avenue Crossing as Crossing Number 843375R at milepost 23.45.

There are four crossings within two miles to the northwest and five crossings within two miles to the southeast. The FRA has been keeping data on railroad crossings for the past 30 years.

According to the FRA Crossing Inventory, railroad activity has seen a steady increase along the CN&L Subdivision at the Columbia Avenue crossing for the past 30 years. Daytime crossings are from the hours of 6 a.m. to 6 p.m. Nighttime crossings are from the hours of 6 p.m. to 6 a.m. Switching movements involve a single train crossing the roadway multiple times in order to serve local businesses. Of those trains engaged in switching movements, the FRA does not designate whether these movements occur during daytime or nighttime hours.

The CN&L Subdivision rail line crosses the corridor just north of Chapin Road, often creating a barrier to vehicular travel.

From 1975 to 1990 there were a total of six crossings per 24-hour period (i.e., three during the day and three at night with no switching movements). From 1990 to 2001 activity increased to a total of 10 trains through the crossing daily (i.e., three during the day, two at night, and five engaged in switching movements). From 2001 to the present activity has continued to increase along the Columbia Avenue crossing with 19 total trains each day (i.e., five during the day, six at night, and eight engaged in switching movements). Based on field observations and anecdotal information, it is apparent that these frequent train crossings present a barrier to the mobility of vehicular traffic along the S-48 Corridor and surrounding streets. **Table 2.2-2** presents the crossing inventory for S-48 Columbia Avenue from 1975 to present.

Columbia Avenue must makes a sharp left-hand turn in order to provide a ninety-degree crossing of the rail line.

In addition to being a barrier to travel, the CN&L Subdivision presents a roadway geometry challenge to the S-48 Columbia Avenue Corridor. Between Clark Street and Amicks Ferry Road, S-48 and the CN&L line run relatively parallel to one another. In order to more safely cross the rail line at a ninety-degree angle, S-48 makes a sharp left-hand turn at its intersection with Northwest Columbia Avenue. The turning radius of this curve presents several potential challenges including limited sight-distance, queue lengths that wrap the corner, access conflicts for mo-

torists attempting to enter the corridor from Northwest Columbia Avenue, and wide, "swing-out" turns for larger vehicles such as trucks and school buses.

Table 2.2-2
FRA Crossing Inventory for CN&L Subdivision at S-48 Columbia Avenue

Period	Thru Movements		Switching Movements	Total
	Daytime	Nighttime		
1975 - 1990	3	3	0	6
1990 - 2001	3	2	5	10
2001 - Present	5	6	8	19

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3. TRANSPORTATION AND LAND USE ISSUES

Through the course of gathering existing conditions data that was presented in Chapter 2 of this report, comments received from the public, and discussions of the SSC, a number of transportation and land use issues within the S-48 Columbia Avenue Corridor were identified. These issues are outlined below along with potential opportunities and constraints.

3.1 Vehicular Travel Issues

The following vehicular travel issues were identified in the S-48 Columbia Avenue Corridor:

- Significant congestion is experienced during peak commuter hours, as S-48 serves as the primary connection between the Town of Chapin and I-26;
- Lack of parallel routes to S-48 and minimal connectivity between S-48 and other major roadways;
- Left turns to/from and queuing extending out of Chapin High School during peak hours creates traffic congestion and a "bottleneck" condition;
- Without major improvements, all intersections in the corridor will fail by 2025 (i.e., delays at intersections will be beyond acceptable levels);
- Ninety-degree turn at western end of Columbia Avenue in front of town hall;
- Increased through traffic at Chapin town center (mainly Lexington Avenue and Clark Street) caused by vehicles avoiding the intersection of S-48 and US 76 conflicts with the desired pedestrian environment for this area;
- Offset intersection at Peak and Clark Streets creates difficult turning movements and makes signalization a challenge;
- Significant queuing of traffic in two-lane sections of the roadway where left turning movements are frequent; and
- Difficult truck ingress and egress to Ellett Brothers warehousing operation.

Opportunities

Improvements to accommodate increased traffic would improve traffic flow and safety throughout the corridor. Widening shoulders, signalizing intersections, and adding turn lanes would improve automobile accessibility and overall safety. Improvements (e.g., dedicated turn lanes, additional travel lanes, signalization, etc.) throughout the corridor coupled with alternate routes will increase the efficiency of the corridor. Based on the current undeveloped nature of a significant portion of the corridor, it is advisable to begin right-of-way acquisition as soon as possible in specific areas where improvements are recommended so as to capitalize on present property values. In addition to traffic improvements, aesthetic enhancements are a possibility as well through the installation of landscaped medians and verges to create a boulevard effect.

Alternate routes to Columbia Avenue would alleviate existing congestion and minimize future intersection failures along the corridor. A bypass to a majority of the S-48 Corridor would provide adequate capacity to address both present and future volume issues, while more localized connections in and around the town center would provide options for motorists and emergency service vehicles. Additionally, existing roadways in close proximity to the Town of Chapin that intersect with but do not currently connect to I-26 (i.e., Peak Street, Old Hilton Road, and Mount Vernon Church Road), present opportunities for additional access to the interstate system through implementation of interchanges at these locations.

A new access and circulation system for Chapin High School would greatly benefit the mobility of the S-48 Corridor. Locating the primary entry/exit point to the rear of the school's property would remove a significant number of trips from Columbia Avenue. An interior loop road would provide greater access to the entire school property and present ingress/egress options to students, teachers, and parents. Additionally, actuated signalization of the parent pickup/drop-off driveway would increase the safety and efficiency of this entry/exit point.

Constraints

To implement roadway improvements, such as widening, adding dedicated turn lanes, and decreasing the degree of curvature in the roadway, additional right-of-way is required. Because in most in-

stances this right-of-way is not already in the possession of the governing agency, such right-of-way would have to be acquired from parcels adjacent to the roadways/intersections to be improved (i.e., private property owners would have to sell such land to the governing agency or said agency would have to use condemnation to acquire the property). This would, in many cases, encroach on front yards or entirely eliminate buildings depending on their proximity to the existing roadway. A distinction must be made with respect to public lands and private lands in the realm of landscaping improvements. Enhancements can easily be made to public lands; however, private lands are only subject to what local regulations stipulate.

Implementation of alternate routes will be challenging and could be met with some resistance. Existing rights-of-way do not present any clearly defined routes that can be easily introduced into the transportation network or the land use context. Additionally, many may perceive an alternate route as merely relocating traffic issues from the S-48 Corridor to another location, rather than actually solving these issues. Alternate routes may also harm the economic vitality of Columbia Avenue and the town center.

3.2 Pedestrian and Bicycle Travel Issues

The following pedestrian and bicycle travel issues were identified in the S-48 Columbia Avenue Corridor:

- Excessive travel speeds, particularly east of Chapin High School, by vehicular modes of travel;
- Lack of sidewalks, associated ADA curb ramps, and general connections between land uses;
- With the exception of the intersection of Columbia Avenue and Chapin Road, there are no controlled pedestrian crossings in the corridor due to the absence of signalized intersections east of Chapin Road;
- Vehicular disregard for pedestrian and bicycle right-of-way and safety; and
- Lack of elements to designate a bicycle-friendly environment (e.g., bike lanes, “share the road” signage, etc).

Opportunities

Increased safety of all modes would greatly benefit the corridor. Keeping vehicle travel speeds within a reasonable range of the posted speed limit increases vehicular, pedestrian, and bicycle safety. Increased safety leads to a more livable pedestrian/bicycle environment and enhances mobility for those who would otherwise have no other means of travel within the corridor (i.e., those who do not have access to an automobile).

Accommodations for pedestrian and bicycle modes of travel improve the multimodal and intermodal experience, lend to a more user-friendly scale, and create safer pedestrian/bicycle environments. Additionally, such amenities would provide individuals with limited mobility additional transportation options. Key areas of focus should be on creating links between portions of S-48 with adjacent residential, academic, commercial centers, and major employment centers (e.g., Chapin High School, downtown, etc.). The town could also investigate development agreements, development regulations, and performance standards to integrate pedestrian facilities into future development along the corridor. Extension of existing sidewalks and shoulders would be logical starting points for such improvements, along with vehicular and pedestrian signalization of intersections. Additionally, educational programs on the rights and responsibilities of bicyclists, pedestrians, and motorists would be beneficial.

It should be noted that the Bike and Pedestrian Pathways Plan for the COATS region recommends bike lanes and sidewalks from US 76 to Chapin High School (0-2 year period) and paved shoulders from Chapin High School to I-26 (0-5 year period).

Constraints

Similar to roadway improvements, to implement pedestrian and bicycle accommodations (i.e., sidewalks and bike lanes) additional right-of-way may be required. In most cases the right-of-way is not already in the possession of the governing agency, and such right-of-way would have to be acquired from parcels adjacent to the roadway/intersections to be improved (i.e., private property owners would have to sell such land to the governing agency or said agency would have to use condemnation to acquire the property). Although not as invasive as right-of-way acquisition for roadway improvements, this would still encroach on what is now private property.

Burdening the development community with the provision of facilities for non-motorized modes may prove troublesome, as it could cause developers to seek out adjacent areas where development requirements are more "friendly."

3.3 Transit Issues

The following transit issues were identified in the S-48 Columbia Avenue Corridor:

- Park-and-ride lot servicing the SmartRide commuter route is limited by size (i.e., number of spaces) and perceived safety;
- Lack of pedestrian and bicycle connections between the SmartRide park-and-ride lot and the Town of Chapin; and
- Absence of transit service to the majority of the corridor.

Opportunities

Safe, efficient, and affordable transit service throughout the entire S-48 Columbia Avenue Corridor would provide an additional mode of travel for individuals with limited mobility and financial means. Such service would allow employers in the corridor and adjacent communities serviced by transit to draw from a larger and more diverse pool of potential employees. Increased transit along the corridor (and throughout the Town of Chapin), improved pedestrian and bicycle connections, and a larger, more secure park-and-ride lot would increase the attractiveness of the SmartRide commuter service. Also, a recent commuter rail study determined that the rail corridor running through Chapin exhibits some characteristics that may be favorable to commuter rail in the long-term.

Constraints

Expanded transit service in the corridor would be the responsibility of the CMRTA. To lengthen existing routes and/or add additional routes would require a commitment of additional equipment, manpower, and funding or a reallocation of existing equipment, manpower, and funding. Beyond this, additional studies would be required to determine appropriate routes and stops and would need to be updated and expanded as new development occurs in the corridor. In addition, to provide efficient new service, the characteristics of new development occurring in the study area would need to be refined to accommodate transit. In all cases, very dense development patterns would be required to make fu-

ture transit services economically feasible and efficient. Additionally, any improvement and/or expansion of SmartRide facilities would require additional funding. There are some questions as to the convenience of the park-and-ride system for residents of Chapin along with its connectivity to the town itself.

3.4 Railroad Corridor Issues

The following railroad corridor issues were identified in the S-48 Columbia Avenue Corridor:

- Perpendicular intersection of S-48 and railroad is accomplished through a ninety-degree turn of Columbia Avenue just north of the rail line;
- Significant queuing of westbound traffic that is waiting for trains to clear at the intersection of S-48 and US 76 creates a difficult left-turn movement for eastbound traffic wishing to access properties adjacent to Northwest Columbia Avenue, resulting in traffic backups across rail line;
- Numerous at-grade rail crossings increase the potential for modal conflicts; and
- Railroad corridor acts as a barrier to travel, limits potential alternate routes, and fragments community cohesion.

Opportunities

Grade separation at the intersection of S-48, US 76, and the rail corridor would improve safety and traffic flow. Trains passing through the corridor at all hours of day and night would not impede traffic flow along S-48. This would also allow for the removal of the sharp ninety-degree turn of Columbia Avenue, relieving stress on truck traffic and other vehicles accessing facilities in close proximity to the rail corridor. Additionally, railroad operators welcome the opportunity to reduce the number of at-grade crossings in high traffic volume areas. Of significant importance to the Town of Chapin is the character the railroad provides; the railroad is a part of the town's identity and history.

Constraints

Although grade separation would benefit vehicular travel and safety and the operations of the railroad, it has not been documented in this study that CSX has any discontent with the current configuration, nor have they shown any initiative in pushing for

fewer at-grade crossings along this corridor. This would imply that in order for such improvements to occur, CSX would have to be persuaded to participate financially and/or an extensive amount of public funding would have to be utilized. In addition, the fragmentation of the town caused by the rail line cannot be avoided at this point without a complete relocation of the line, which is highly unlikely.

3.5 Land Use Issues

The following land use issues were identified in the S-48 Columbia Avenue Corridor:

- Large amount of vacant land fronting the corridor that is zoned general commercial (GC) and intensive development (ID) presents the potential for build-out scenarios that are suburban in character, assuming continued sprawl-like development patterns take place;
- Grouped incompatible land uses give the corridor a confusing and contradictory character;
- Town of Chapin development regulations lack standards that encourage dense, mixed use development and could allow the corridor to build out in a sprawl-like fashion, increasing trip generation through the corridor;
- As development continues, community character is eroding; and
- Many existing land uses (some with historic potential) are located in close proximity to the roadway, increasing the impacts of potential future widening;

Opportunities

Refinement of local development regulations through the addition of items such as frontage improvement requirements, impact fees, and performance/design standards would encourage density by design while decreasing the likelihood of build-out scenarios that replicate suburban development patterns, proportionately share the burden of infrastructure (i.e., utilities and roadways) financing between local municipalities and private developers, and preserve the character of the corridor. Also, requiring developers to provide a specific level of public amenities (e.g., public open space, sidewalks, trails, landscaping, site design that facilitates transit ac-

cess, etc.) as part of the site plan approval process could offer the potential of enhanced community character.

Constraints

Although strengthening local development controls would protect the study area from suburban-style build-out and encourage a more urban form, such an action would have overarching implications reaching beyond the S-48 Columbia Avenue Corridor to the town as a whole. In addition, placing additional performance burdens upon developers such as impact fees, design standards, and site plan approval requirements may actually drive development away from the corridor to other, more "favorable" sites in the region.

3.6 Other Issues

Additional areas of concern were brought to the attention of the Project Team through public involvement efforts including: availability of parking; signalization of intersections outside the study area; signage regulations; litter control; and specific development scenarios. Although these are valid issues, they fall outside the scope of the S-48 Columbia Avenue Corridor Study. These items were not specifically addressed as part of this study; however, they have merit and should be considered under future, more applicable efforts.

4. PRELIMINARY ALTERNATIVE SOLUTIONS

This chapter presents preliminary transportation and land use alternatives, and evaluates these alternatives based upon a series of performance criteria.

4.1 Preliminary Alternatives

This section identifies a range of potential alternatives that were developed for addressing various issues, opportunities, and constraints identified in Chapter 3. Where applicable and appropriate, these alternatives are grouped/classified according to the associated level of effort and/or capital investment necessary for implementation, as follows:

- **Low,** meaning items associated with management, enforcement, procedures, or lower cost capital investments;
- **Medium,** indicating a middle range of effort, such as larger measures of management or enforcement and/or medium cost capital investments; and
- **High,** indicating a major change of policy, regulations, and/or high level of capital investment.

