

SUMMARY WORKBOOK

SEAS SOUTHEAST AREA STUDY

Kimley»Horn

UPPER COASTAL PLAIN
RURAL PLANNING ORGANIZATION



CAMPO
NC Capital Area Metropolitan Planning Organization

August 2017



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1

INTRODUCTION

Building on the work completed through the Southwest Area Study and the Northeast Area Study, the Capital Area Metropolitan Planning Organization (CAMPO) initiated the Southeast Area Study to define the area's strategy to accommodate existing and future travel needs. The Southeast Area Study includes portions of both Wake and Johnston Counties and 11 municipalities—Archer Lodge, Benson, Clayton, Four Oaks, Garner, Kenly, Micro, Raleigh, Selma, Smithfield, and Wilson's Mills. High growth rates, coupled with the desire to preserve the character of the Southeast Area, resulted in a need to identify a unified vision and comprehensive transportation strategy. The planning process integrates land use and transportation—leading to an approach that embraces connectivity and accessibility.

The Southeast Area Study identifies strategies to establish a multimodal transportation system that promotes economic vitality and quality of life for residents and visitors throughout the area. The recommendations from the Southeast Area Study will update CAMPO's overall Comprehensive Transportation Plan; identify project priorities to be considered in the next Metropolitan Transportation Plan; and inform Johnston County's Comprehensive Transportation Plan.

SEAS

SOUTHEAST AREA STUDY

The Capital Area Metropolitan Planning Organization, building on the work completed through the Southwest Area Study and Northeast Area Study, has initiated the Southeast Area Study which includes all or part of eleven municipalities and portions of Wake and Johnston counties. The Southeast Area Study will update CAMPO's overall Comprehensive Transportation Plan and will produce project priorities to be included in the next Metropolitan Transportation Plan.

Location



Populations

Archer Lodge	4,372
Benson	3,398
Clayton	16,648
Four Oaks	2,039
Garner	26,213
Kenly	1,428
Micro	365
Raleigh	414,530
Selma	6,150
Smithfield	11,234
Wilson's Mills	2,429

Get Involved



PUBLIC SYMPOSIA



METROQUEST



STAKEHOLDER INTERVIEWS



WEBSITE



SOCIAL MEDIA

Source: Information: U.S. Census Bureau, 2009-2013 American Community Survey

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Study Area

The population of the Southeast Area grew by 62% between 2000 and 2015—a higher growth rate than the Raleigh Metropolitan Statistical Area (MSA) during the same timeframe. The significant movement of different population cohorts and the area's draw of economic development and proximity to Raleigh is exceeding the capacity limits of strategic corridors in the local Southeast Area network. This trend is particularly evident when looking at employment trends in the study area; only 30% of 73,000 employed in the Southeast Area are residents.

Despite the decline in net migration nationally, North Carolina remains among the top 10 states attracting inflow of population from across the U.S. As larger portions of the population choose to live in more urban environments, the metro Raleigh area will see substantial growth. Tethered to fast-growing Raleigh and Wake County, the Southeast Area is anticipated to continue attracting its share of new residents moving into the overall metropolitan area.

At the outset of the study development, a Land Use, Environmental, and Transportation Inventory was prepared to assess current conditions and trends within the Southeast Area. Notable findings from this inventory are included in this report. The full Land Use, Environmental, and Transportation Inventory is provided as an appendix to this Summary Workbook.

Demographics

The dynamic demographics in the Southeast Area reflect how the study network needs to respond to existing and future populations. The growth expected in the Southeast Area, combined with a desire to maintain the area's unique character, underscores the need for recommendations that blend land use and transportation strategies.



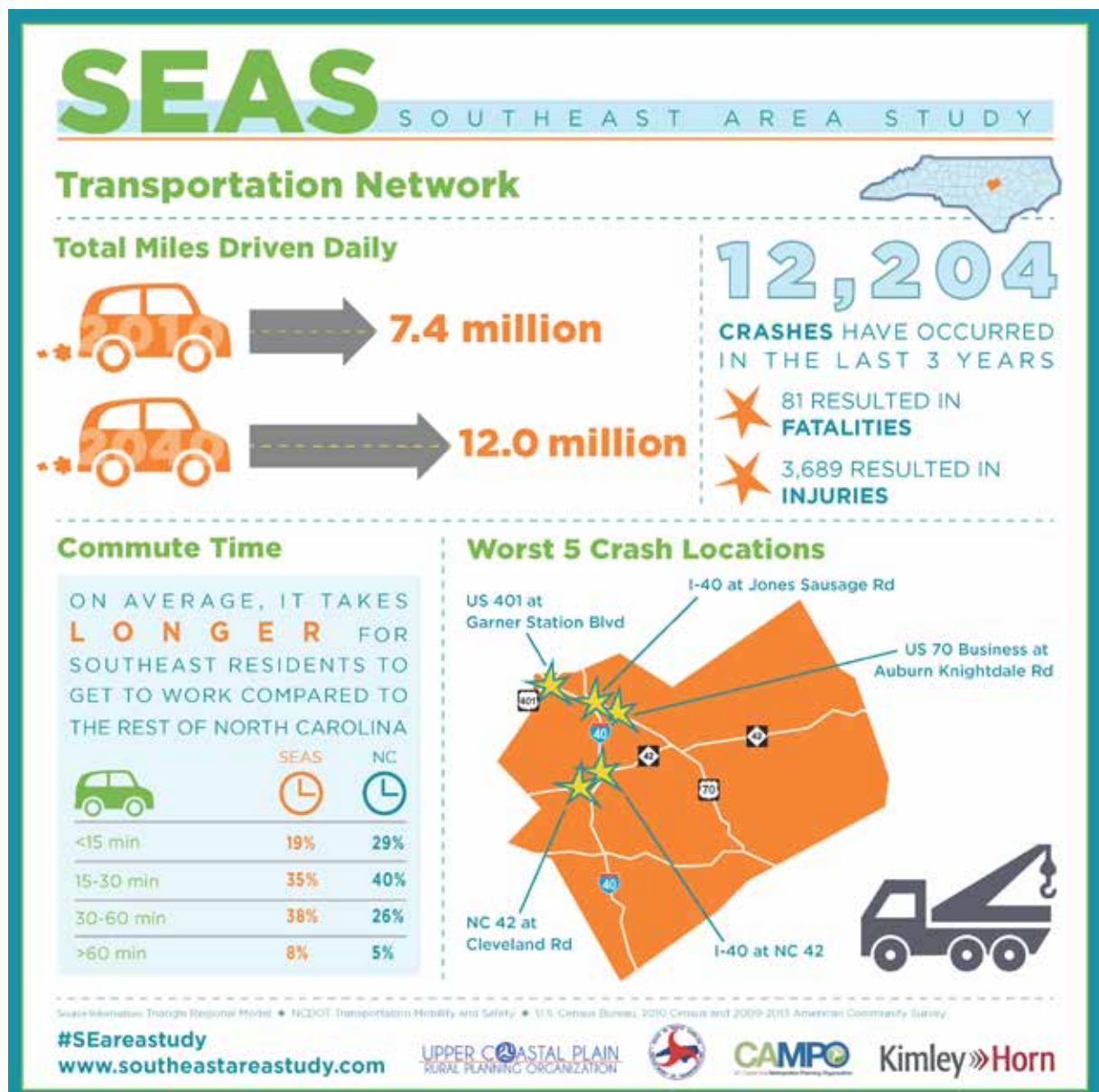
Market and Land Use

The larger Raleigh-Durham market has experienced consistent positive growth, particularly in the retail and office submarkets. Much of the retail and office growth is demonstrated in the Wake County portion of the study area, with retail being the larger player in non-residential development—comprising just under 10% of the region's total. The cities and towns within the Southeast Area have policies and initiatives designed to capture some of the Raleigh-Durham market growth. These policies and initiatives drive economic development and growth, ranging from redevelopment incentive grants to Economic Development Authorities.

A key objective of the Southeast Area Study is to build upon policy frameworks that are already in place and construct recommendations for adjusting these existing frameworks to achieve commonly-held goals. Each jurisdiction's existing policies, plans, and ordinances already support some or all of the planning themes identified for this study. An opportunity exists to build upon these areas of convergence, address transitional areas between jurisdictions, and move toward a policy framework that helps the area's growth align with its vision.

Transportation

The Southeast Area is uniquely suburban and rural in nature, resulting in transportation demand that has historically been auto-centric. However, due to its proximity to the Raleigh core, the Southeast Area has begun to experience the influence of more urban environments, requiring a more flexible transportation system that includes multimodal considerations. A comprehensive assessment of the current and future needs of the transportation network necessitates an understanding of metrics such as congestion and safety along with the integration of multimodal strategies.



SEAS

SOUTHEAST AREA STUDY

Cycling



What is a bikeway?

Bikeways are travelways that provide shared or exclusive space for bicycle travel. They accommodate both utilitarian and recreational cyclists.

Bikeway Types

Type	Description	Other Users
Multi-Use Paths	Wide paths located in parks and open space	
Sidepaths	Wide paths located adjacent to roadways	
Sharrows	Low-speed roadways with "Share the Road" pavement markings	
Wide Outside Lanes	Wider than typical travel lanes	
Paved Shoulders	Additional pavement beyond the travel lane edge	none
Bike Lanes	Roadway space dedicated exclusively for bicycle travel	none

5 Es of Bicycle Planning

Engineering	Education	Encouragement	Enforcement	Evaluation and Planning

What is a greenway?

Greenways are linear parks consisting of undeveloped land set aside for recreational use and environmental protection. They typically include unpaved trails or multi-use paths designed for walkers, joggers, and cyclists.

Southeast Area Greenways

Name	Length	Connected Destinations
Neuse River Greenway (south of Walnut Creek Greenway)	8 miles	<ul style="list-style-type: none"> Anderson Point Park Poole Road Park Walnut Creek Amphitheatre Neuse River
Clayton River Walk on the Neuse	4 miles	<ul style="list-style-type: none"> Neuse River Riverwood Community
Sam's Branch Greenway	1.2 miles	<ul style="list-style-type: none"> Clayton Neuse River
Neuse Riverwalk and Buffalo Creek Greenway	3 miles	<ul style="list-style-type: none"> Bob Wallace Jaycee Kiddie Park Smithfield Community Park Smithfield Middle School Smithfield-Selma Senior High School
South Garner Trail	1.8 miles	<ul style="list-style-type: none"> Lake Benson Park White Deer Park

Source information: City of Raleigh • Town of Clayton • Town of Smithfield • Town of Garner • The League of American Bicyclists

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Regional Influences

The Southeast Area Study is largely driven by the region's primary economic powerhouse, Wake County. Downtown Raleigh, the hub of the region, contains over 5 million square feet of office space and more than 50,000 employees. It is considered a magnet for technology and innovation companies, which have brought more than 2,200 jobs with higher-than-average salaries. The Research Triangle Park (RTP) is home to more than 190 companies, containing more than 22.5 million square feet of built space. More than 40,000 full-time employees work in RTP, with an additional 10,000 contract workers. As companies continue to seek locations that offer a mixture of uses, proximity to services, and residential opportunities to attract talent, the Southeast Area will continue to be a pivotal player in the larger Raleigh market.



2 PLANNING FRAMEWORK

A coordinated planning process encourages the free exchange of ideas among stakeholders and the public the current and future transportation needs of the region. The engagement strategies for the Southeast Area Study encouraged participation throughout the process to gain a greater understanding of the region's priorities, cooperatively identify possible solution to shared challenges, and contemplate the tradeoffs between competing interests. Through a broad-based engagement strategy, the Southeast Area Study reflects and respects the needs and values of those who live, work, and travel in the region.

Public Engagement

Throughout the planning process, the project team reached out to the public frequently to gather feedback on a wide variety of topics. The multitiered approach outlined below fostered ongoing two-way communication, and strengthened the foundation of the plan's recommendations.

Public Symposia

Two public symposia were held during the study to provide the larger community the opportunity to meet with the project team and offer feedback. The public symposia occurred at the Clayton Center on October 8, 2015 and January 12, 2017. Total attendance at the two meetings exceeded 130 participants. Input gathered at both meetings helped inform the project team's prioritization of the plan's guiding principles, as well as the multimodal transportation recommendations.

Social Media

The project team posted study updates to Twitter using the hashtag #SEAreaStudy, with daily posts in the weeks leading up to the second public symposium. Symposium-related tweets were also posted in Spanish in early January 2017.

Project Website

The SEAS project website (<http://www.southeastareastudy.com>) was maintained for the duration of the study. The site provided relevant maps, documents, meeting materials, a live #SEAreaStudy Twitter feed, and a calendar of events for the public to stay informed on the project's progress. The website also provided a link to subscribe to the SEAS mailing list, through which the project team disseminated reminders about major project milestones and events such as the public symposia.

Online Survey

An online questionnaire and interactive map allowed participants to provide responses on a variety of topics, as well as input location-specific preferences and opinions via a mapping interface. The survey generated:

- 609 responses
- 199 written comments
- 1,844 locations identified as needing improvement
- 19,854 individual data points

A Spanish-language survey was also made available on the project website.

EMAIL BLASTS

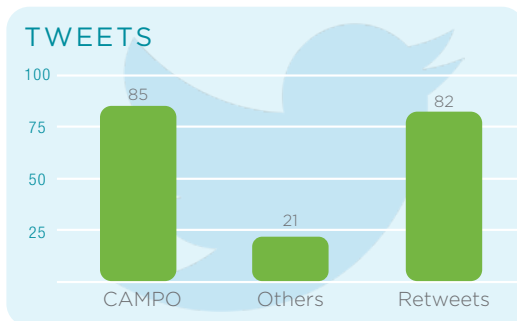
236 MAILING LIST MEMBERS
FOR STUDY
MILESTONES
AND EVENT REMINDERS



PUBLIC SYMPOSIA

2 PUBLIC SYMPOSIA
WITH A COMBINED
130 PARTICIPANTS

SOCIAL MEDIA



ONLINE SURVEY

Responses

609

Written Comments

199

Places Needing Improvement

1,844

Individual Data Points



19,854

Spanish language
survey made
available on project
website

1

JURISDICTIONAL MEETINGS

2 ROUNDS OF MEETINGS

WERE HELD WITH LOCAL PLANNING



STAFF FROM EACH OF THE

**11 STUDY AREA
MUNICIPALITIES**

TO VET THE STUDY'S SCENARIO
PLANNING PROCESS AND PREFERRED
GROWTH STRATEGY

WORKSHOPS

TO ENGAGE LOCAL LAND USE AND
TRANSPORTATION STAKEHOLDERS



PROJECT COMMITTEES



Stakeholder
Oversight Team
78 members



Core Technical
Team
44 members



3 Hot Spot
Committees
18 members each

PROJECT WEBSITE

MAINTAINED FOR THE
22 MONTHS OF THE STUDY
WITH A PROJECT SUMMARY,
EVENTS CALENDAR, GALLERY,
CONTACT INFORMATION, AND
HELPFUL LINKS

Stakeholder Engagement

In addition to the general public, a targeted group of stakeholders and local government officials were involved in the process throughout the plan's development. Many of these individuals brought a wide base of local knowledge and technical expertise to the project team, expressing concerns and identifying opportunities in certain areas of the region. Consulting frequently with stakeholders helped to ensure that these competing interests are balanced in the plan's final recommendations.

Jurisdictional Meetings

The project team met with each Southeast Area jurisdiction twice during the scenario planning process—once to confirm the location types to code into the model as specified by current land use plans and later to vet the Preferred Growth Scenario. The scenario planning process is described in more detail in Chapter 3.

Land Use Stakeholders

On September 27, 2016, three meetings were held with key stakeholders to discuss land use considerations for the Southeast Area Study. Stakeholders representing local chambers of commerce, advocacy groups, and the real estate community reviewed results from the scenario planning process and provided structured feedback to help guide the selection of the Preferred Growth Scenario.

Transportation Stakeholders

On November 15, 2016, two meetings were held with transportation stakeholders to discuss preliminary transportation recommendations. Representatives from local homeowner associations, multimodal advocacy groups and agencies, major employers, and the NCDOT Rail Division provided feedback via a project prioritization exercise with maps and tables. The feedback helped inform the plan's multimodal recommendations.

Core Technical Team

The project team met frequently with the Core Technical Team (CTT), which included planners and technical staff from study area municipalities, NCDOT, and the two local MPOs. This allowed members the opportunity to regularly review and participate in technical analyses related to the study. Nine CTT-exclusive meetings occurred over the course of the planning process.

The Stakeholder Oversight Team

The Stakeholder Oversight Team (SOT) included the CTT member as well as participants from the larger stakeholder community, including local elected officials, economic development agencies, transportation agencies, school districts, and environmental agencies. The SOT convened three times to serve as a high-level sounding board for the findings and recommendations developed as part of the study. The SOT included representatives from the following entities:

- GoRaleigh
- GoTriangle
- Johnston County Area Transit System
- Johnston County Economic Development
- Johnston County Public Utilities Department
- Johnston County Schools
- North Carolina Department of Environment and Natural Resources
- North Carolina Department of Transportation Units (Bicycle/Pedestrian, Transit, etc.)
- Triangle J Council of Governments
- Upper Coastal Plain Council of Governments
- Wake County Environmental Services
- Wake County Parks
- Wake County Public School System
- Wake County Transportation and Rural Access

Guiding Principles

Guiding principles reflect a community's vision for a long-range transportation plan. The statements help drive project identification and prioritize recommendations. Taken as a whole, the Southeast Area Study's guiding principles outline a cohesive strategy that will guide regional growth and development. The figure below illustrates these principles.



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3 SCENARIO PLANNING

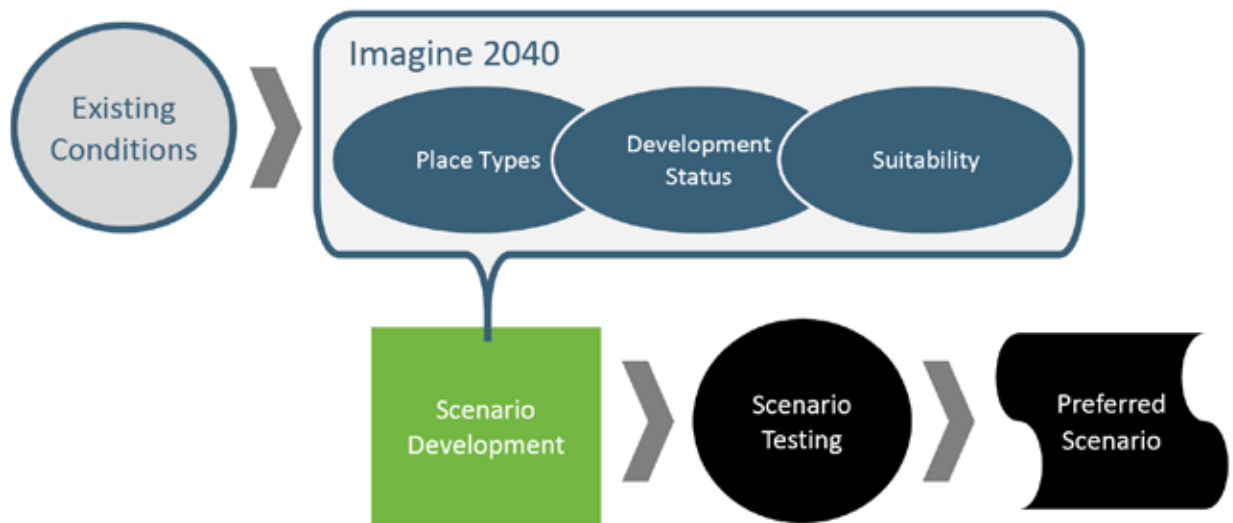
The connection between land use, urban form, and transportation is well documented. When these connections are explored in a data-driven way, more informed decisions can be made to create a transportation system that aligns with local and regional goals. To understand growth in the Southeast Area and its likely impact on transportation, the Southeast Area Study built on the recent and ongoing Triangle scenario planning initiatives to explore possible growth patterns and help stakeholders understand the likely outcomes of future decisions.

The Southeast Area Study scenario planning process was not intended to yield a regional growth strategy that overrides local land use control. Instead, it offered another way for stakeholders to identify and discuss the strengths and weaknesses associated with competing growth strategies and make informed decisions. Throughout the process, planners relied on the Study's guiding principles to evaluate the results, testing each scenario against goals related to economic vitality, livability, sustainable growth, and rural preservation.

The process yielded a Preferred Growth Scenario that leverages locally adopted plans throughout much of the study area, promotes compact growth in existing centers, and anticipates future development likely to occur along regional transportation corridors.

Scenario Planning Process

The scenario planning process adapted a digital growth model first developed as part of Imagine 2040 to explore how different growth patterns would affect the transportation network. Two alternative scenarios were then compared against a baseline scenario representing the continuation of current plans. These scenarios were tested against a series of performance measures, and a preferred scenario was then created as a blend of the three alternatives. The diagram below outlines this process.



Imagine 2040 and Connect 2045

Imagine 2040 was an initiative started in 2010 by CAMPO and the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) to promote coordinated decision-making processes for a more sustainable transportation system. Three important components of the Imagine 2040 model were used in the Southeast Area Study scenario analysis:

- **Place Types:** Land use types and development patterns that describe an area's density and characteristics
- **Development Status:** Parcels that are undeveloped or underdeveloped are likely to see growth in future years, while developed parcels will likely not change
- **Suitability:** A set of 21 different factors—such as proximity to roads and intersections, transit, utilities, natural features, and activity centers—that determine how likely a parcel is to develop

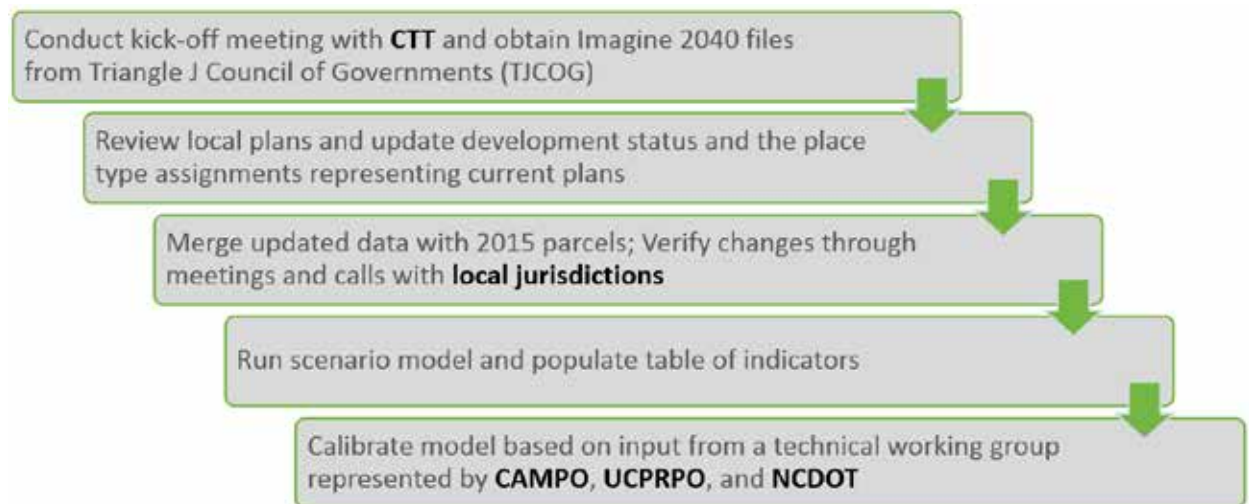


The Triangle J Council of Governments (TJCOG), with direct support from DCHC MPO, CAMPO, and member jurisdictions, is currently updating Imagine 2040. The new model (Connect 2045) will inform upcoming Metropolitan Transportation Plans. During the Southeast Area Study process, member jurisdictions updated place type assignments and development status. The preferred scenario from the Southeast Area Study process will be delivered to TJCOG for incorporation in the regional modeling process.

