

SOUTH MAIN STREET CORRIDOR STUDY



PREPARED FOR:

TOWN OF WAKE FOREST
NORTH CAROLINA
JULY 2024

REPORT ACKNOWLEDGMENTS

Thank you to all of the organizations and individuals who committed their time, energy, and resources to this effort. This study would not have been possible without the support of many throughout the process. On behalf of the Town of Wake Forest and the Stantec team, thanks to the diverse group of participants whose collective efforts are reflected in this report. They are as follows:

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1 INTRODUCTION



South Main Street near Forestville Road.

Located within the dynamic Research Triangle, one of the fastest-growing regions in the United States, Wake Forest, North Carolina, represents a quintessential example of rapid small town growth.

Just minutes from the state capital, Raleigh, this once small rural town has transformed into a bustling suburban community. With its population now approaching 48,000 and growing, Wake Forest faces increasing development pressures. The challenge lies in managing this growth in a manner that is both sustainable and safe. This Study articulates Wake Forest's vision for addressing these challenges, marking a critical step towards guiding its growth and development in a responsible and thoughtful way.

THIS CHAPTER COVERS:

- About this Study
- Why Focus on South Main Street
- About the Process
- Guiding Principles
- Existing Plans & Policies

ABOUT THIS STUDY

This Study represents a focused examination of South Main Street, which both boasts significant amenities and confronts distinct challenges that are not apparent from a high level perspective. It prompts an essential question: what could a fully envisioned South Main Street look like?

The project team seeks to understand potential future issues along South Main Street and address them proactively. It is important that the foundation for South Main Street's future is robust and well-considered. By delving into the unique difficulties this area faces, the aim is to craft solutions that are truly beneficial for the community.

The culmination of this Study will present a preferred conceptual design, offering a detailed "perspective" for the future of South Main Street. The contents of this document will ultimately be included in an updated Town Comprehensive Transportation Plan (CTP), laying the groundwork for subsequent stages, including securing funding, detailed design development, and eventual construction. This approach solidifies South Main Street as a thriving cornerstone gateway of Wake Forest's identity and development, meeting the needs of the community while preserving its unique character.

THIS STUDY WILL REVIEW:

- ➔ The current conditions of South Main Street.
- ➔ What is happening along the corridor today?
- ➔ What does this corridor look like in the future?

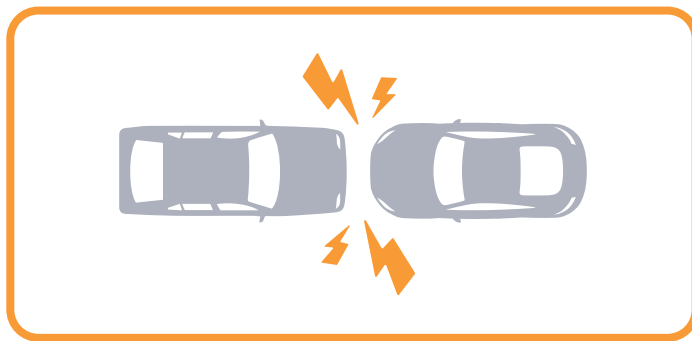


FIGURE 1-A
MAP OF THE STUDY AREA - FROM CAPITAL BLVD TO NC 98

WHY FOCUS ON SOUTH MAIN STREET

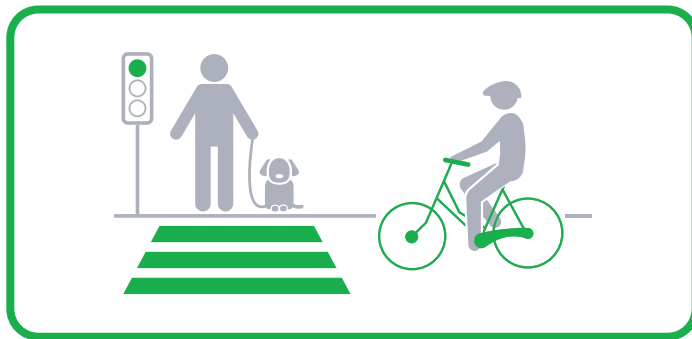
South Main Street represents more than just a roadway thoroughfare; it is a vital artery of community life and economic activity. As part of the rapidly growing Research Triangle area, Wake Forest is experiencing transformative growth that presents both opportunities and challenges. The Town's rich history, dating back to its founding in the early 19th century, contrasts with the contemporary needs of a diversifying and expanding population.

As such, this Study focuses on the segment of South Main Street designated as US-1A, stretching from US-1/Capital Boulevard to NC-98. As this thoroughfare is under the jurisdiction of the North Carolina Department of Transportation (NCDOT), enhancements require collaborative planning and coordination between the Town and NCDOT.



SAFETY CONCERNS

The considerable vehicular traffic on South Main Street, compounded by unrestricted access points, driveways, and left-turn lanes, contributes to a roadway environment with **crash rates significantly exceeding state averages**. Anticipated traffic increases, driven by growth and redevelopment, underscore the urgency of addressing these safety issues now.



CHALLENGES IN TRANSIT, BICYCLE, AND PEDESTRIAN INFRASTRUCTURE

Currently, South Main Street presents considerable challenges for bicyclists and pedestrians. Incomplete sidewalks, abruptly terminating bike lanes with little connectivity, and minimal separation from fast-moving vehicular traffic, degrade the user experience. Improvements to improve safety and accessibility for all users are imperative.



BALANCING DEVELOPMENT AND PRESERVATION

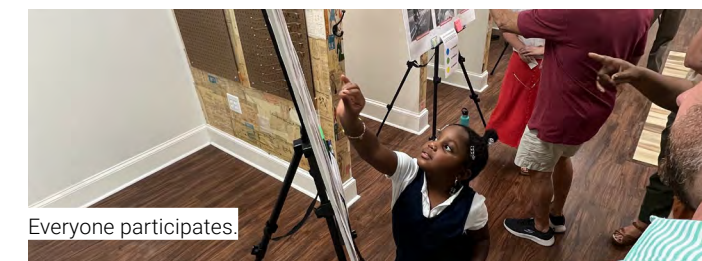
Amidst ongoing development encircling South Main Street, including the adjacent commuter rail S-Line connecting Raleigh and Richmond, the preservation of historic properties along the roadway needs a nuanced approach. This balance aims to accommodate growth while honoring and preserving the historical legacy of the area.

ABOUT THE PROCESS

The South Main Street Corridor Study was conducted from August 2023 through May 2024, unfolding in three distinct phases shown in **Figure 1-B** below:



FIGURE 1-B
PROJECT TIMELINE



INVESTIGATION

The initial phase involved gathering community feedback and performing preliminary data analysis. This stage culminated in an Open House event, which provided a platform for the public to voice their concerns, challenges, and opportunities identified along the corridor.



DESIGN

In the subsequent phase, the project team developed and refined design alternatives. This process included ongoing engagement with the community and stakeholders, including property owners and business owners, to involve a wide range of perspectives. A second Open House was organized to gather input on two proposed design concepts, aiding in the determination of the final preferred design.



REPORTING

The final phase consolidated all collected data and insights into this comprehensive report. Presentations to the Town Council, culminating in the Study's endorsement in June 2024, marked its successful conclusion. This step established the recommendations needed to achieve the community's selected direction for South Main Street.

GUIDING PRINCIPLES

As the role of South Main Street has evolved, so too must its design. In response to this need for change, a set of Guiding Principles was formulated based on comprehensive input from the community. Feedback was received through an extensive engagement process, including surveys, interactive mapping, symposiums, focus groups, and stakeholder outreach. Recommendations are informed by these principles, blending community goals, compromises, and design of stakeholders.



1

Provide Equitable Access:
Provide safe, convenient access for all users, enhancing inclusivity and accessibility.



2

Prioritize Safety:
Reduce transportation conflicts and risks, ensuring a safer environment for everyone.



3

Enhance Connectivity:
Improve the integration of the existing transportation network with key destinations.



4

Promote Sustainability:
Incorporate green infrastructure practices and encourage sustainable mobility options.



5

Engage the Community:
Involve the community to ensure the project reflects the Town's identity and meets its needs.

EXISTING PLANS & POLICIES

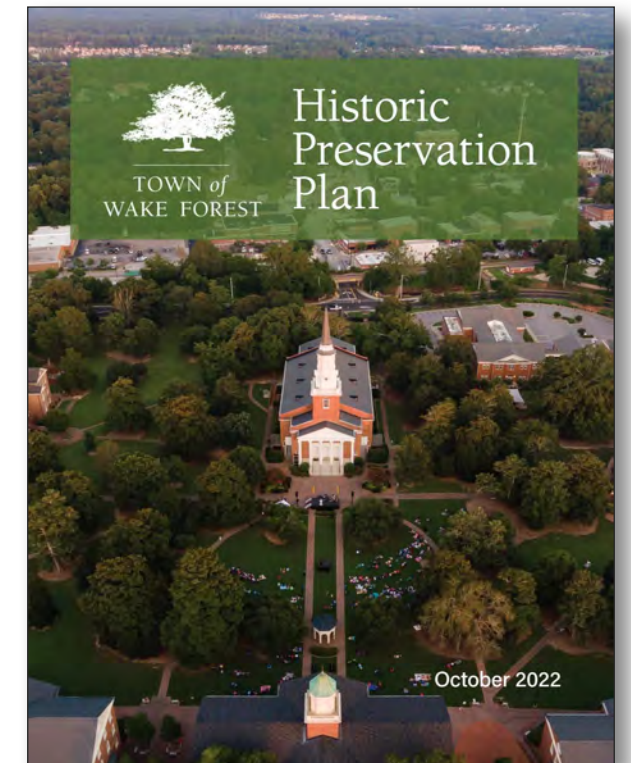
The Town of Wake Forest has diligently prepared for its future growth through comprehensive planning. In alignment with these initiatives, the project team reviewed existing plans prior to analyzing South Main Street.

TOWN OF WAKE FOREST HISTORIC PRESERVATION PLAN (2022)

This Plan establishes key objectives for preserving the Town's historic character:

- It aims to fortify the Historic Preservation Program with necessary resources and support for its mission.
- The plan prioritizes the preservation of the Town's historic character, emphasizing the importance of its architectural and cultural heritage.
- It highlights the goal of enhancing diversity, equity, and inclusion within the preservation program, ensuring the Town's history reflects its diverse population.
- The plan also advocates for community education initiatives to enrich residents' understanding and appreciation of the Town's history.