The preliminary alternatives listed are not intended to represent an exhaustive compilation of fully developed designs or approaches for improvements within the S-48 Columbia Avenue Corridor. They were developed to serve as a starting point of discussion regarding the overall reasonableness of design concepts and possible courses of action for improvements.

4.1.1 Vehicular Travel

Issues identified were congestion in the corridor during peak commuter hours, a lack of parallel routes and connections between S-48 and other roadways, "bottleneck" conditions, the projection that all intersections will fail (i.e., delays at intersections will be beyond acceptable levels) by the year 2025, geometric design challenges, increased through traffic at Chapin's town center due to vehicular traffic avoiding the intersection of S-48 and US 76, and difficult truck ingress and egress to key land uses.

Alternatives

Medium

- Work with Lexington-Richland School District 5 to create connections to and circulation within the Chapin High School property to reduce dependency/demand on S-48 (see **Figure 4.1-1**).

- Improve intersections through the implementation of dedicated turn lanes, traffic signals, and correction of geometric deficiencies at all intersecting streets along the corridor.

- Create new, localized east/west linkages between existing north/south streets.

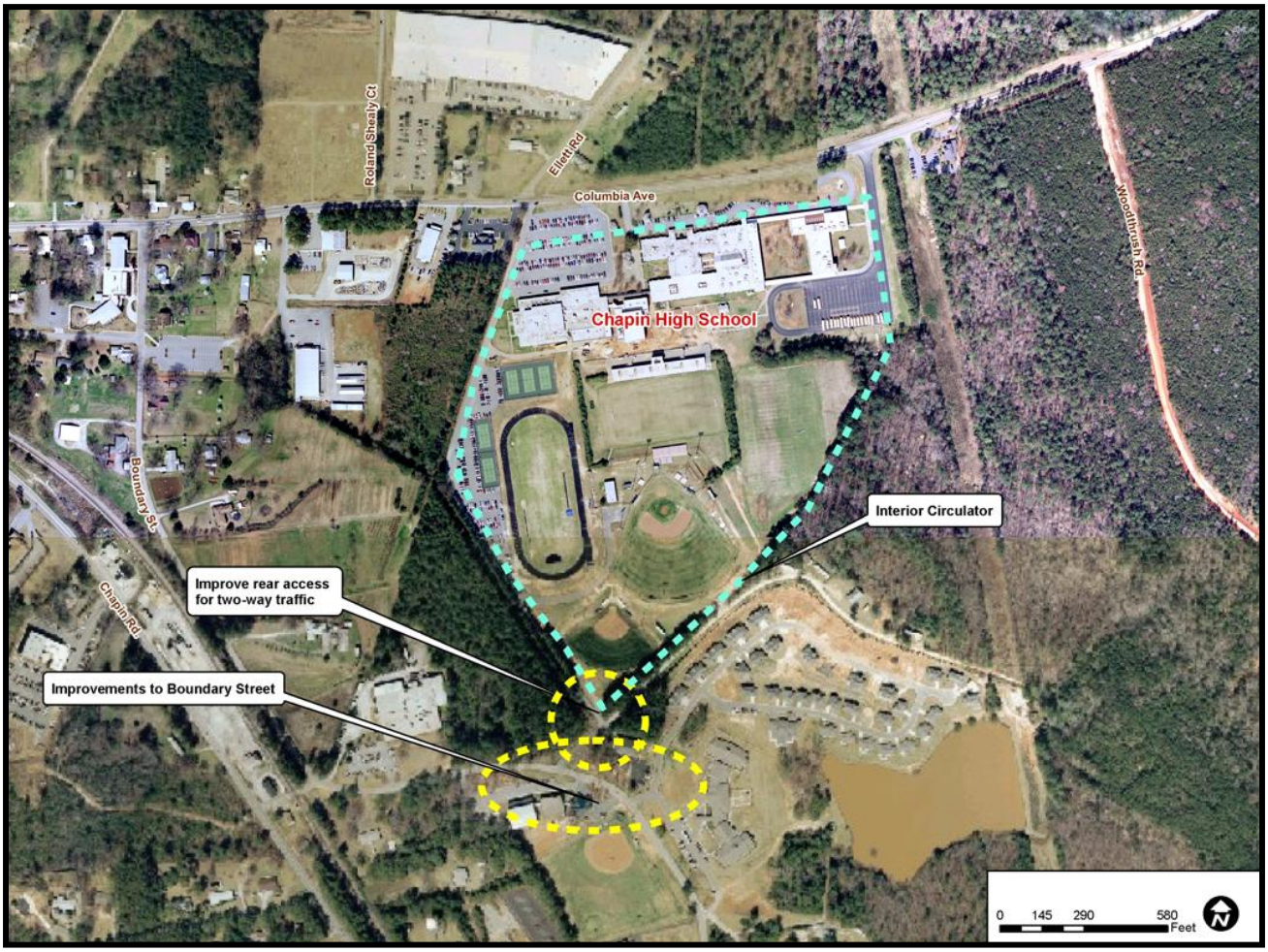


Figure 4.1-1
Potential for Redesigned Circulation and Access at Chapin High School

High

- Widen S-48 to five lanes throughout the length of the corridor.
- Widen S-48 to three lanes beginning at Chapin Road and transition to five lanes.
- Construct a northern and/or southern connector by either utilizing existing rights-of-way within the local street network or by creating a new right-of-way to service the town (see **Figure 4.1-2**).
- Create new interchange(s), with appropriate roadway improvements, at I-26 to serve as an alternate connection between the Town of Chapin, surrounding residential developments, and the interstate (see Figure 4.1-2).

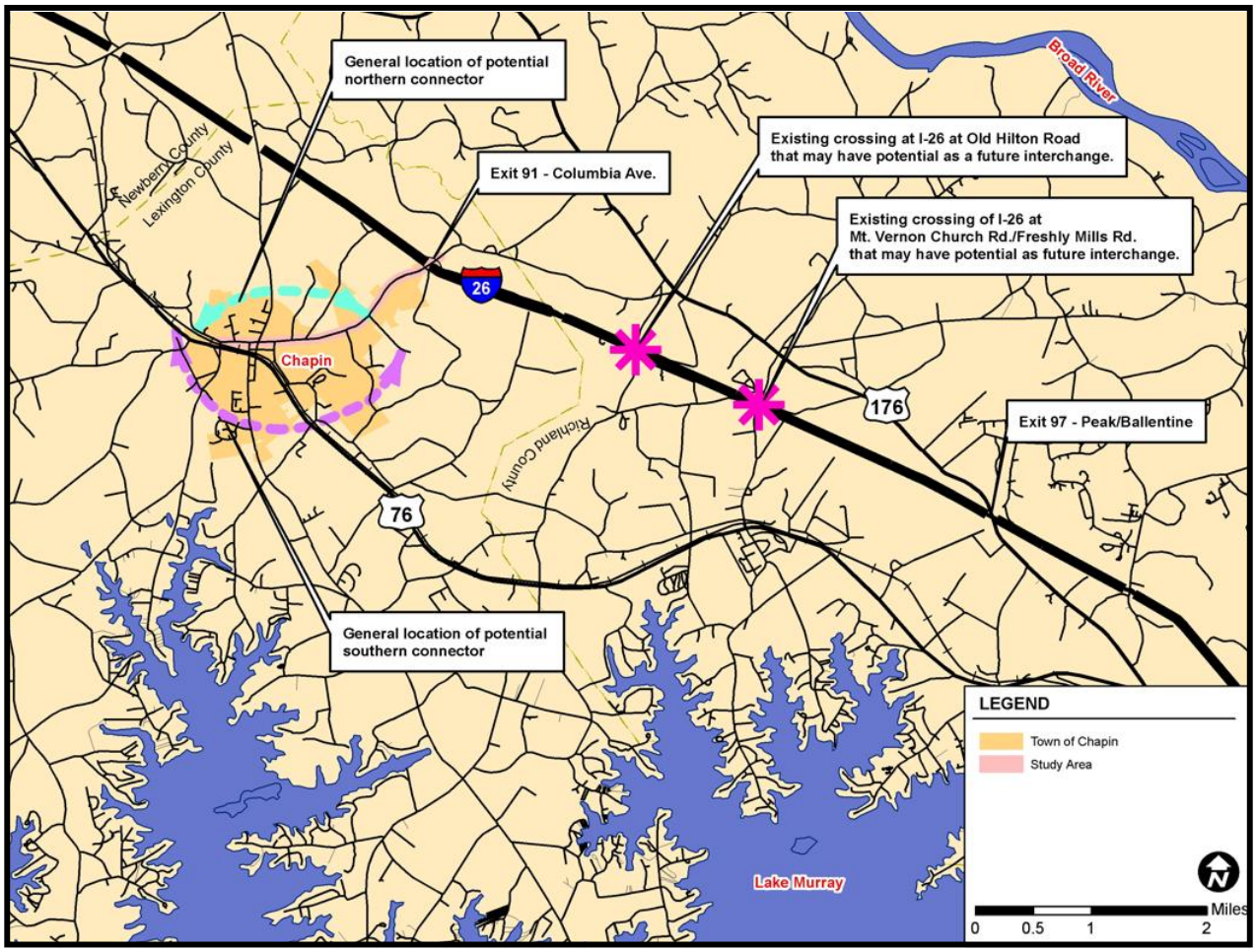


Figure 4.1-2
Potential for Connectors and Interchanges

4.1.2 Pedestrian and Bicycle Travel

Issues identified included excessive travel speeds (particularly east of Chapin High School), lack of sidewalks and associated ADA curb ramps, nonexistence of general connections between land uses, no controlled pedestrian crossings due to the absence of signalized intersections east of Chapin Road, vehicular disregard for pedestrian and bicycle right-of-way and safety, and a lack of elements to designate a bicycle-friendly environment (e.g., bike lanes, "share the road" signage, etc.).

Alternatives

Low

- Implement amenities and education programs to increase the attractiveness of bicycle and pedestrian travel in the corridor including:
  - Install "share the road" signs throughout the corridor;
  - Provide bike racks at key locations throughout the corridor including Chapin High School, SmartRide park-and-ride, and the town center; and
  - Institute an elementary school curriculum on issues of bicycle and pedestrian safety in Lexington-Richland School District 5 as part of the local, county, or state police community relations programs.
- Institute a pedestrian travel improvement program that includes periodic spot improvement or replacement of sidewalks along the corridor and installation of ADA curb ramps at surface transitions.
- Implement minor streetscape improvements (e.g., street trees, shrubbery, benches, wayfinding devices, etc.) at key locations along the corridor (e.g., near the town center, in front of the high school, etc.).

Medium

- As part of future intersection upgrades (i.e., signalization, addition of dedicated turn lanes, etc.), install high visibility crosswalks (i.e., bold striping) with limited intelligent transportation system (ITS) elements (e.g., pedestrian countdown signals and infrared detectors).

- Establish logical pedestrian connections between land uses through the installation of either sidewalks along appropriate roads (e.g., Columbia Avenue, Woodthrush Road, East Boundary Street, etc.) or, where suitable, through independent trail systems along various types of linear features (e.g., railroads, utility easements, etc.).

High

- As part of roadway improvements (i.e., widening), install and/or replace sidewalks (minimum width of 5 feet) throughout the entire corridor.

- As part of roadway improvements (i.e., widening), install bicycle lanes (minimum width of 5 feet) on both sides of the corridor.

- As part of roadway improvements (i.e., widening), implement streetscape improvements (e.g., patterned crosswalks, street trees, decorative pedestrian scale lighting, underground utilities, street furniture, wayfinding devices, etc.) along the corridor.

4.1.3 Transit

Issues identified included the limited size and perceived safety of the SmartRide park-and-ride lot, lack of pedestrian and bicycle connections to the park-and-ride lot, and the absence of transit service to the majority of the corridor.

Alternatives

Low

- Increase the attractiveness of the SmartRide service by initiating more aggressive promotion through local agencies (e.g., town hall, chamber of commerce, etc.) and increasing security and capacity of the park-and-ride facility (relocate if necessary).

Medium

- As part of pedestrian and bicycle improvements, establish pedestrian/bicycle connections/linkages between the park-and-ride lot, land uses throughout the corridor, and the town center.

High

- Connect the existing park-and-ride system to business and residential uses along the corridor, as well as the town center via a dedicated shuttle or circulator route service.

- Extend present transit routes and/or add additional routes to service businesses and residential uses throughout the corridor.

4.1.4 Railroad Corridor

Issues identified included the perpendicular intersection of S-48 and the railroad through a ninety-degree turn, significant queuing of westbound traffic that is waiting for trains to clear, difficult left turn movements for those wishing to access properties along Northwest Columbia Avenue, numerous at-grade railroad crossings that increase the potential for modal conflicts, and the railroad's limiting of potential alternate routes and fragmenting of the community.

Alternatives

Low

- Install additional advance warning signage to alert drivers to the geometric challenges associated with the rail crossing.

- Prohibit left turns onto Northwest Columbia Avenue by traffic traveling eastbound on Columbia Avenue.

High

- Capitalize on natural topography by extending Columbia Avenue along the right-of-way of Northwest Columbia Avenue and create a grade separated crossing of the railroad west of the existing at-grade crossing (see **Figure 4.1-3**).

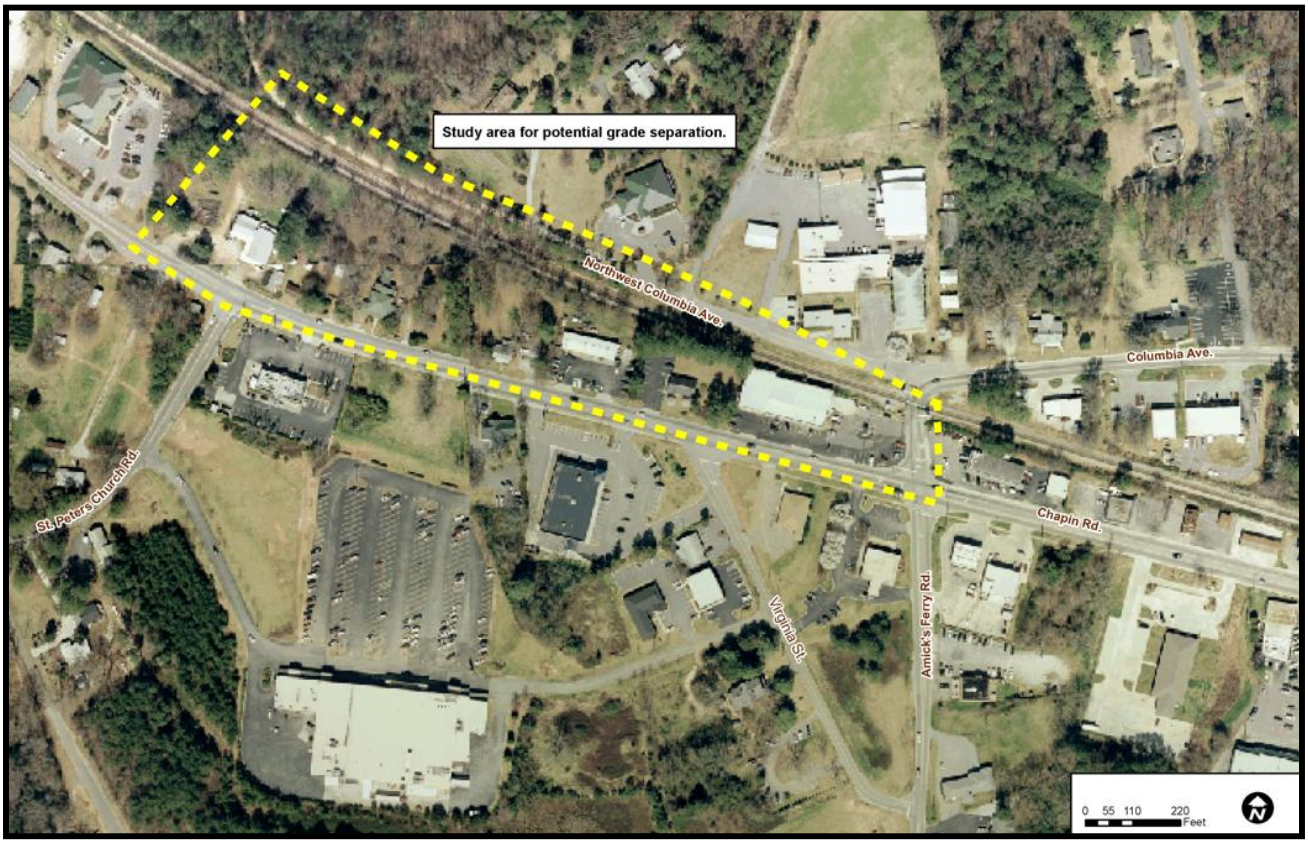


Figure 4.1-3
Study Area for Potential Railroad Grade Separation

4.1.5 Land Use

Issues identified included large amounts of land zoned general commercial (GC) and intensive development (ID) with the potential to build out in a low density, "sprawl-like" pattern (e.g., large residential lot sizes, limited mix of uses, etc.), incompatible land uses, eroding community character, and the proximity of existing land uses to the roadway increasing the impacts of potential future widening.