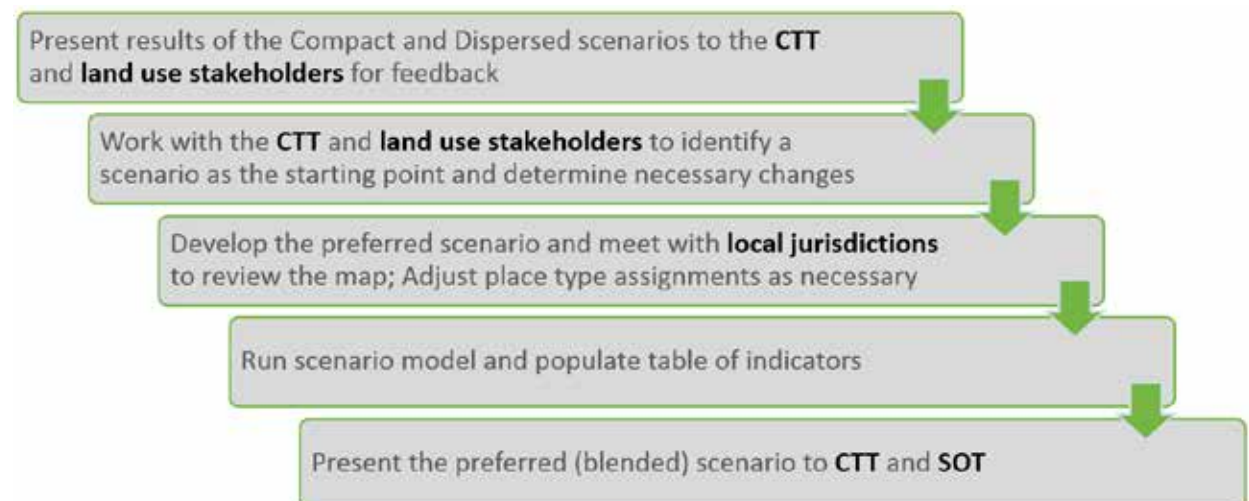
Community Input

The scenario planning process used Imagine 2040 as its starting point. The project team worked with the CTT, staff from each local jurisdiction, and land use stakeholders to refine Imagine 2040's Current Plans scenario and build two alternative scenarios. In addition, a working group with representatives from CAMPO, UCPRPO, Johnston County, and NCDOT provided technical oversight. These stakeholders helped review the results and develop the preferred scenario. As shown below, stakeholder and community input was continually sought throughout the process:

Creating the Three Scenarios



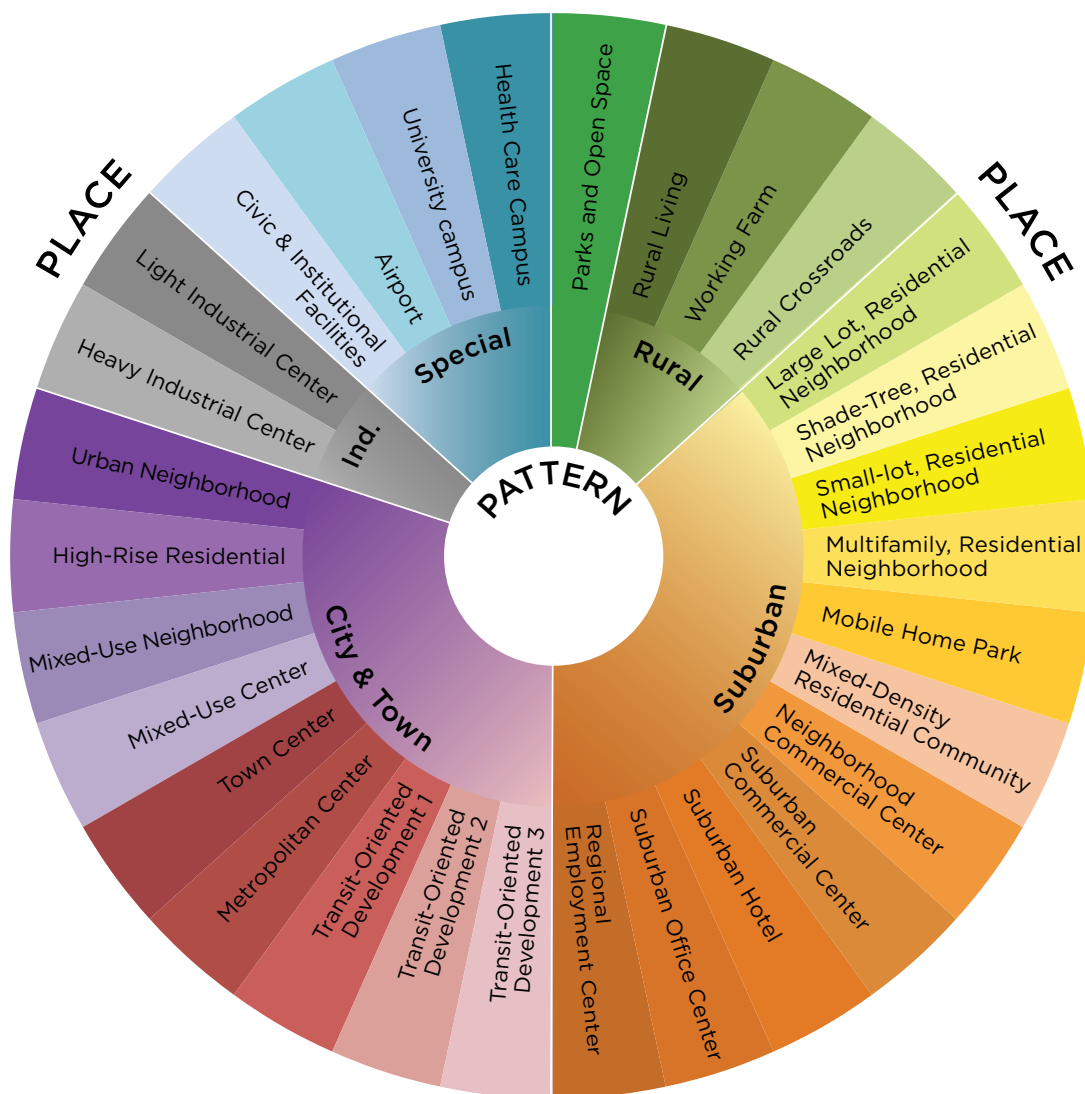
Reviewing the Results and Developing the Preferred Scenario



Place Types and Community Types

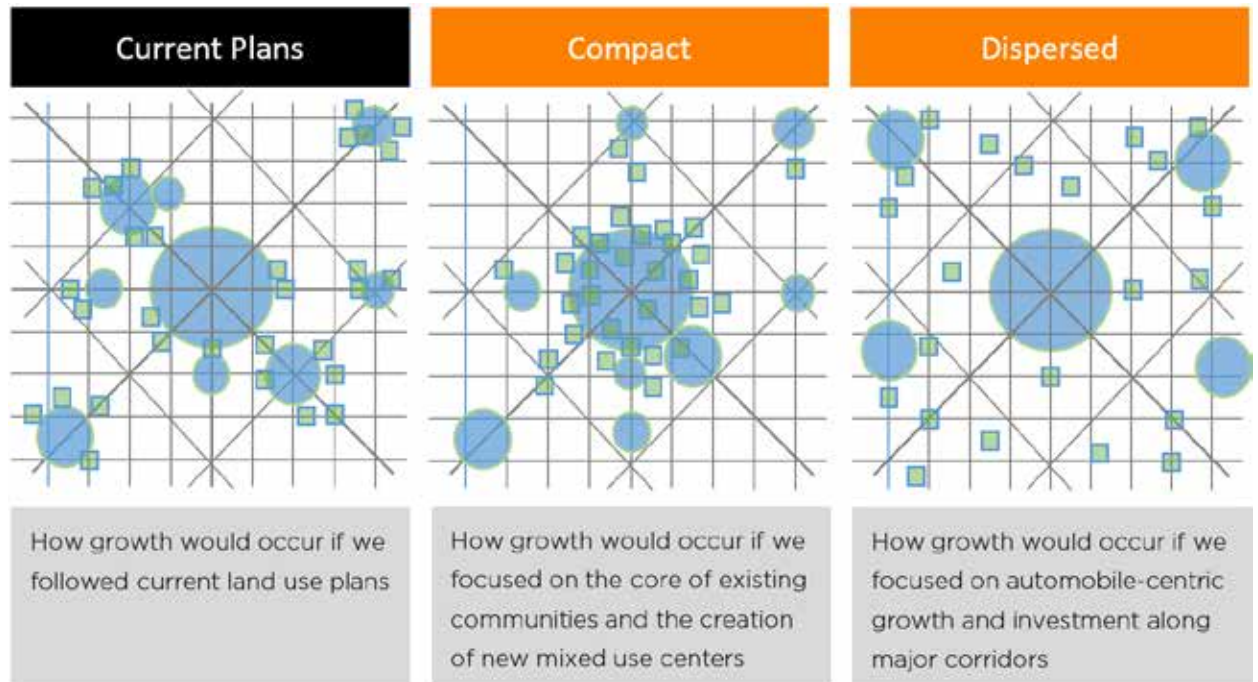
To begin, every parcel of land in the study area is assigned one of 30 different place types spanning a range of residential, commercial, industrial, and mixed-use development possibilities. These place types include information about allowable density and development intensity and are adjusted to reflect the pertinent value for the parcel’s jurisdiction.

The place types are then “rolled up” into consolidated community type categories—city and town, suburban, rural, protected green space, special, and industrial. For the Southeast Area Study, the place types were used as a unit of analysis, while community types simply represent a simplified communication tool to better understand a scenario’s general development pattern.

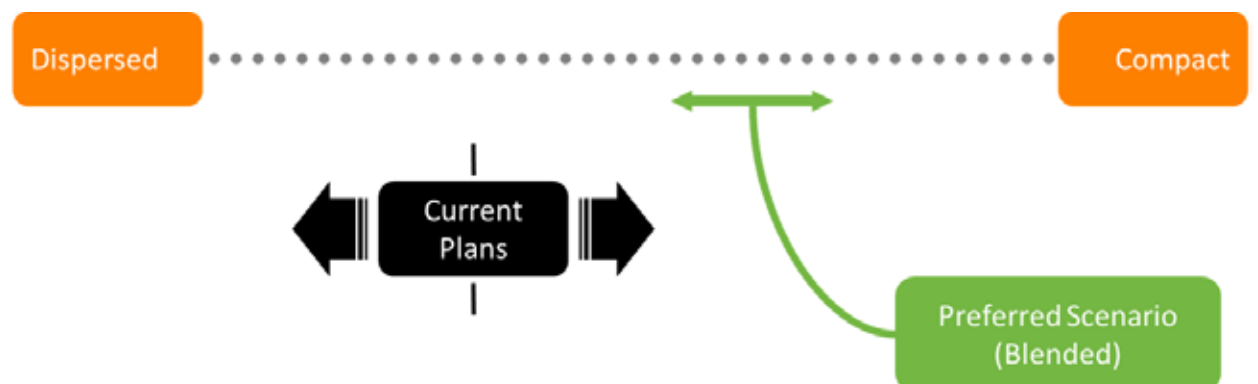


Growth Alternatives

Three scenarios were initially created, with two alternatives compared against a scenario reflecting current county and municipal land use plans. After evaluation, these growth alternatives contributed to a blended preferred scenario.



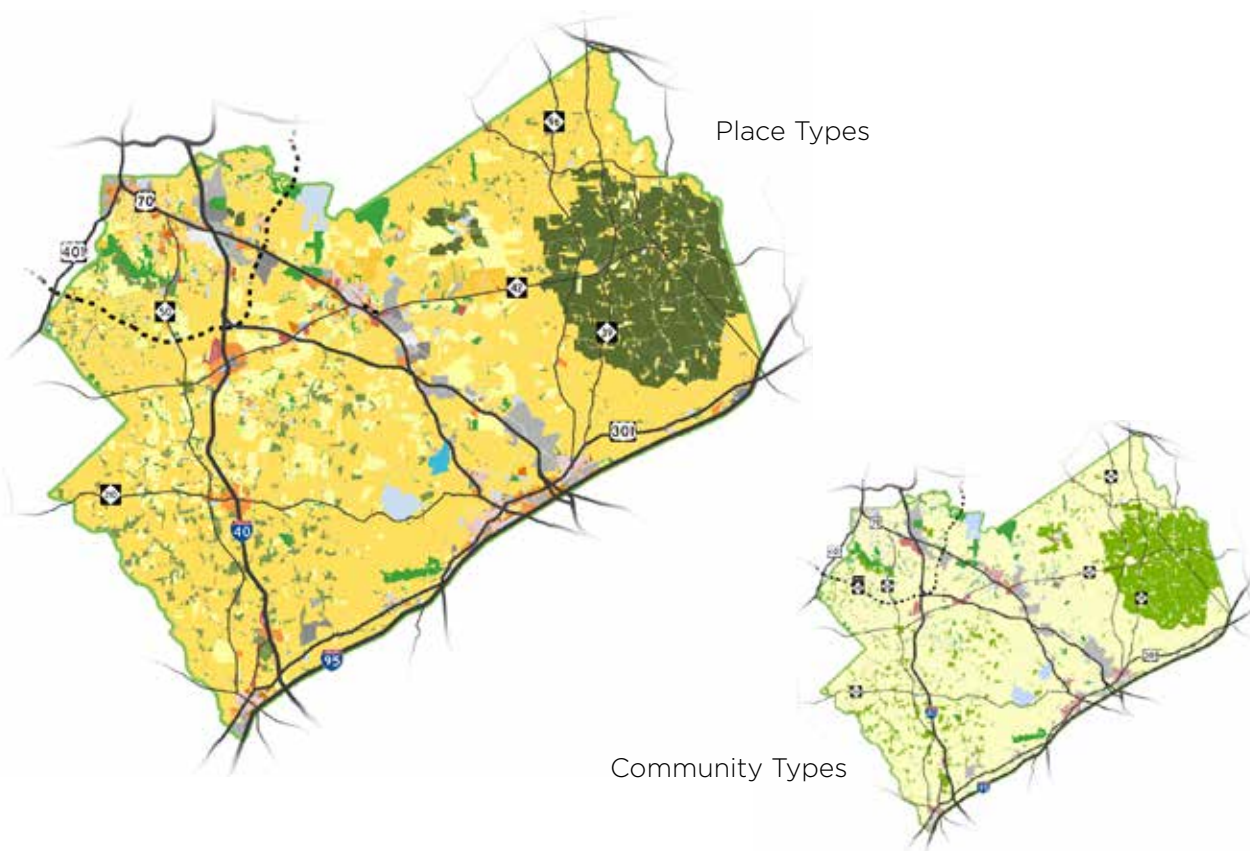
The Compact and Dispersed scenarios exist on opposite ends of the development spectrum and were designed to exaggerate these development patterns in the region. The performance of the Current Plans scenario was expected to land somewhere along the spectrum between these two extremes. Based on reactions to the performance of these scenarios by local jurisdictions, the Preferred Scenario was then designed to balance these extremes and offer a market-supported alternative that responds to regional trends.



Current Plans

Characteristics

- Representative of current land use plans, programs, and policies
- Updated to include 2015 parcels
- Verified through discussions with jurisdictions
- Account for approved or proposed developments (e.g., Flowers Plantation)

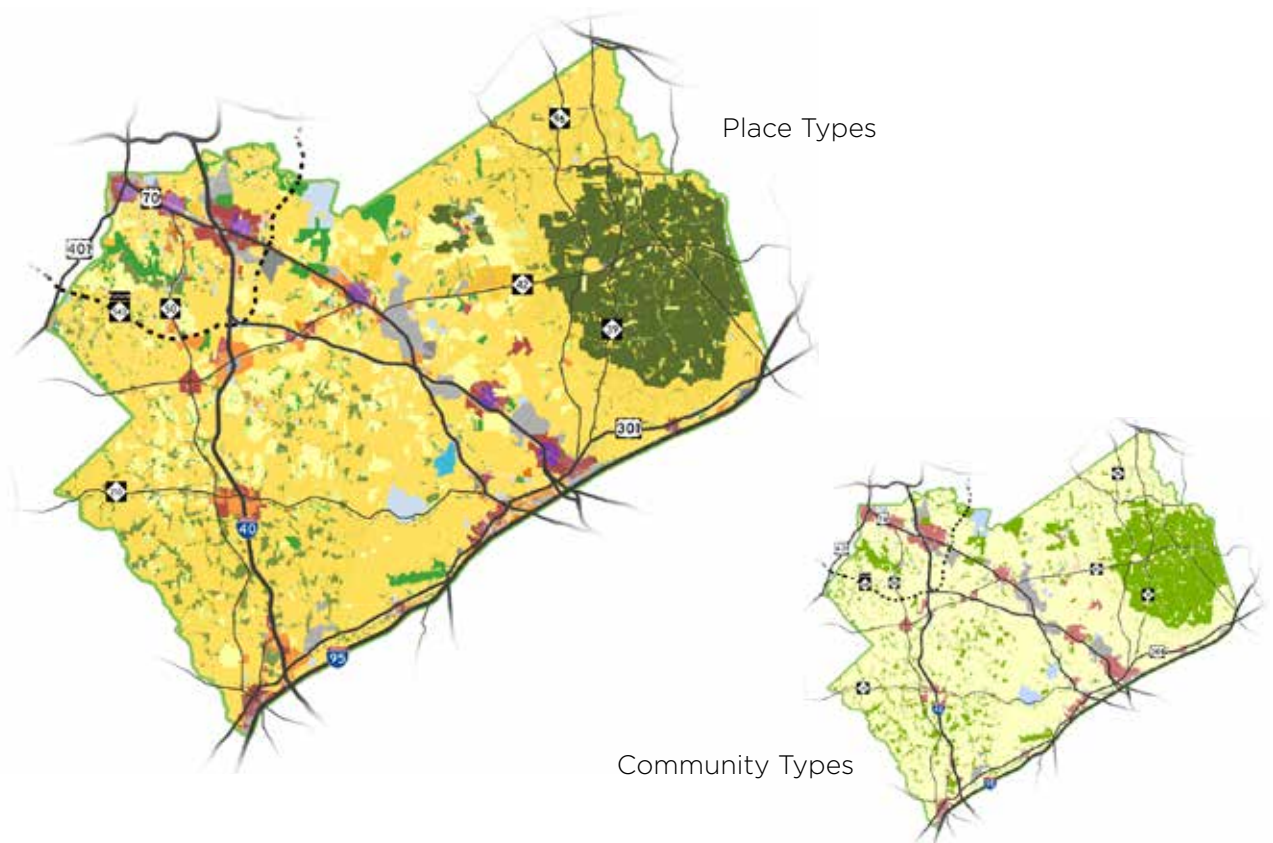


Rural				Suburban										City and Town							Ind.		Special																																						
Parks and Open Space				Rural Living		Working Farm		Rural Crossroads		Large lot, Residential		Shade-Tree, Residential		Small-lot, Residential		Multifamily, Residential		Mobile Home Park		Mixed-Density Res Comm.		Neighborhood Comm. Ctr.		Suburban Comm. Ctr.		Suburban Hotel		Suburban Office Center		Regional Employment Ctr.		Urban Neighborhood		High-Rise Residential		Mixed-Use Neighborhood		Mixed-Use Center		Town Center		Metropolitan Center		Transit-Oriented Dev. 1		Transit-Oriented Dev. 2		Transit-Oriented Dev. 3		Light Industrial Center		Heavy Industrial Center		Health Care Campus		University Campus		Airport		Civic & Inst. Facilities	

Compact

Characteristics

- Large areas of rural conservation
- Increased densities in and around municipalities and activity centers
- Focus on crossroads activity centers
- Increased densities in northern parts of the study area

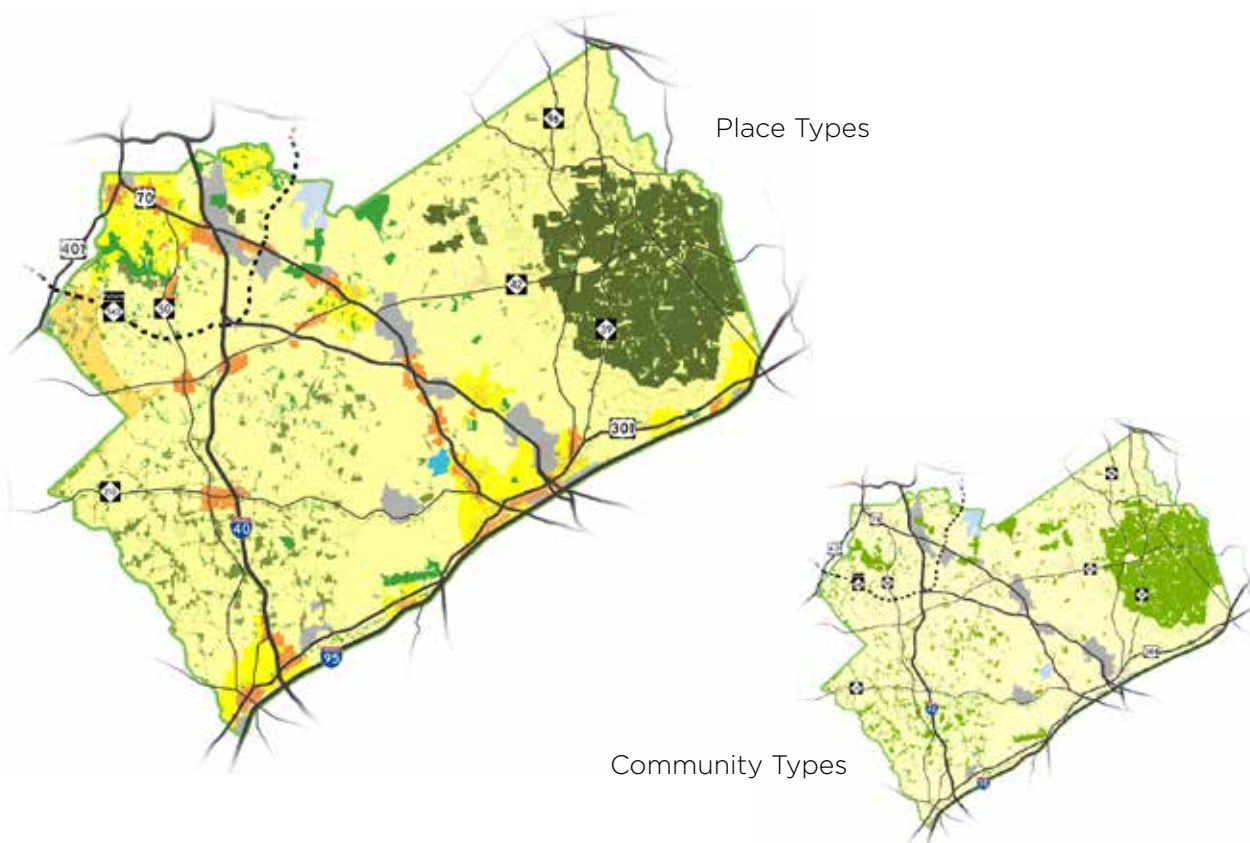


Rural				Suburban								City and Town							Ind.	Special									
Parks and Open Space	Rural Living	Working Farm	Rural Crossroads	Large lot, Residential	Shade-Tree, Residential	Small-lot, Residential	Multifamily, Residential	Mobile Home Park	Mixed-Density Res Comm.	Neighborhood Comm. Ctr.	Suburban Comm. Ctr.	Suburban Hotel	Suburban Office Center	Regional Employment Ctr.	Urban Neighborhood	High-Rise Residential	Mixed-Use Neighborhood	Mixed-Use Center	Town Center	Metropolitan Center	Transit-Oriented Dev. 1	Transit-Oriented Dev. 2	Transit-Oriented Dev. 3	Light Industrial Center	Heavy Industrial Center	Health Care Campus	University Campus	Airport	Civic & Inst. Facilities