Most of the historic districts in Wake Forest are concentrated around the downtown area, especially the northern corridor. This information provides a valuable context for future preservation efforts and allows for targeted strategies to be developed. The Plan singles out the Windsor Park Study List Historic District for potential further study and evaluation, and it notes the impacts of new transportation projects, like the S-Line, balancing development needs with preservation efforts.



"While mobility for residents is often improved as a result of these projects, they can often alter the character of historic places if not carefully implemented."

- From the Historic Preservation Plan (October 2022)

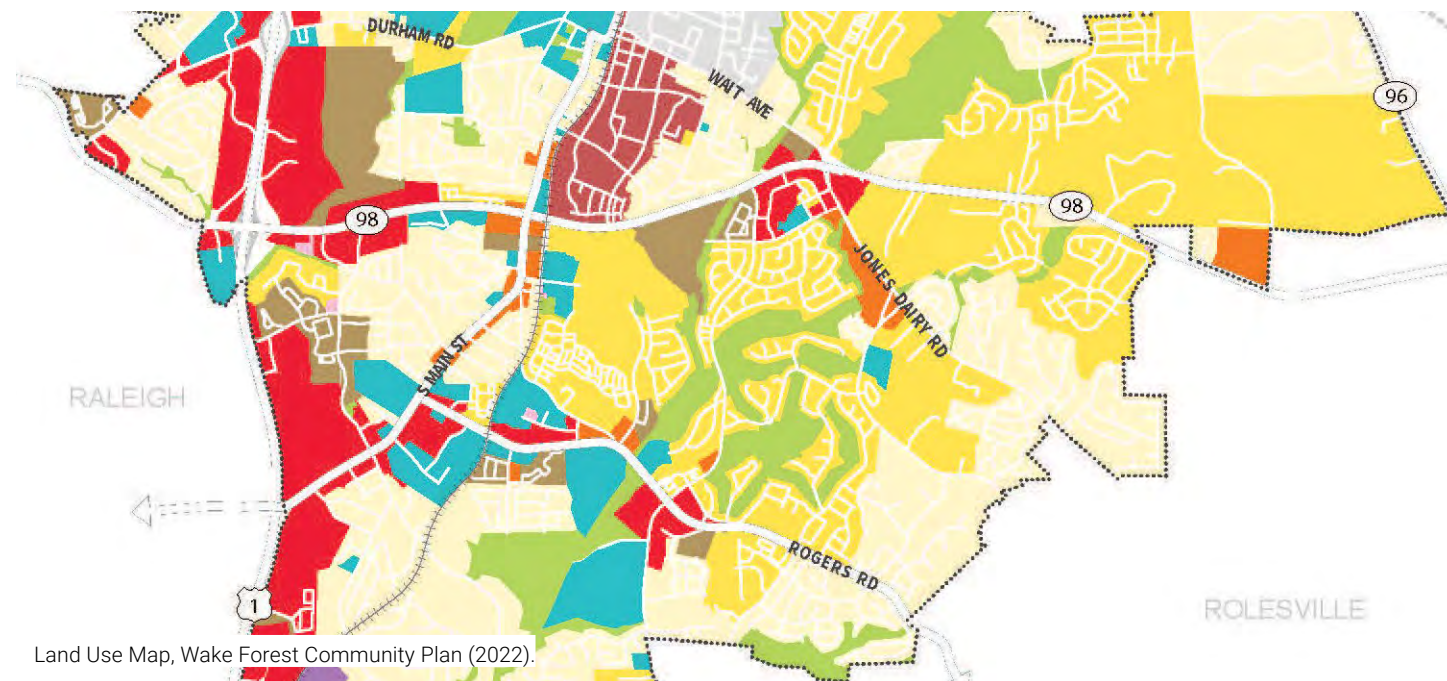
TOWN OF WAKE FOREST COMMUNITY PLAN (2022)

This Community Plan envisions Wake Forest’s development and growth, aiming to:

- Achieve a balanced mix of uses,
- Stimulate downtown growth,
- Enhance and maintain green spaces,
- Promote safe and interconnected public transit,
- Preserve the Town’s historic charm,
- Offer diverse housing options,
- Support a pedestrian- and bicycle-friendly environment, and
- Encourage strategic growth and unique business ventures.



The Plan advises development within the Town limits using existing infrastructure efficiently to maintain Wake Forest's small-town feel. It suggests redeveloping areas like South Main Street to enhance pedestrian experiences. Envisioning a vibrant, mixed-use community, the Plan sees the S-Line station as a catalyst for transit-oriented development, boosting Town connectivity and accessibility. By prioritizing strategic growth, character preservation, and a sustainable, inclusive community, the Community Plan positions Wake Forest for a thriving and livable future.



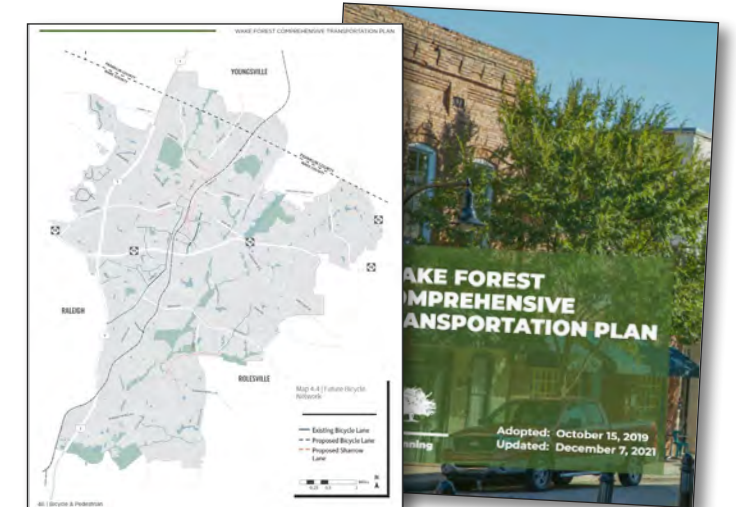
Land Use Map, Wake Forest Community Plan (2022).

TOWN OF WAKE FOREST COMPREHENSIVE TRANSPORTATION PLAN (2019)

Guided by principles of innovation, efficiency, inclusivity, safety, and flexibility, this Plan introduces the concept of the Wake Forest Commuter Rail, or S-Line, which is to feature three potential stations: Downtown Wake Forest, NC98 station Park & Ride (P&R), and the Capital Boulevard Station. Notably, one station is positioned near South Main Street, just south of NC-98, signifying the Plan’s commitment to providing safe, efficient, and inclusive transportation options for both residents and visitors.

Specific intersections along South Main Street identified for enhancements include:

- Proposing an interchange at US-1 and South Main Street,
- High-visibility crosswalks proposed at South Avenue and South Main Street,
- Recommended widening at NC-98 and South Main Street, and
- Widening also recommended at Rogers Road and South Main Street.

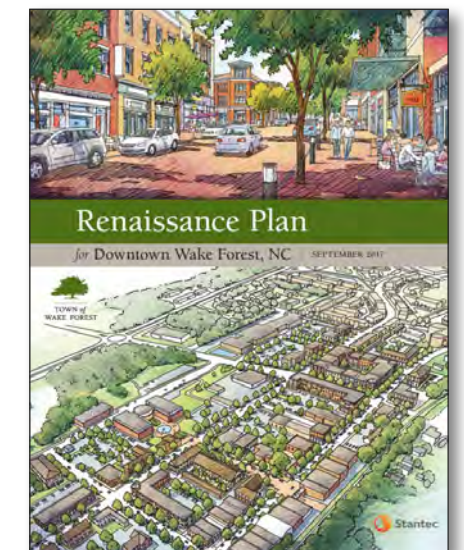


TOWN OF WAKE FOREST RENAISSANCE PLAN (2017)

This Plan sets forth a vision for revitalizing the downtown area of Wake Forest, highlighting a significant gateway at Main Street and NC-98, and proposing retail expansion and development in the vicinity. Additionally, a multi-purpose path along NC-98 is recommended to improve pedestrian accessibility. The Plan is organized around several ambitious goals:

- Enhancing retail opportunities,
- Strengthening connections within the downtown core,
- Managing vehicular traffic effectively,
- Establishing a vibrant destination for both residents and visitors,
- Prioritizing community needs, and
- Identifying potential for development and redevelopment.

The Renaissance Plan’s ultimate objective is to transform downtown Wake Forest into a vibrant, welcoming area, aiming to uplift the overall quality of life and attract a broad audience to the downtown space.



OTHER PLANS

WAKE COUNTY DESTINATION STRATEGIC PLAN (2018):

Aimed at showcasing Wake Forest's distinct attributes to draw visitors, this Plan addresses retail enhancements, transportation branding, and the creation of links to key attractions, underscoring the Town's unique appeal.

CONNECT 2050 (2022):

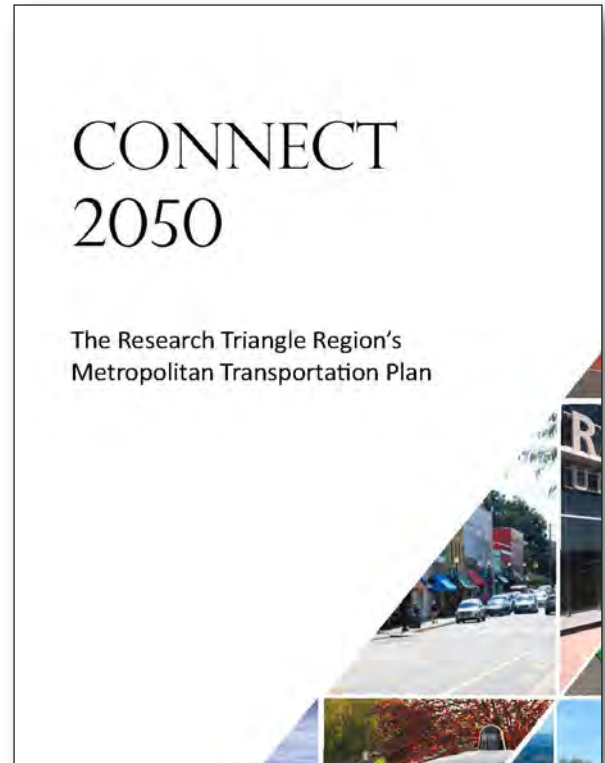
Envisioned by the Capital Area Metropolitan Planning Organization and the Durham Chapel Hill Carrboro Metropolitan Planning Organization, Connect 2050 aims to develop a sustainable transportation framework for the Raleigh and Triangle region. The Plan focuses on:

- Improving regional connectivity,
- Expanding travel choices, and
- Alleviating traffic congestion.