Alternatives

Low

- Increase coordination between the Town of Chapin, Lexington County, CMCOG, and the South Carolina Department of Transportation (SCDOT) during the site plan approval process in order to reconcile proposed land uses to the community and the transportation network.

High

- Refine municipal development regulations to include the encouragement of denser development with a mix of uses to assist in reducing the need for and length of automobile trips.

- Refine municipal regulations to require developers to provide a higher level of public amenities. Such standards/guidelines include:
  - Identify logical corridors for street and sidewalk system extensions and require (as part of site plan approval) dedication of right-of-way (as a minimum) for such improvements as new developments come online.
  - Develop performance standards that could be used to focus municipal site plan review targeted at improving multimodal access and compatible transitions amongst adjoining land uses. Such standards could include provisions for public open space, internal sidewalks, trails, landscaping, buffer yards between adjacent uses, interconnectivity of parcels, and shared parking.
  - Institute impact fees for development, thereby redistributing the cost burden of infrastructure improvements (i.e., utilities and roadways) to developers rather than the Town of Chapin.

4.2 Alternatives Evaluation

4.2.1 Performance Criteria

Each of the alternative solutions were assessed against a series of performance criteria based upon issues, opportunities, and constraints identified in Chapter 3. Performance criteria have been developed as follows (in no particular order):

- Ability to improve the safety and security of the transportation system for vehicular and non-vehicular users;
- Ability to facilitate integration and connectivity among various modes of transportation (i.e., automobile, bus, pedestrian, bicycle);
- Ability to improve the experience, access, and mobility of pedestrians and bicyclists in the corridor;

- Ability to improve the experience, access, and mobility of transit users in the corridor;
- Ability to maintain adequate traffic mobility for vehicular users in the corridor;
- Ability to enhance and preserve community character;
- Ability to be reasonably implemented, considering policy and regulatory jurisdictions and realistic funding mechanisms;
- Ability to be reasonably maintained or enforced following implementation; and
- Ability to contribute to the meeting of future growth expectations along and immediately adjacent to the corridor for the year 2025.

Preliminary alternatives that substantially met these criteria were carried forward for further refinement, development, and analysis in the recommendation phase of this study (see Chapter 5). In many cases, given the presence of closely related issues, the evaluation indicated that aspects of individual alternatives should be merged into more comprehensive proposals for key areas along the corridor.

4.2.2 Preliminary Alternatives Evaluation

Preliminary alternative solutions presented in Section 4.1 were evaluated using the above outlined performance criteria. The evaluation process was highly collaborative with input from specialists in the arenas of transportation, traffic, land use, engineering, and community character.

All information included in Chapters 1, 2, and 3 of this report was considered in this evaluation. The results of the evaluation are summarized in **Table 4.2-1** included at the end of this section.

Based on the qualitative nature of this evaluation, alternative solutions were evaluated comparatively to one another. A relative scoring system with three rankings was devised as follows: low potential for meeting criteria (1); moderate potential for meeting criteria (2); and high potential for meeting criteria (3). Rankings were distributed based on the ability of each alternative to meet the specific criterion in question in relation to other alternatives' capacities to meet the criterion (i.e., because the rankings are

qualitative, no formal thresholds were established to quantitatively define low, moderate, and high).

Based on individual scores for each criterion, an average score was determined for each alternative. Those alternatives receiving an average score of 2 or higher were advanced for further refinement (see Chapter 5).

4.2.2.1 Evaluation of Vehicular Travel Alternatives

In the case of vehicular travel all alternatives pass with a score of two or greater with the exception of widening S-48 to five lanes throughout the length of the entire corridor. It was determined that although this alternative met future growth expectations for 2025, it would be unreasonable to implement due to costs and the erosion of community character. Additionally, although it would have a significant benefit for automobile traffic, it does not directly promote the integration of all modes, or improve the experience, access, and mobility of pedestrians, bicyclists, and transit users.

4.2.2.2 Evaluation of Pedestrian and Bicycle Alternatives

The majority of bicycle and pedestrian travel alternatives received an average a score of two or higher with the exception of bicycle amenities and minor streetscape improvements. These lower scores can be attributed to only a moderate ability to facilitate the integration of modes and improve the environment of pedestrians, bicyclists, and transit users, a lack of addressing immediate travel needs, such as maintaining adequate traffic mobility, and an inability to contribute to meeting future growth expectations in 2025.

4.2.2.3 Evaluation of Transit Alternatives

The only transit alternative to meet the evaluation criteria was the establishment of pedestrian and bicycle linkages between the park-and-ride, corridor, and town center. Creating pedestrian and bicycle connections between the existing park-and-ride facility and other land uses rated high due to its integration of multiple modes of transportation, pedestrian and bicycle friendliness, and transit orientation.

The remainder of the transit alternatives had average scores below 2 primarily because they do not significantly contribute to meeting future growth demands, nor can they be easily implemented or maintained.

4.2.2.4 Evaluation of Railroad Corridor Alternatives

Two out of the three alternatives regarding the railroad corridor had average scores below a 2. Adding additional advance warning signage to alert motorists to the ninety-degree turn at the railroad crossing and prohibiting left turns onto Northwest Columbia Avenue by eastbound traffic both received low scores because they result in minimal safety benefits while failing to enhance the overall transportation network (e.g., mobility, access, level of service, etc.). Implementing a grade separation west of the existing at-grade crossing received an average score well above a 2.

4.2.2.5 Evaluation of Land Use Alternatives

All of the land use alternatives received scores of 2 or higher.

Table 4.2-1
Summary of Alternatives vs. Performance Criteria

Alternatives	Performance Criteria									
	Improve safety and security of transportation system	Facilitate integration and connectivity of all modes	Improve experience, access, and mobility of pedestrians and bicyclists	Improve experience, access, and mobility of transit users	Maintain adequate traffic mobility	Enhance and preserve community character	Reasonable implementation	Reasonable maintenance or enforcement	Contributes to meeting future growth expectations for 2025	Average Score
Vehicular Travel										
New circulation and connections within Chapin High School property	2	2	2	1	2	2	3	3	2	2.11
Dedicated turn lanes, traffic signals, and correction of geometric deficiencies at intersecting streets	2	2	3	1	2	3	3	3	2	2.33
New, localized east/west linkages	2	2	2	1	2	2	2	3	2	2.0
Widen S-48 to five lanes for entire length of corridor	3	1	1	1	3	1	1	3	3	1.88
Widen S-48 to three lanes beginning at Chapin Road and transition to five lanes	3	2	2	1	3	2	2	3	2	2.22
Construct northern and/or southern connector	3	2	2	1	3	2	2	3	3	2.33
New interchange(s) with I-26 with appropriate roadway improvements	3	1	1	1	3	3	1	3	3	2.22

Key
1 = low potential for meeting criteria
2 = moderate potential for meeting criteria
3 = high potential for meeting criteria

Table 4.2-1
Summary of Alternatives vs. Performance Criteria

Alternatives	Performance Criteria									Average Score
	Improve safety and security of transportation system	Facilitate integration and connectivity of all modes	Improve experience, access, and mobility of pedestrians and bicyclists	Improve experience, access, and mobility of transit users	Maintain adequate traffic mobility	Enhance and preserve community character	Reasonable implementation	Reasonable maintenance or enforcement	Contributes to meeting future growth expectations for 2025	
Pedestrian and Bicycle Travel										
Amenities and education programs (e.g., "share the road" signs, bike racks, etc.)	1	2	2	1	1	2	3	3	1	1.77
Spot improvement or replacement of sidewalks and the addition of ADA curb ramps	2	2	2	2	1	2	3	3	1	2.0
Minor streetscape improvements at key locations	1	2	2	2	1	2	3	3	1	1.88
High visibility crosswalks with limited ITS elements	2	2	2	2	1	2	3	3	1	2.0
Pedestrian connections between land uses	2	3	3	2	1	3	2	3	1	2.22
Sidewalks throughout corridor	2	3	3	3	1	3	2	3	1	2.33
Bicycle lanes throughout corridor	2	3	3	3	1	3	2	3	1	2.33
Streetscape improvements along the corridor	2	2	3	2	1	3	2	2	1	2.0

Key
1 = low potential for meeting criteria
2 = moderate potential for meeting criteria
3 = high potential for meeting criteria

Table 4.2-1
Summary of Alternatives vs. Performance Criteria

Alternatives	Performance Criteria									Average Score
	Improve safety and security of transportation system	Facilitate integration and connectivity of all modes	Improve experience, access, and mobility of pedestrians and bicyclists	Improve experience, access, and mobility of transit users	Maintain adequate traffic mobility	Enhance and preserve community character	Reasonable implementation	Reasonable maintenance or enforcement	Contributes to meeting future growth expectations for 2025	
Transit										
Increase attractiveness of SmartRide through promotion and security and capacity improvements to park-and-ride facility	2	2	1	3	1	2	2	1	1	**1.66**
Pedestrian and bicycle connections between park-and-ride, corridor, and town center	2	3	3	3	1	3	2	3	1	**2.33**
Connect park-and-ride to corridor and town center via shuttle	2	3	3	3	1	2	1	1	1	**1.88**
Extend or add routes to service corridor	2	3	3	3	1	2	1	1	1	**1.88**

Key
1 = low potential for meeting criteria
2 = moderate potential for meeting criteria
3 = high potential for meeting criteria

Table 4.2-1
Summary of Alternatives vs. Performance Criteria

Alternatives	Performance Criteria									Average Score
	Improve safety and security of transportation system	Facilitate integration and connectivity of all modes	Improve experience, access, and mobility of pedestrians and bicyclists	Improve experience, access, and mobility of transit users	Maintain adequate traffic mobility	Enhance and preserve community character	Reasonable implementation	Reasonable maintenance or enforcement	Contributes to meeting future growth expectations for 2025	
Railroad Corridor										
Additional advance warning signage concerning geometric challenges	2	1	1	1	1	1	3	3	1	1.55
Prohibit left turn onto Northwest Columbia Avenue	3	1	1	1	2	2	3	1	1	1.66
Extend Columbia Avenue to St. Peter's Church Road and grade separate crossing of railroad	3	3	3	2	3	2	2	2	2	2.44

Key
1 = low potential for meeting criteria
2 = moderate potential for meeting criteria
3 = high potential for meeting criteria

Table 4.2-1
Summary of Alternatives vs. Performance Criteria

Alternatives	Performance Criteria									Average Score
	Improve safety and security of transportation system	Facilitate integration and connectivity of all modes	Improve experience, access, and mobility of pedestrians and bicyclists	Improve experience, access, and mobility of transit users	Maintain adequate traffic mobility	Enhance and preserve community character	Reasonable implementation	Reasonable maintenance or enforcement	Contributes to meeting future growth expectations for 2025	
Land Use										
Increase coordination between approval agencies	3	2	2	1	2	3	2	2	2	2.11
Refine regs to encourage denser development with mix of uses	2	3	3	3	2	3	2	2	2	2.44
Street and sidewalk system plan and right-of-way dedication requirement	2	3	3	3	2	3	1	1	2	2.22
Performance standards targeting improved multimodal access and interconnectivity of parcels	3	3	3	3	2	3	2	2	2	2.55
Impact fees	3	2	2	2	2	3	1	1	2	2.0

Key
1 = low potential for meeting criteria
2 = moderate potential for meeting criteria
3 = high potential for meeting criteria

5. RECOMMENDATIONS

5.1 Corridor-Wide Recommendations

A series of corridor-wide actions are recommended for implementation that would address transportation and land use issues throughout the S-48 Columbia Avenue Corridor. These include land use and regulatory measures and lower cost capital improvements. Cost estimates and phasing for these recommendations are included in Chapter 6.

Such actions should be considered in two contexts: 1) as potential individual, discreet programs that could be implemented in various locations throughout the study area; but moreover, 2) as a series of objectives and elements that could be strategically incorporated into ongoing public improvement programs and/or regulatory processes.

5.1.1 Land Use & Access Management Recommendations

The relationship of future land use characteristics to the continued efficiency of the transportation network in and around the S-48 Columbia Avenue Corridor is of primary importance to encouraging a sustainable setting for reasonable growth. Seeking alternatives to the pattern of car-dependent development, the identification of a rational connection between land use and transportation is being recognized more and more as critical to reducing the need for costly future road construction and expansion projects. Other benefits include preserving natural resources, fostering more livable and socially interactive neighborhoods, and, through reductions in car travel, assisting in the promotion of the attainment of air quality standards for metropolitan areas. Key to achieving such goals along the S-48 Columbia Avenue Corridor, and in the Town of Chapin as a whole, is the implementation of land use and access management measures.

With regard to amendment or creation of regulations, it should be noted that such changes could impact a larger area than just the corridor proper, and therefore, most likely would be implemented in the context of more comprehensive actions regarding development control for the Town of Chapin in its entirety. In all cases, it is the intent of the recommendations to be in concert with and strengthen existing local regulatory controls.

5.1.1.1 Increased Coordination Between Town of Chapin and Lexington County

Increased communication and coordination between the Town of Chapin and Lexington County during the development process, specifically the site plan approval process is recommended. Such communication and coordination will improve the understanding and implementation of access management measures (e.g., curb cut frequency and placement, inter-parcel connectivity, etc.). In addition, increased coordination will ensure that proposed land uses are reconciled to the transportation network and developments occurring in the County are compatible with Town standards (since these developments will most likely one day become part of the Town).