Dispersed

Characteristics

- Proliferation of suburban residential development countywide
- No density increases in existing municipalities
- Expansion of highway commercial development along major corridors
- Conversion of agricultural land into lower density residential development



Rural				Suburban										City and Town							Ind.		Special						
Parks and Open Space	Rural Living	Working Farm	Rural Crossroads	Large lot, Residential	Shade-Tree, Residential	Small-lot, Residential	Multifamily, Residential	Mobile Home Park	Mixed-Density Res Comm.	Neighborhood Comm. Ctr.	Suburban Comm. Ctr.	Suburban Hotel	Suburban Office Center	Regional Employment Ctr.	Urban Neighborhood	High-Rise Residential	Mixed-Use Neighborhood	Mixed-Use Center	Town Center	Metropolitan Center	Transit-Oriented Dev. 1	Transit-Oriented Dev. 2	Transit-Oriented Dev. 3	Light Industrial Center	Heavy Industrial Center	Health Care Campus	University Campus	Airport	Civic & Inst. Facilities

Results

The three initial scenarios—Current Plans, Compact, and Dispersed—were evaluated using a set of performance metrics (or indicators). These indicators offer various ways to evaluate the relative performance of the scenarios and are based, in part, on previous quadrant studies (e.g., Southwest Area Study and Northeast Area Study). Additional input from the CTT and technical working group represented by CAMPO, UCPRPO, and NCDOT helped ensure the performance metrics were customized to the unique dynamics of the Southeast Area. The final set of performance metrics includes 15 indicators organized into four groups:



The four categories of performance metrics relate to the broader goals of the Southeast Area Study, including livability, economic vitality, sustainable growth, network connectivity, and traffic flow. Once the model results were available and the table of indicators was populated, a preliminary report card was prepared to show the relative comparison between scenarios. This report card is shown on the next page. A complete table of numeric indicators is provided at the end of this chapter on page 33.

Scenario Report Card

Performs WORSE
than Current Plans



Performs BETTER
than Current Plans

Quality of Place

Learning Centers

Proximity to libraries and schools



Housing Diversity

Mix of dwelling unit types within the study area



Access to Parks and Greenways

Proximity to parks and greenways



Jobs and Housing Balance

Ratio of jobs to households within urban place types



Walkability

Dwelling units within walkable place types



Sustainable Growth

Urban Footprint

Growth in urban place types



Urban Density

Density within urban place types



Water Consumption

Average water consumption



Energy Consumption

Average energy consumption



Growth Distribution

Context Distribution

Percent of land area by community type

	Current Plans	Compact	Dispersed
City & Town	1.6%	4.2%	0.5%
Suburban	74.4%	74.3%	79.9%
Rural	15.7%	14.1%	13.6%
Protected Green Space	2.8%	2.3%	2.0%
Other	5.6%	4.9%	4.0%

Household Distribution

Percent household growth allocated by community type

	Current Plans	Compact	Dispersed
City & Town	4.2%	26.6%	0.4%
Suburban	90.9%	69.0%	96.9%
Rural	2.0%	1.0%	1.2%
Protected Green Space	1.1%	1.1%	0.0%
Other	1.8%	1.5%	1.5%

Employment Distribution

Percent employment growth allocated by community type

	Current Plans	Compact	Dispersed
City & Town	15.2%	60.7%	1.2%
Suburban	55.0%	21.9%	80.4%
Rural	1.5%	0.3%	0.5%
Protected Green Space	1.2%	1.3%	0.0%
Other	26.7%	15.4%	17.9%

Regional Transportation

Vehicle Miles Traveled

Vehicle miles traveled (Triangle Regional Model)



Vehicle Hours Traveled

Vehicle hours traveled (Triangle Regional Model)



Congested Corridors

Miles of congested corridors (Triangle Regional Model)



Preferred Scenario

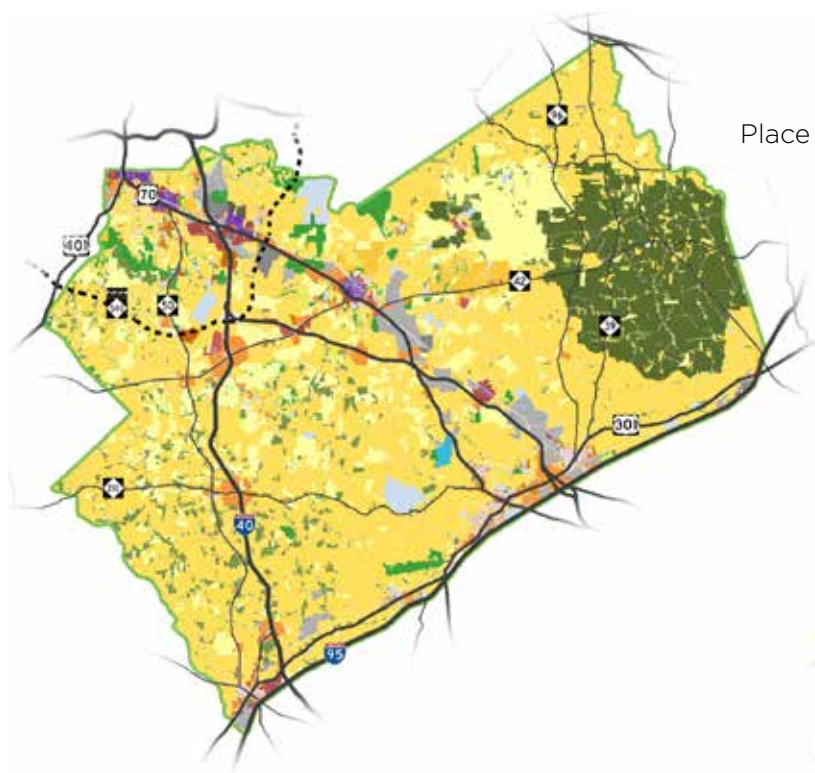
The scenario results were presented to the CTT and land use stakeholders, and they were asked to identify one scenario as their starting point and determine what changes would be necessary to create a preliminary preferred scenario. Several comments showed a preference for how the Compact scenario concentrated more development in existing town centers and placed more emphasis on transit-oriented (or transit-ready) development at appropriate locations. Other comments showed appreciation for how the Dispersed scenario protected the availability of single family detached homes. While the Compact scenario was selected as a general starting point, representatives from each jurisdiction selected the foundational scenario for their area. Therefore, the preferred scenario combines elements of each of the initial three scenarios. Based on a series of individual work sessions, specific elements of the preferred scenario were adjusted and tested.

The preferred scenario:

- Encourages additional growth in existing town centers and emerging activity centers, such as future transit stations and major highway interchanges
- Continues the current plan's trajectory throughout much of the unincorporated area
- Allows for an increase in density in the northern part of the study area as Raleigh continues to grow

After the preferred scenario was finalized, the table of indicators was populated and a final report card offering a snapshot of the scenario's performance was prepared. The final report card is provided on the following pages and includes explanatory narrative. The full table of numeric indicators can be found at the end of this chapter on page 33.

Attendees at the November 2016 joint meeting of the CTT and SOT participated in a keypad polling exercise during which they weighed in on the importance of the performance metrics. The intent was to use their feedback to highlight critical indicators. The indicator within each group that the committees identified as most important are highlighted with a ★ in the pages that follow and highlighted in the table at the end of the chapter on page 33.



Place Types



Community Types

Rural				Suburban								City and Town						Ind.		Special									
Parks and Open Space	Rural Living	Working Farm	Rural Crossroads	Large lot, Residential	Shade-Tree, Residential	Small-lot, Residential	Multifamily, Residential	Mobile Home Park	Mixed-Density Res Comm.	Neighborhood Comm. Ctr.	Suburban Comm. Ctr.	Suburban Hotel	Suburban Office Center	Regional Employment Ctr.	Urban Neighborhood	High-Rise Residential	Mixed-Use Neighborhood	Mixed-Use Center	Town Center	Metropolitan Center	Transit-Oriented Dev. 1	Transit-Oriented Dev. 2	Transit-Oriented Dev. 3	Light Industrial Center	Heavy Industrial Center	Health Care Campus	University Campus	Airport	Civic & Inst. Facilities

Growth Distribution

When considering the Southeast Area's future, the way growth is distributed drives economic competitiveness, sustainability, and transportation patterns. Each scenario differs in terms of how much growth is allocated to existing cities and towns. The preferred scenario takes a “middle ground” approach in allocating more growth to cities and towns than the dispersed scenario. As seen in the other category of indicators described in the pages that follow, these tradeoffs have tangible effects on the region's quality of place, transportation system, and sustainability.

Context Distribution

Percent of land area by community type

	Current Plans	Compact	Dispersed	Preferred Growth Strategy
City & Town	1.6%	4.2%	0.5%	2.8%
Suburban	74.4%	74.3%	79.9%	75.2%
Rural	15.7%	14.1%	13.6%	14.1%
Protected Green Space	2.8%	2.3%	2.0%	2.3%
Other	5.6%	4.9%	4.0%	5.6%

Household Distribution

Percent household growth allocated by community type

	Current Plans	Compact	Dispersed	Preferred Growth Strategy
City & Town	4.2%	26.6%	0.4%	18.2%
Suburban	90.9%	69.0%	96.9%	73.7%
Rural	2.0%	1.0%	1.2%	1.4%
Protected Green Space	1.1%	1.1%	0.0%	1.3%
Other	1.8%	1.5%	1.5%	5.3%

Employment Distribution

Percent employment growth allocated by community type

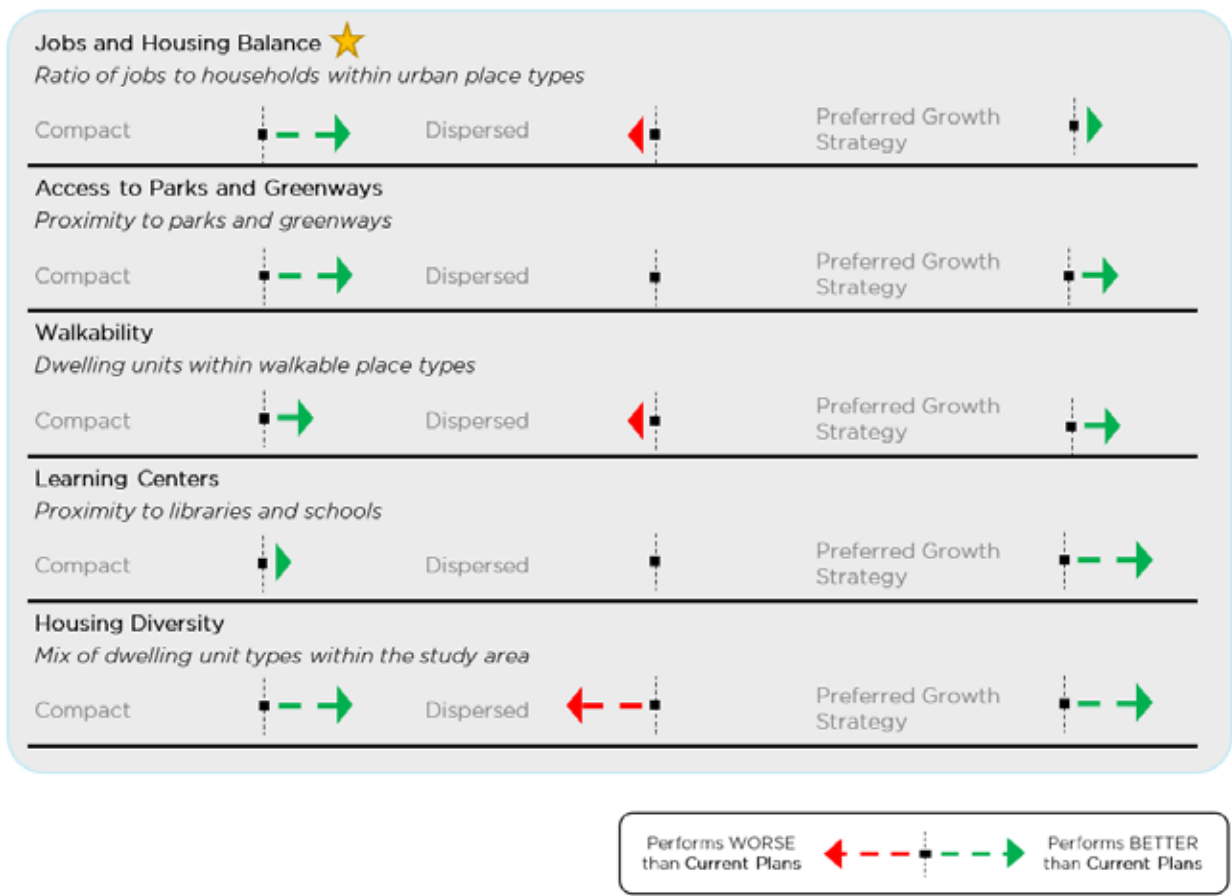
	Current Plans	Compact	Dispersed	Preferred Growth Strategy
City & Town	15.2%	60.7%	1.2%	43.8%
Suburban	55.0%	21.9%	80.4%	31.8%
Rural	1.5%	0.3%	0.5%	1.2%
Protected Green Space	1.2%	1.3%	0.0%	1.4%
Other	26.7%	15.4%	17.9%	21.8%

 Critical indicator, according to CTT and SOT

Quality of Place

The region’s development pattern greatly affects the “quality of place” of its cities, towns, and neighborhoods—that intangible essence that makes a place feel like home. Though quality of place can be difficult to measure, it is closely tied to an area’s desirability and economic vitality. By defining a few characteristics cited as most important during the Southeast Area Study process, we can determine how new patterns of growth will affect these characteristics.

As shown in the report card below, the preferred scenario performs better than current plans on all measures. This is because it supports additional job and housing growth in existing city and town centers, which helps promote a good ratio of jobs to housing—one of the main drivers in a region’s congestion, affordability, and quality of life.

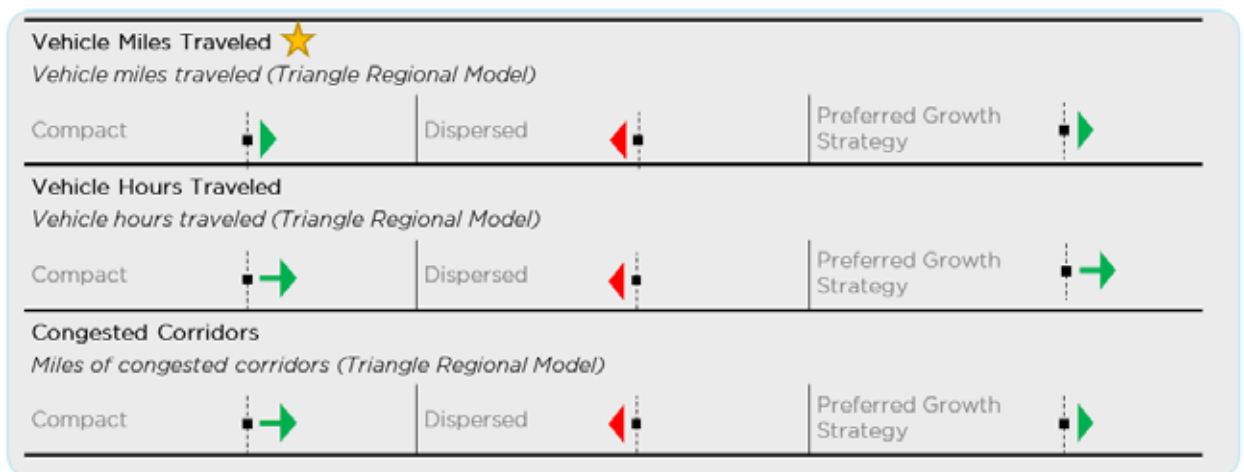


★ Critical indicator, according to CTT and SOT

Regional Transportation

The region's future growth pattern will have a substantial effect on the way residents travel. With growth in more compact town centers, destinations are likely to be closer together and residents will spend less time driving. As growth becomes more dispersed, destinations become more spread out, causing residents to rely more on driving for longer distances.

As expected from a blended scenario, the preferred scenario performs better than the dispersed scenario on the report card's transportation measures, but not quite as well as the pure compact scenario. In this growth pattern, residents will be slightly more reliant on vehicle travel than in the compact growth scenario, leading to slightly more vehicle miles traveled per capita, more time in the car, and more congestion. Minimizing time spent in the car and reducing miles of congested corridors were noted as especially important factors by the SOT.

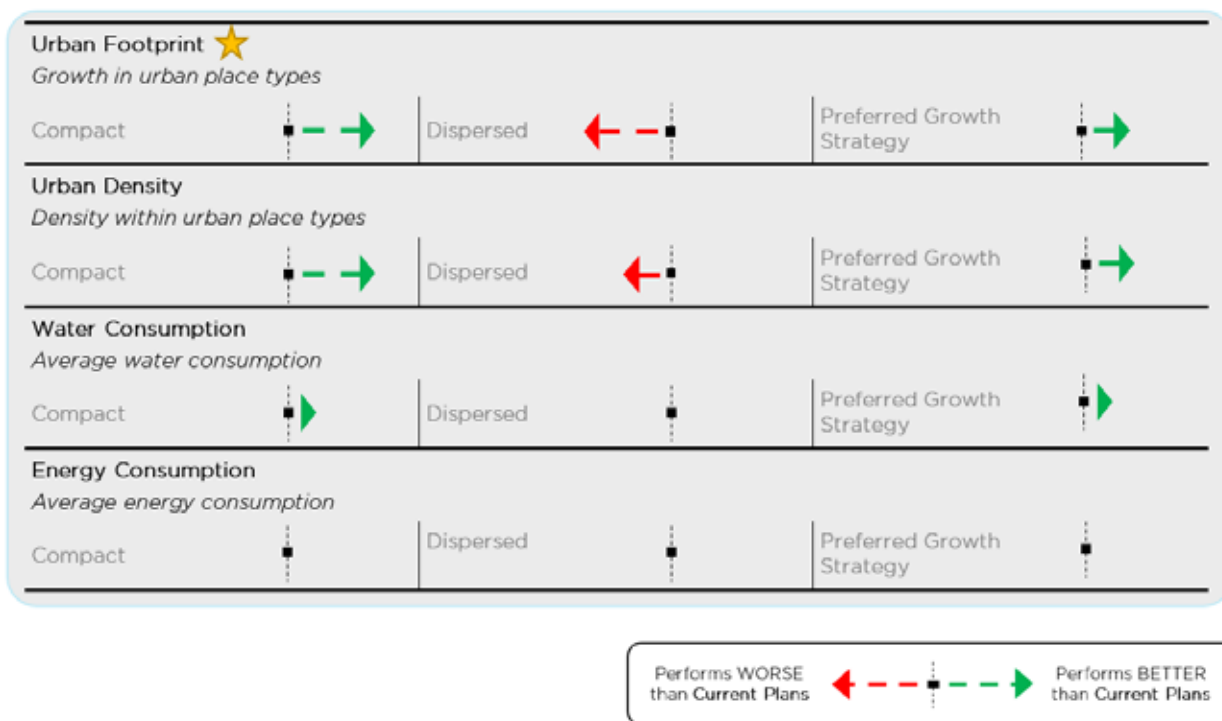


★ Critical indicator, according to CTT and SOT

Sustainable Growth

The sustainability of a growth pattern refers to a region's ability to support itself long-term, both financially and environmentally. Historically, compact neighborhoods are less expensive to build and maintain infrastructure in because more people can be served in a smaller area. Similarly, multifamily housing units tend to use less water and energy than single-family homes, so areas with more housing diversity tend to be more energy efficient.

The preferred scenario performs better than current plans on all measures except energy consumption, where it performs nearly equal to the current plan's scenario. The preferred growth strategy also performs better on promoting growth in existing urban place types, which helps constrain sprawl and keep the region sustainable as population continues to grow. This factor was especially important to the SOT.