US 1 CORRIDOR STUDY (2006, updated 2014):

This Study explores the feasibility of transforming Capital Boulevard into an access controlled freeway to increase road efficiency, potentially reimagining US-1A with on/off ramps instead of conventional intersections. Given that the South Main Street Study intersects with US-1A, this presents an opportunity for improved traffic flow and connectivity that could significantly impact South Main Street.

As South Main Street serves as a key entry and exit point for Wake Forest, especially from US-1A, any modifications to traffic patterns and roadway configurations on US-1 could influence development patterns, land use, and urban design strategies along South Main Street. As such, the findings from the US 1 Corridor Study are crucial for informing our approach and integrating our efforts within the broader transportation framework of Wake Forest.



Existing condition on US-1 & S. Main Street intersection.

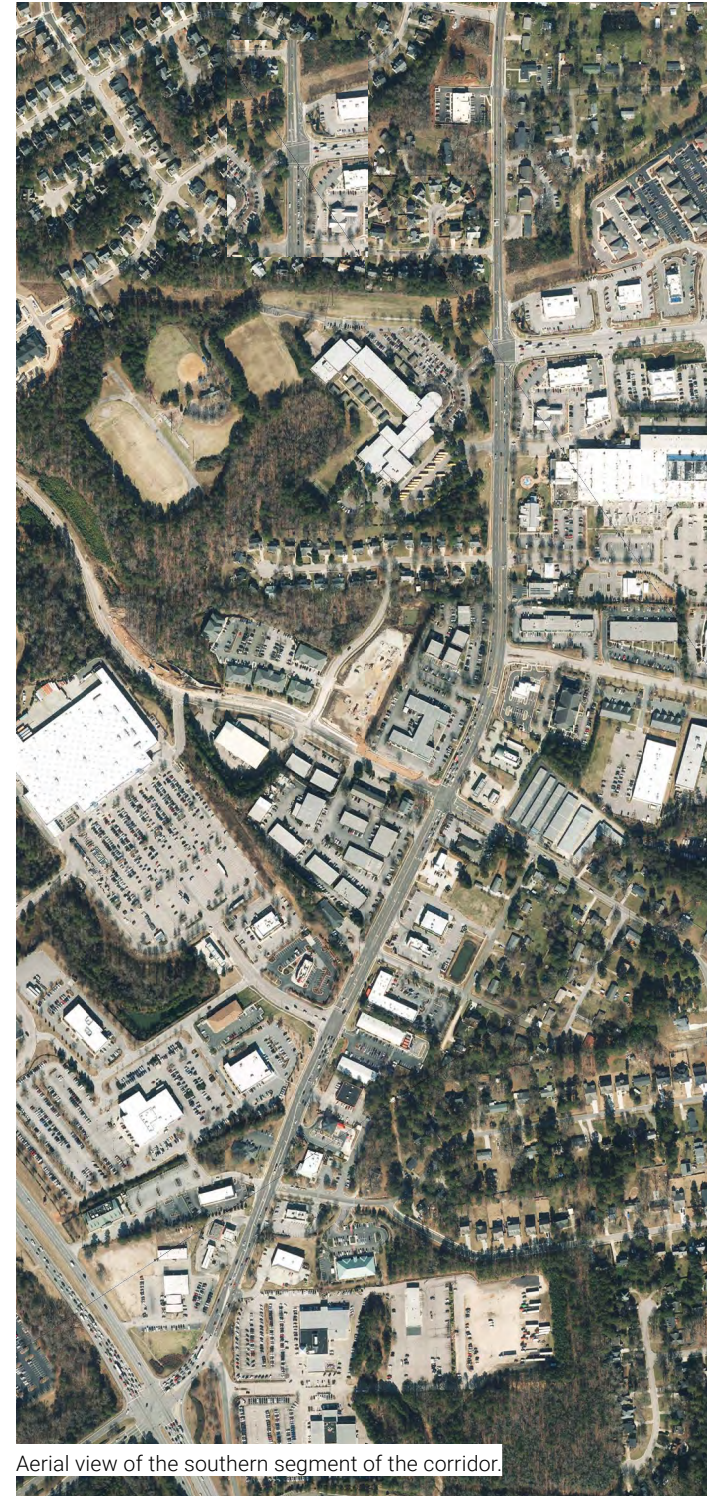
CHAPTER 2

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2 INVESTIGATION



Aerial view of the southern segment of the corridor.

◀ Located in northeastern Wake County, the Town of Wake Forest, a key part of the Research Triangle area, has witnessed significant population growth, with its population reaching 47,600 residents by 2020. This growth, driven by attractive living conditions, economic opportunities, and nearby research and educational institutions, cements the Town's status as an innovation and education hub.

While previous plans provide insights into the development of South Main Street, an understanding of its current conditions is essential for creating a safe and accessible environment for all its users. This analysis encompasses a range of factors, including safety, traffic flow, sidewalk infrastructure, utilities, demographic trends, and land use patterns, forming the foundation of our investigation into this Corridor Study.

THIS CHAPTER COVERS:

- Demographics
- Land Use
- Historical Properties & Districts
- Corridor Profile
- Vehicle Conditions
- Multimodal Conditions
- Crashes & Safety

BACKGROUND & CONTEXT

DEMOGRAPHICS

South Main Street's usage highlights Wake Forest's dynamic growth, with an estimated population of 48,047, increasing at nearly 3% annually. Data (Figure 2-A) shows a community in transition, with a young median age, significant households with disabilities, reliance on personal vehicles for commuting, and minimal walking, biking, or public transit use, emphasizing the need for inclusive and multifaceted transportation solutions.