5.1.1.2 Official Map

South Carolina law defines an "official map" as a map or maps showing the locations of existing or proposed infrastructure as adopted by the governing authority of a municipality or county. Official maps may be established to reserve future locations of public streets and highways, public utility rights-of-way, public building sites, and public open spaces, as well as to regulate structures or changes of land uses within those rights-of-way. Official mapping affords a level of preservation of such infrastructure routes and locations prior to requiring land acquisition.[1]

It is recommended that the Town of Chapin and Lexington County partner to develop an official map that includes the incorporated limits of the Town of Chapin and adjacent areas of Lexington County that are anticipated for future annexation. Such a partnership is necessary because future infrastructure will traverse portions of both the Town and County and South Carolina law only permits official maps to "include the whole or any part or parts of the municipality or county within the jurisdiction of the establishing governing authority."[2] Therefore, the Town cannot independently adopt an official map that includes portions of the County. In fact, it may be necessary for two official maps to be adopted (i.e., one by the Town and one by the County), but these maps would work in concert. Any official map(s) must be certified by the county

[1] This section summarizes SC Code of Laws 6-7-1210 through 6-7-1280, which is included in Appendix E.

[2] SC Code of Laws 6-7-1230.

clerk of circuit court and may consist of separate maps drawn to different scales, but they must be indexed on a map depicting the entire jurisdiction of the Town and/or County.

Both the Town and County planning commissions must adopt a comprehensive plan or the major street portion of those plans to move forward with the adoption of an official map (the Town of Chapin Land Development Plan currently serves as the town's comprehensive plan – it should be verified that this document is sufficient for comprehensive planning requirements). Once this is approved, the planning commissions may make surveys for the exact location of lines for proposed new, extended, widened, or improved streets and highways in the Town/County. The planning commissions can then make a map of the surveyed areas, thus certifying that the mapped lines are the rights-of-way needed for future infrastructure. The same process should be followed for public building sites and public open spaces, if desired. The certifying of the maps by the planning commissions comes in the form of a recommendation and does not constitute the opening or establishment of a public facility by the Town and/or County. After the recommendation is made, Chapin Town and Lexington County Councils may adopt the maps as the official maps following an advertised public hearing.

After the adoption of the official map by the Town/County, no permit can be issued for the construction, improvement, repair, or moving of any building or structure and no change in land use can be made on any land located within the mapped lines of any street or highway, public building site, public utility line, or public open space as shown on the official map. Processes exist for additions and modifications to the map, appeals by affected property owners, and exemption of property from the restrictions of the map.

It is important to note several issues surrounding official mapping. First, an official map is only as strong as the local governments' ability to acquire the property on which improvements are mapped, since acquisition is the only real mechanism for permanently preserving needed properties (i.e., once a property owner indicates their desire to develop, the only way to stop such development is through acquisition). Second, an official map puts the public on notice of desired corridors and properties for improvements and this can be a double-edged sword. While it depicts a master plan for improvements and will lead to the short-term

preservation of necessary properties, it also allows investors to purchase desired properties with the intent of making a profit off local governments when acquisition does finally occur. Finally, large-scale roadway projects that will be executed by the SCDOT present an additional challenge. Right-of-way for SCDOT projects cannot be acquired until the completion of right-of-way plans, which effectively removes any real or perceived short-term "teeth" in the official mapping of these projects.

Having said the above, it is recommended that adoption of an official map(s) be a high priority to the Town of Chapin and Lexington County, as this document will serve as a master plan for infrastructure improvements in the area and notify the public of the desire to preserve the rights-of-way for the majority of the capital improvement projects recommended as part of the S-48 Columbia Avenue Corridor Study.

5.1.1.3 Zoning Overlay Districts

An overlay district is used to place additional requirements or relax existing requirements to the underlying zoning district. It is not a separate zoning classification, rather it applies supplemental regulations to an area. It is quite common to apply overlay districts to significant transportation corridors. In this particular case, it will be necessary for the Town of Chapin and Lexington County to work together in the establishment of overlay districts, as parcels fronting the corridor are not presently all within the incorporated boundaries of the Town.

Overlay districts would provide significant benefits to the S-48 Columbia Avenue Corridor by:

- Reducing and preventing traffic congestion;
- Eliminating visual clutter by enhancing aesthetic character; and
- Situating compatible land uses in close proximity to one another.

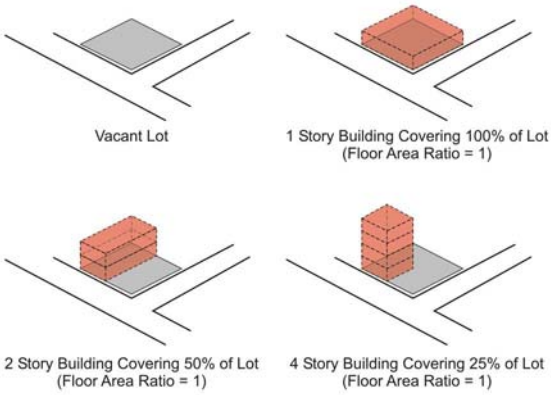
Several elements are recommended for the institution of successful overlay districts. The types of uses included in an overlay district must be clearly defined, and it is recommended that a mix of uses be incorporated into the overlay district. A mix of uses will bring about diversity in activity levels, while also allowing for reduced trip generations due to close proximity to adjacent complementary goods and services. By incorporating a mix of uses,

overlay districts will create nodes of activity or activity centers, rather than "stripped-out," "sprawl-like" development patterns.

By allowing specific types of land uses within an overlay district, the organization of the corridor can be taken a step further in complexity by creating zones of development along the length of the corridor. These zones of development are intent on concentrating pockets of development along the corridor in an effort to create multiple nodes or activity centers that meet a wide range of needs for the community. These various activity centers should be anchored by a specific land use (e.g., medical park, office park, industrial park, outdoor mall) and supplemented by a mix of uses. To ensure that the anchor land use does not dominate the activity center, a percentage of each use to exist in any node could be mandated by the overlay district.

In addition to the above recommendations for overlay districts, there are many others, which will serve as a means to increase aesthetic appeal, density, and inter-parcel connectivity:

- Each overlay district should include signage regulations to preserve aesthetic character along the corridor. Signage regulations should regulate size and encourage monument-style signs close to the ground. Further, these regulations should focus signage elements, such as color and the use of lighted signs.
- Landscaping regulations should serve as a means to increase aesthetic value by screening elements such as parking through the use of vegetation or built elements, while adjacent incompatible land uses can be screened through the use of buffer yards.
- Architectural design regulations should be incorporated into each overlay district as well, in order to maintain a uniform design throughout the area that is consistent with current buildings in the area (a design overlay district currently exists in the area, but does not cover all parcels along the corridor).
- Setback or build-to standards will contribute to uniformity and enhance visual quality.
- Where appropriate, overlay districts can bring about denser development by reducing minimum lot sizes. Similarly, floor area ratio (FAR) standards can regulate lot coverage in the area. Denser development



Floor Area Ratios

provides the potential for more public open space, while also reducing trip generations significantly.

- Overlay districts should include regulations pertaining to shared-parking, shared access roads, and shared curb cuts. This will reduce congestion and increase inter-parcel connectivity by limiting the number of access and conflict points along the corridor.
- Sidewalk dedications and public pathways will not only increase inter-parcel connectivity, but also increase travel opportunities for other modes of transportation (i.e., bicycles and pedestrians) to other areas of the corridor.

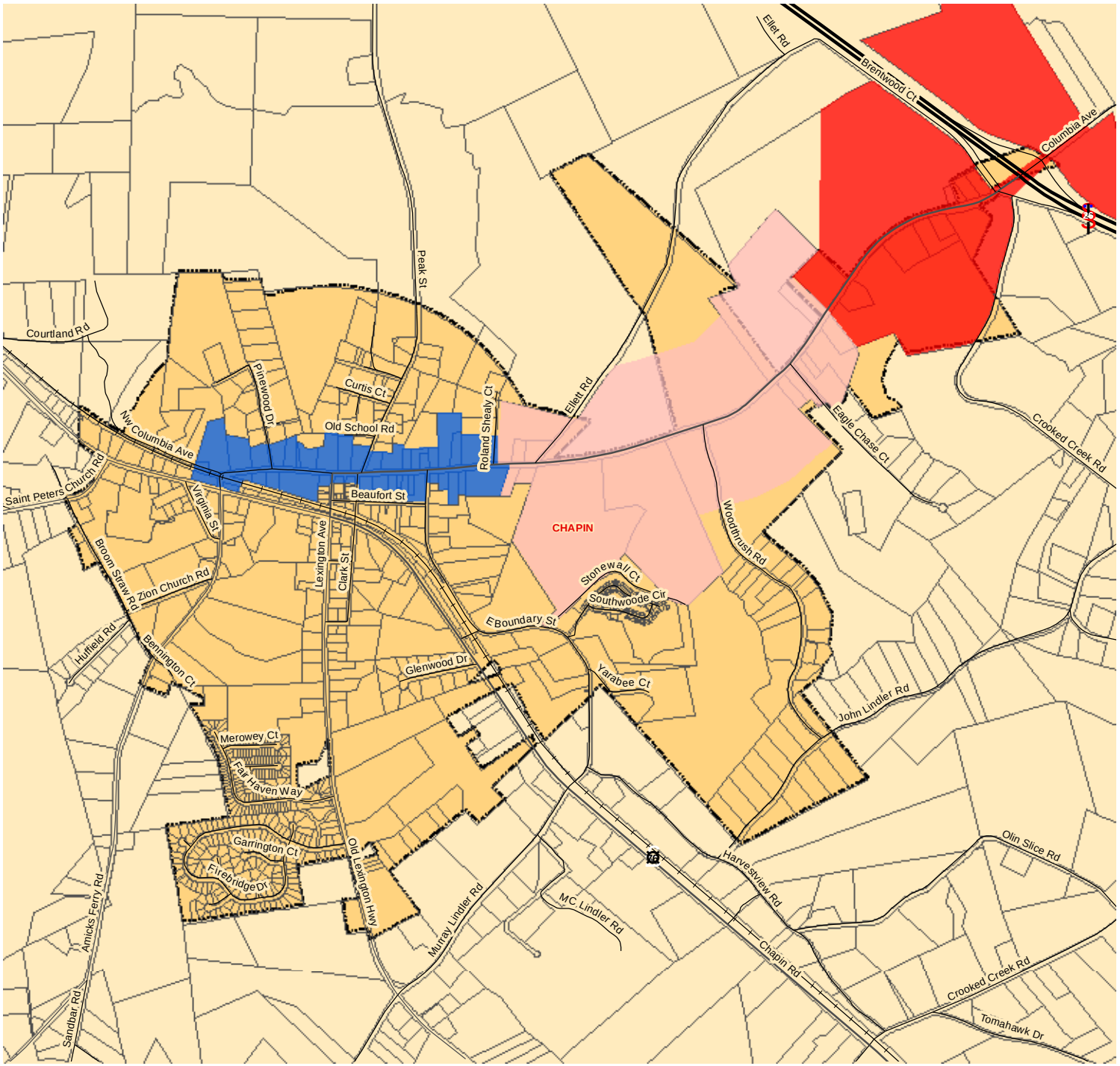
Overlay Districts Defined

Because the S-48 Columbia Avenue Corridor exhibits several distinct development areas, it would be inappropriate to place a single overlay district over the entire corridor. Therefore, it is recommended that several overlay districts be created based upon these unique development areas, including Interstate, Corridor, and Urban Village designations. Each of the overlay districts have been geographically defined to include only parcels that have frontage along S-48 Columbia Avenue; however, it would be acceptable to expand these to properties off of S-48, if logical reasons for such expansion exist. **Figure 5.1-1** depicts the conceptual boundaries of corridor overlay districts for the S-48 Columbia Avenue Corridor and they are outlined below.

Interstate Overlay District

The Interstate Overlay District is located at the eastern end of the S-48 Columbia Avenue Corridor and primarily encompasses properties within direct visual and physical access of I-26. Development within this overlay district should be interstate commercial in nature, consisting of a variety of land uses including gas stations, restaurants, hotels, and limited retail establishments.

The district should regulate signage, landscaping, curb cuts, access points, and, most importantly, screening from adjacent land uses; however, it should be less stringent than the other overlay districts, allowing the district to serve the market it is intended to serve - interstate travelers. Signage of an interstate commercial character should be allowed with restrictions on height and size. Landscaping should screen parking and service areas from adjacent



S-48 Columbia Avenue Corridor Study

LEGEND

Overlay Districts

- Interstate
- Corridor
- Urban Village

Town of Chapin

Source: CMCOG 2005; Parsons Brinckerhoff 2006
Map Created: 03/21/06

This map is for conceptual presentation purposes only, and is believed to be fundamentaly accurate; however, no guarantees as to its accuracy or completeness are expressed or implied.

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Figure 5.1-1
Zoning Overlay Districts

land uses, while at the same time improving the curb appeal of land uses within the district. To the extent possible, access points should be shared and curb cuts minimized. Building density should be at a lower level than the rest of the corridor, with an understanding that interstate commercial activity is automobile oriented and ample, convenient parking is needed.

Corridor Overlay District

The Corridor Overlay District is located in the central portion of the S-48 Columbia Avenue Corridor, beginning east of Eagle Chase Court and extending westward to Roland Shealy Court. Most of the parcels in this district are of a significant size and it is anticipated that much of this area will see large-scale developments. It is important that the Corridor Overlay District encourage a mix of uses on a single parcel and high density, both of which will contribute to the reduction of vehicle trips. The number and frequency of access points (i.e., curb cuts) to S-48 should be limited and placed in an efficient manner, but provision for ample access within and between parcels should be encouraged. Developments should be a mixture of single- and multi-family residential, office, institutional, and commercial land uses.

It is recommended that development performance standards be central to the Corridor Overlay District to assist in focusing municipal site plan review processes for new development in the district. Such standards would promote improved access, compatibility of adjoining land uses, and overall aesthetic character and appeal. The following are recommended to be included:

- Frontage improvement standards for new developments should be adopted as part of the district (e.g., curb and gutter, sidewalks, landscaping, etc.). Standards should allow for discretion based on the size and type of development under construction.
- Buffer yards or transitions should be mandatory between typically incompatible land uses (e.g., residential and industrial). Standards should specify minimum distances of separation; type, size, and quantity of vegetation (e.g., trees, shrubs, etc.), built elements (e.g., walls, fences, etc.), and/or transitional land uses (offices/accessory uses) that satisfy the buffer requirement. Density of buffer elements should increase as the distance between incompatible land uses decreases.

- Minimum requirements for dedicated open space within the interior of development parcels (i.e., based on zoning classification) should be employed to promote preservation of community character, conservation of natural resources, creation of future trail networks, reduction of impervious surfaces, and other municipal goals and priorities.
- Inter-parcel connectivity should be encouraged so as to limit the number of access and conflict points along the S-48 Columbia Avenue Corridor. This can be accomplished through standards that require interior circulation networks, shared access roads, and shared curb cuts.
- Parking lot design and placement that enhances a development's visual presence along the roadway and allows for interconnectivity with parking of adjacent properties should be encouraged. Specifically, parking should be located along the side, rear, or interior of a development parcel, have an appropriate balance of impervious (i.e., pavement) and pervious surfaces (i.e., landscaping), and when practical, connect to parking facilities or access roads of abutting development parcels.