★ Critical indicator, according to CTT and SOT

Indicator	Unit	Current Plans	Compact	Dispersed	Preferred Growth Strategy
Growth Distribution					
Land Area by Community Type	City and town	1.6%	4.2%	4.2%	2.8%
	Suburban	74.4%	74.3%	74.3%	75.2%
	Rural	15.7%	14.1%	14.1%	14.1%
	Protected green space	2.8%	2.3%	2.3%	2.3%
	Other (special, industrial, etc.)	5.6%	4.9%	4.9%	5.6%
Household Growth by Community Type	City and town	4.2%	26.6%	0.4%	18.2%
	Suburban	90.9%	69.0%	96.9%	73.7%
	Rural	2.0%	1.0%	1.2%	1.4%
	Protected green space	1.1%	1.1%	0.0%	1.3%
	Other (special, industrial, etc.)	1.8%	1.5%	1.5%	5.3%
Employment Growth by Community Type	City and town	15.2%	60.7%	1.2%	43.8%
	Suburban	55.0%	21.9%	80.4%	31.8%
	Rural	1.5%	0.3%	0.5%	1.2%
	Protected green space	1.2%	1.3%	0.0%	1.4%
	Other (special, industrial, etc.)	26.7%	15.4%	17.9%	21.8%
Quality of Place					
Jobs and Housing Balance	Ratio of jobs to households within city and town place types	1.42	1.55	1.42	1.57
Access to Parks and Greenways	Jobs and dwelling units within 0.5 miles of an existing or proposed park or greenway	85,105	108,162	82,685	107,746
Walkability	Dwelling units within city and town place types	5,327	27,698	455	19,262
Learning Centers	Jobs and dwelling units within 0.25 miles of an existing or planned library or school	8,090	20,337	7,977	20,482
Housing Diversity	Percentage of single- and multi-family dwelling units	8% multi-family 92% single-family	27% multi-family 73% single-family	8% multi-family 92% single-family	27% multi-family 73% single-family

Indicator	Unit	Current Plans	Compact	Dispersed	Preferred Growth Strategy
Regional Transportation					
Vehicle Miles Traveled (based on Triangle Regional Model)	Total miles	12,661,454	12,721,274	12,630,112	13,036,137
	Per capita (study area)	28.79	26.48	29.38	26.59
Vehicle Hours Traveled (based on Triangle Regional Model)	Total hours	358,874	365,404	360,311	384,149
	Per capita (study area)	0.82	0.76	0.84	0.78
Congested Corridors (based on Triangle Regional Model)	Total miles	186	193	183	202
	Miles per capita (study area)	42.40	40.23	42.63	41.28
Sustainable Growth					
Urban Footprint	Jobs and dwelling units added in city and town place types	12,758	70,598	1,137	48,238
Urban Density	Average dwelling units per acre in city and town place types	0.80	1.96	0.40	1.96
Water Consumption	Average gallons of water consumed per household per day	381	331	380	331
Energy Consumption	Average kilowatts of energy consumed per household per month	1,096	1,056	1,096	1,056

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4 MULTIMODAL RECOMMENDATIONS

With an overall goal to connect people and places through a variety of travel mode choices, the Southeast Area Study's transportation recommendations focus on the comprehensive regional system rather than considering each travel mode separately. The resulting recommendations focus on overall mobility to provide a true multimodal system that invests in an economically vibrant region.

Because it is impossible to plan for transportation without also thinking about land use, the Southeast Area Study transportation recommendations respond to the preferred growth strategy described in Chapter 3, and were refined using travel demand modeling to project the region's potential needs several decades into the future. Recommendations also originated from existing plans, collaboration with the CTT, a technical analysis of current network deficiencies, and feedback from stakeholders and the general public.

The project team drew from these sources to compile a “project universe” containing the following modes:



Roadway



**Bicycle &
Pedestrian**



Transit

The project universe is intended to represent the full range of projects that could be considered for future implementation within the Southeast Area. By its nature, the project universe is neither financially constrained nor directly tied to performance metrics such as congestion relief or safety enhancements. Recommendations within the project universe were further refined and prioritized through input from the SOT, CTT, and public outreach.

This chapter documents facility improvements recommended as part of the Southeast Area Study, as well as the methodology employed to arrive at those recommendations. As a complement to these facility recommendations, the Southeast Area Study Best Practices document (included in the Appendix) discusses land use policies and programs that can help support the transportation network. Project sheets providing details on each of the roadway, transit, and non-motorized recommendations have also been prepared for use as an at-a-glance reference tool by CAMPO, UCPRPO, and member jurisdictions.

Roadway

The Roadway element of the Southeast Area Study highlights the region's plan to mitigate traffic congestion and improve roadway infrastructure for all motorists. Given that the population of the Southeast Area is expected to grow by 300,000 over the next 25 years, addressing existing and future areas of congestion is essential to support the study's planning themes of traffic flow, travel safety, and freight movement. Many of the key corridors in the Southeast Area (such as I-40, US 70, and NC 42) traverse multiple jurisdictions; regional collaboration will be key to implementing these improvements.



This section also includes a review of previous and ongoing planning efforts that affect roadway improvements, including ITS, freight, and rail plans.

Roadway Project Universe

A variety of methods and tools were used to establish the universe of project recommendations. These tools included a combination of community input and technical analysis for an integrated planning approach.

Previous Planning Efforts

State, regional, and local plans for the Southeast Area were reviewed for all travel modes. Previous recommendations were vetted, checked for inconsistencies between plans, and incorporated into the project universe where appropriate.

Travel Demand Modeling

The Triangle Regional Model (version 6) was used to assess existing congestion and predict future congestion on the road network in the study area. The 2010 existing network and the 2040 existing plus committed network models were run, with socioeconomic inputs from the Preferred Growth Strategy created through the scenario planning process (see Chapter 3).

Safety Needs

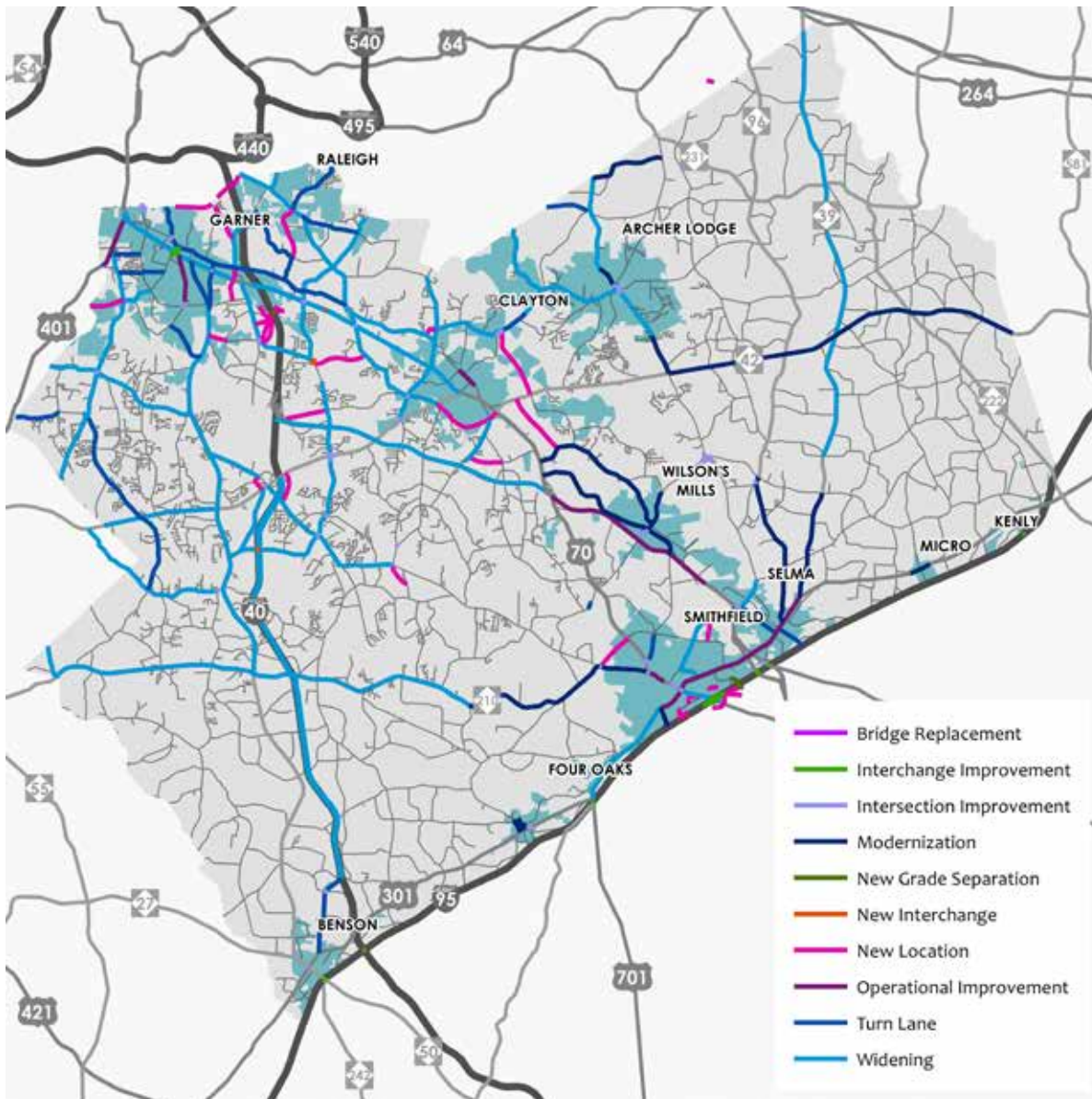
Historical crash data was reviewed for the study area to identify locations with the greatest safety concerns. Where possible, project recommendations were identified that may help mitigate these concerns.

Perceived Community Needs

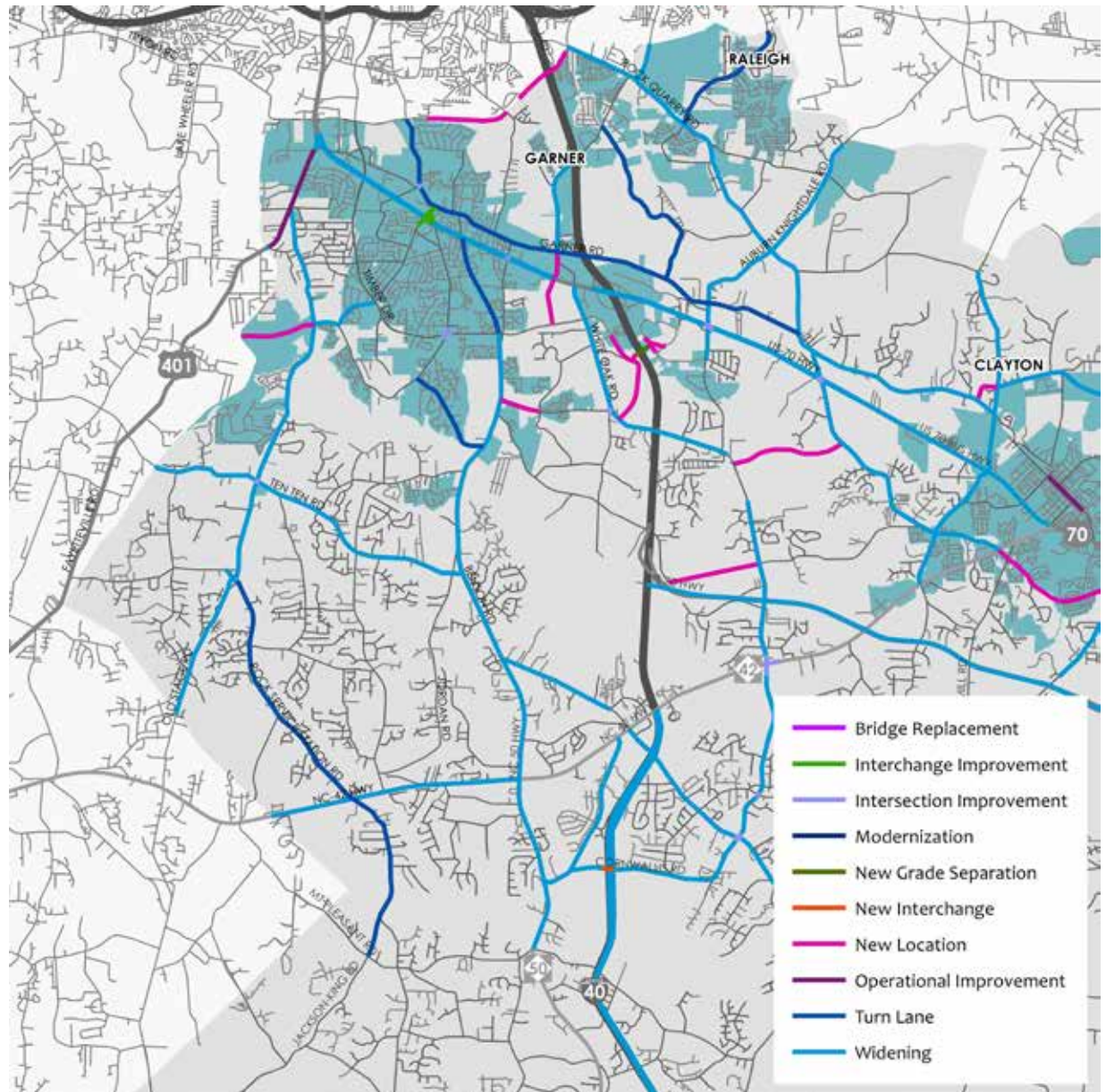
Meetings with the CTT, SOT, stakeholders, and the general public allowed the project team to supplement the roadway recommendations from previous plans with additional projects that meet the transportation needs and safety concerns voiced by the communities in the Southeast Area.

The maps on the following pages show the roadway project universe.

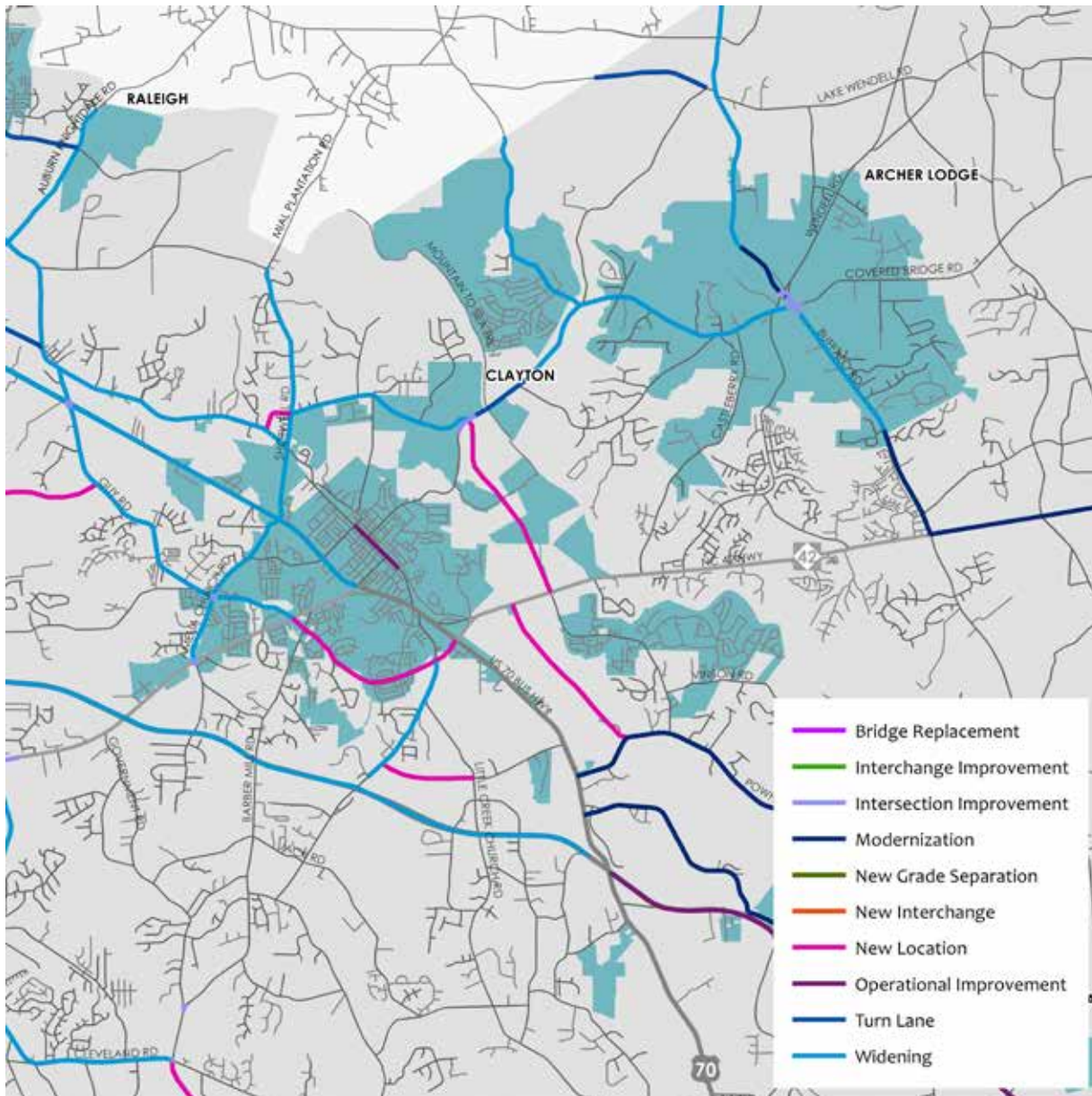
Roadway Project Universe, SEAS Study Area