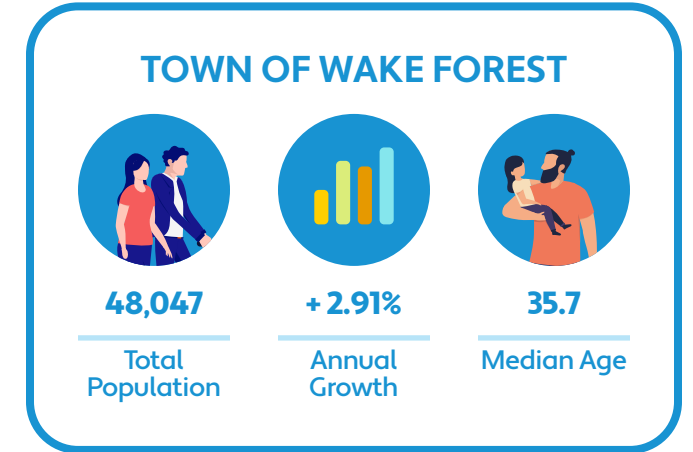
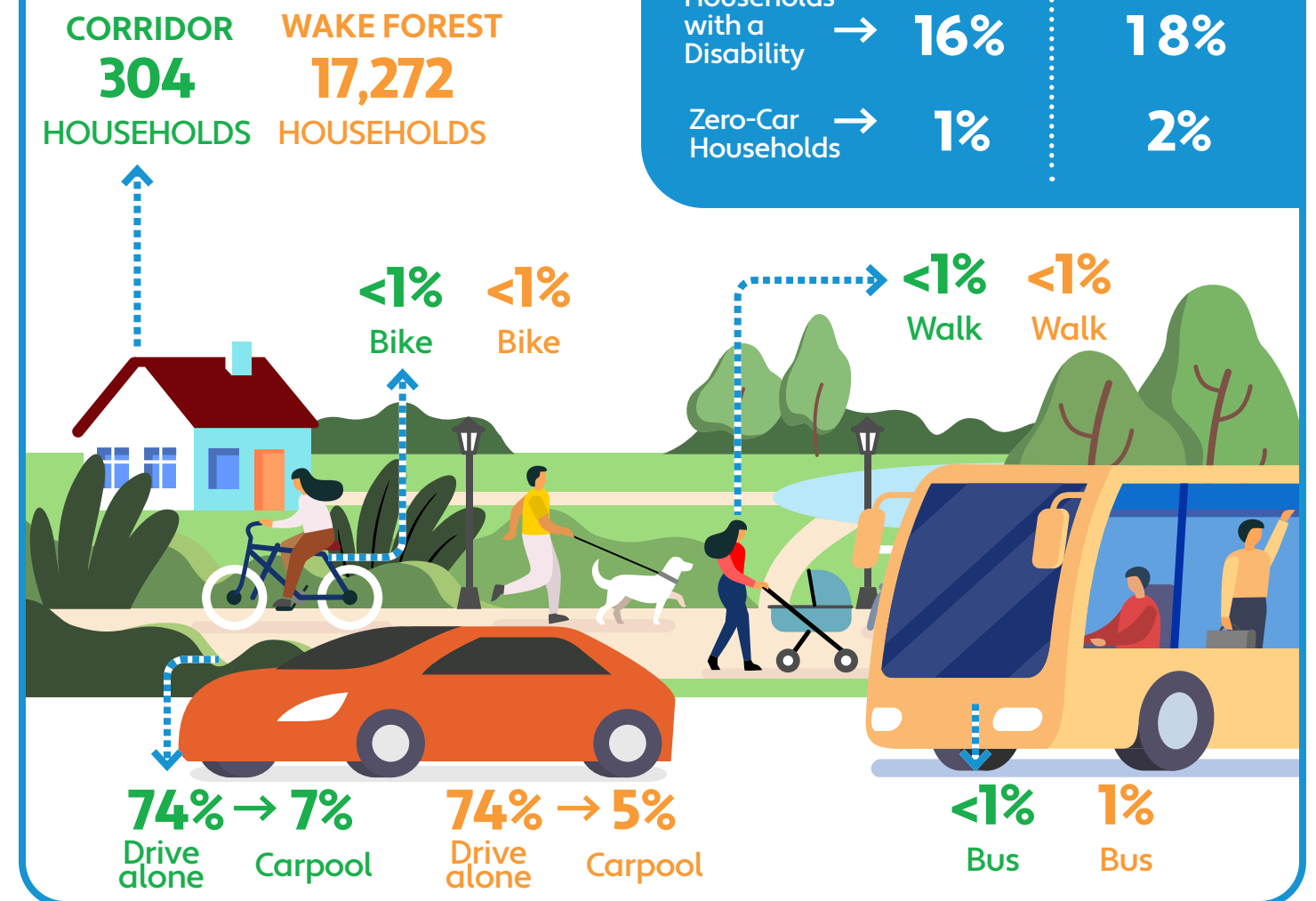
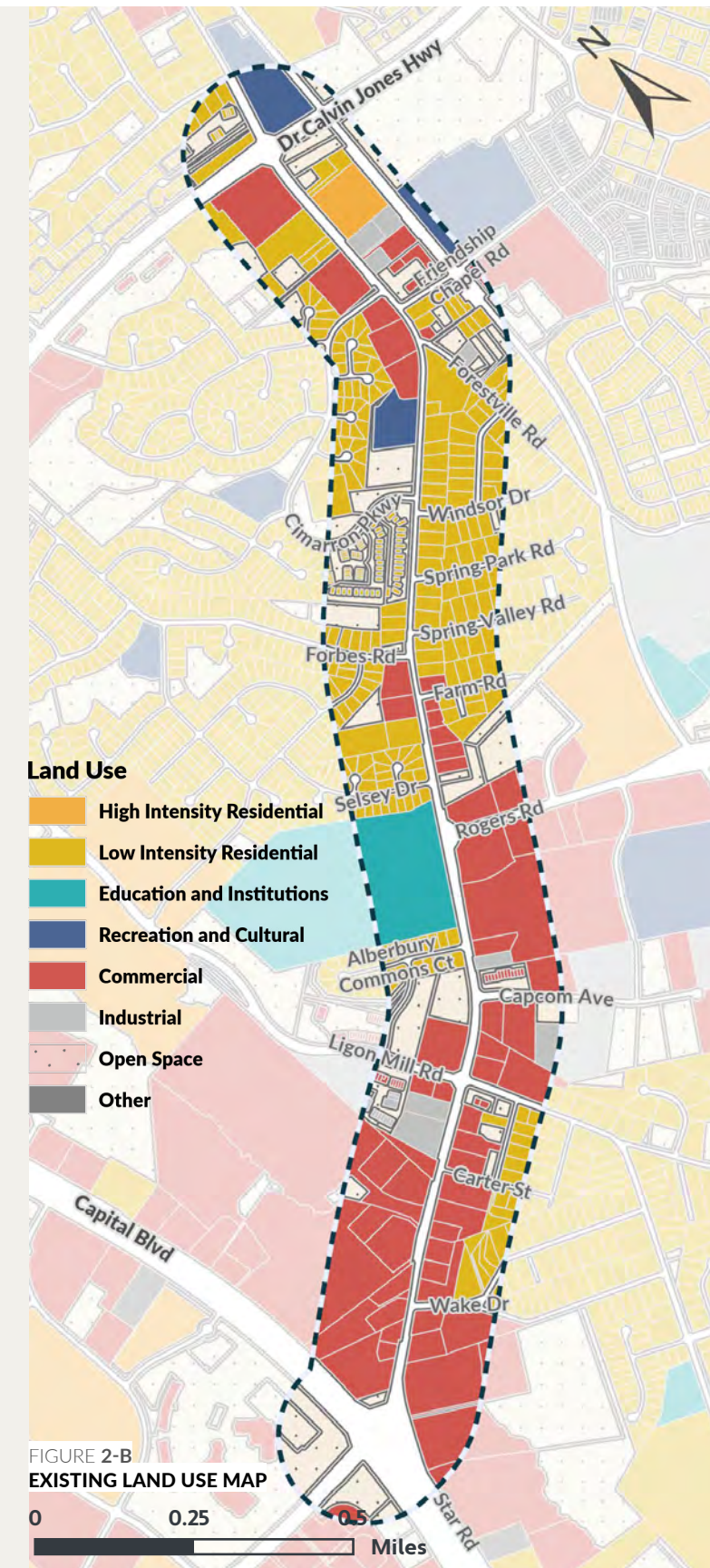


FIGURE 2-A
VISUAL SUMMARY OF WAKE FOREST'S DEMOGRAPHIC PROFILE



Source: U.S. Census Bureau American Community Survey 5-Year Estimates (2018-2022), Commute Characteristics by Sex, Disability Characteristics.



LAND USE

Despite South Main Street's diverse mix of land uses, there are specific opportunities and challenges for development and integration. Notably, the existing configuration of the corridor presents a barrier to creating a cohesive community for those without personal vehicles. This corridor, marked by separate commercial sectors near US-1 and residential areas closer to NC-98, with a school situated between them, exemplifies the critical need for improved pedestrian and public transportation connectivity. This separation challenges the ability of residents to navigate between work, home, and school seamlessly.

Enhancing pedestrian pathways and diverse transportation options along South Main Street is essential to forging safe, accessible connections across these distinct zones. Future planning should prioritize infrastructure enhancements that support pedestrian mobility and public transportation, facilitating a more integrated, car-independent lifestyle that upholds the Town's quality of life and environmental sustainability.



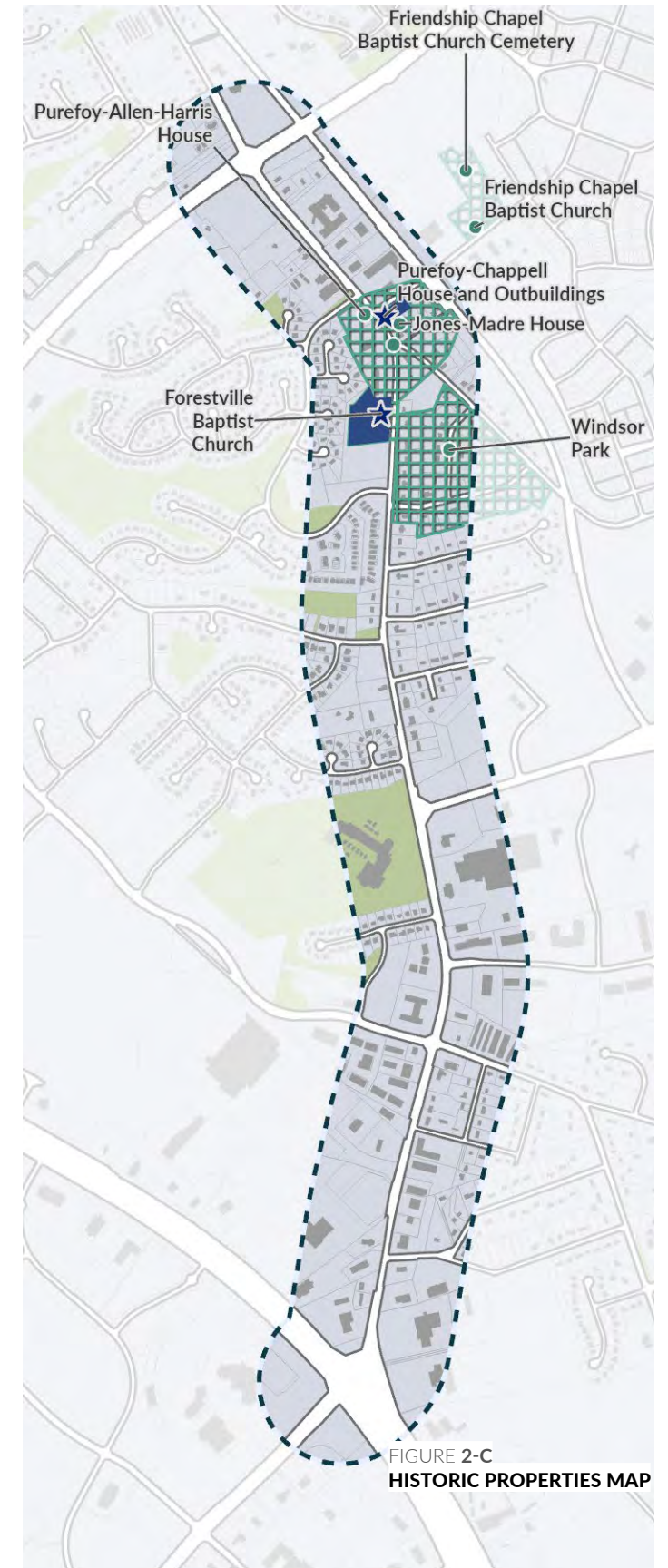
HISTORIC PROPERTIES & DISTRICTS

Within the South Main Street corridor area, two sites are included in the National Register of Historic Places. Among these, the Purefoy-Chappell House and outbuildings stand out as a significant historical landmark, showcasing architecture and lifestyles from earlier eras. Similarly, the Forestville Baptist Church is a key historical site, reflecting the religious and community life of Wake Forest's past. Both sites are important to Wake Forest's identity, preserving unique narratives that contribute to the town's charm and character.

Historic resources along the South Main Street Corridor include:

- **Friendship Chapel Missionary Baptist Church and cemetery**, NC Study List for National Register of Historic Places, 245 Friendship Chapel Road.
- **Purefoy-Chappell House**, Local Historic Landmark and Individually Listed in the National Register of Historic Places, 1255 S. Main Street.
- **Jones-Madre House**, Historic Preservation Easement held by Capital Area Preservation, Inc, 1269 S. Main Street.
- **Forestville Baptist Church and Cemetery**, Individually listed in the National Register of Historic Places, 1350 S. Main Street.
- **Windsor Park**, NC Study List for National Register of Historic Places, roughly bounded by S. Main Street, Forestville Road, and Windsor Drive.
- **Purefoy-Allen-Harris House**, NC Study List for National Register of Historic Places, 1248 S. Main Street.