Urban Village Overlay District

The Urban Village Overlay District is located at the western end of the S-48 Columbia Avenue Corridor in the area typically recognized as the "town center" of Chapin. The primary purpose of this district is to preserve, enhance, and expand upon the historic, "village" character of this area. New development should be compatible with existing buildings and incorporate either a converted residential appearance or traditional downtown multi-storied, mixed-use structures (e.g., commercial "storefronts" on ground floor, residential above). This district should be a highly "walkable" environment with appropriate sidewalk, streetscape, and building design that is safe, convenient, and comfortable for pedestrians. Providing a compatible mix of goods, services, and living spaces in close proximity to one another should result in fewer vehicle trips in this area of the corridor.

Some aspects of the Urban Village Overlay District include signage regulations, landscaping requirements, minimization of curb cuts, parking requirements, and design guidelines. Signage in this district should be ground-mounted or placed on the building façade with strict restrictions on size, color, and lighting. Landscaping regulations should focus on creating a welcoming pedestrian environ-

ment, while also screening parking facilities. Curb cuts should be minimized through shared driveways, coupled with joint parking and inter-parcel access to reduce trip generation. Design guidelines should regulate building elements such as street orientation, materials, scale, articulation, minimum height requirements (e.g., no less than three stories), build-to lines, and floor area ratio requirements.

5.1.1.4 Consideration of Impact Fees

It is recommended that the Town of Chapin consider the institution of impact fees on future development as a method for sharing the cost of public infrastructure between the public and private sectors. It is important to understand that impact fees can only be assessed on a proportionate basis (i.e., the developer is only responsible for the impact created by their specific development) and fees must be expended on their intended uses within 3 years of collection or refunds can be requested. Because the process for instituting impact fees in South Carolina is challenging, impact fees should be given balanced consideration, weighing the cost versus benefit of enacting such an ordinance. Should the Town determine that the benefit of instituting impact fees outweighs the cost of implementation and management of such fees, Appendix E can serve as a guide to the process.

5.1.2 Capital Improvement Recommendations

5.1.2.1 S-48 Columbia Avenue Widening

As currently programmed in the COATS TIP, improvements to S-48 Columbia Avenue will upgrade the roadway by widening S-48 to five lanes (i.e., two travel lanes in each direction with a center turn lane throughout) between US 76 and I-26. In order to preserve and enhance the character of the S-48 Columbia Avenue Corridor, while making the most efficient use of the existing transportation system (per the statement of purpose and goals and objectives of this study), a slightly different approach is being recommended here.

Traffic analysis performed to date indicates that a five-lane section for the entire length of S-48 between US 76 and I-26 would be needed to provide adequate capacity for traffic volumes in 2025. However, if some of these volumes can be diverted from S-48, then a cross section could be utilized that is more sensitive to the surrounding context. The Southern Connector is recommended

in Section 5.2.3 as a new east-west connection that will remove a significant amount of traffic from S-48 Columbia Avenue in the urban village area. Additionally, it should be noted that the *Bike and Pedestrian Pathways Plan for the COATS Study Area* identifies an Early Action Project that recommends sidewalks and bike lanes be constructed on both sides of S-48 between Chapin Road (US 76) and Chapin High School by March 2008.

Based on the above, it is recommended that a combination of a three- and five-lane section be implemented along Columbia Avenue (see **Figure 5.1-2**). A three-lane section is recommended from US 76 to just east of Roland Shealy Court. In this area, the right-of-way width would be 75 feet with 12-foot travel lanes, 4-foot bike lanes, a 15-foot planted median (center turn lane where needed), and 5-foot planted verge areas and 5-foot sidewalks on both sides of Columbia Avenue. Additionally, the posted speed limit would be 35 miles-per-hour (mph) (with a design speed of 40 mph). Further, appropriate streetscape elements, including street trees, decorative pedestrian scale lighting, and banners, are recommended. **Figure 5.1-3** shows a rendered typical section for this area of S-48 Columbia Avenue.

From just east of Roland Shealy Court to I-26, a five-lane section is recommended. In this area, the right-of-way width would be 100 feet with 12-foot travel lanes, 4-foot bike lanes, a 15-foot planted median (center turn lane were needed), and 5-foot planted verge areas and 5-foot sidewalks on both sides of Columbia Avenue. Additionally, the posted speed limit would be 45 mph (with a design speed of 50 mph). Further, appropriate streetscape elements, including street trees, decorative high-mast vehicular scale lighting, and banners, are recommended. **Figure 5.1-4** shows a rendered typical section for this area of S-48 Columbia Avenue.

Contextual Highway Design

It is further recommended that the principals of contextual highway design (also known as context sensitive solutions) be followed in the design and construction of the widening of S-48 Columbia Avenue. Contextual highway design is a collaborative, interdisciplinary approach that meets functional requirements for service, safety, and structural adequacy, while adapting the highway to its

S-48 Columbia Avenue Corridor Study

LEGEND

- S-48 3-Lane Section
- S-48 5-Lane Section
- Bennington Court Extension
- Southern Connector Phase I
- Southern Connector Phase II
- Extension & Grade Separation

Town of Chapin

Source: CMCOG 2005; Parsons Brinckerhoff 2006
Map Created: 07/31/06

This map is for conceptual presentation purposes only, and is believed to be fundamentaly accurate; however, no guarantees as to its accuracy or completeness are expressed or implied.

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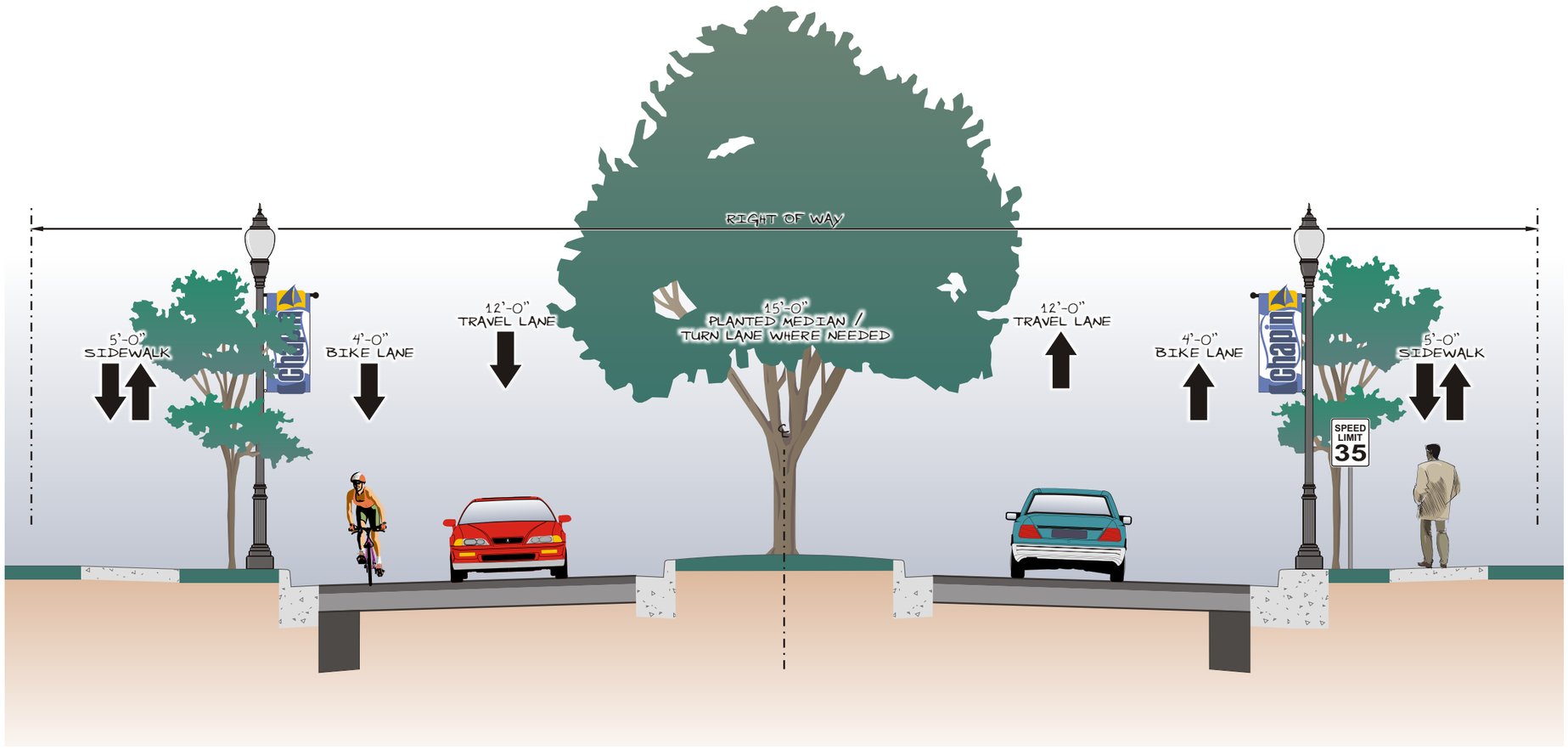
Figure 5.1-2
Capital Improvement Recommendations

S-48 Columbia Avenue Corridor Study

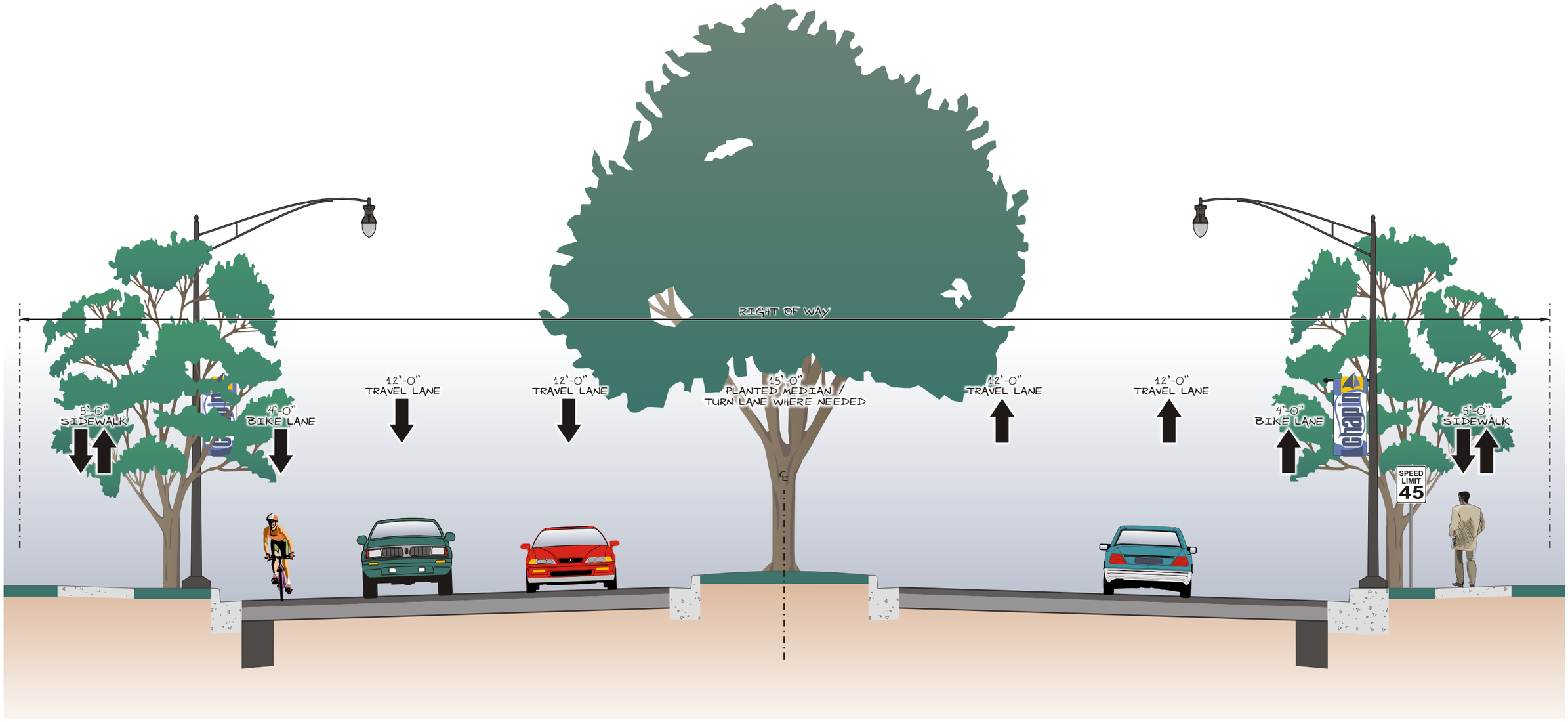


S-48 COLUMBIA AVENUE - TYPICAL 3-LANE SECTION

NOT TO SCALE

Figure 5.1-3
S-48 Columbia Avenue
Typical 3-Lane Section

S-48 Columbia Avenue Corridor Study



S-48 COLUMBIA AVENUE - TYPICAL 5-LANE SECTION

NOT TO SCALE

Figure 5.1-4
S-48 Columbia Avenue
Typical 5-Lane Section

setting, and preserving or enhancing aesthetic, environmental, and cultural resources.[3]

Three important elements comprise successful contextual highway design: 1) political leadership that supports the project and the pursuit of required funding; 2) project leadership that provides the necessary resources and philosophy; and 3) project ownership that understands and is committed to implementing contextual design principles. At the heart of contextual highway design is the concept that any roadway project must consider the physical context, as well as the context of perceptions and feelings that occur on a personal level among stakeholders that are affected by the implementation of the project.

The overall goal of contextual highway design is to establish a sense of harmony between the user and the environment at the speed for which the roadway is designed. This harmony reflects consistency and compatibility. Implementing designs that are in harmony with the natural and human environments are a small part of a project's total costs. This level of harmony can also affect the design speed of the roadway as design elements are combined to create a level of driver expectancy. The design speed is typically based upon the function of the roadway and the character of the surrounding area. Elements such as curves, grades, lane widths, medians, sight distances, signs, and markings all trigger a subconscious response from the driver known as driver expectancy. This term is derived from the real-world scenario the driver expects as a result of these elements.

The key to determining an appropriate design speed is the harmonization of the highway to its immediate environment. It is important to interpret the appropriate level of driver expectancy as to not invite "over-driving" the limits of the roadway. Non-invasive traffic calming measures (e.g., narrowing of lane widths, addition of road curvature, limiting the field of vision with vertical landscaping elements, etc.) may be appropriate in some cases to prevent over-driving.

It is important to remember that roadway users are transient, but roadway neighbors are not. Contextual highway design must not

[3] The basis for much of the discussion in this section is taken from Parsons Brinckerhoff's industry guide *Concepts in Contextual Highway Design: A PB Reference Guide* (2002).

only take into account the experience of the driver, but it must also take into account the experience of those in close proximity to the roadway. This is particularly important in sensitive areas, such as residential communities, business districts, schools, parks, and recreation areas, as are present along the S-48 Columbia Avenue Corridor.