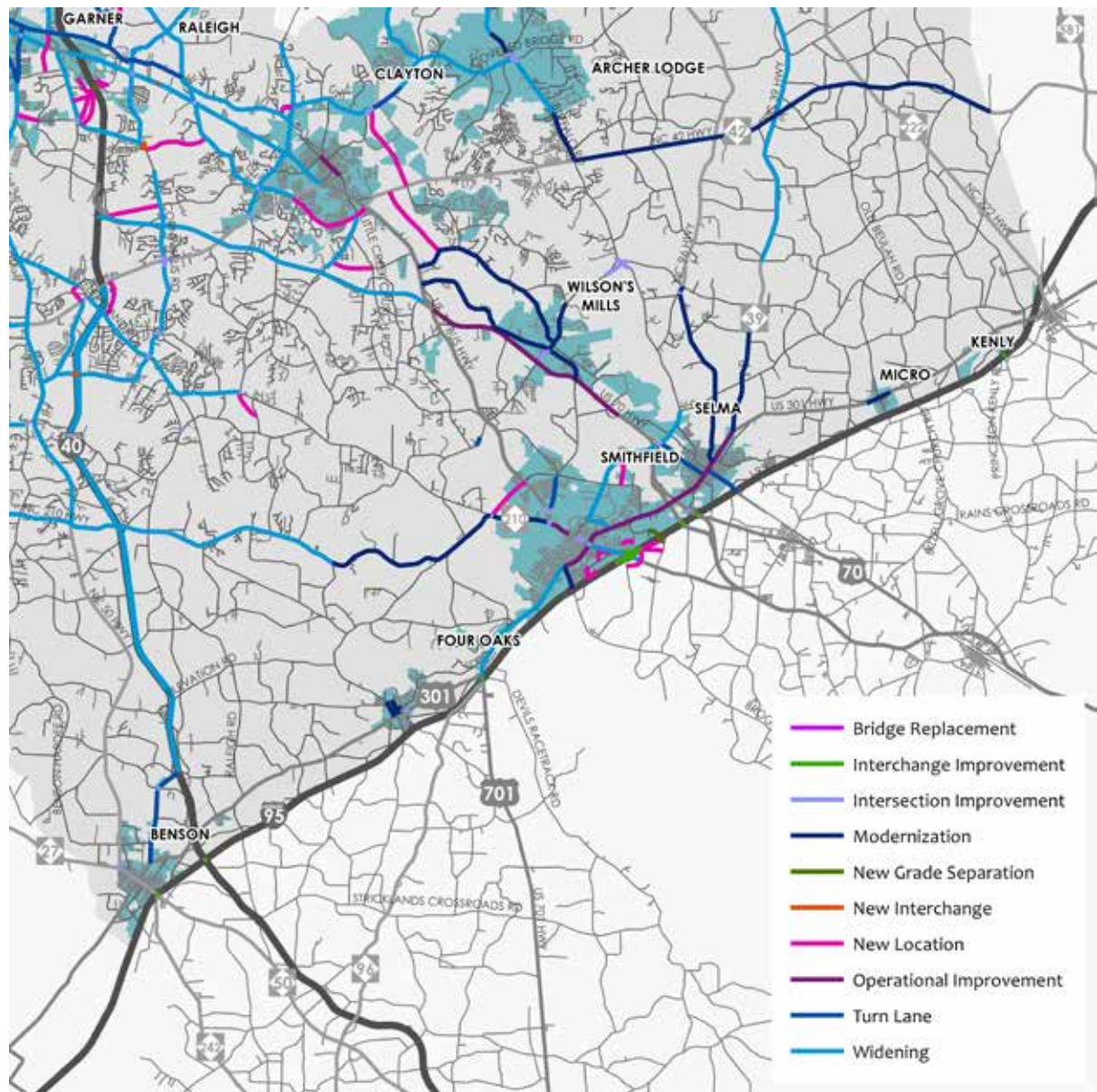
Roadway Project Universe, Wake County



Roadway Project Universe, Clayton and Archer Lodge



Roadway Project Universe, Johnston County

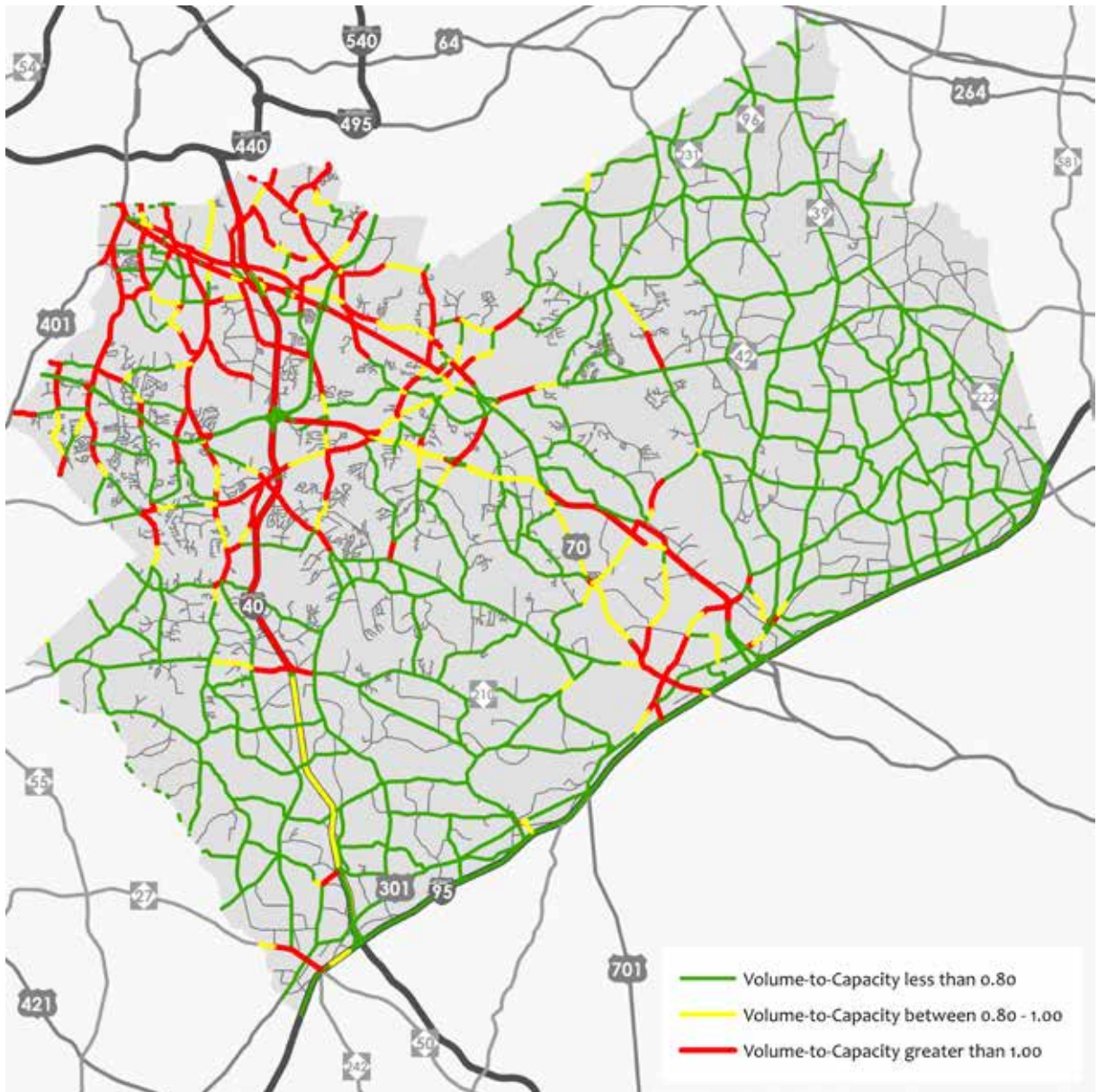


Critical Projects

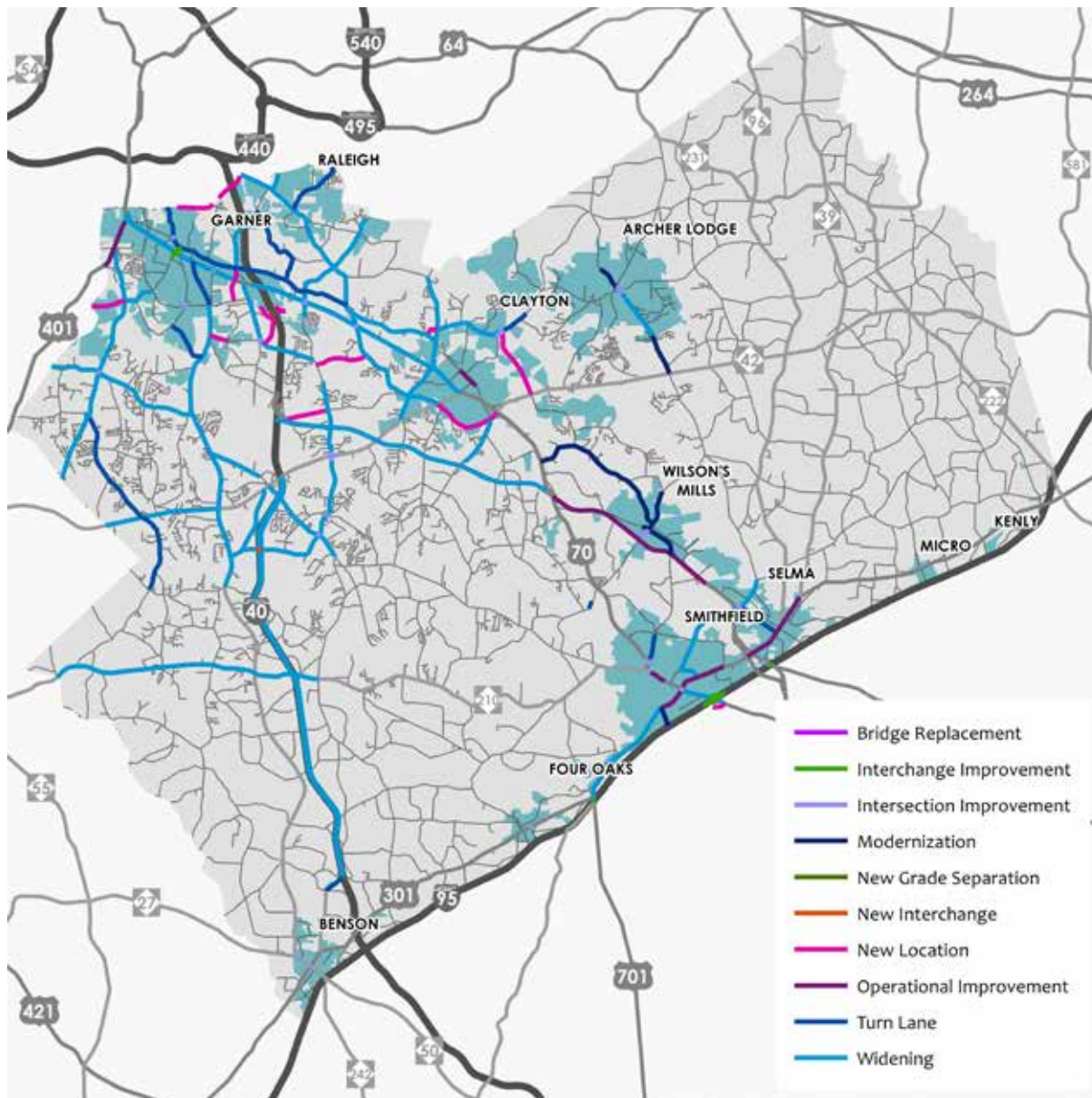
The Southeast Area Study is intended to be used as a tool to guide project identification and prioritization for CAMPO, UCPRPO, NCDOT, and member jurisdictions. As such, the study must respond to quantitative metrics that can help identify which projects may be most viable. Using the project universe as a starting point, “critical projects” were distinguished from longer term “vision projects” using a process that was both quantitative and qualitative. For roadway projects, the Triangle Regional Model provides the best look into what needs are being addressed by the project network. The project team used the travel demand model to highlight projects that meet critical congestion needs. In instances where a project covered a facility with only a portion exhibiting congestion, the project was broken into segments. Phasing these projects created a more realistically implementable and more easily fundable set of critical projects. The lists of critical and vision projects were vetted with CTT members and modified based on their comments. Cost estimates were then developed for critical roadway projects.

The maps on the following pages show the congestion issues identified by the Triangle Regional Model along with the critical projects identified to alleviate these issues.

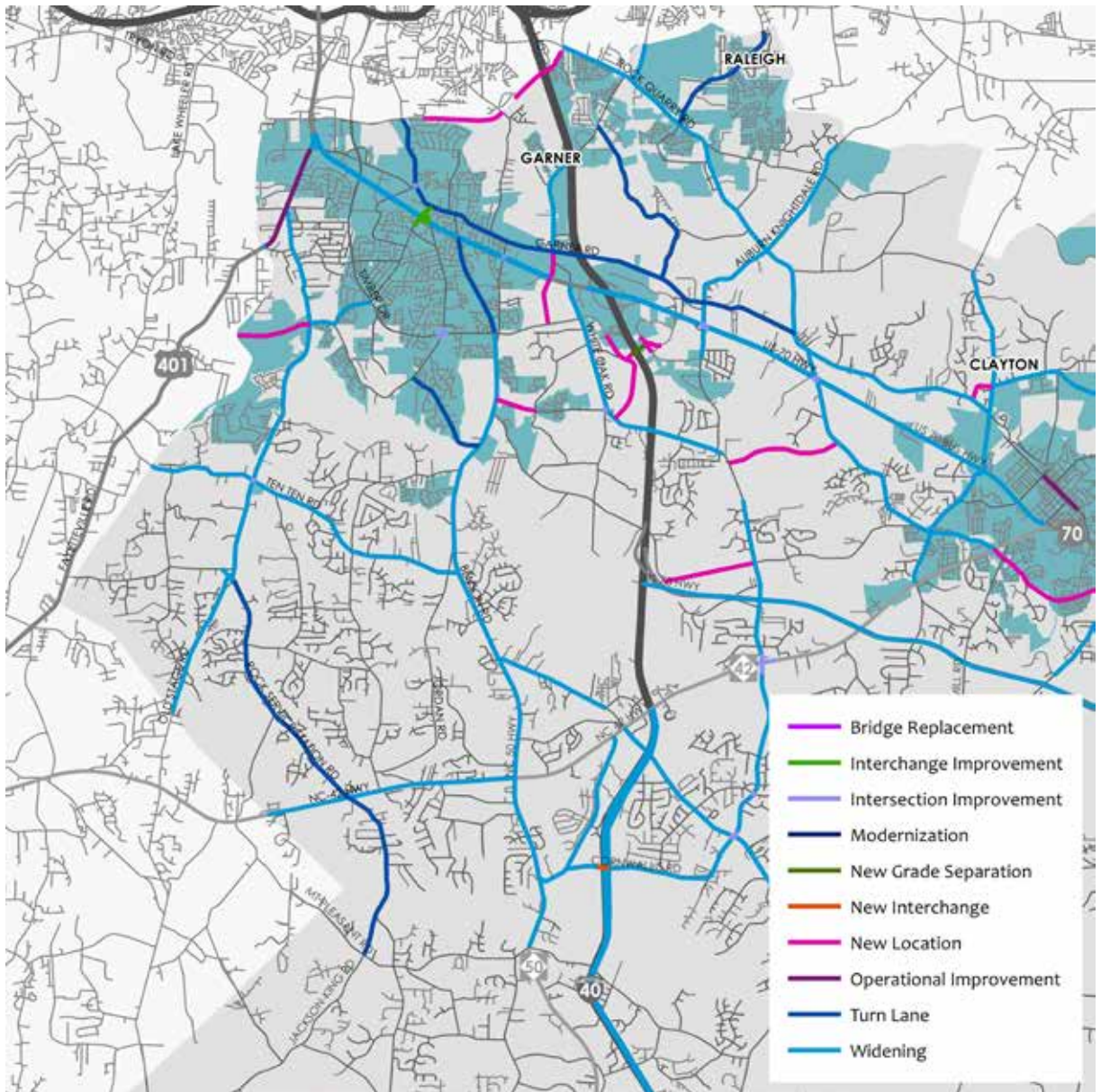
2045 Roadway Congestion, Existing Plus Committed Network



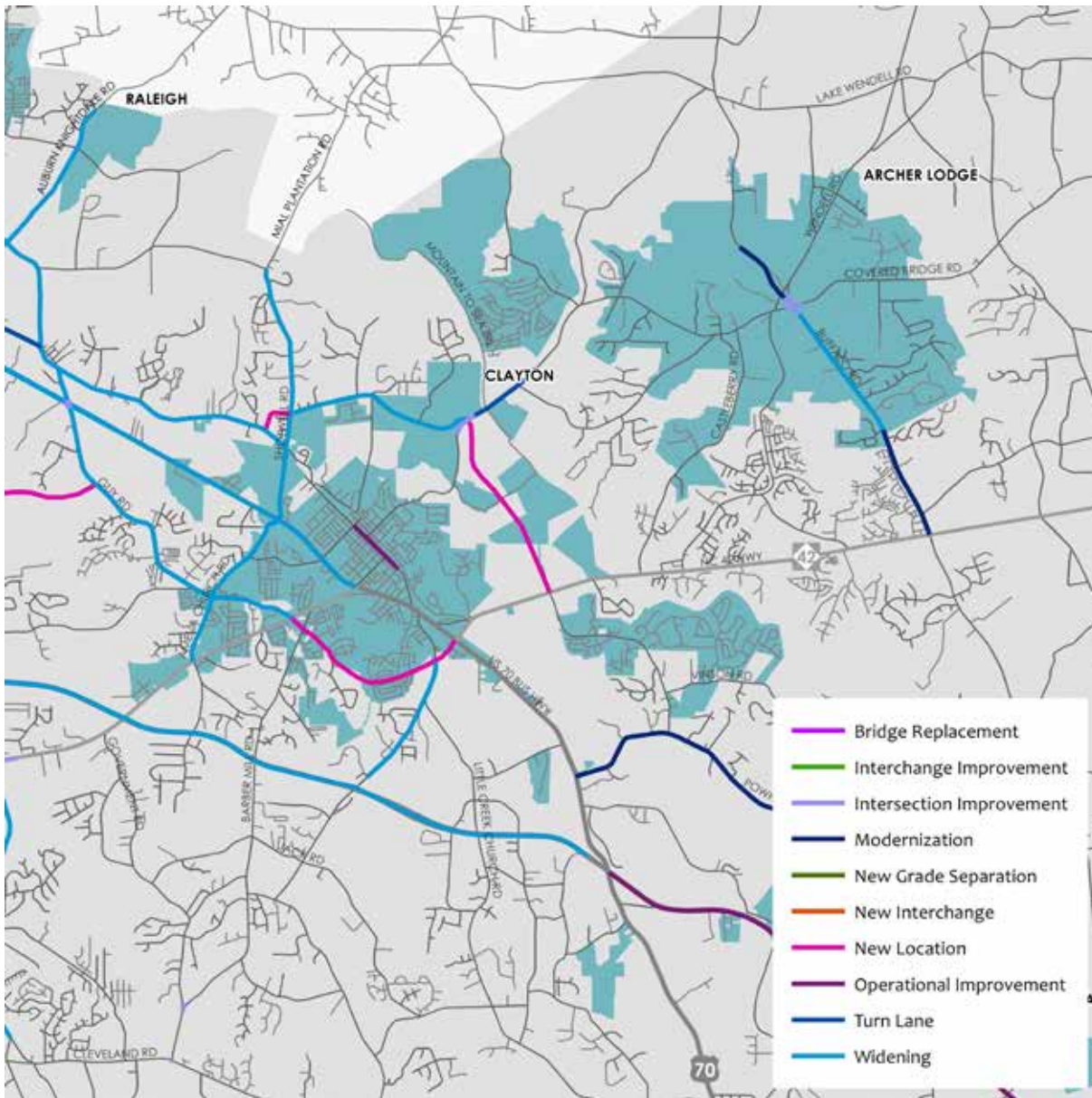
Critical Roadway Projects, SEAS Study Area



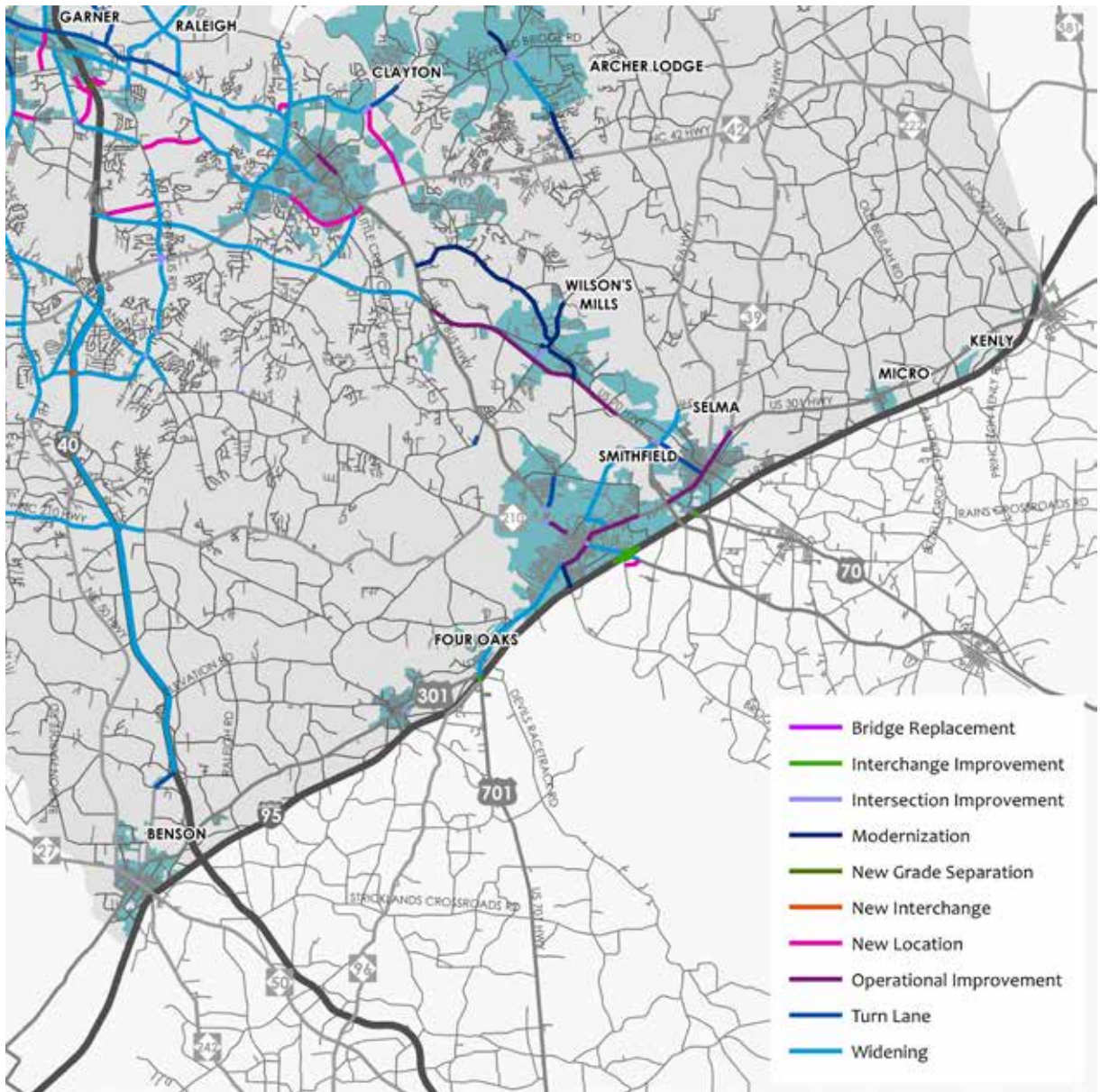
Critical Roadway Projects, Wake County



Critical Roadway Projects, Clayton and Archer Lodge



Critical Roadway Projects, Johnston County



Supporting Recommendations

In addition to the facility-level recommendations identified in the universe of projects and critical projects, it is important to consider the effects on the roadway network of Intelligent Transportation Systems (ITS), freight, and rail. Each plays a unique role in shaping the decision-making process for future improvements. For each of these three areas, the Southeast Area Study is guided by previous or ongoing planning efforts that explore these issues and solutions in greater detail.

Intelligent Transportation Systems

ITS has been a focal point for investment at the state and regional levels for quite some time. According to the 2040 Metropolitan Transportation Plan (MTP), NCDOT had begun or completed \$13.5 million of these ITS projects by April 2013, including highway, system preservation, transit, and North Carolina Turnpike-related projects. In 2010, CAMPO updated its ITS Strategic Deployment Plan (SDP). The update included the identification of 175 feasible projects for the Triangle region over a 25-year horizon period, totaling \$315 million. Most notably, the SDP update streamlined ITS projects into the region's general transportation planning process. Within the Southeast Area Study region, the SDP update identified I-40 and NC 540 as strategic network corridors.

Freight and Rail

As part of the recommendations development process, previous and ongoing freight and rail planning efforts were reviewed. Rail planning efforts include not only changes to the passenger and freight rail service, but also how the roadway network interacts with the rail network at crossings. These planning efforts should be closely considered as member jurisdictions move forward with implementing the recommendations in the Southeast Area Study.

Triangle Freight Plan

CAMPO is partnering with the DCHC MPO and NCDOT to develop a Regional Freight Plan for the Triangle region. A portion of this region is contained in the Southeast Area. Member jurisdictions are actively involved in the development of this plan, providing feedback on how freight should move through their communities in the future. This plan is in its final stages of development and was not yet available for review when the Southeast Area Study was completed. Moving forward, the Regional Freight Plan will serve as a guidepost for future decision-making for regional freight mobility.

NCRR Commuter Rail Ridership and Market Study

The 2010 NCRR Commuter Rail Ridership and Market Study identified Durham-Wilson's Mills as the best portion of the Greensboro-Goldsboro corridor for commuter rail service, in terms of ridership and gross revenue. The study emphasized the importance of close collaboration with transit agencies, since successful implementation of rail service is dependent on connections to nearby bus service. It also concluded that ridership will depend heavily on rail fares. If high ridership and associated public benefits (rather than gross revenue) are the priority of stakeholders, then a reduced fare should be considered.

Rail and Roadway Connections

The Southeast Area Study includes recommendations in locations with roadway and railroad crossings. Two of those locations are considered in detail as part of the hot spot studies in the following sections. The realignment of Jones Sausage Road in Garner (described in the Garner 40/70 Catalyst Site Study) would mitigate existing safety concerns at the Jones Sausage Road/White Oak Road railroad crossing. The Smithfield Gateway Analysis Study provides details on replacing the grade-separated railroad crossing with US 70 Business as an improved gateway to downtown Smithfield. For these locations, as well as any railroad crossing location within the region, coordination with the NCDOT Rail Division will be critical to understanding the long-term vision for the area.

Completing the Streets

The guiding principles of the Southeast Area Study embrace the integration of travel modes to create a travel network that serves all types of users. With the creation of the Preferred Growth Strategy, a connection can be made between the types of land uses that an area supports and the most compatible multimodal accommodations. To illustrate this relationship, the project team developed a Street Design Guide to assign future cross-sections to roadway projects. The Street Design Guide is a reference tool that provides general guidance on the assignment of context-appropriate roadway cross-sections based on posted speed limits and the surrounding community type. While there are always exceptions, the table on the following page offers an understanding of the expectations for street design to complement the urban form of a given area and provide consistency with stated NCDOT policy for design elements as well as Complete Street objectives.

Once cross-sections were assigned using the Street Design Guide methodology, critical project cross-sections were reviewed and edited by the CTT. These revised cross-sections drove the final roadway, bicycle, and pedestrian recommendations for the Southeast Area Study.



The following is a context based reference guide for the use of CAMPO approved cross-sections in the Southeast Area Study. While there are always exceptions, this table offers a greater understanding of the expectations for street design to compliment the urban form of a given area to offer an expression of consistency with stated NCDOT policy for design elements as well as Complete Street objectives. The table organized around the Community Types referenced during the planning process (Rural, Suburban, City & Town, Industrial, and Special). Understanding that categories "Industrial" and "Special" are limited locations that take on design characteristics of one of the other three categories, the table has been limited to Rural, Suburban, and City & Town.

Street Design Guide

Section ID	Rural	Suburban	City & Town	Bike/Ped	Posted Speed	Edge
2A	●			5' Paved Shoulders	55	Shoulder
2B	●			4' Paved Shoulders	45 or less	Shoulder
2C	●	●		4' Paved Shoulders	35 or less	Shoulder
2D		●		4' Paved Shoulders, 5' Sidewalks	25-45	Shoulder
2E		●	○	5' Bike Lane, 5' Sidewalk	25-45	C&G
2G		○	●	Parking Both Sides, 5' Bike Lane, 5' Sidewalk	25-45	C&G
2H		○	●	Parking One Side, 5' Bike Lane, 5' Sidewalk	25-45	C&G
2I		●	○	Median, 5' Bike Lane, 5' Sidewalk	25-45	C&G
3A	●			4-5' Paved Shoulders	25-55	Shoulder
3B		●	○	Share the Road, 5' Sidewalk	25-45	C&G
4A	●			Median, 4-10' Paved Shoulders	45-70	Shoulder
4B	●			Median, 4-5' Paved Shoulders	35-55	Shoulder
4C		●		Median, Wide Outside Lanes, 5' Sidewalks	35-45	C&G
4D		●		Median, 5' Bike Lanes, 5' Sidewalk	35-45	C&G
4E		●		Grass Median, 5' Bike Lanes, 5' Sidewalk	35-55	C&G
5A		●	○	Wide Outside Lanes, 5' Sidewalks	35-45	C&G
6A	●			Median, 12' Paved Shoulders	45-70	Shoulder
6B		●		Median, Wide Outside Lanes, 5' Sidewalks	55-70	C&G
8A		●		Median, 5' Sidewalks	45-70	C&G

- Primary Cross-Section
- Secondary Cross-Section

Hot Spot Studies

Several roadway recommendations originated from three hot spot studies conducted as a part of the Southeast Area Study that address specific transportation issues within the study area. More details about these studies are available in the Appendix.