- ★ **National Register Listing**
- **National Register Listing Area**
- **Other Important Historic Place** *Includes both the national Study List and Capital Area Preservation property*
- **Other Important Historic Place** *Includes both the national Study List and Capital Area Preservation property*





Project team walking the corridor during a site visit.

EXISTING CONDITIONS

CORRIDOR PROFILE

The Corridor Profile graphic, presented on the following page, visually synthesizes information regarding the current conditions of South Main Street. This illustration effectively highlights both positive aspects and challenges, revealing discernible patterns and trends along the corridor.

This profile tells the story of how South Main Street developed as a US Highway Alternate Route (US Alt 1). Despite its proximity to downtown across NC-98, the street is predominantly car-oriented. The land use along South Main Street adopts a “highway commercial” style, characterized by commercial properties with individual driveway entrances. The absence of interconnected, large parking lots results in a high frequency of curb cuts along the sidewalk, posing increased risks for pedestrians. This existing layout underscores the need for strategic interventions to enhance safety and walkability.

WHAT WE LOOKED AT:

- Number of lanes
- Right-of-Way
- Pavement width
- Traffic Volumes
- Posted Speeds
- Vehicle Crashes
- Bicycle & Pedestrian Crashes
- Utilities & Power Lines
- Land Use

Corridor Profile: visualizes these characteristics on Fig. 2-D

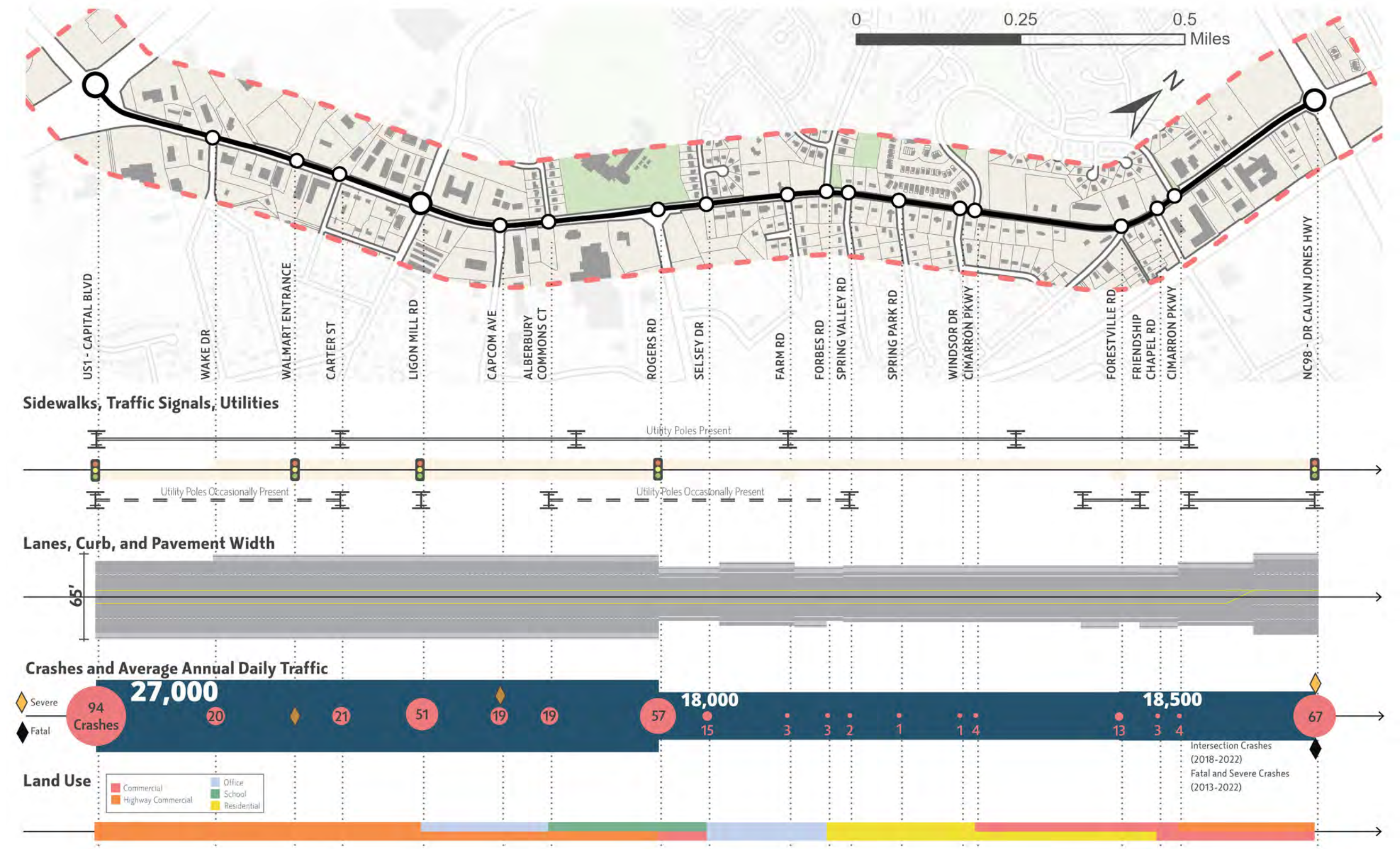


HOW TO READ THE CORRIDOR PROFILE:

Each section diagrams a different piece of information about South Main Street. The black center line represents the center of the roadway, so that you can see the differences between each side of the road.

The diagrams below the map are lined up along the intersections. Follow the dotted line up to the map to get context for a particular section. The diagrams are aligned the same way as the map—Northwest to the top.

FIGURE 2-D CORRIDOR PROFILE



EXISTING LANE MEASUREMENTS (CROSS-SECTIONS)

The varying width of South Main Street and the critical role of curbs highlight distinct zones for potential sidewalk enhancements and pedestrian safety improvements.

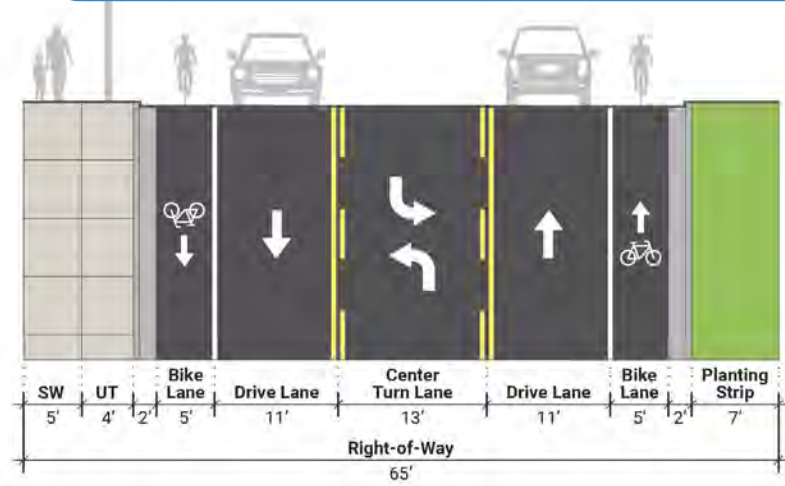
What does South Main Street look like from Rogers Road to NC- 98?

In this section, South Main Street has:

- Two 11' vehicle lanes
- One center turn lane
- 45 foot wide pavement
- 5 foot sidewalk on one side
- Bike lanes that disappear through intersections

Even though there is sidewalk and bike lane in this part of the road, they are not very comfortable to use.

What is a cross-section?
A "cross-section" is a way to describe the design of a road. It is a way to visualize how big the different parts of the road are. It shows things like: measurements of lane width, if bike lanes are present, and how wide sidewalks are.



What does South Main Street look like from US-1 to Rogers Road?

In this section, South Main Street has:

- Four 12' vehicle lanes
- One center turn lane
- 60 foot wide pavement
- Occasional 5 foot sidewalks

This is a wide roadway that makes crossing difficult if you are walking or biking.

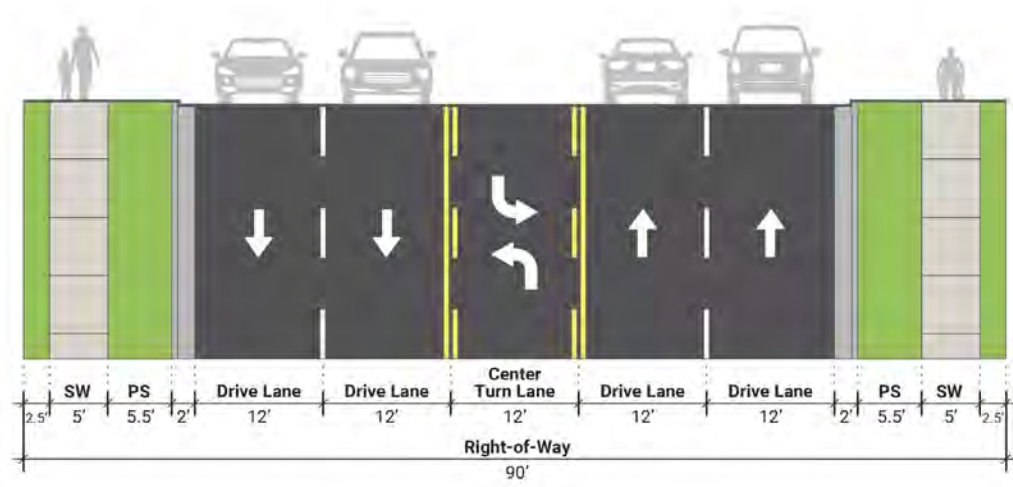


FIGURE 2-E
EXISTING LANE MEASUREMENTS (NORTHERN AND SOUTHERN SEGMENT CROSS-SECTIONS)

VEHICLE CONDITIONS

TRAFFIC VOLUMES

As a gateway to downtown Wake Forest and a primary means of travel for commuters between Wake Forest and the Triangle region, South Main Street supports large volumes of traffic. Between 18,000 to 27,000 vehicles travel the corridor each day, a number typical of large, urban arterials. How these volumes are changing, however, depends upon location. North of Rogers Road, volumes have slowly declined over the past 15 years at a rate of -1% per year. South of Rogers Road, however, the opposite has occurred, with volumes increasing at a rate of nearly +2% per year.