5.1.2.2 Targeted Pedestrian Improvements

Countdown Pedestrian Signal

Retrofitted ADA Curb Ramp

In the event that implementation of the widening of S-48 Columbia Avenue (see Section 5.1.2.1), which will include comprehensive pedestrian facilities, is delayed, it is recommended that targeted pedestrian improvements be made in areas where sidewalks are cracked, heaved, or nonexistent. One key area where sidewalks presently do not exist and should be constructed is along the front of the Chapin High School property.

It is further recommended that logical pedestrian connections between adjacent institutional, commercial, and residential land uses be established. This could be accomplished either through the installation of sidewalks throughout certain areas of the corridor or through the creation of a trail system through land dedications from property owners. Such facilities would assist in linking land uses and promoting use of the SmartRide commuter bus service by those who do not have access to an automobile.

Any new or improved pedestrian facilities should meet or exceed ADA requirements. In addition, ADA compliant curb ramps should be installed at all surface transitions.

5.1.2.3 Targeted Streetscape Improvements

In the event that the implementation of the widening of S-48 Columbia Avenue (see Section 3.2.1), which will include comprehensive streetscape elements, is delayed, it is recommended that targeted streetscape improvements be made at key nodes along the S-48 Columbia Avenue Corridor. Areas of particular focus should include gateways, transitions between designated overlay districts, and in the vicinity of intersections. Additionally, property owners should be encouraged to beautify the frontages of their properties along the corridor.

Any interim treatments should be low cost, reasonable applications intended to only fill the gap between today and when full streetscapes will be implemented as part of the S-48 widening. Such improvements could be implemented by the Town or be structured as part of a public-private partnership through a "community pride" initiative (e.g., businesses sponsor installation and maintenance and in return receive some type of public recognition, Town purchases planting materials with garden clubs installing and maintaining planting beds, etc.).

5.2 Site-Specific Recommendations

This section outlines a series of recommendations specifically targeted at key areas within the S-48 Columbia Avenue Corridor. Each involves future capital improvements aimed at facilitating improved mobility and safety for all modes. Cost estimates and phasing for these recommendations are included in Chapter 6.

5.2.1 Chapin High School Access and Circulation Improvements

In order to enhance safety, reduce modal conflicts, and better accommodate vehicular and pedestrian travel in and around Chapin High School, a series of access and circulation improvements are recommended in the following sections. **Figure 5.2-1** depicts these improvements.

5.2.1.1 Rear Entry

It is recommended that improvements to the rear entry of the Chapin High School campus be made to create a viable ingress/egress alternative to access points along S-48 Columbia Avenue. The rear entry should be widened to accommodate two-way traffic, and sidewalks should be established from Boundary Street into the campus proper. Additionally, improvements may be warranted at the intersection of Boundary Street and Stone Wall Court to reduce potential for congestion during morning and afternoon peak hours (e.g., dedicated turn lanes). It is further recommended that the school continue the practice of requiring students to access the western student lots from this rear entry.

Existing one-way rear entry to Chapin High School property.

5.2.1.2 Parent Drop-off/Pick-up Entrance

The former bus storage parking lot on the northeastern end of the Chapin High School campus is now utilized for student parking and parent drop-off/pick-up. During collection of existing conditions and issues identification, it was recognized that some problems exist at this entrance/exit to the school. As part of the analysis of this entrance/exit to Chapin High School, traffic counts were collected (i.e., all traffic counts are on file with CMCOG and available upon request). These counts were not of a significant enough volume to warrant any type of traffic study of this area; however, the observations made while performing the counts indicated that safety and mobility issues do exist at this location.

Queuing onto S-48 Columbia Avenue at Chapin High School parent drop-off/pick-up driveway.

During peak morning and afternoon pick-up/drop-off periods, the vehicle storage capacity of this driveway is insufficient to accommodate the number of vehicles waiting to pick-up and drop-off students. At these peak periods, vehicles queue the entire length of the driveway and onto S-48, creating "gridlock" conditions for through-motorists (i.e., this appears to be more of an issue in the afternoon, as parents arrive prior to the dismissal of school and must wait in line for students). To bypass this gridlock condition, motorists not accessing the school utilize the center turn lane as a through lane, accelerating as they pass the "parked" vehicles waiting to enter the high school property. This in turn creates a dangerous situation for westbound motorists on S-48 who are attempting to turn left into the school and parents leaving the school via a left turn onto S-48; just as they find an opening to turn left, an automobile will pass through the intersection in the center turn lane. A number of near misses were observed, and, based on the current operation of this entrance/exit, it is reasonable to assume that it is only a matter of time until an accident does occur.

It is recommended in the near-term (i.e., 0-2 year period) that a right turn lane be constructed along eastbound S-48 Columbia Avenue. By moving turning cars from the travel lane, through-motorists may continue eastbound without darting out into the center turn lane. Also, widening this intersection for the right turn lane will improve sight distance for motorists turning left into or out of the school. Additionally, vehicle storage within the school campus should be explored to determine if a larger portion of the

S-48 Columbia Avenue Corridor Study

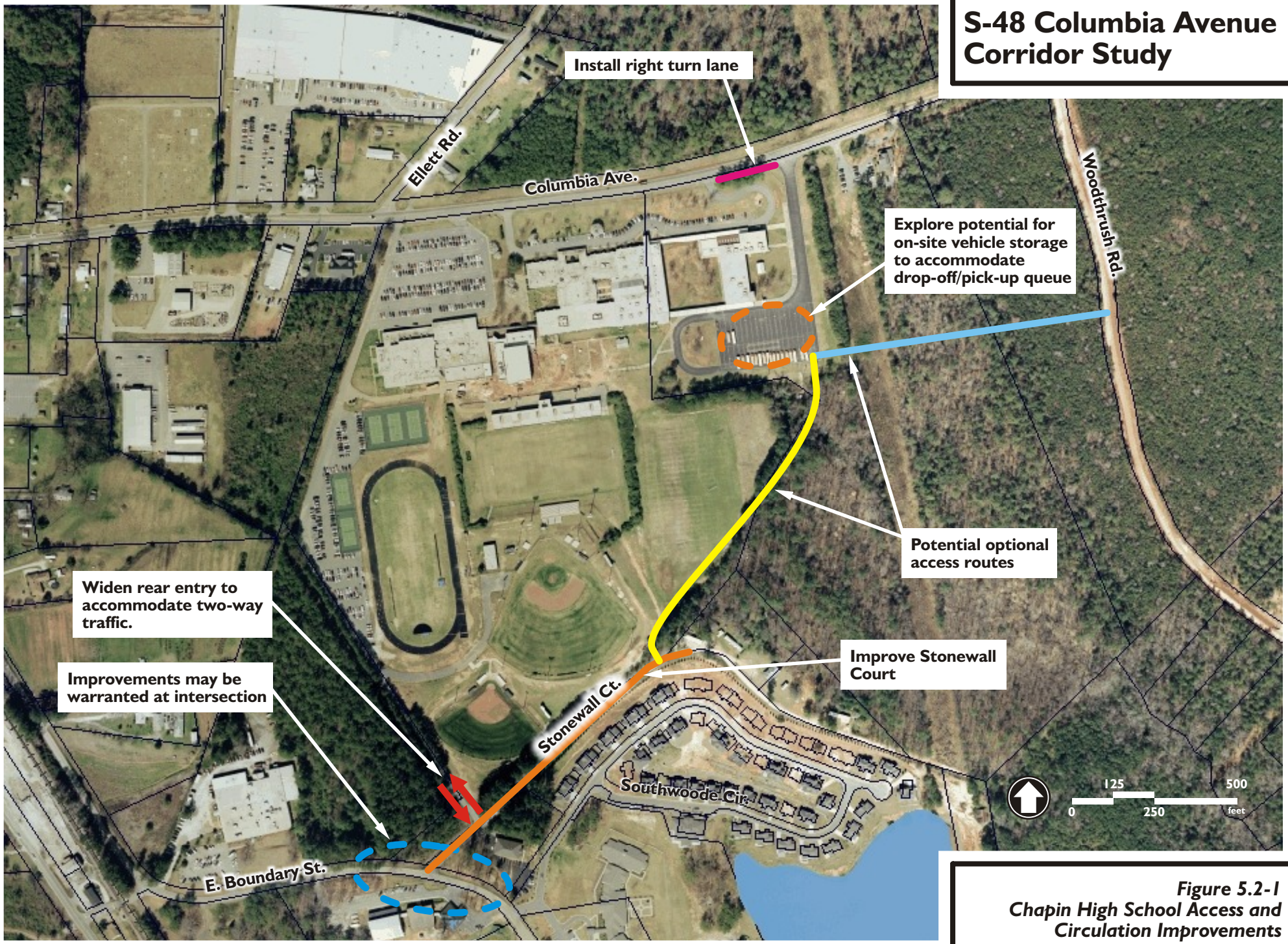


Figure 5.2-1
Chapin High School Access and Circulation Improvements

former bus storage facility could be utilized to house the automobiles of waiting parents on the school's property, rather than within the right-of-way of Columbia Avenue.

The realignment of Ellett Road is currently being investigated by the Town of Chapin and Lexington County, and there is potential that the new intersection of Ellett Road and S-48 Columbia Avenue could occur directly across from the Chapin High School drop-off/pick-up drive. It is recommended that further study of this possibility be undertaken, as this might allow this intersection to meet warrants for signalization (it does not presently), which would improve the safety and functionality of this intersection.

A medium-term recommendation that would further improve access and mobility for parents, students, and teachers is the creation of a second access to the drop-off/pick-up parking area. Two potential alignments exist for this alternative access: 1) construction of an interior campus roadway connecting the southwest corner of the parent drop-off/pick-up lot to an improved Stonewall Court; or 2) construction of a driveway from the southwest corner of the parent drop-off/pick-up lot connecting to Woodthrush Road and ultimately to the proposed Southern Connector (see Section 5.2.3). Both are viable alignments; however, the first option may prove to be the easier to implement, as it would require little to no right-of-way acquisition (i.e., the majority of the new roadway would be located on school property), while the second option would traverse another landowner's property.

With all of the above recommendations, coordination and cooperation between Lexington-Richland School District 5, SCDOT, Lexington County, and the Town of Chapin would be essential for success.

5.2.2 Bennington Court Extension

The lack of east-west linkages south of the Town of Chapin (several did exist prior to the construction of Lake Murray) reduces the options for those who wish to travel between origins southwest of Chapin and destinations southeast of Chapin (or vice versa). A prime example are those residents who live along Amick's Ferry and St. Peter's Church Roads who daily travel to the Chapin Elementary/Chapin Middle School campus off of Old Lexington Highway and Old Bush River Road. Presently, these individuals must go north to Chapin Road (US 76) and then traverse

back south on Lexington Avenue/Old Lexington Highway. Not only does this result in more miles traveled and fuel expended, it exacerbates the traffic flow issues that already exist along US 76 and specifically at the Columbia Avenue/Chapin Road/Amick's Ferry Road Intersection.

The Amick's Ferry Road to Lexington Avenue segment of the proposed Southern Connector (see Section 5.2.3) would provide the most efficient long-term solution to this issue; however, in the short-term (i.e., prior to construction of the Southern Connector), the extension of Bennington Court is recommended as a reasonable stopgap measure (see Figure 5.1-2). This new connection between Amick's Ferry Road and Lexington Avenue would begin at the intersection of Amick's Ferry Road, Broom Straw Road, and Bennington Court and traverse east to form a "T" intersection with Lexington Avenue. A two-lane section (i.e., one travel lane in each direction) should be sufficient to handle traffic volumes prior to the construction of the Southern Connector. As part of the design process, it should be determined if signalized intersections are warranted at each end of this new street.

As much of the traffic traveling in this area originates from neighborhoods outside the Town's incorporated limits (i.e., Lexington County), it is further recommended that the Town of Chapin and Lexington County partner to fund the design, construction, and maintenance of the Bennington Court Extension (a detailed cost estimate for the design and construction of this project is included in Appendix G). This would expedite the new street's implementation, as state and federal "hoops" would be avoided. Additionally, it would represent a good faith effort by the Town and County to be "team players" in alleviating traffic congestion in the Town of Chapin.

5.2.3 Southern Connector

As a means of maintaining the character of the S-48 Columbia Avenue Corridor while providing adequate capacity for projected traffic volumes, the Southern Connector is recommended as an alternate connection between points west and east of Chapin. This new roadway will provide a viable option to S-48 that will be more convenient and efficient for a majority of motorists that now travel S-48 and additional volumes in the future.

Not envisioned as a highway facility, the Southern Connector would be an urban boulevard with a posted speed limit of 35 mph (design speed of 45 mph). Based on its location traversing through undeveloped land and residential land uses, this street should function as a parkway with low speeds and a high degree of character. It is recommended that the principles of contextual highway design presented in Section 5.1.2.1 be applied to the design and construction of the Southern Connector. Also, it would be most appropriate to place the Corridor Overlay District outlined in Section 5.1.1.3 over parcels fronting along the Southern Connector to ensure that future development is of the desired type, density, and style. Additionally, specific attention should be given to providing adequate pedestrian and bicycle connections from adjacent land uses and along this new facility.

It is recommended that initially the section of the Southern Connector between Amick's Ferry Road and Old Lexington Highway be constructed as a two-lane section (i.e., one lane in each direction), with adequate right-of-way acquired for a future five-lane section. Ultimately, a five-lane section is recommended for the entirety of the Southern Connector. The right-of-way width would be 100 feet with 12-foot travel lanes, a 15-foot planted median (center turn lane where needed), 5-foot planted verge areas on both sides, a 5-foot sidewalk on the eastern side, and a 10-foot shared-use path to the west. Additionally, appropriate streetscape elements, including street trees, decorative high-mast vehicular scale lighting, and banners, are recommended. **Figure 5.2-2** shows a rendered typical section for the Southern Connector.

5.2.3.1 Southern Connector Conceptual Alignment

A conceptual Southern Connector alignment is depicted in Figure 5.1-2. It begins approximately 0.25 mile north of the intersection of Amick's Ferry Road and Sandbar Road and approximately 0.75 mile south of the Columbia Avenue/Chapin Road/Amick's Ferry Road intersection. The alignment traverses east across undeveloped land to intersect with Old Lexington Highway at Murray Lindler Road. It then follows the right-of-way of Murray Lindler Road to its intersection with Chapin Road (US 76). From there it continues on a northeasterly path utilizing and improving the existing East Boundary Street at-grade railroad crossing. After curving through open land and several residential land uses, the Southern Connector links up with the right-of-way of Woodthrush Road just north of residential uses and connects to S-48 in the vicinity of the

existing intersection of Columbia Avenue and Woodthrush Road. Presently this connection to S-48 at Woodthrush Road is envisioned as a perpendicular connection at a signalized intersection (assuming the intersection meets signal warrants); however, during design it should be determined if this is most appropriate or if other intersection configurations are more appropriate. Additionally, the alignment depicts a future phase of the Southern Connector that would connect Amick's Ferry Road to St. Peter's Church Road.

It should be noted that the Southern Connector would affect (either directly or indirectly) several existing and proposed residential areas. Residences are located primarily along the southeast side of Murray Lindler Road; therefore, every attempt should be made to confine the majority of right-of-way acquisition to the northeastern side of Murray Lindler Road where general commercial parcels primarily exist. Another area with a number of residences is the section of the Southern Connector between Chapin Road and Columbia Avenue. With residences on East Boundary Street, Yarabee Court, Southwoods Circle, Stonewall Court, and Woodthrush Road, and over 100 homes being planned for an 80-acre parcel just west of Woodthrush Road, it will be important for contextual design principles to be utilized.