Three hot spot studies have been conducted to address specific transportation issues in the study area:

- Archer Lodge Hot Spot Study
- Garner 40/70 Catalyst Site
- Smithfield Interchange Analysis

Archer Lodge Hot Spot Study

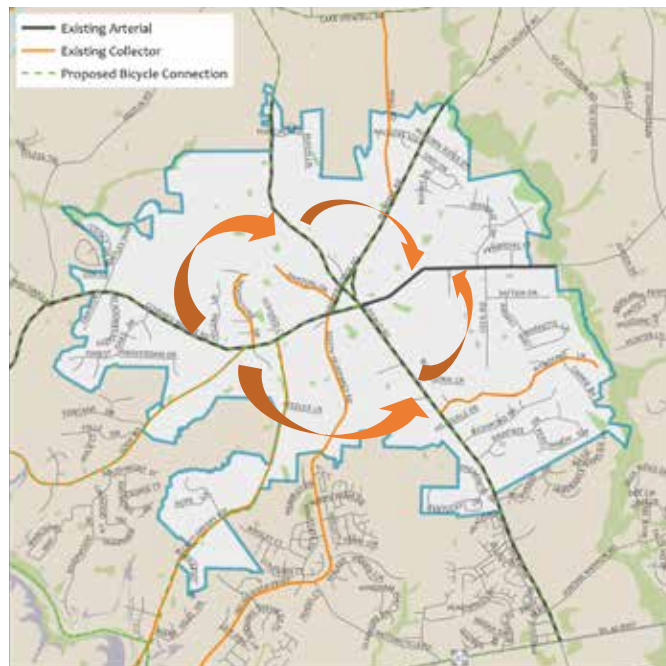
Based on the recent growth and ongoing development pressure within Archer Lodge and the surrounding area, the Town of Archer Lodge was identified as a hot spot study area. The Archer Lodge Hot Spot Study was performed to complete the following goals:

- Evaluate the existing traffic conditions and roadway network
- Provide recommendations for future transportation improvements to meet current and future projected traffic demand
- Identify opportunities to enhance connectivity to key activity centers within the community
- Identify strategies to enhance the sense of community and mobility valued by Archer Lodge residents

Recommendations from the Archer Lodge Hot Spot Study include:

- Facility recommendations for future collector and connector streets, focused primarily on the connection points with existing roadways
- Revisions to zoning and subdivision ordinances that could result in clustered development patterns and preserved open space and habitat areas
- Implementing a collector street policy to encourage connectivity and accessibility

- Establishing commercial design guidelines to facilitate new development that is compatible with the existing rural character
- Creating code requirements to reserve right-of-way or install new collector roadways to assist with implementation of collector and connector street recommendations
- Integrating bicycle and pedestrian connectivity in development plans for key activity centers to enhance multimodal accessibility



Garner 40/70 Catalyst Site

The objective of the 40/70 Catalyst Site analysis in Garner was to improve traffic circulation to accommodate future development. Key issues that had to be considered within this area included the upcoming I-5111 I-40 widening project, existing and future development near the US 70/White Oak intersection, a skewed railroad crossing at Jones Sausage Road, three new Wake County Public Schools in the area, the future character of Timber Drive, and growth pressures in the Greenfield Industrial Park.

A series of potential improvements were identified for this area. These improvements were developed with a focus on overall system connectivity, and were studied within the travel demand model. Multimodal integration in the area was also considered by incorporating current plans. Key improvement areas include:

- Proposed White Oak Road/I-40 interchange
- Realigned railroad crossing on Jones Sausage Road
- Jones Sausage Road Extension
- Timber Drive Extension
- New bridge over I-40
- Intersection improvements at White Oak Road/Ackerman Road/Hebron Church Road



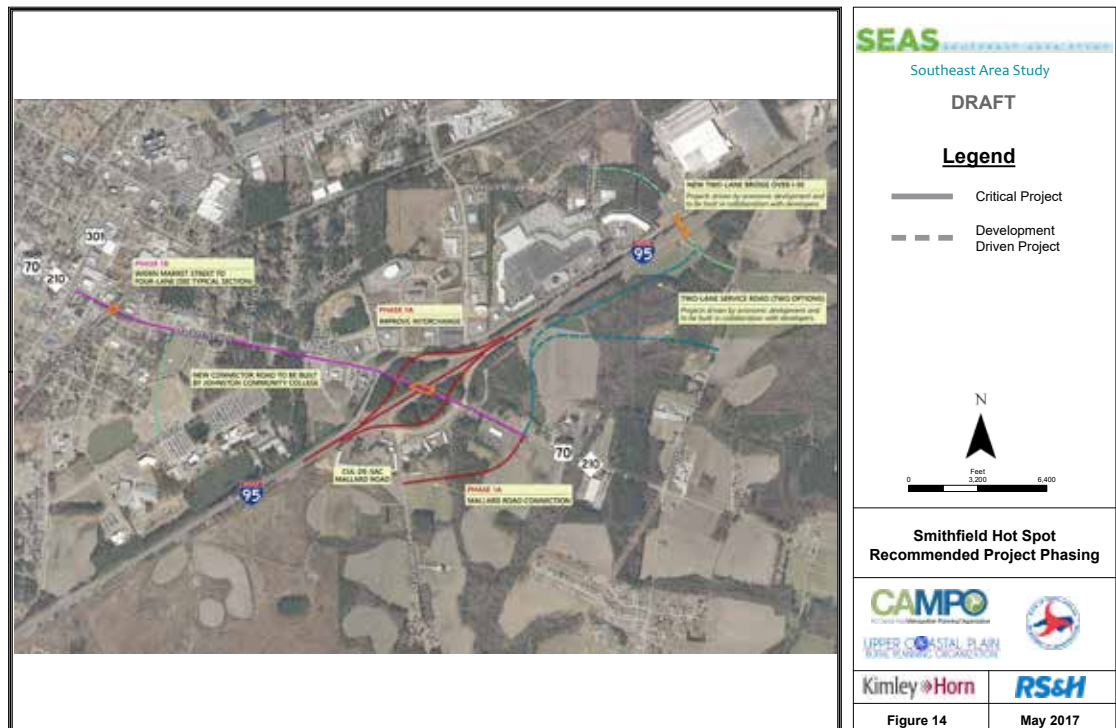
4 MULTIMODAL RECOMMENDATIONS

Smithfield Gateway Analysis

The objective of the Gateway Analysis in Smithfield was to facilitate smooth traffic flow to reduce congestion near the outlet mall and Johnston Community College and plan for upcoming development east of I-95. Issues identified in this area include flooding along US 70 Business (Market Street) at the railroad underpass, access management concerns, a proposed restructuring of the interchange with I-40, and the potential for new development east of I-95.

An interchange configuration analysis was conducted for the I-95/US 70 Business interchange to determine the preferred alignment of the improved project. Other potential improvement areas for the Smithfield Gateway include:

- Improvement of US 70 Business (Market Street), including widening and complete streets concepts
- New service road in the southeast interchange quadrant
- New bridge over I-95 east of US 70 Business
- Review of the existing service road access to outlet malls







Bicycle and Pedestrian

The bicycle and pedestrian element of the Southeast Area Study highlights on the region's potential to be more walkable and bicycle-friendly, giving residents, workers, and visitors the option to travel by foot or bike for both recreation and transportation. The Southeast Area Study recommendations take two forms—a comprehensive set of strategic pedestrian and bicycle facility connections, such as sidewalks, bike lanes, and shared use paths, and programmatic improvements such as pursuing NCDOT funding for active transportation plans and bolstering existing Safe Routes to Schools programs.

Methodology

Similar to the study's roadway recommendations, the bicycle and pedestrian element was developed using a strategic blend of technical analysis and community feedback. The ultimate goal was to improve the overall mobility in the region and provide viable options to those looking to travel within the region. The development of the Southeast Area Study's infrastructure recommendations included input from the CTT, the SOT, and the public.

Previous Planning Efforts

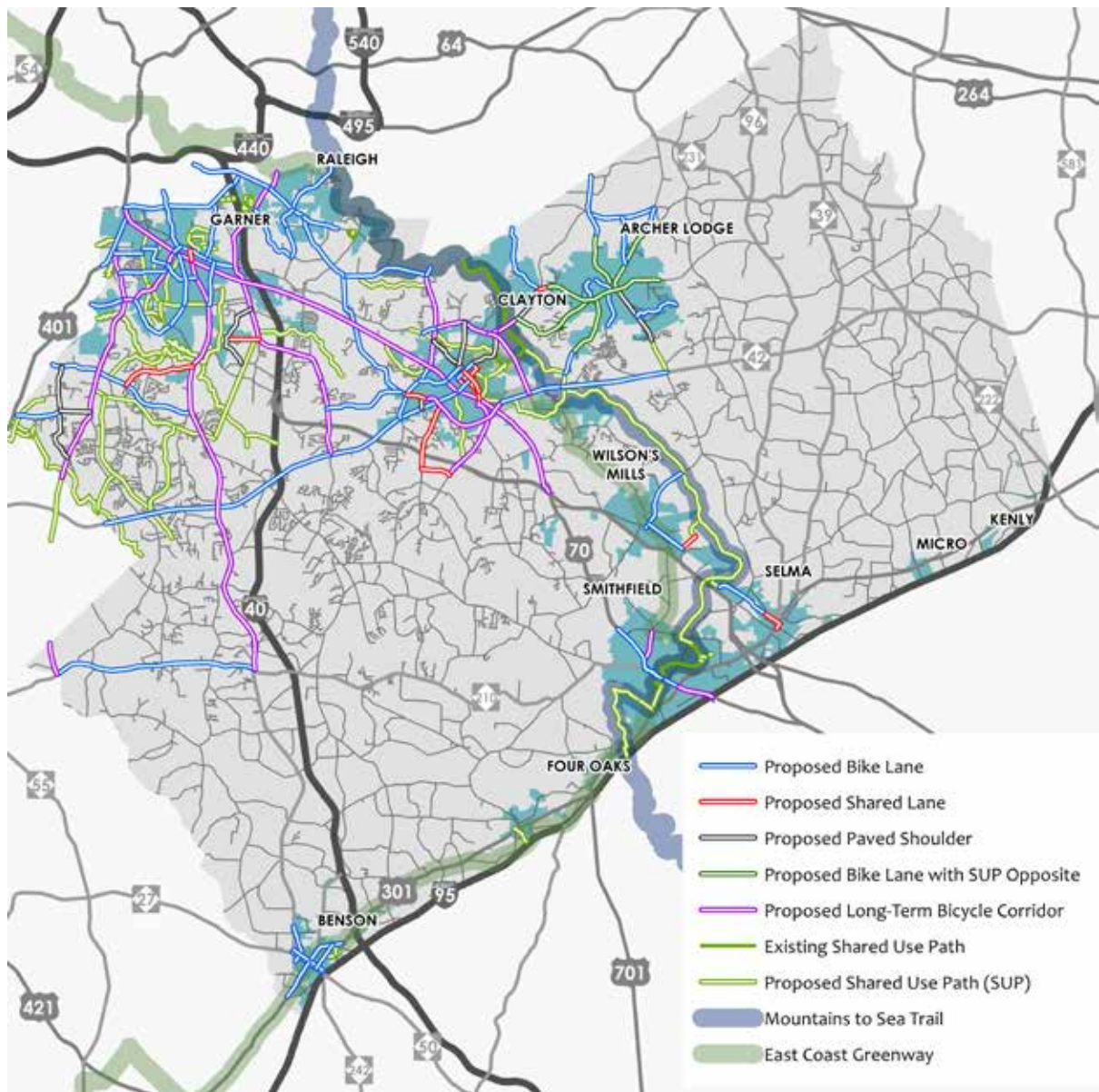
The Southeast Area Study project team leveraged the work completed in previously adopted plans and supplemented existing facility recommendations with intentional connections to the proposed alignments of the Mountains-to-Sea Trail and East Coast Greenway. These new recommendations augment the existing planned facilities to create a comprehensive bicycle and pedestrian network that links significant activity centers with the proposed statewide facilities. The previous planning efforts that served as the foundation of the future network are summarized in the table on the following page.

Plan	Year	Description
Clayton Comprehensive Bicycle Plan	2005	Clayton's first Comprehensive Bicycle Plan was funded by a planning grant awarded by NCDOT's Division of Bicycle and Pedestrian Transportation along with a local match. The plan recommended a mix of bike lanes, multi-use paths, paved shoulders, signed routes, and wide outside lanes in the Town of Clayton.
Johnston County Mountains-to-Sea Trail Master Plan	2006	Created by the North Carolina Department of Environment and Natural Resources, NCDOT, Johnston County, the Town of Clayton, and the Town of Smithfield, the Johnston County Mountains-to-Sea Trail Master Plan describes the trail's benefits and offers guidance for implementation.
Garner Transportation Plan	2010	The Town of Garner is currently updating their Transportation Plan. The current plan, dated 2010, describes the Town's priorities for addressing transportation issues. The plan includes several sidewalk, greenway, bike lane, and crosswalk recommendations.
Capital Area Metropolitan Planning Organization 2040 Metropolitan Transportation Plan	2012	The 2040 Metropolitan Transportation Plan is CAMPO's federally-mandated, fiscally-constrained long range transportation plan. The Southeast Area Study will be one element of CAMPO's forthcoming 2045 Metropolitan Transportation Plan.
Johnston County Comprehensive Transportation Plan	2014	Johnston County's CTP was originally created in 2011 and was updated in 2014. The CTP details challenges for highway, transit, bicycle, and pedestrian projects in Johnston County. The plan includes pedestrian recommendations for Johnston County municipalities within the Southeast Area (except for Archer Lodge) and bicycle recommendations for Archer Lodge, Benson, Clayton, Four Oaks, and Smithfield.
Johnston County Parks and Recreation Master Plan	2015	The Johnston County Parks and Recreation Master Plan provides action steps for Johnston County to improve its recreational facilities including parks, community centers, and trails. The plan recommends connectivity between Clayton, Selma, Smithfield, Four Oaks, Benson, and the Mountains-to-Sea Trail.
Mountains-to-Sea North Carolina State Trail Master Plan	2015	The Mountains-to-Sea State Trail Master Plan promotes completion of the hiking trail across North Carolina. Two planning segments, Falls Lake/Neuse River and Johnston County, follow the Neuse River through the Southeast Area.
BikeRaleigh Plan Update	2016	The BikeRaleigh Plan Update describes how the City of Raleigh will improve safety, comfort, and convenience for bicyclists. The plan aims to accommodate bicyclists of all ages and abilities, and it emphasizes separated bike lanes and safer streets.
Wake County Greenways Master Plan	2016	The Greenways Master Plan focuses on creating greenway connections along natural corridors. The plan categorizes its recommendations using four major objectives: bridge the gaps, connect parks and lakes, connect the communities, and complete the system.

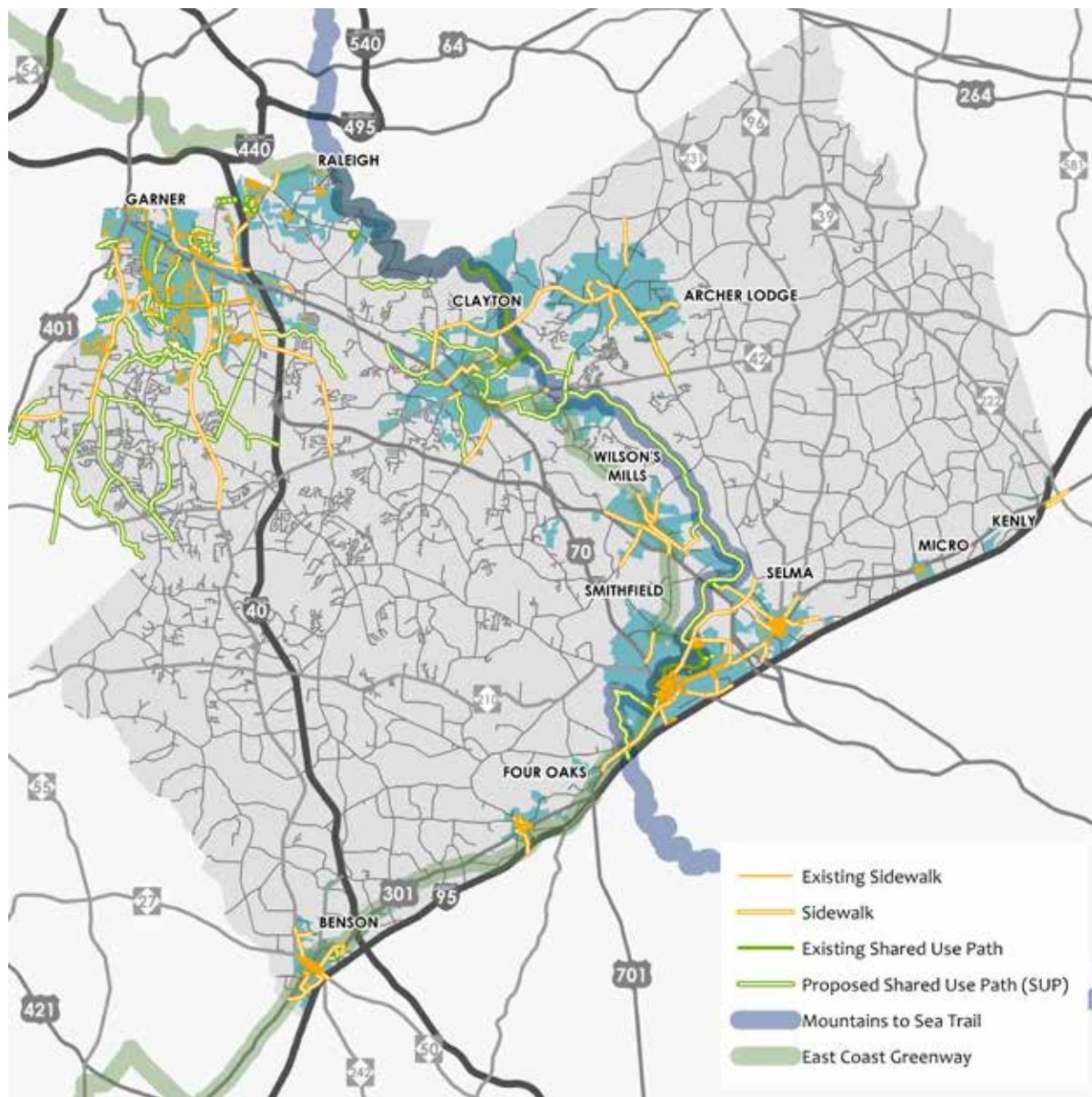
Facility Recommendations

The Southeast Area Study seeks to improve bicycle and pedestrian connectivity within communities, between communities, and between activity centers and recreational trails. Starting with the infrastructure recommendations from previous planning efforts, the Southeast Area Study identifies gaps in connectivity and proposes sidewalks, shared use paths, and bikeways. Maps on the following pages illustrate the Southeast Area Study's bicycle and pedestrian infrastructure recommendations.

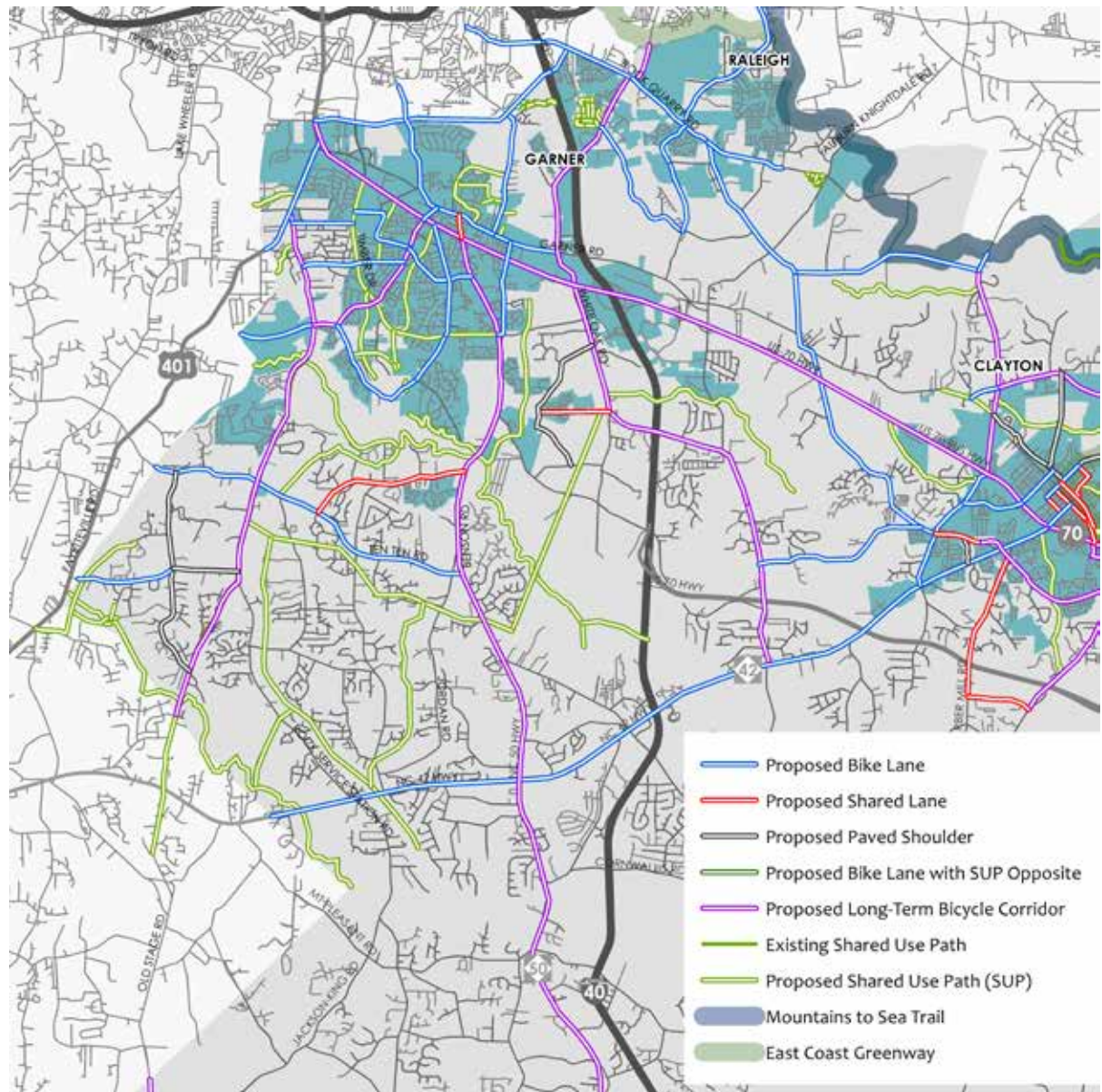
Recommended Bicycle Improvements, SEAS Study Area