During off-peak periods, these volumes approach the capacity of a roadway between three- to five-lanes. During AM and PM rush hours, however, traffic surges on the corridor, contributing to significant traffic congestion along South Main Street. Congestion, uncontrolled driveways and turning movements create a recipe for crashes: as a result **South Main Street's crash rate is 2.37 times greater than that of similar roads in North Carolina.** Addressing these safety challenges is a key focal point of this study.



Vehicle traffic on South Main Street, off-peak hours.

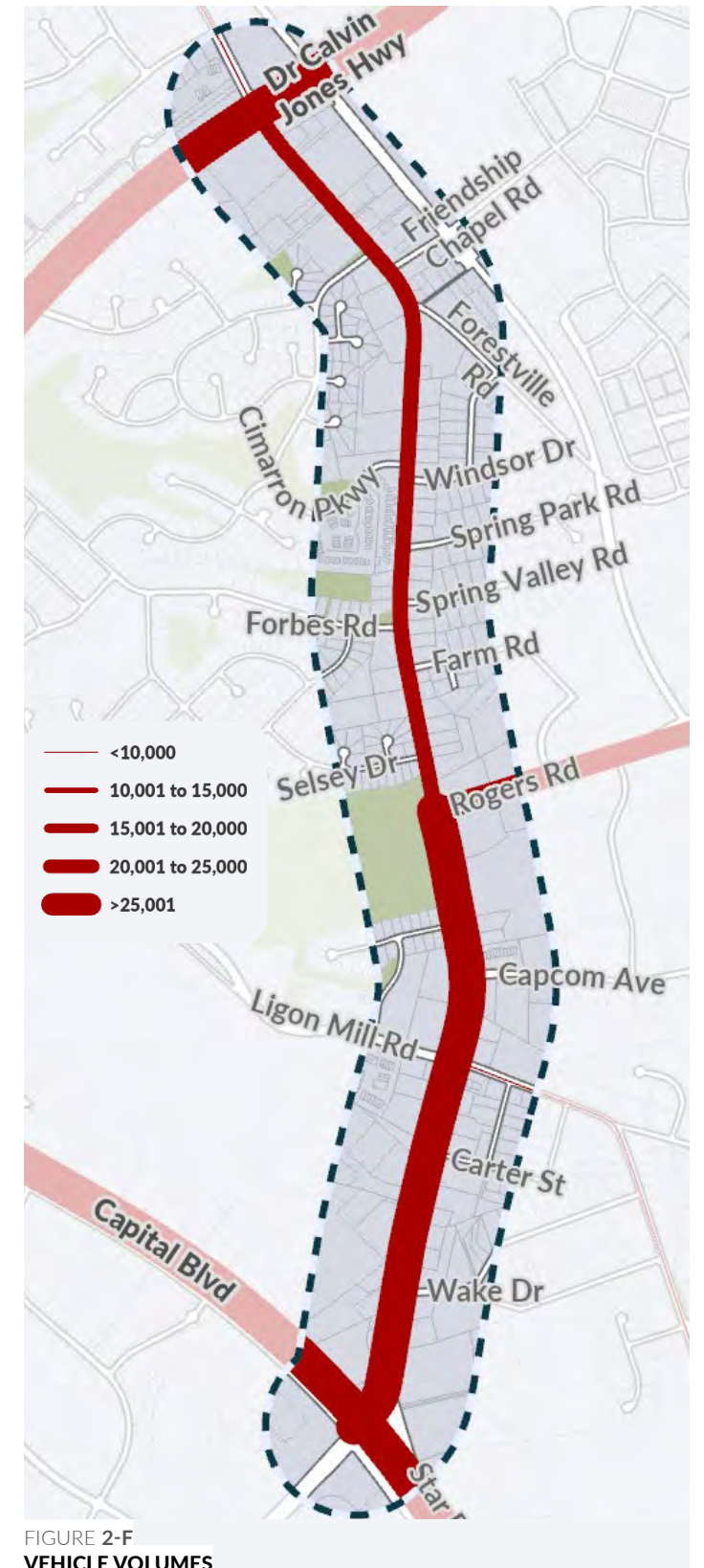


FIGURE 2-F
VEHICLE VOLUMES

BIKING CONDITIONS: DANGEROUS	
Bike Lanes:	Inconsistent
Intersections/Crossings:	Bike lanes disappear at the intersection
Safety:	High traffic volumes make biking dangerous on South Main Street

WALKING CONDITIONS: POOR	
Sidewalks:	Inconsistent
Intersections/Crossings:	Few crossing opportunities Wide road (difficult to cross)
Safety:	High traffic volumes make it stressful to walk

TRANSIT CONDITIONS: POOR	
Frequency:	1 hour 15 minutes (between buses)
Span:	5:45 AM to 6:45 PM (Mon - Fri) 8 AM to 8:30 PM (Sat) No Service Sundays
Stop locations:	High traffic volumes make it stressful to walk



Bike facilities end south of Rogers Road.

MULTIMODAL CONDITIONS

MULTIMODAL LEVEL OF SERVICE

South Main Street’s current design significantly hinders pedestrian and bicycle activity. While driving conditions may be deemed satisfactory, the same cannot be said for those walking or bicycling. The absence of dedicated bike lanes forces bicyclists to share the road with vehicles, a daunting prospect given the street’s high traffic volumes. Pedestrian experiences fare only marginally better; sidewalks, where they exist, are often in poor condition and discontinuous. The greatest challenge for pedestrians is crossing South Main Street—some may find themselves walking up to a mile to find a safe signalized crossing point. With the roadway’s width varying between 45 to 60 feet, crossing becomes a significant barrier for many.

Additionally, the corridor is served by bus routes (the Loop), yet reaching bus stops is complicated by the lack of continuous sidewalks and scarce crossing points. This layout often places transit users on the less accessible side of the road, necessitating risky crossings at busy intersections or indirect routes that double back to a safe crossing, complicating travel for those with mobility challenges or when sidewalks are missing. Enhancements in pedestrian infrastructure and safer, more accessible crossings are essential to support multimodal use of South Main Street, ensuring it caters effectively to all users, not just motorists.



Sidewalks are prevalent, but conditions vary.

BIKE AND PEDESTRIAN FACILITIES

Bike facilities are fragmented and inadequate along South Main Street. Bike lanes are found only between Rogers Road and Friendship Chapel Road, but lacking separation and connectivity they are rarely used and inadequate for most users.

- ✕ Bicycle Crash
- ✕ Pedestrian Crash
- Multi-Use Path
- - - Proposed Multi-Use Path

- Bike Lane
- - - Proposed Bike Lane

Source: North Carolina Pedestrian-Bike Information Network (CPBIN) & Wake Forest Comprehensive Transportation Plan (CTP).

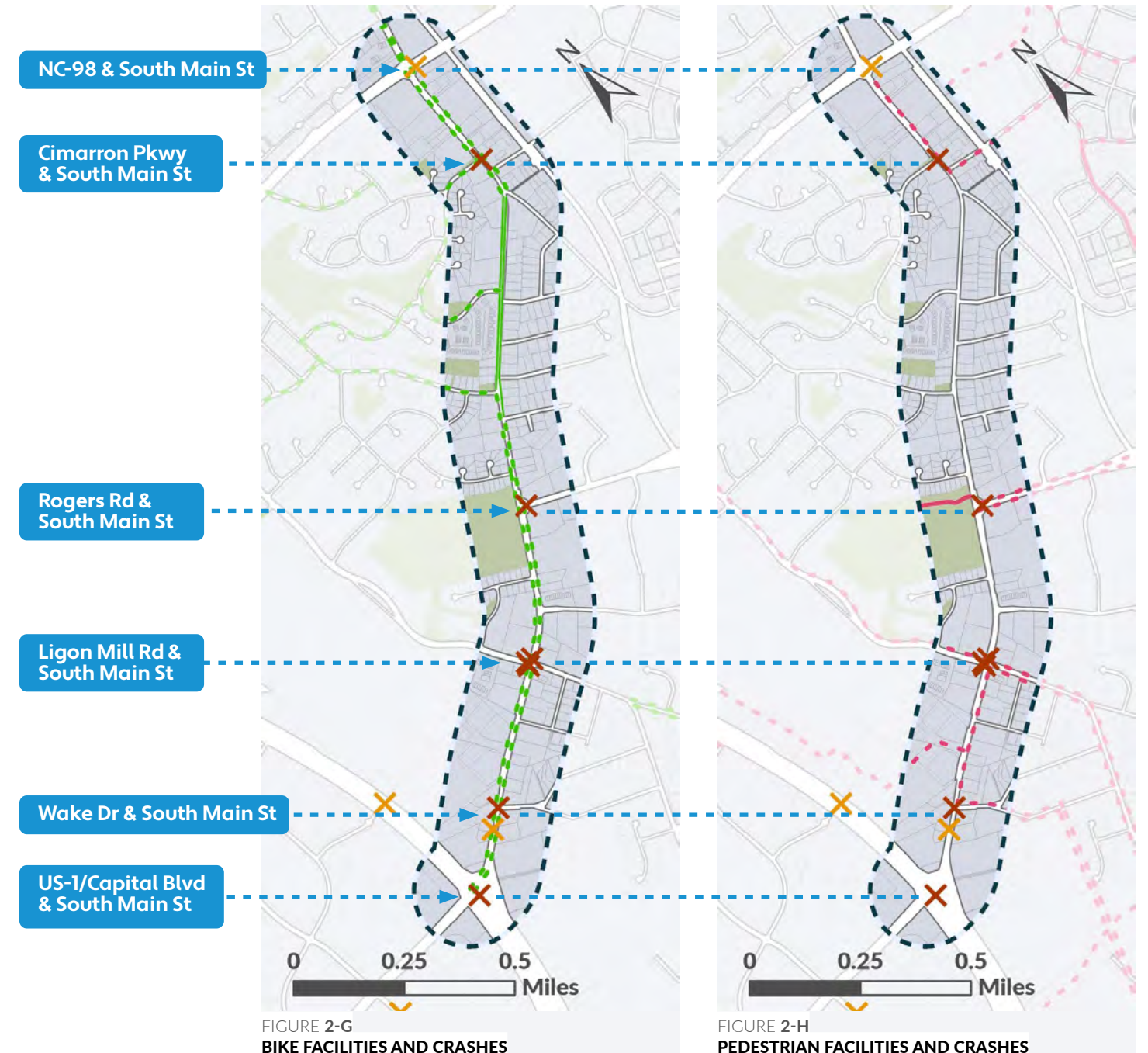


FIGURE 2-G
BIKE FACILITIES AND CRASHES

FIGURE 2-H
PEDESTRIAN FACILITIES AND CRASHES

While pedestrians have more continuous sidewalks, crossing locations are critically lacking and invite risky behavior for those needing to reach their destination. Crosswalks exist at the NC 98 / Dr. Calvin Jones Highway, Rogers Road, Ligon Mill Road, and Walmart Drive intersections: **as far as one mile apart.**