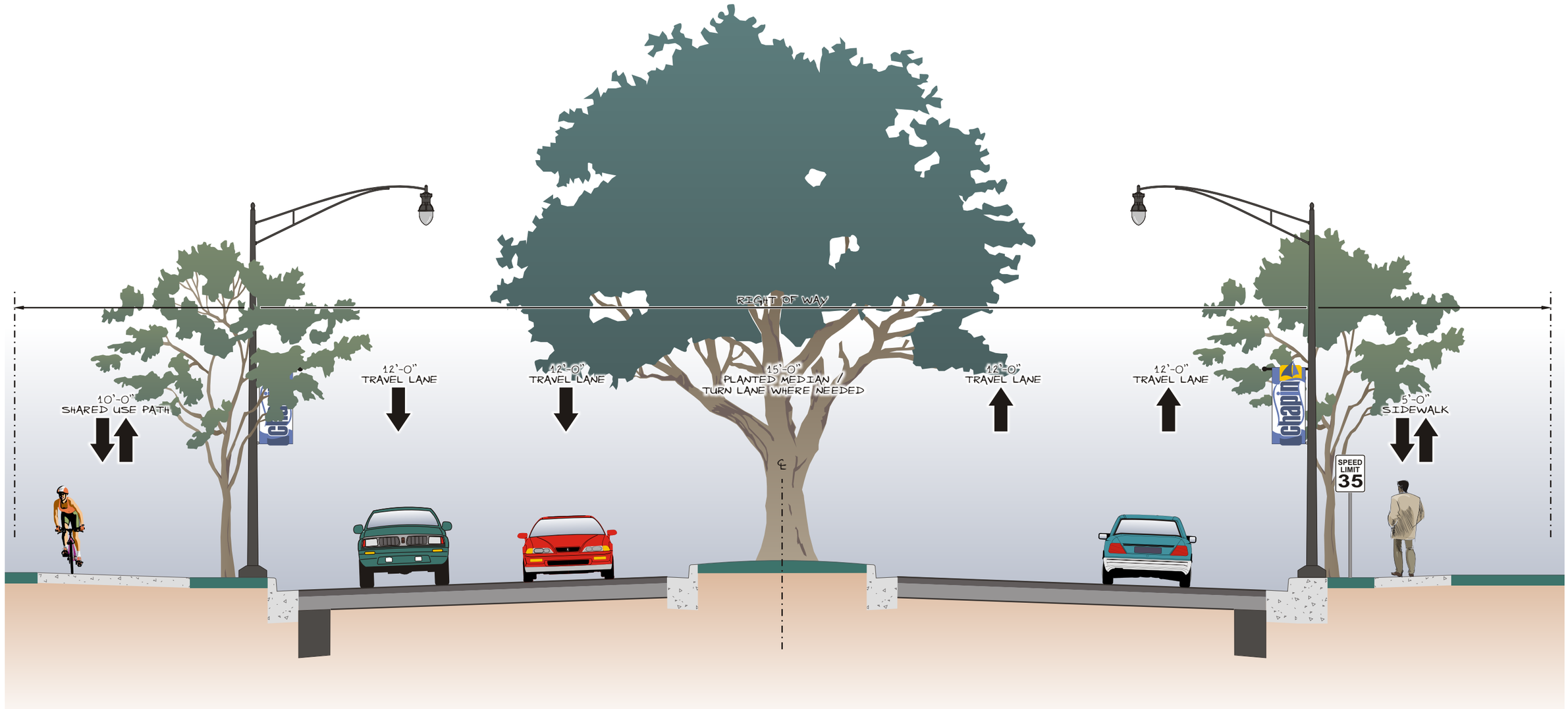
5.2.3.2 Intersection of Southern Connector and S-48

The Southern Connector will intersect with S-48 Columbia Avenue in the vicinity of S-48's existing intersection with Woodthrush Road (i.e., Woodthrush Road will be realigned to form a "T" intersection with the Southern Connector approximately one-quarter mile south of Columbia Avenue). It is assumed that this will be a four-legged intersection with a new road accessing future development north of Columbia Avenue. It is further assumed that S-48 will ultimately be five-laned.

The ultimate Southern Connector Intersection should include:

- Signalization including protected left turns (assuming signal warrants are met);
- Implementation of a left turn lane, through lane, and through/right turn lane southbound and a left turn lane, through lane, and right turn lane northbound;

S-48 Columbia Avenue Corridor Study

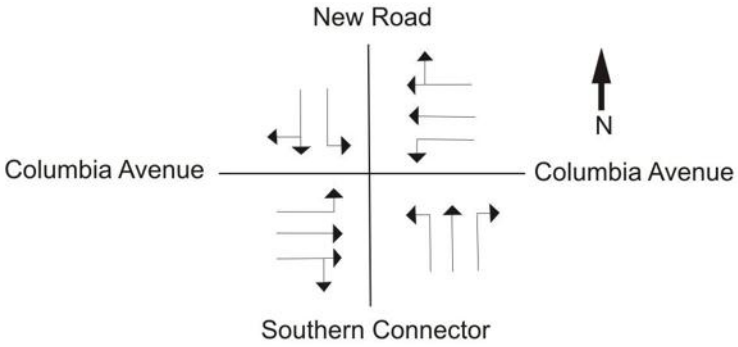


SOUTHERN CONNECTOR - TYPICAL SECTION

NOT TO SCALE

Figure 5.2-2
Southern Connector
Typical Section

- Acquisition of additional right-of-way to accommodate future dual west-bound left turn lanes on Columbia Avenue;
- Creation of enhanced crosswalks utilizing patterned concrete or asphalt streetprint in all directions with actuated crossing signals;
- Construction of curbs, gutters, and ADA compliant sidewalks in the immediate vicinity of the intersection;



- Installation of ADA compliant ramps at all surface transitions;
- Planting of street trees and landscaping along right-of-way, where applicable; and
- Installation of traffic signal mastarms and decorative pedestrian scale lighting.

5.2.4 Intersection Improvements

The future no build traffic analysis included in Appendix C analyzed seven critical intersections along the S-48 Columbia Avenue Corridor. This analysis projected the failure of all of these intersections in the design year 2025. Even with signalization, these intersections will operate at a level of service (LOS) F with high delays. Improvement of these intersections should be considered a priority to remedy future traffic flow issues. Ideally, it would make the most sense to improve these intersections as part of the overall widening of S-48 (see Section 5.1.2.1); however, if widening of S-48 is delayed, it would be necessary to improve these intersections independent of that project.

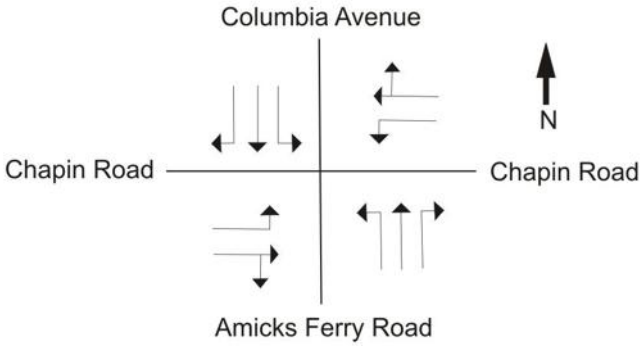
As part of the development of alternatives, a traffic analysis was conducted that included the widening of S-48 Columbia Avenue and construction of the Southern Connector (see Section 5.2.3). That traffic study is documented in Appendix F. Based on the outcomes of that study, the following sections outline recommended improvements to four of the seven critical intersections along the S-48 Columbia Avenue Corridor (the other three are addressed as part of more comprehensive recommendations in Sections 5.2.3 and 5.2.6). Recommendations are intended to be multimodal in nature, addressing mobility and access for both motorized and

non-motorized modes, while also enhancing the visual character of the corridor. Additionally, signalization has been assumed for all intersections; however, a signal warrant analysis should be performed as part of design for each of these intersections to determine if such signalization is justified.

5.2.4.1 Amick's Ferry/Chapin Road (US 76) Intersection

A program of improvements for the Amick's Ferry/Chapin Road Intersection should include:

- Signalization to provide protected left turns from the existing dedicated left turn lanes on Chapin Road (assuming signal warrants are met);
- Addition of a northbound dedicated right turn lane on Amick's Ferry Road and a southbound dedicated right turn lane on Columbia Avenue;
- Creation of enhanced crosswalks utilizing a pronounced striping pattern in all directions with actuated crossing signals;
- Construction of curbs, gutters, and ADA compliant sidewalks in the immediate vicinity of the intersection;



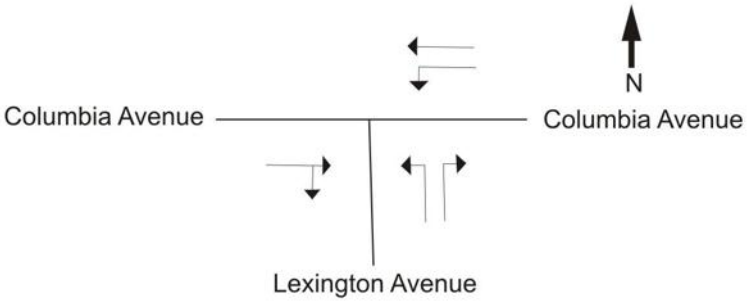
- Installation of ADA compliant ramps at all surface transitions;
- Planting of street trees and landscaping along right-of-way, where applicable; and
- Installation of traffic signal mastarms and decorative pedestrian scale lighting.

5.2.4.2 Lexington Avenue Intersection

A program of improvements for the Lexington Avenue Intersection should include:

- Signalization (assuming signal warrants are met);
- Implementation of separate left and right turn lanes on Lexington Avenue;
- Creation of enhanced crosswalks utilizing patterned concrete or asphalt streetprint in all directions with actuated crossing signals;

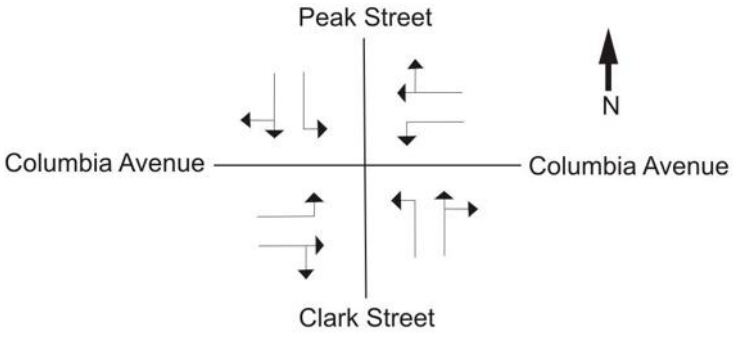
- Construction of curbs, gutters, and ADA compliant sidewalks in the immediate vicinity of the intersection;
- Installation of ADA compliant ramps at all surface transitions;
- Planting of street trees and landscaping along right-of-way; and
- Installation of traffic signal mastarms and decorative pedestrian scale lighting.



5.2.4.3 Clark Street/Peak Street Intersection

As a typical improvement plan, existing geometry and a conceptual design plan of recommended improvements for the Clark Street/Peak Street Intersection are depicted in **Figure 5.2-3**. Such a program of improvements should include:

- Signalization (assuming signal warrants are met);
- Relocation of Peak Street to correct offset alignment with Clark Street;
- Creation of enhanced crosswalks utilizing patterned concrete or asphalt streetprint in all directions with actuated crossing signals;
- Construction of curbs, gutters, and ADA compliant sidewalks in the immediate vicinity of the intersection;

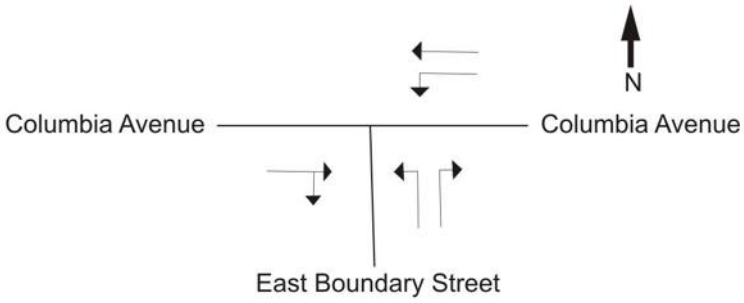


- Installation of ADA compliant ramps at all surface transitions;
- Planting of street trees and landscaping along right-of-way, where applicable; and
- Installation of traffic signal mastarms and decorative pedestrian scale lighting.

5.2.4.4 East Boundary Street Intersection

A program of improvements for the East Boundary Street Intersection should include:

- Signalization (assuming signal warrants are met);
- Implementation of separate left and right turn lanes on East Boundary Street;



- Creation of enhanced crosswalks utilizing a pronounced striping pattern in all directions with actuated crossing signals;
- Construction of curbs, gutters, and ADA compliant sidewalks in the immediate vicinity of the intersection;
- Installation of ADA compliant ramps at all surface transitions;
- Planting of street trees and landscaping along right-of-way; and
- Installation of traffic signal mastarms and decorative pedestrian scale lighting.