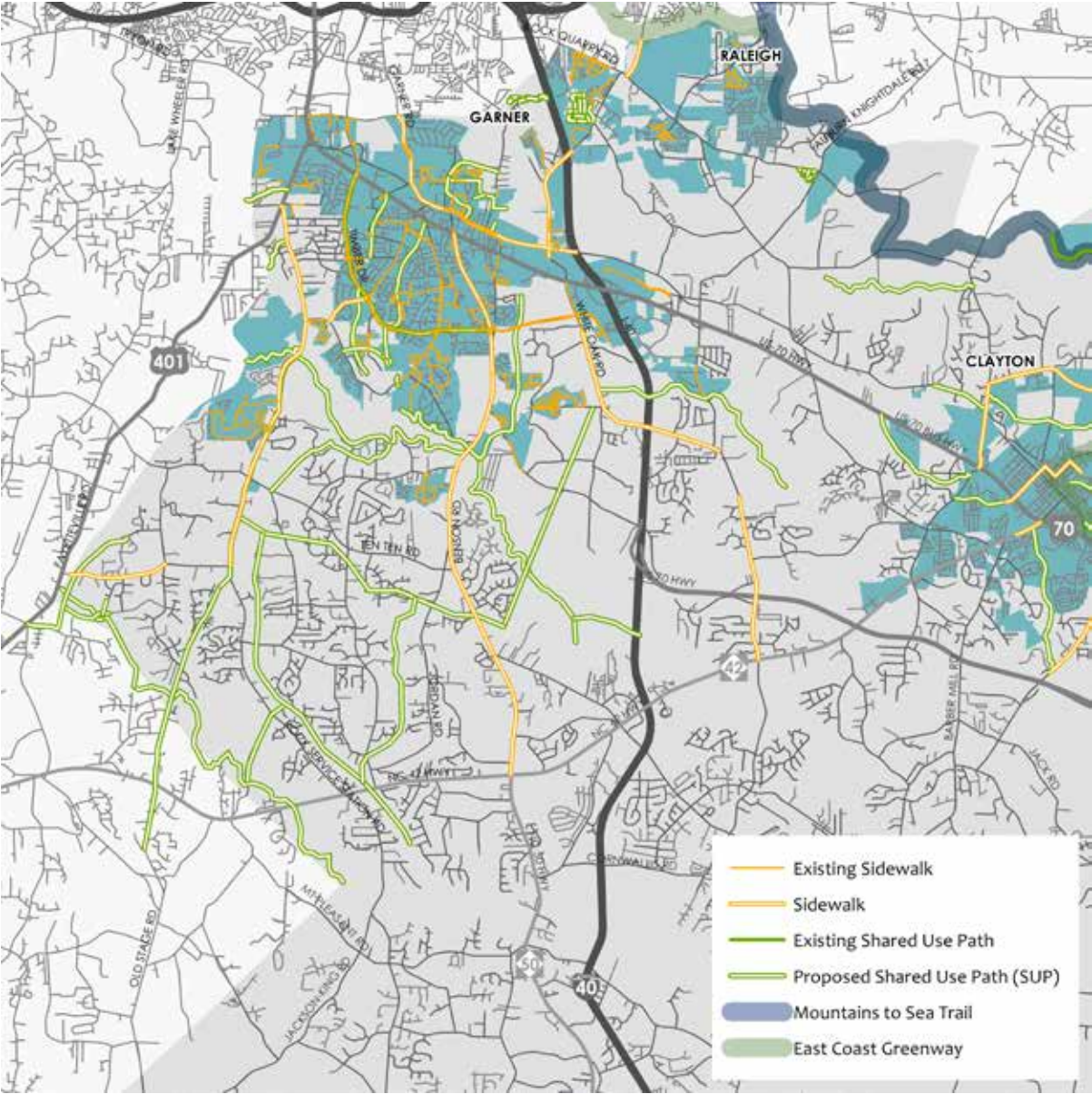
Recommended Pedestrian Improvements, SEAS Study Area



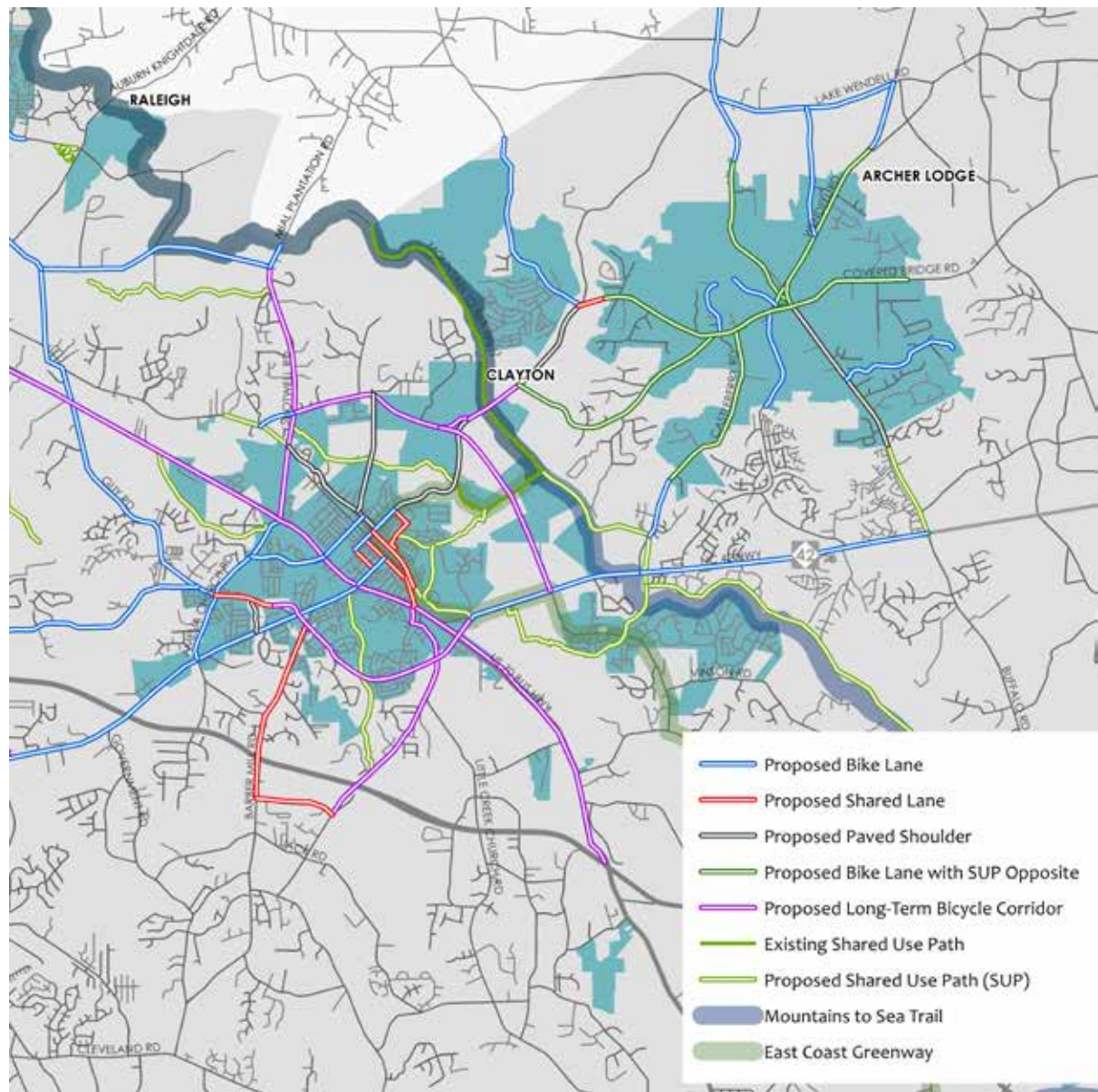
Recommended Bicycle Improvements, Wake County



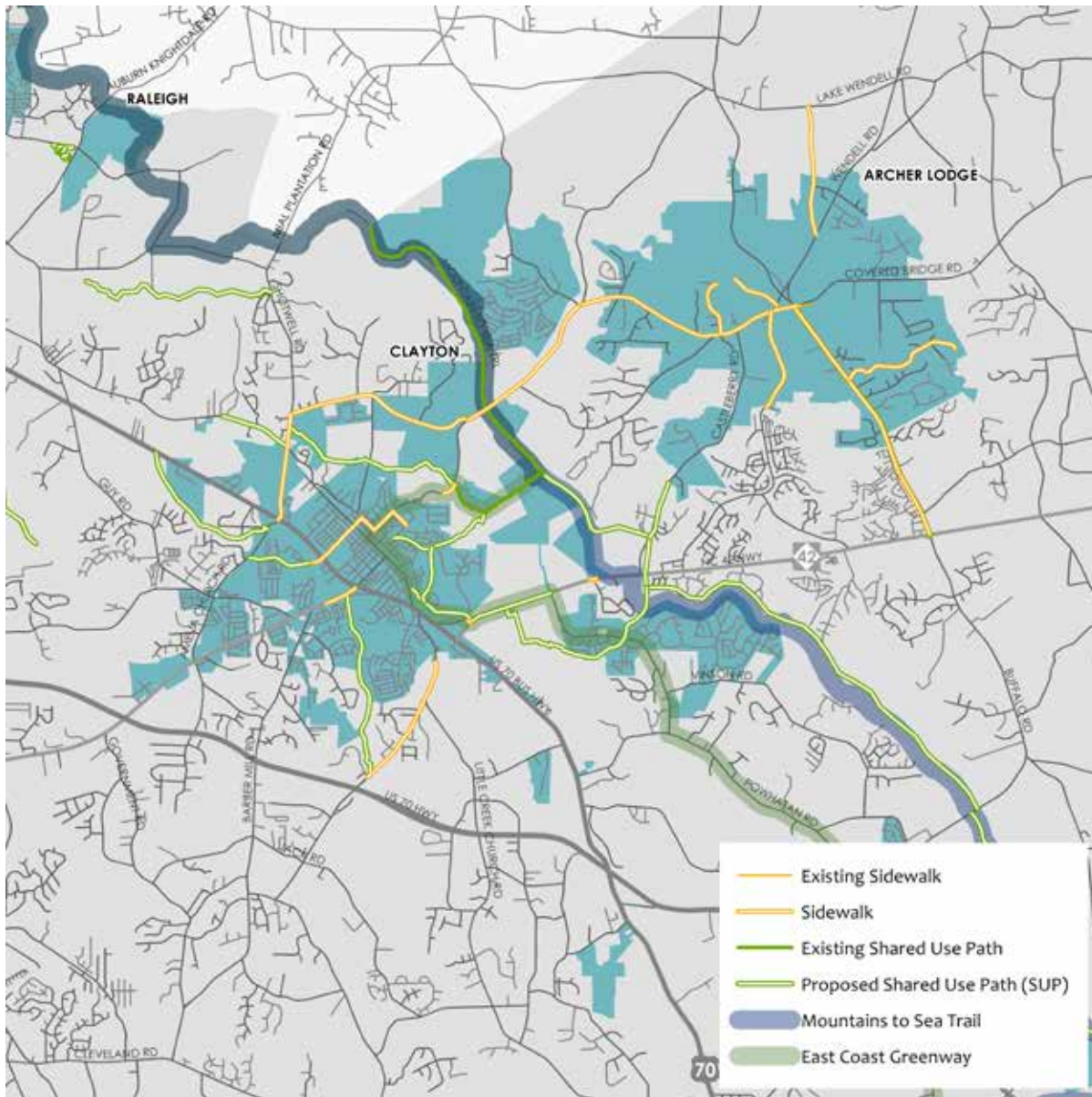
Recommended Pedestrian Improvements, Wake County



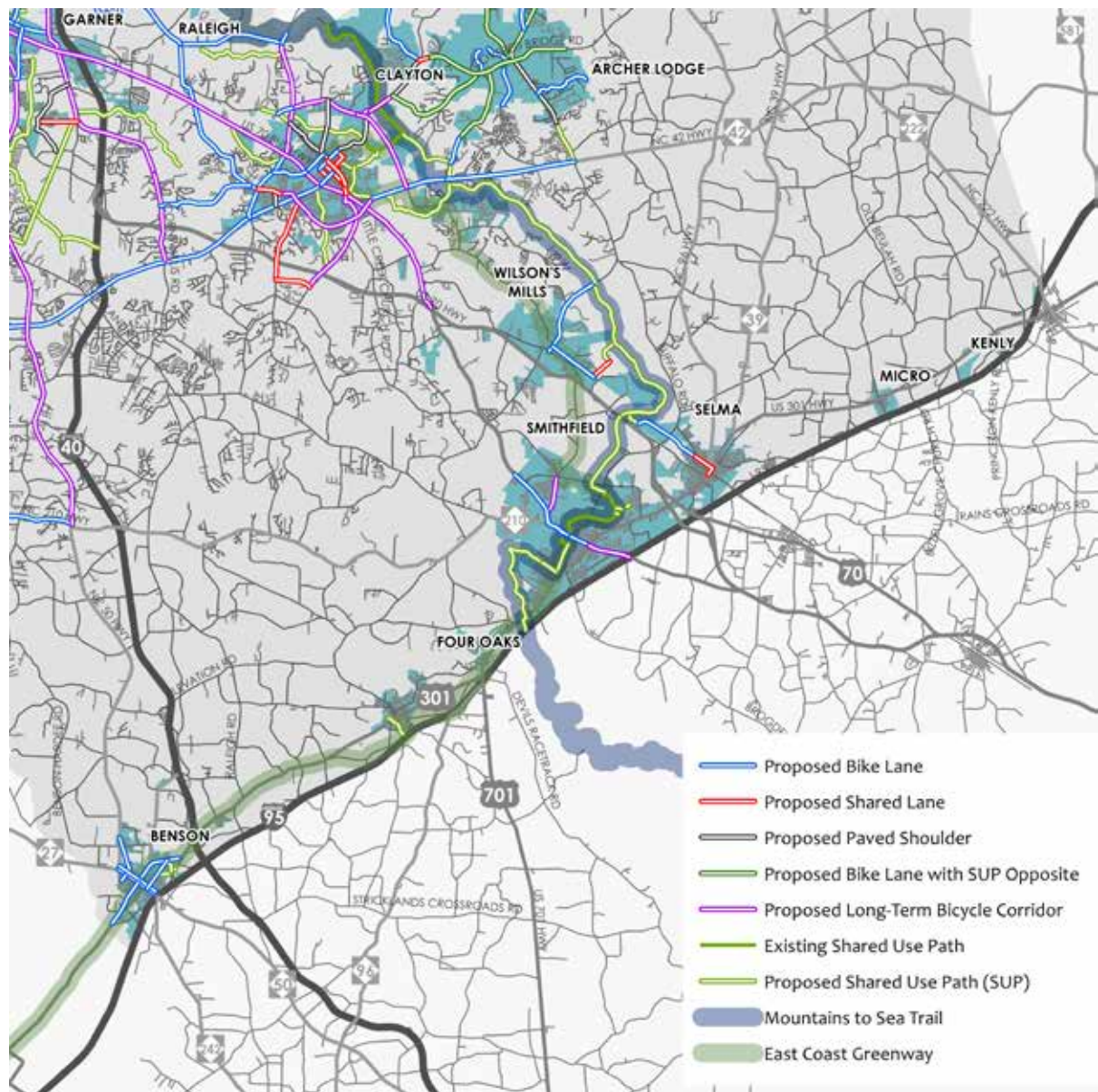
Recommended Bicycle Improvements, Clayton and Archer Lodge



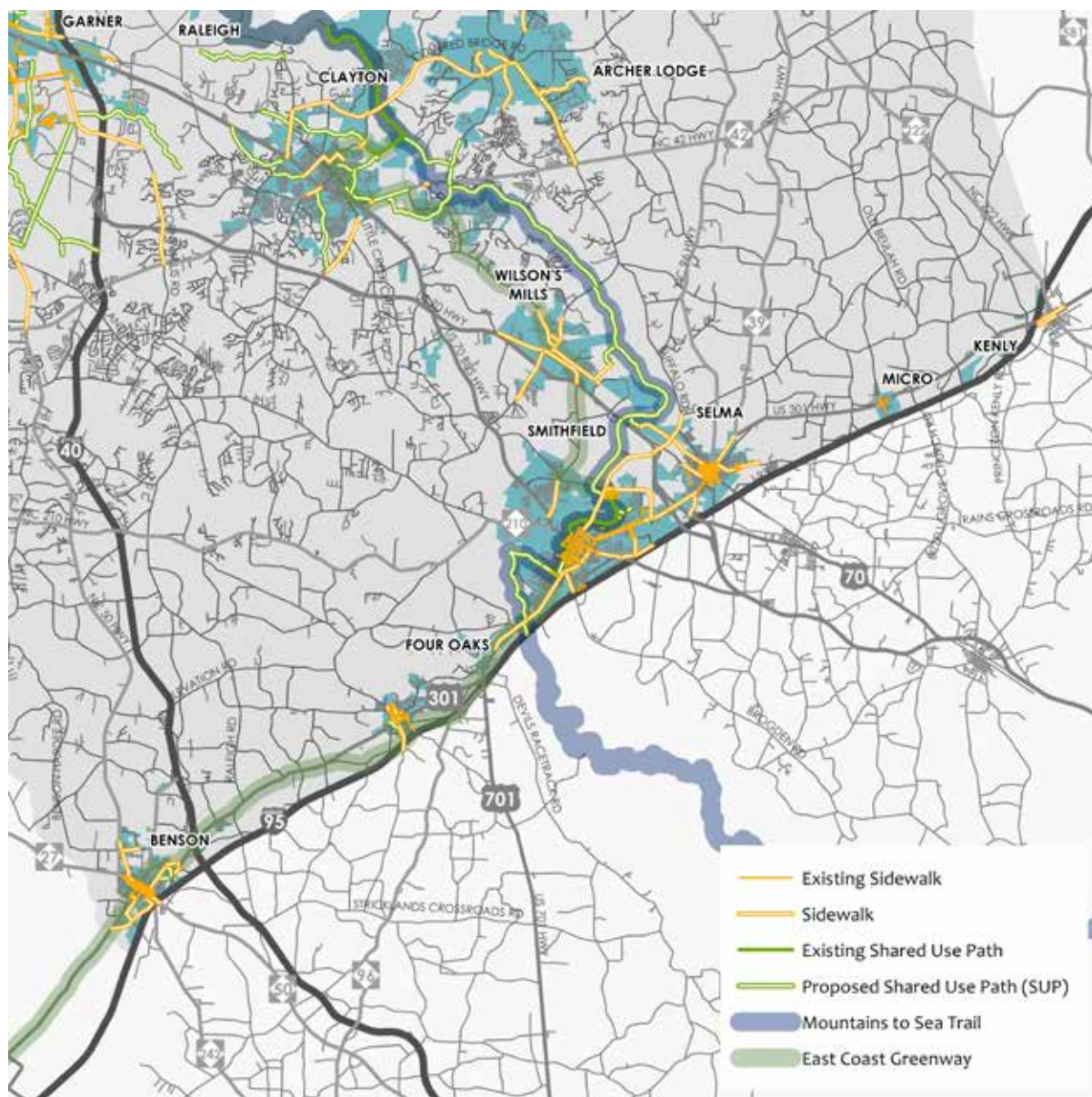
Recommended Pedestrian Improvements, Clayton and Archer Lodge



Recommended Bicycle Improvements, Johnston County



Pedestrian Improvements, Johnston County



Programs and Policies

A series of recommended policies and programs are in place at the regional, state, and federal levels to support improved bicycle and pedestrian mobility. Three key programs are described below, along with their application within the Southeast Area.

Safe Routes to School

The goal of the Safe Routes to School (SRTS) movement is to improve walking and bicycling conditions for students in elementary and middle school. Supported by a federally-funded program in the 2005 surface transportation bill—Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)—NCDOT's SRTS program comprises the planning and design of bicycling and walking infrastructure, as well as education and encouragement initiatives.

Active Routes to School

NCDOT partnered with the North Carolina Division of Public Health to establish the Active Routes to School project (ARTS) under the statewide SRTS program. The project aims to increase the number of students walking and bicycling to school by creating opportunities through events, training, and outreach. The project groups every North Carolina county into one of 10 regions, each one administered by an ARTS Regional Project Coordinator. Wake County is one of nine counties in Region 5 and Johnston County is one of eight counties in Region 7. Recent ARTS efforts in Wake County include the development of a Wake County SRTS/ARTS Toolkit that serves as a guide for schools and communities to create local SRTS programs. More than 1,600 students participated in Walk to School Day events in Johnston County in October 2016.

NCDOT-DBPT Planning Grant Initiative

The NCDOT Division of Bicycle and Pedestrian Transportation (DBPT) maintains a Planning Grant Initiative program that awards grants to municipalities, counties, and regions to undertake planning efforts, including bicycle plans, pedestrian plans, joint bicycle and pedestrian plans, and corridor studies. Grant amounts and local match requirements vary by study area population. The Town of Clayton completed their Comprehensive Bicycle Plan in 2005 using an NCDOT-DBPT planning grant. Communities with grant-funded plans older than five years can reapply for a planning grant.

Program and Policy Recommendations

To support the proposed improvements to the region's bicycle and pedestrian infrastructure, the Southeast Area Study recommends the following key policy and program efforts:

- Elementary and middle schools should regularly coordinate with Jennifer Delcourt and Nicole Westley, ARTS Regional Project Coordinators for Regions 5 and 7, respectively, to establish and maintain SRTS programs and hold Walk/Bike to School Day events.
- While the City of Raleigh recently updated their Bicycle Plan, Clayton's Comprehensive Bicycle Plan is more than 10 years old, and no other municipality in the Southeast Area has completed a bicycle plan or pedestrian plan. All Southeast Area municipalities can apply for NCDOT-DBPT planning grants, and municipalities with populations less than 5,000 can pursue grants for joint bicycle and pedestrian plans.
- To support local, regional, and statewide planning efforts for bicycling and walking, NCDOT-DBPT has created the Pedestrian Bicycle Infrastructure Network (PBIN), a digital database of existing and recommended bicycle and pedestrian facilities across the state. The PBIN is publicly available, however, the accuracy of its data depends on contributions from North Carolina localities. Southeast Area municipalities should provide NCDOT-DBPT with the most up-to-date existing and recommended facility data in their jurisdictions.
- New development and redevelopment are valuable opportunities for communities to improve connectivity and accessibility for pedestrians and bicycles. However, sidewalk requirements for private development can vary from municipality to municipality. Bicycle facility requirements are even less common. Southeast Area municipalities that do not currently require developers to provide accommodations for bicyclists and pedestrians should update their ordinances to include sidewalk, bikeway, and bike parking requirements.



Transit

Public transit provides people with access to housing, jobs, medical care, entertainment, recreation, and more. It benefits those with limited travel choices as well as those who choose to ride, which ultimately leads to an overall reduction in cars on the road. This reduction in car trips helps to reduce road congestion, travel times, air pollution, and energy consumption—all of which benefit riders and non-riders alike.

The incorporation of public transit into broader economic and land use planning can help communities expand business opportunities and create a sense of community through more human-scale urban design. Transit-supportive policies can also lead to an improved local economy, better quality of life, and enhanced sense of neighborhood safety and security, all by providing more transportation choices.