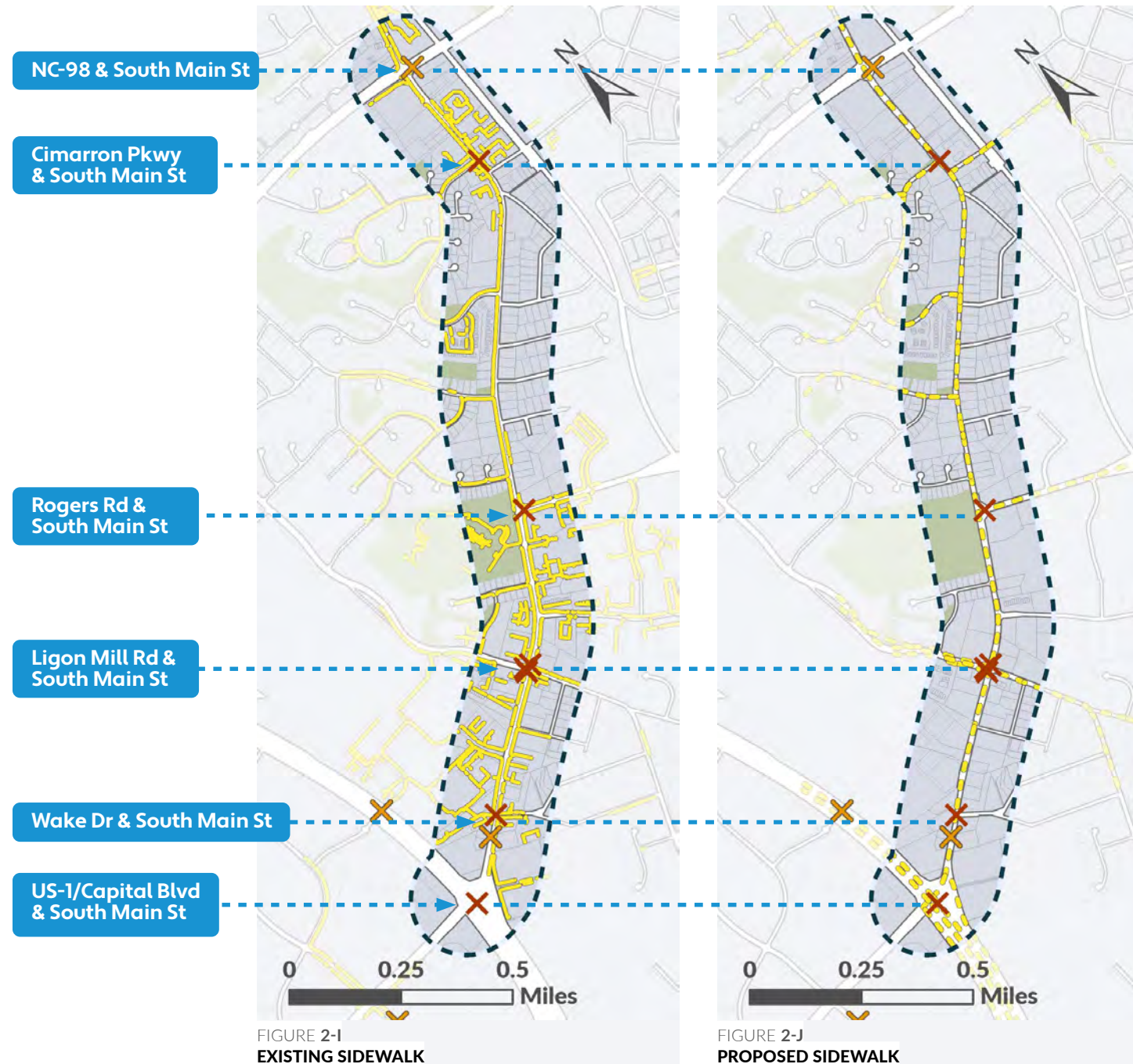


FIGURE 2-I
EXISTING SIDEWALK

FIGURE 2-J
PROPOSED SIDEWALK

CRASHES AND SAFETY

With a crash rate nearly 2.5x that of similar corridors in North Carolina, there are a number of issues contributing to the high number of crashes and unsafe conditions on South Main Street.

- **Capital Boulevard:** one of the busiest intersections in the region, this is also the highest-crash intersection on the corridor. **Elevation change** and a **free-flowing right turn lane** onto South Main Street create hazards related to the intersections geometric design.
- **Capital Boulevard to Rogers Road:** high volumes and **uncontrolled driveways** create conflicting movements throughout this section.

Limited crossing opportunities for bicyclists and pedestrians also creates hazardous conditions. Pedestrian crashes are predominantly observed between Capital Boulevard and Rogers Road, where higher-intensity land uses and destinations are in greater frequency.

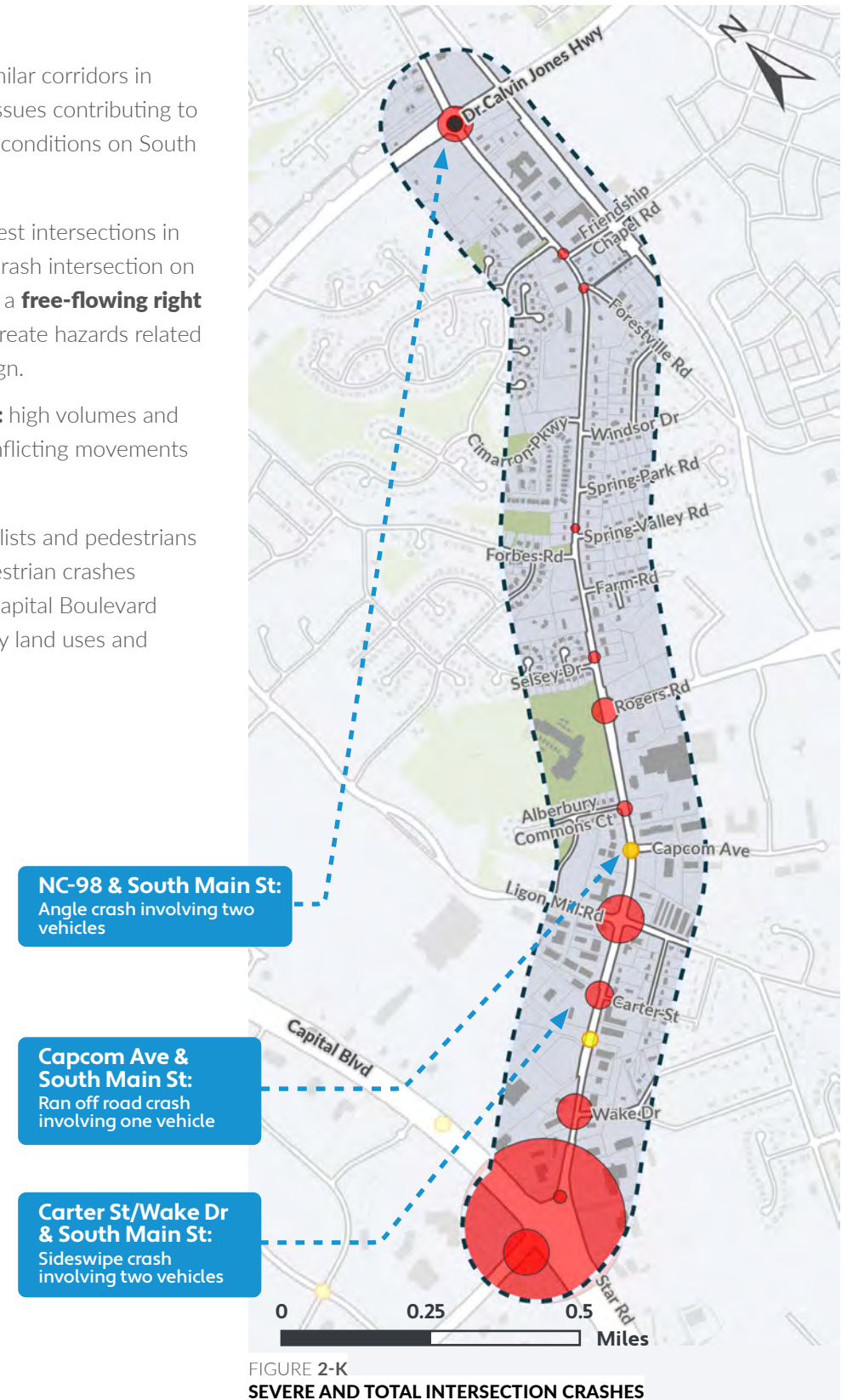
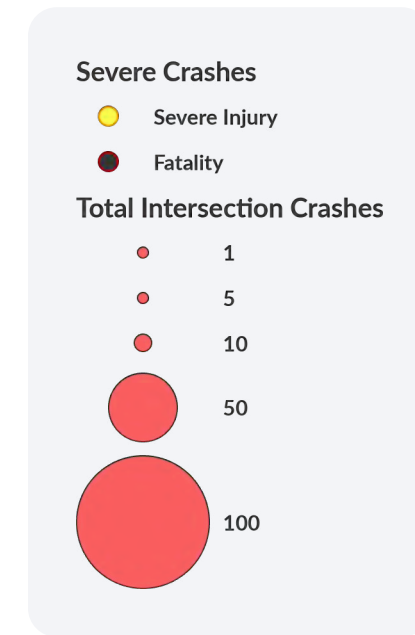
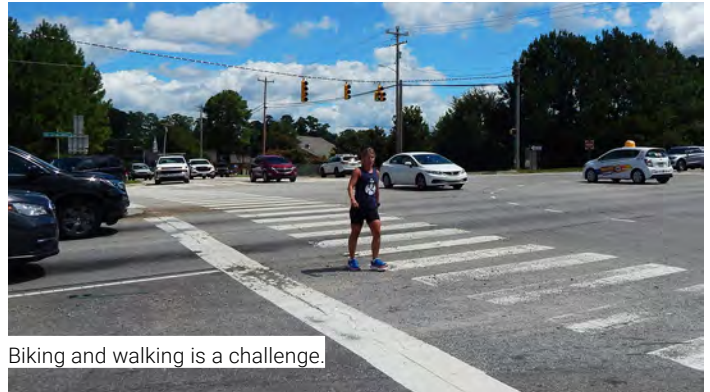


FIGURE 2-K
SEVERE AND TOTAL INTERSECTION CRASHES

KEY TAKEAWAYS ←

Drivers, bicyclists, and pedestrians have very different experiences on South Main Street.