5.2.5 Replacement of S-48/I-26 Interchange

Based on the traffic analysis performed for the future build scenario (see Appendix F), the existing two-lane bridge over I-26 and its associated ramps will not be adequate in the design year 2025. Additionally, the bridge currently has a structural rating of "fair," and based on traffic volume projections will become functionally obsolete in the very near-term. SCDOT has recently improved the existing bridge to extend its useful life, but sight distance between the ramps and the bridge continues to be an issue. Based on the above, it is recommended that the S-48/I-26 Interchange be replaced in the long-term. It may be appropriate to analyze this interchange as a single point urban interchange, but such analysis was not included in the scope of this study. As such, the following improvements are recommended:

- Five-lane bridge over I-26 (i.e., two travel lanes in each direction with continuous center turn lane);
- Two through lanes and a dedicated right turn lane on eastbound approach of S-48 at eastbound ramps of interchange and two through lanes and a dedicated left turn lane on westbound approach of S-48 at eastbound ramps of interchange;
- Through lane and through/right turn lane on westbound approach of S-48 at westbound ramps of interchange and two through lanes and a dedicated left turn lane on eastbound approach of S-48 at westbound ramps of interchange;
- Dedicated right turn lane and through/left turn lane on the eastbound off-ramp;

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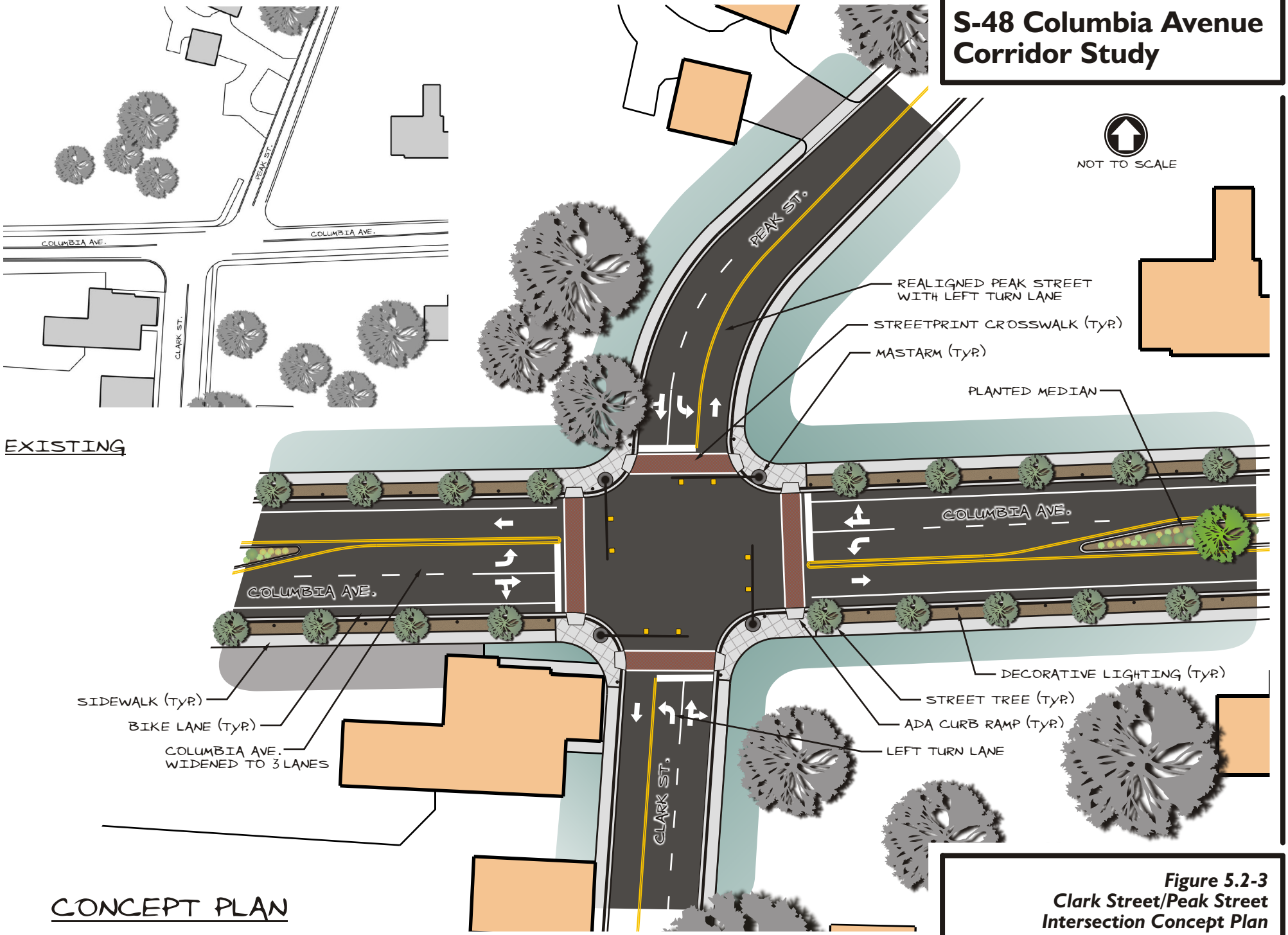
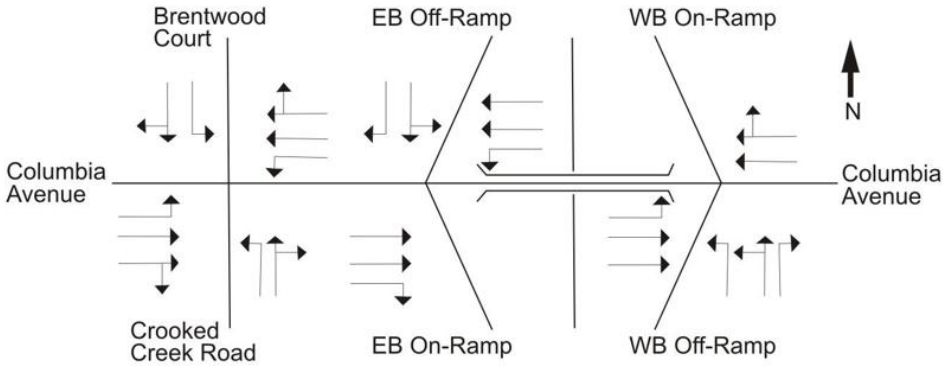


Figure 5.2-3
Clark Street/Peak Street Intersection Concept Plan

- Dedicated left turn lane, through/left turn lane, and dedicated right turn lane on the westbound off-ramp; and
- Additionally, Crooked Creek Road should be pulled out of the interchange to form a new intersection with Brentwood Court (the distance between this new intersection and the eastbound ramps of I-26 should be further evaluated during design) west of the interchange to include:
  - Signalization (assuming signal warrants are met);
  - Through lane, through/right turn lane, and dedicated left turn lane on eastbound and westbound approaches of S-48; and
  - Through/right turn lane and dedicated left turn lane on Brentwood Court and Crooked Creek Road.



5.2.6 S-48 Columbia Avenue Extension and Railroad Grade Separation

It is recommended that S-48 Columbia Avenue be extended along the right-of-way of Northwest Columbia Avenue and a grade separated crossing of the railroad be created west of the existing at-grade crossing. By placing the grade separated crossing westward of the existing at-grade crossing, natural topography can be capitalized upon, allowing for a more graceful curved crossing, preservation of community character, and reduction of the cost of construction. Once having crossed the railroad, the Columbia Avenue Extension would intersect with Chapin Road across from St. Peter's Church Road. Figure 5.1-2 presents a conceptual alignment for this extension of Columbia Avenue and railroad grade separation.

Once this new grade separation is constructed, the existing at-grade crossing at Amick's Ferry Road and Chapin Road would be closed. This would create a "T" intersection at Amick's Ferry and Chapin Roads, eliminating direct access from Amick's Ferry Road to S-48 Columbia Avenue. Since this access cannot be removed until an adequate alternative is in place (i.e., the Southern Connector), this is a long-term recommendation.

5.2.7 New I-26 Interchange

Based on the current rate of development between Ballentine and Chapin, it is recommended that a new interchange with I-26 be constructed. This interchange should be located between existing interchanges at S-48 (exit 91) and US 176 (exit 97). As this is a long-term recommendation having implications far beyond the scope of this study, no analysis of this recommendation was conducted. Therefore, a new interchange should be evaluated in the future to determine need, functionality, and location (i.e., existing crossings of I-26 currently exist at Old Hilton Road and Mount Vernon Church Road). This interchange has the potential to reduce demand on both the S-48/I-26 Interchange and the US 176/I-26 Interchange.

6. PRELIMINARY IMPLEMENTATION PLAN

Table 6.0-1 presents a preliminary plan of implementation for recommended improvements discussed in Chapter 5. Recommendations have been grouped into four development periods:

- Short-term (0-5 years);
- Medium-term (5-10 years);
- Long-term (10-20 years); and
- Extended-term (20+ years).

Actions can be placed into three categories: policy and regulatory actions; minor capital improvements; and major capital improvements. The policy and regulatory actions will set the "tone" for future development along the S-48 Columbia Avenue Corridor and should all be accomplished in the 0-2 year period following publication of this study. Those actions include (ranked in order of priority):

1. Increased Coordination Between the Town of Chapin and Lexington County;
2. Official Map;
3. Zoning Overlay Districts; and
4. Consideration of Impact Fees.

Minor capital improvements include the following (ranked in order of priority):

1. Chapin High School Parent Drop-off/Pick-up Right Turn Lane;
2. Chapin High School Rear Entry Improvements;
3. Bennington Court Extension and/or initial two-lane section of Southern Connector between Amick's Ferry Road and Old Lexington Highway;
4. Chapin High School Parent Drop-off/Pick-up Alternate Access;
5. Targeted Pedestrian Improvements; and
6. Targeted Streetscape Improvements.

Major capital improvements include the following (rank in order of priority):

1. S-48 Widening, 3-Lane Section;
2. Southern Connector;
3. S-48 Widening, 5-Lane Section;
4. Replacement of S-48/I-26 Interchange;
5. S-48 Columbia Avenue Extension and Railroad Grade Separation; and
6. New I-26 Interchange.

Where applicable, an estimated order-of-magnitude cost is presented for each recommended action in the implementation plan (detailed cost estimates are included in Appendix G). For the majority of the capital projects, costs were estimated using unit pricing values from SCDOT reference documents and other nationally published cost-estimating sources. For all other recommendations, the costs where derived examining similar, prior efforts.

The COATS TIP 2006-2011 includes improvements to S-48 Columbia Avenue. Funding has been allocated for design with $400,000 in FY 2008 and $400,000 in FY 2009. Additional funding will need to be allocated in the TIP or secured from other sources to realize construction of improvements recommended by this study. Additional potential funding sources are included in Appendix H.

Table 6.0-1
Preliminary Implementation Plan

Action	Estimated Order-of-Magnitude Cost[1]	Potential Responsible Agencies	Target Start Date[2]	Target Completion Date	Comments
Short-Term (0 to 5 years)					
Increased Coordination Between Town of Chapin and Lexington County	N/A	Town of Chapin; Lexington County	Immediately	Continuous and On-going	• Begin increased coordination immediately to ensure effectiveness of other recommendations.
Official Map	$40,000 - $75,000[3]	Town of Chapin; Lexington County; CMCOG	August 2006	January 2007	• Adoption of an official map should be the highest priority "product" recommendation to ensure that right-of-ways are preserved (e.g., Bennington Court Extension, Southern Connector, etc.). • Town/County staff or CMCOG staff could produce the official map, or, if needed to expedite development and adoption, a consultant could perform these services.
Zoning Overlay Districts	$50,000 - $80,000[3]	Town of Chapin; CMCOG	November 2006	March 2007	• Need to be adopted prior to new development occurring on the eastern end of the corridor. • Town or CMCOG staff could develop overlay districts, or, if needed to expedite development and adoption, a consultant could perform these services
Consideration of Impact Fees	N/A	Town of Chapin; CMCOG	August 2006	TBD	• Town of Chapin planning commission should review the cost/benefit of impact fees and determine if such should be pursued and on what timeframe.
Chapin High School Parent Drop-off/Pick-up Right Turn Lane	$103,000[4]	Lexington-Richland School District 5; SCDOT	October 2006	August 2007	• To increase the immediate safety and functionality of this intersection, implementation of this right turn lane should be of the highest priority to Lexington-Richland School District 5. • Partnering between Lexington-Richland School District 5 and SCDOT will be essential.
Chapin High School Rear Entry Improvements	$522,000[4]	Lexington-Richland School District 5	January 2008	August 2008	• Partnering between Lexington-Richland School District 5 and SCDOT will be essential.
Targeted Pedestrian Improvements	$60 per linear foot[3]	SCDOT; Town of Chapin; Private Property Owners	As needed	TBD	• Prior to the widening of S-48, targeted improvements to pedestrian facilities should be undertaken by the Town of Chapin (e.g., spot sidewalk replacement, establishment of key connections, installation of ADA curb ramps, etc.). • Private property owners should be encouraged to establish pedestrian connections within their properties and to adjacent properties.
Targeted Streetscape Improvements	No more than $5,000 per location[3]	Town of Chapin; Private Property Owners	As needed	TBD	• Prior to the widening of S-48, targeted streetscape improvements should be undertaken by the Town of Chapin (e.g., gateway treatments, intersection beautification, etc.). • Private property owners should be encouraged to participate either through beautification of their own properties or sponsorship of public projects. • Any treatments should be low cost, reasonable applications intended to only fill the gap between today and when full streetscapes will be implemented as part of the S-48 widening.
Southern Connector Initial 2-Lane Section (Amick's Ferry Rd. to Old Lexington Hwy.)	$2,415,000[4]	Town of Chapin; Lexington County; SCDOT	January 2007	July 2009	• This section of the Southern Connector should be implemented soon, as it will immediately deliver tangible traffic flow improvements at a reasonable cost in today's financial climate. • It may not be necessary to implement this project and the Bennington Court Extension – this project should take priority over the Bennington Court Extension, if funding is adequate. • While a 2-lane section would be initially implemented, right-of-way for a 5-lane section should be acquired.

Table 6.0-1
Preliminary Implementation Plan

Action	Estimated Order-of-Magnitude Cost[1]	Potential Responsible Agencies	Target Start Date[2]	Target Completion Date	Comments
Bennington Court Extension	$824,000[4]	Town of Chapin; Lexington County	January 2007	July 2009	• It is recommended that the Town of Chapin and Lexington County partner to fund the design, construction, and maintenance of this project in order to expedite the new street's implementation and present a good faith effort to be "team players" in alleviating traffic congestion in the Town of Chapin. • It may not be necessary to implement this project and the initial 2-lane section of the Southern Connector – the initial 2-lane section of the Southern Connector should take priority over this project, if funding is adequate.
S-48 Widening 3-Lane Section	$4,326,000[4]	SCDOT	July 2007	June 2011	• The widening of this section of S-48 should be implemented soon, as it will immediately deliver tangible traffic flow improvements at a reasonable cost in today's financial climate. • If the widening of this section of S-48 is delayed, then independent improvement of intersections along this section must be undertaken to preserve level of service.
Medium-Term (5 to10 years)					
Chapin High School Parent Drop-off/Pick-up Alternate Access	$1,424,000[4]	Lexington-Richland School District 5; SCDOT	January 2009	July 2012	• Partnering between Lexington-Richland School District 5 and SCDOT will be essential.
Southern Connector (Amick's Ferry Rd. to S-48 Columbia Ave.)	$17,991,000[4]	SCDOT	June 2009	January 2014	• If full funding is not available, the Southern Connector could be initially constructed as a 3-lane section (with right-of-way acquisition for a 5-lane section) and still retain an appropriate level of service in 2025.
Southern Connector (Amick's Ferry Rd. to St. Peter's Church Rd.)	$4,864,000[4]	SCDOT	January 2013	June 2015	• If full funding is not available, the Southern Connector could be initially constructed as a 3-lane section (with right-of-way acquisition for a 5-lane section) and still retain an appropriate level of service in 2025.
Long-Term (10 to 20 years)					
S-48 Widening 5-Lane Section	$10,080,000[4]	SCDOT	January 2014	June 2017	• If the widening of this section of S-48 is delayed, then independent improvement of intersections along this section must be undertaken to preserve level of service.
Replacement of S-48/I-26 Interchange	$20,000,000 - $24,000,000[3]	SCDOT	July 2014	June 2019	• The bridge of this interchange currently has a structural rating of "fair," and based on traffic volume projections will become functionally obsolete in the near future.
S-48 Columbia Avenue Extension and Railroad Grade Separation	$5,368,000[4]	SCDOT	January 2020	December 2024	• Once this new grade separation is constructed, the existing at-grade crossing at Amick's Ferry Road and Chapin Road would be closed; therefore, this recommendation cannot be implemented until an alternative route from Amick's Ferry Road to the eastern end of S-48 is provided (i.e., the Southern Connector).
Extended-Term (20+ years)					
New I-26 Interchange	TBD	SCDOT	TBD	TBD	• To determine need and timing, this new interchange should be regionally evaluated once the new COATS Travel Demand Model is available.

[1] Cost estimates are in 2006 dollars.

[2] Assumes funding availability.

[3] Derived from experience on prior, similarly scoped efforts.

[4] Itemized order-of-magnitude cost estimate in Appendix G.