The Southeast Area is well-positioned to benefit from public transit improvements. The towns that make up the linear “string of pearls” along the US-70 corridor have an opportunity to establish network of transit routes to support economic resurgence among their communities and offer location advantages to businesses and individuals who choose to work or live in them.

Modes Supported by Densities

Transit is an umbrella term for many different types of equipment (known as modes) and service characteristics (most notably, frequency). Successful transit generally requires a minimum of seven residential units per acre in residential areas and 25 employees per acre in commercial centers. Densities should run about two to four times these amounts for premium quality transit such as high frequency buses, bus rapid transit (BRT), light rail transit (LRT), or heavy rail. Increased population and employment densities lead to more potential riders living or working within walking distance of transit stations/stops. Higher densities, especially residential densities, are recommended depending on the type of transit serving the area, as detailed in the table on the following page. Such densities create adequate transit ridership to justify frequent service, and help create active street life and commercial activities, such as grocery stores and coffee shops, within convenient walking distance of homes and worksites.

Recommended Residential and Employment Density Thresholds

Transit Mode/ Service Frequencies	Population			Employment		
	Dwelling Units/Acre	Population/ Acre	Population/ Square Mile	Jobs/Acre	Jobs/ Square Mile	Million Sq. Ft. Commercial Space
Flex Bus	0.2	0.5	320			
Community Circulator	0.8	2	1,300			
Local Bus						
60 minutes	3-6	8-16	5,000- 10,000	4-8	2,500- 5,000	5-8
30 minutes	6-12	16-31	10,000- 20,000	8-16	5,000- 10,000	8-20
15 minutes	12-18	31-47	20,000- 30,000	16-24	10,000- 15,000	
10 minutes	18-36	47-92	30,000- 60,000	24-48	15,000- 30,000	
<=5 minutes	>36	>92	>60,000	>48	>30,000	
Bus Rapid Transit	10-20	26-52	17,000- 33,000	>13	>8,500	
Light Rail Transit	12-30	31-78	20,000- 50,000	>15	>10,000	
Heavy Rail	>17	>45	>30,000			

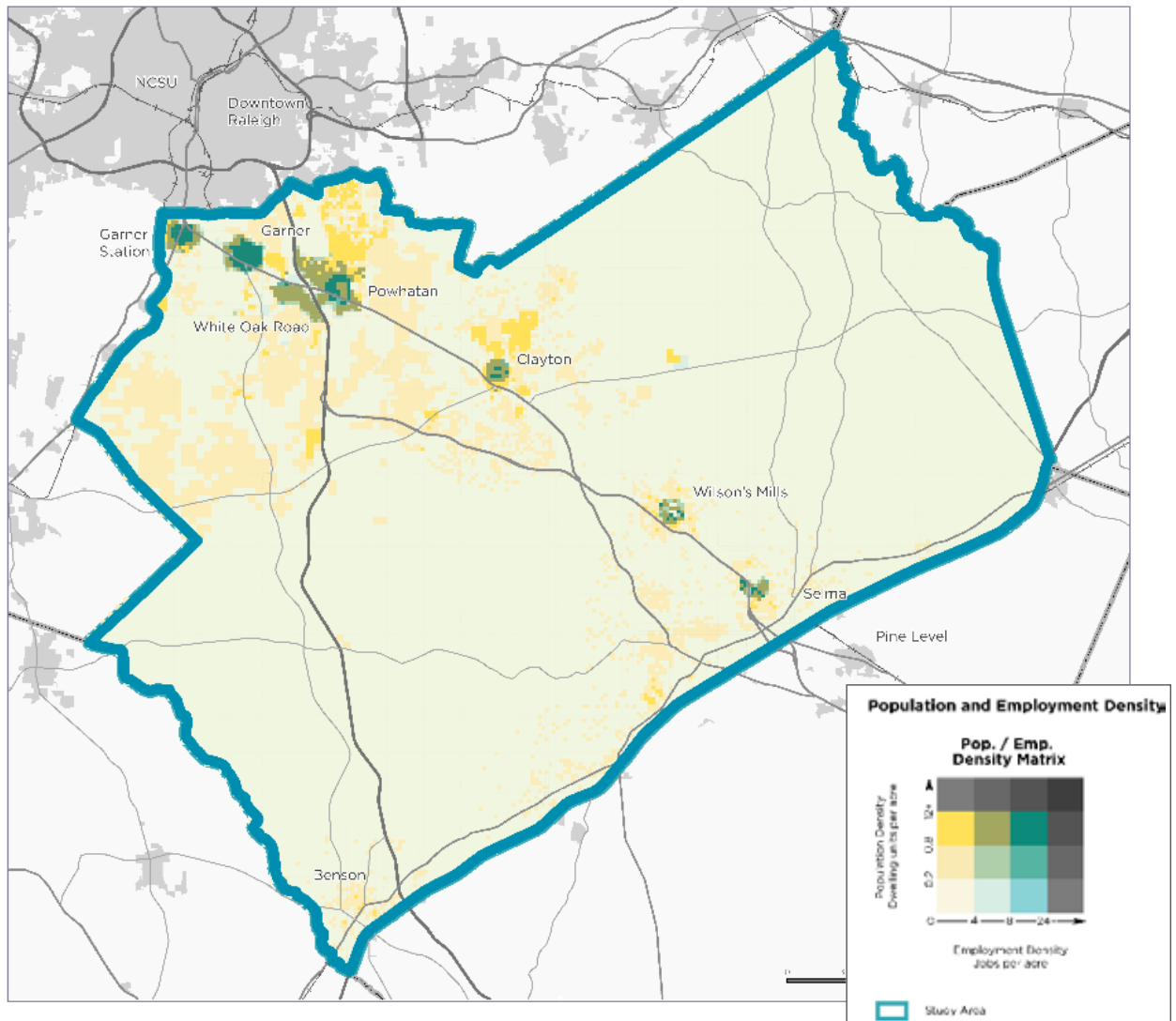
Source: Nelson\Nygaard, compiled from a large number of various sources.

High-quality transit supports the development of higher-density centers, which can provide accessibility and agglomeration benefits (efficiencies that result when many activities are located in proximity to one another), while automobile-only transportation systems limit the effectiveness of urban density because they are space-intensive, requiring large amounts of land for roads and parking facilities. Large scale Park & Ride facilities without other uses tend to conflict with transit supportive neighborhoods, since a rail or bus station surrounded by large parking lots and arterials with heavy traffic is unlikely to provide the densities needed to generate sufficient transit demand. It is therefore important that such facilities be properly located, designed, and managed to minimize such conflicts and sited where they can accommodate transit without negatively impacting the development potential of the area.

Densities in the Southeast Area

The Southeast Area projected in the Blended Scenario is not a particularly dense region, with much of the study area at fewer than 0.2 dwelling units per acre. There are, however, a series of communities that form a “string of pearls” of higher than average population and employment densities, which could be well-served by future transit improvements.

Population and Employment Density



The communities of Garner Station, Garner, Powhatan, Clayton, Wilson's Mills, and Selma make up this “string of pearls” that align along the US-70 corridor southeast of Raleigh. Each of these communities has population and employment densities that would lend themselves to improved transit service.

Transit Service Recommendations

There are a variety of potential transit recommendations appropriate for the Southeast Area. Several of these strategies were previously articulated in the 2015 Wake County Transportation Plan and NCDOT's Upper Coastal Plain Rural Planning Organization's (UCPRPO) prioritization projects. Additional strategies are unique to this study. Both the previous and new transit service improvement recommendations are detailed in the sections below.

Recommendations from Previous Plans

There are eight major recommendations to improve transit service in the study area that were derived from previous regional transportation plans. Two recommendations are for new or expanded rail service, four are for new or expanded fixed-route bus service, and two are for flex-bus service (shown on the following page).

Rail Service Recommendations

Rail service recommendations include establishing a 37-mile commuter rail line connecting Garner, Raleigh, North Carolina State University, Cary, Morrisville, Research Triangle Park, Durham, and Duke. A second rail option is to extend the east-west commuter rail line past Garner and into Johnston County with stations located in communities with higher population and employment densities. This option would require state, federal, and Johnston County support, as Wake County funds would only be spent on improvements within the same county.

Fixed-Route Bus Service Recommendations

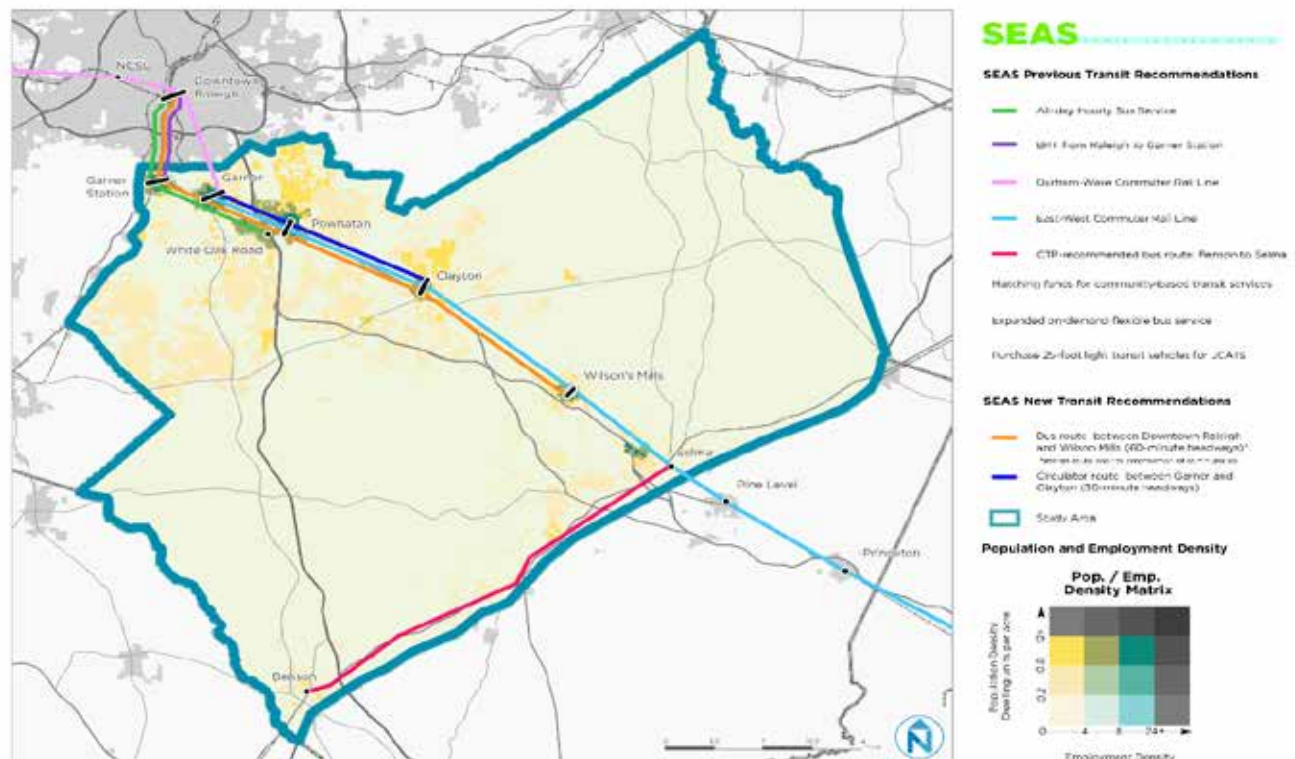
Fixed-route bus service recommendations include:

- An all-day hourly bus service from White Oak Road between Garner and Clayton to downtown Raleigh.
- A bus route between Selma and Benson in the southwestern-most part of the study area.
- Establish BRT service between Raleigh and Garner Station in the northern-most part of the study area.
- Set aside local funds that would match existing funds for community-based transit services. The matching funds program would create a partnership that would help to determine the best transit services to provide, which parts of each community should be connected, and when the services would be implemented.

Flex-Bus Service Recommendations

Flex-bus service recommendations include establishing a flexible service area through the portion of the Southeast Area that falls within Wake County. Under this recommendation, the area would be served by an expanded on-demand, call-in program of vans and ride connection services called “Wake TRACS.” A second flex-bus service recommendation is to purchase new light transit vehicles for the Johnston County Area Transit System (JCATS). Due to increasing demand, JCATS vehicles are wearing out at a faster rate than they are being replaced. This recommendation would expand the JCATS vehicle fleet and ensure newer vehicles are on hand if and when older vehicles break down.

Recommended Transit Improvements



New Transit Service Recommendations

Two additional service recommendations emerged during this study based on the projected blended scenario as strategies that could potentially serve to complement previous studies' recommendations. These recommendations include a bus route between downtown Raleigh and Wilson's Mills with 60-minute headways and a circulator route between Garner and Clayton with 30-minute headways. The recommended frequencies of these routes are based on the transit-support densities chart and associated matrix. The bus route between downtown Raleigh and Wilson's Mills would complement previous recommendations as an extension of proposed intra-city transit routes connecting to Downtown Raleigh. The circulator route between Garner and Clayton would complement previous recommendations by serving as an interim transit route prior to the construction of the East-West Commuter Rail Line.

Park and Rides

The transit recommendations outlined as part of this analysis are supported by an expanded system of park and ride locations. These sites are proximate to the Southeast Area's projected higher density locations, and provide easy access to the regional roadway network. The recommended locations of these park-and-ride lots are:

- At the intersection of NC 42 East and US 70 Business in Clayton
- At the intersection of Main Street (SR 1910) and Wilson's Mills Road (SR 1913) in Wilson's Mills
- At the intersection of US 301 (Wall Street) and W. Hale Street (American Legion) in Benson
- On East Railroad Street at the existing train station in Selma

Paratransit Service Recommendations

Under federal law, any public agency operating a fixed-route transit system is required to provide complementary paratransit service covering all areas within a 3/4-mile radius of all agency-run bus routes, and within a "core service area" that includes areas surrounded by served corridors even if they are more than 3/4 mile from a bus route. For transit agencies operating a light rail or rapid rail transit service, this service area must also include a 3/4-mile radius around each rail station, with service provided from points within the service area of one station to points within the service area of another.

Some portions of the study area lack the density to support traditional fixed-route service. While paratransit service is not required by law in these areas, providing paratransit service for elderly and disabled residents offers value to the community. In such cases, demand-response service can provide a viable mobility solution in place of fixed-route service. In the Southeast Area and elsewhere, demand-response service has historically been provided using smaller (15-22 passenger) vehicles dispatched via a centralized call center. Paratransit service providers in the area may also consider partnering with transportation network companies (TNCs) such as Uber and Lyft as an alternative service option.

Transit Supportive Policies

For transit to be effective, it requires more than vehicles carrying riders. Design policies are integral elements to ensuring that people can identify and access the transit system, while land use and zoning policies help concentrate people and mix land uses to maximize transit's effectiveness. When combined, design and land use policies not only increase transit's ridership potential, but also its value as an economic development and sustainability tool. Below is a list of overarching policy areas that directly affect regional transit ridership.

Density

Successful transit service requires a certain amount of population or employment density. Increased population and employment densities lead to more potential riders living or working within walking distance of transit stations/stops. Such densities create adequate transit ridership to justify frequent service.

Mixed Uses

To support transit, municipalities can establish transit supportive zones around transit stops and stations. These zones encourage active street life and commercial activities that generate trips throughout the day. Such zones should also encourage residential and commercial space within convenient walking distance of transit. This strategy takes advantage of unused transit supply in off-peak hours and results in routes that are more productive than in areas with traditional rush-hour peaks.

Pedestrian Orientation

People who can walk to different land uses in under 10 minutes are more likely to use those sites, including retail establishments, parks, and community facilities. Placing daily goods and services, as well as recreational destinations, within walking distance of residences increases the incentive to use alternative modes, supporting transit use for commuting and other regional travel.

Access and Connections

For transit to be successful, pedestrians must be able to conveniently access the service and easily walk when they get off the bus or train. Reducing vehicular roadway lane widths, rededicating roadway space to bicyclists and pedestrians, reducing the number of conflict points between motorized and non-motorized modes, and increasing road and path connectivity, among others, are all strategies that can help improve access and connections to transit stops and stations.

Transit Infrastructure and Amenities

Transit stops that are easy to find and use are critical to passengers getting on and off, regardless of whether the transit mode is a bus or train. Adequate pedestrian accessibility and enhanced passenger amenities at transit stops are critical to attracting people to transit. Provision of stop infrastructure is frequently tied to the number of riders who board and alight at each stop. The greater the number of riders (currently or planned), the greater the capital investment.

Parking Policies

There are two main reasons that people take transit—time and money. Transit use increases when it is the faster commute option, which is often the result when heavy traffic congestion is combined with an exclusive transit right-of-way. But transit use can also increase when the costs associated with it are lower than those of driving. Driving costs can include tolls or congestion pricing, or the cost of parking. A well-thought out regional parking policy that prioritizes jobs and housing over parking lots and garages around transit stations, and prices the remaining parking at rates that are reflective of demand will ultimately encourage more people to take transit.

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5 INITIATIVES AND INVESTMENTS

The Southeast Area Study represents something unique—an opportunity to create a unified planning approach across boundaries and jurisdictions. As the first integrated planning effort between CAMPO and UCPRPO, the Southeast Area Study brought together the larger region in a way that had not previously been done. This planning process allowed for idea sharing between jurisdictions, consideration of regional project impacts, identification of a shared vision, and a better understanding of where the region needs to go in the future.

Unified Approach

The Southeast Area Study has resulted in the development of a series of land use and transportation strategies that will serve its member jurisdictions in both CAMPO and UCPRPO. The transportation recommendations detailed in Chapter 4 will become the bedrock of CAMPO's Comprehensive Transportation Plan for this region, and will also inform the creation of CAMPO's Metropolitan Transportation Plan. While the UCPRPO area is not subject to the development of a Metropolitan Transportation Plan, these transportation recommendations can be incorporated into the area's Comprehensive Transportation Plan. Perhaps most importantly, the Southeast Area Study transportation recommendations were created with a combined effort of stakeholders from the CAMPO and UCPRPO areas. Each area will benefit from the enhanced knowledge of the types of improvements that are important to the region.

The Southeast Area Study has also been the catalyst for the identification and assessment of land use policies and growth strategies. Three key elements of the land use analysis provided an in-depth perspective on how the Southeast Area may continue to play a vital and growing role in the Triangle Region.

Market Assessment — A market assessment was performed as a component of the larger scenario planning process to provide insight into current and future growth patterns that affect development in the Southeast Area. Using this review of existing conditions and trends, the market assessment was able to serve as a guide in the creation of alternative scenarios. The full Southeast Area Study Market Assessment is included in the Appendix.

Scenario Planning — To understand growth in the Southeast Area and its likely impact on transportation, the Southeast Area Study built on the recent and ongoing Triangle scenario planning initiatives to explore possible growth patterns and allow stakeholders to understand the likely outcomes of future decisions. The Southeast Area Study scenario planning process offered a way for stakeholders to identify and discuss the strengths and weaknesses associated with competing growth strategies and make informed decisions. The process yielded a Preferred Growth Scenario that leverages locally adopted plans throughout much of the study area, promotes compact growth in existing centers, and anticipates future development likely to occur along regional transportation corridors. Additional details can be found in Chapter 3 of this Summary Workbook and the Scenario Planning Documentation provided in the Appendix.

The Scenario Planning process is a key element in the development of the Southeast Area Study. The Preferred Growth Scenario has a strong foundation rooted in multijurisdictional support. Results from the Preferred Growth Scenario were used in the following ways during the development of recommendations. Each of these areas are described in more detail in Chapter 4.

- Socioeconomic information stemming from the Preferred Growth Scenario was used within the Triangle Regional Model to help test recommended roadway projects.
- Roadway cross-sections were determined using the Street Design Guide. The Street Design Guide helps to link roadway design features with the appropriate land use context drawn from the Preferred Growth Scenario.
- Population and employment information from the Preferred Growth Scenario was used to determine densities that would be supportive of different levels of transit service.

Looking beyond the Southeast Area Study, the findings from the Preferred Growth Scenario are being referenced as a starting point for the development of the Triangle region's Connect 2045 scenario plan update.

Implementation Toolkit — The Southeast Area Study is built upon an understanding of the interrelationship of transportation and land use decision-making. An analysis of land use is essential to produce an effective and implementable transportation study. Transportation issues facing the region such as congestion, safety, connectivity, and multimodal linkages cannot be fully addressed with the resources available. To close the gap, changes in land use policies and strategies can make the largest positive impact.

This toolkit explores the current conditions and future needs and strategies for each of the jurisdictions within the study area. Following a plan and policy review, a series of recommended land use priority strategies were developed for each jurisdiction. These priority strategies are explored in detail, along with steps for implementation, benefits of the strategies, and examples of successful application elsewhere. The Implementation Toolkit is included in the Appendix.

Creating an Implementable Plan

While serving as a framework for transportation and land use decision-making, the Southeast Area Study also seeks to provide tools for implementation. Key implementation tools have been introduced in Chapter 4 and are summarized here.

Critical Projects — CAMPO and UCPRPO will work with NCDOT to determine how projects recommended in the Southeast Area Study advance into funding and completion. To aid in this process, a series of critical roadway projects were identified that help respond to existing and future congestion needs while also considering public and committee feedback. These projects can function as a starting point for recommendations that should be considered for inclusion in the NCDOT Strategic Transportation Investments (STI) process. This is particularly beneficial for the UCPRPO area, which does not have the benefit of a financially constrained Metropolitan Transportation Plan to help identify the best candidate projects to be considered and scored through the STI process.

Hot Spot Studies — Chapter 4 and the Appendix contain information about the three hot spot locations chosen for additional study within the Southeast Area Study. A series of recommendations resulted from these studies that seek to provide insight about the unique challenges facing each area. Phasing of improvements was a key consideration during the development of these recommendations. The Archer Lodge Hot Spot Study focuses on policy solutions that could be considered in the near-term to facilitate future growth, while the Garner 40/70 Catalyst Site and the Smithfield Gateway Analysis focus on key roadway solutions that can be phased to gain the most utility from each improvement.

Project Sheets — The multimodal transportation recommendations identified as part of the Southeast Area Study will serve as a catalyst for future improvements. CAMPO has created a database of project sheets that serves as a repository for proposed MTP and CTP improvements throughout the MPO area. Following the format established by CAMPO, project sheets were created for the multimodal improvement projects identified in the Southeast Area Study. These project sheets can serve as a resource not only for CAMPO, but also for UCPRPO, NCDOT, and member jurisdictions who want an at-a-glance reference for projects in their area.

Conclusion

Achieving the full vision of the Southeast Area Study will require decades of investment, continued commitment from CAMPO, UCPRPO, NCDOT, and support from local and regional partners. The return on investment for these groups will be a more cohesive and unified area, sharing prosperity among the member jurisdictions, and making the Southeast Area more competitive and attractive among its regional peers. The full implementation of the Southeast Area Study will incorporate planned growth and result in improved multimodal access, while accommodating the trips that are being made in the area both today and into the future.