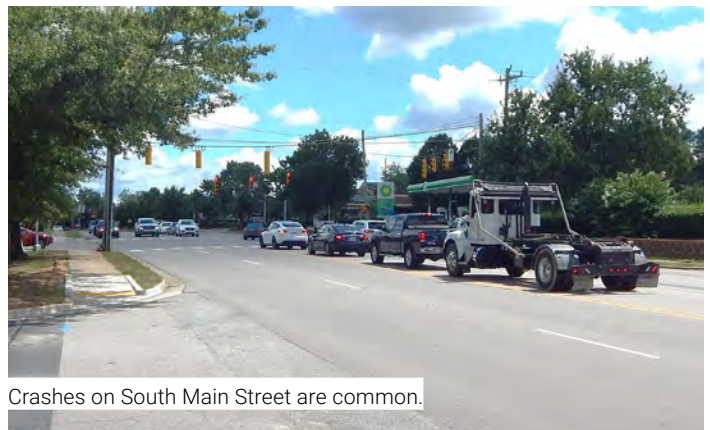
Wake Forest has grown faster than South Main Street's ability to keep pace. As a result, its design no longer matches its function. For drivers, congestion throughout the day is worsening -- poor during peak hours -- while the lack of continuous bike lanes and sidewalk gaps prevent nearly all users from biking or walking.



Biking and walking is a challenge.

Safety -- for all users of South Main Street -- is a paramount concern.

The factors contributing to South Main Street's safety challenges are numerous -- high traffic volumes, uncontrolled driveways, and unrestricted turning movements to name a few. US 1 / Capital Boulevard, Capcom Avenue, Ligon Mill Road, Rogers Road, and NC 98 / Dr. Calvin Jones Highway are all high-crash locations intersections that make this stretch of road among the most dangerous in North Carolina.



Crashes on South Main Street are common.

Rogers Road is a critical intersection for a growing corridor.

Rogers Road is located near the midpoint of the study area and divides South Main Street into two experiences. One of the highest-crash locations on the corridor, it also marks a change in volumes, as well as the end of bike facilities and the entrance to Wake Forest Middle School. Design solutions at this critical location must both improve traffic operations and address abundant safety concerns.



Rogers Road intersection, looking north.

CHAPTER 3 ENGAGEMENT

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3 ENGAGEMENT

Recognizing the importance of public participation, this Study is grounded in an understanding of the community’s views. The project team engaged with neighborhood residents, business owners, and community leaders to uncover issues and strategies beyond what data alone could reveal. Community input activities included online tools like surveys and interactive maps, in-person events such as open houses, and targeted discussions with stakeholders. This approach has incorporated many voices.



Engagement activity on the Corridor Concept Design Boards.

This chapter outlines the project’s engagement strategy aimed at capturing insights, concerns, and aspirations from a diverse group of stakeholders, including residents, business owners, bicyclists, pedestrians, and public transit users. This chapter also highlights how community feedback has directly shaped design choices, safety enhancements, and multimodal improvements, leading to a more inclusive, accessible, and vibrant South Main Street.

THIS CHAPTER COVERS:

- Online Engagement
- Advisory Committee Meetings
- Public Meetings
- Key Takeaways

ONLINE ENGAGEMENT

WEBSITE

Designed to offer easy access, the website provided comprehensive details on the study’s objectives, timelines, and opportunities for public involvement. It featured updates on project milestones, scheduled meetings, outcomes of past meetings, relevant documents, and visual materials.

Additionally, it outlined various channels through which individuals could contribute their insights and feedback. This digital platform played a pivotal role in engaging thousands of community members, ensuring widespread awareness and participation in the development of the corridor study throughout its progression.

5,006
Website Visits

1,879
Unique Website Visitors



Project Website Sample.

COMMUNITY SURVEY

Concluding in March 2024, the survey provided valuable insights into community concerns and preferences:

790
Total Responses

- A notable safety concern at Rogers Road, especially dangerous for middle school crossings.
- Difficulty in enforcing speed limits, with frequent instances of speeding.
- Identification of South Main Street as a primary destination for shopping/errands and as a major route to highways.
- Highlighted issues include traffic congestion and safety concerns.
- Urgent improvement needed at intersections like Rogers Road, Ligon Mill Road, and Capital Boulevard.
- Community prioritization of improvements: intersections and signals, center medians, and pedestrian facilities.

These results underline a critical community demand for enhanced safety measures, particularly for vulnerable road users like pedestrians and bicyclists.

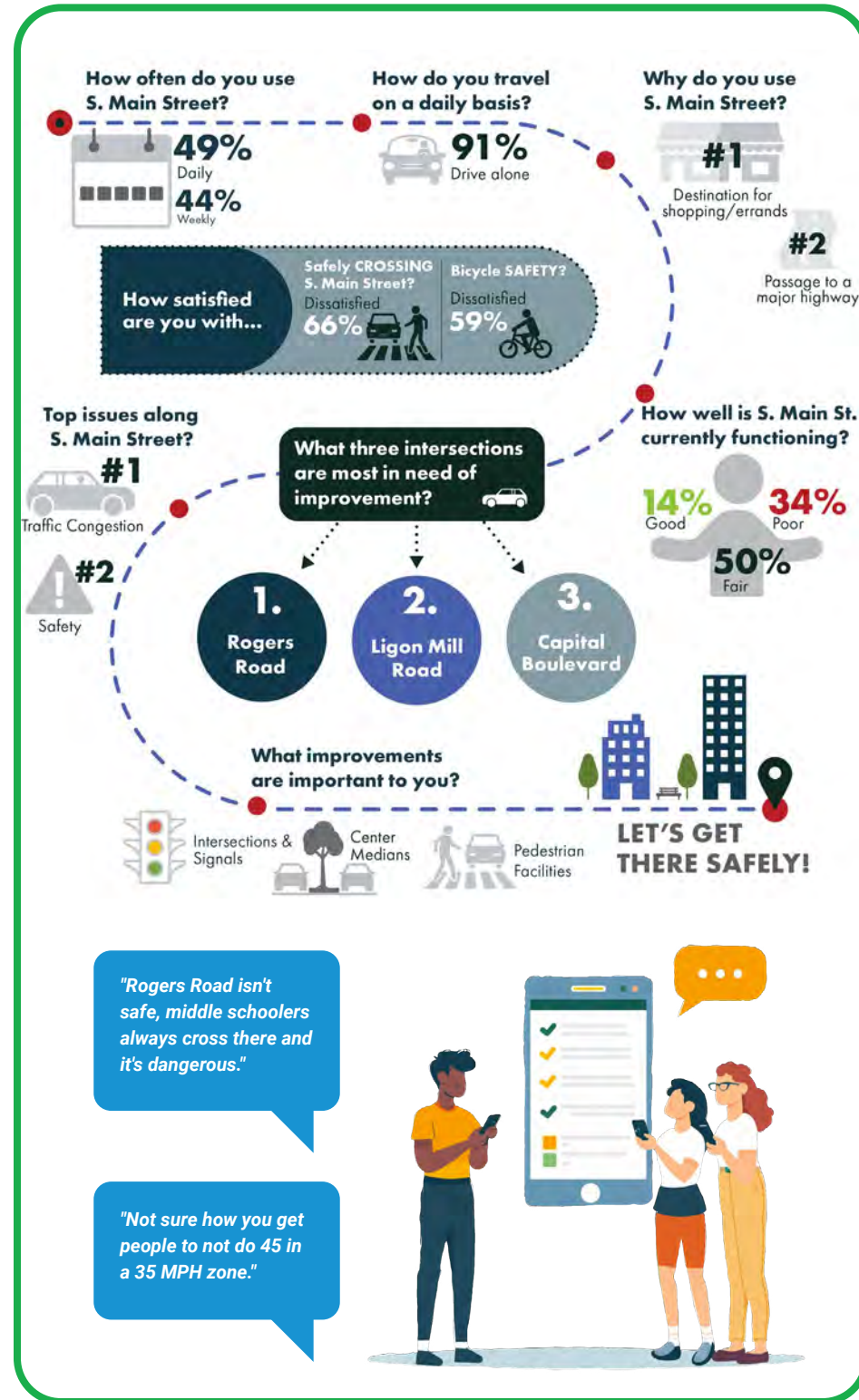


FIGURE 3-A
KEY TAKEAWAYS FROM THE GENERAL SURVEY

BUSINESS SURVEY

Participation from 18 businesses revealed critical insights: a majority of their customers (64%) arrive by driving alone, with lesser numbers carpooling (16%), using transit or rideshare (8%), walking (8%), and biking (1%). These data suggests a predominant reliance on private vehicle travel, yet it simultaneously underscores a latent demand for enhanced multimodal access.

A key finding from the business survey was the unanimous agreement on the necessity for improved safety measures, identifying it as paramount for fostering a conducive business environment. This was closely followed by the expressed need for diversified transportation options to cater to the varied mobility preferences of their clientele. Additionally, the survey highlighted the growing relevance of small-scale delivery services, with significant weekly and daily e-commerce deliveries, contrasting sharply with the infrequent large truck deliveries.

18
Participating Businesses

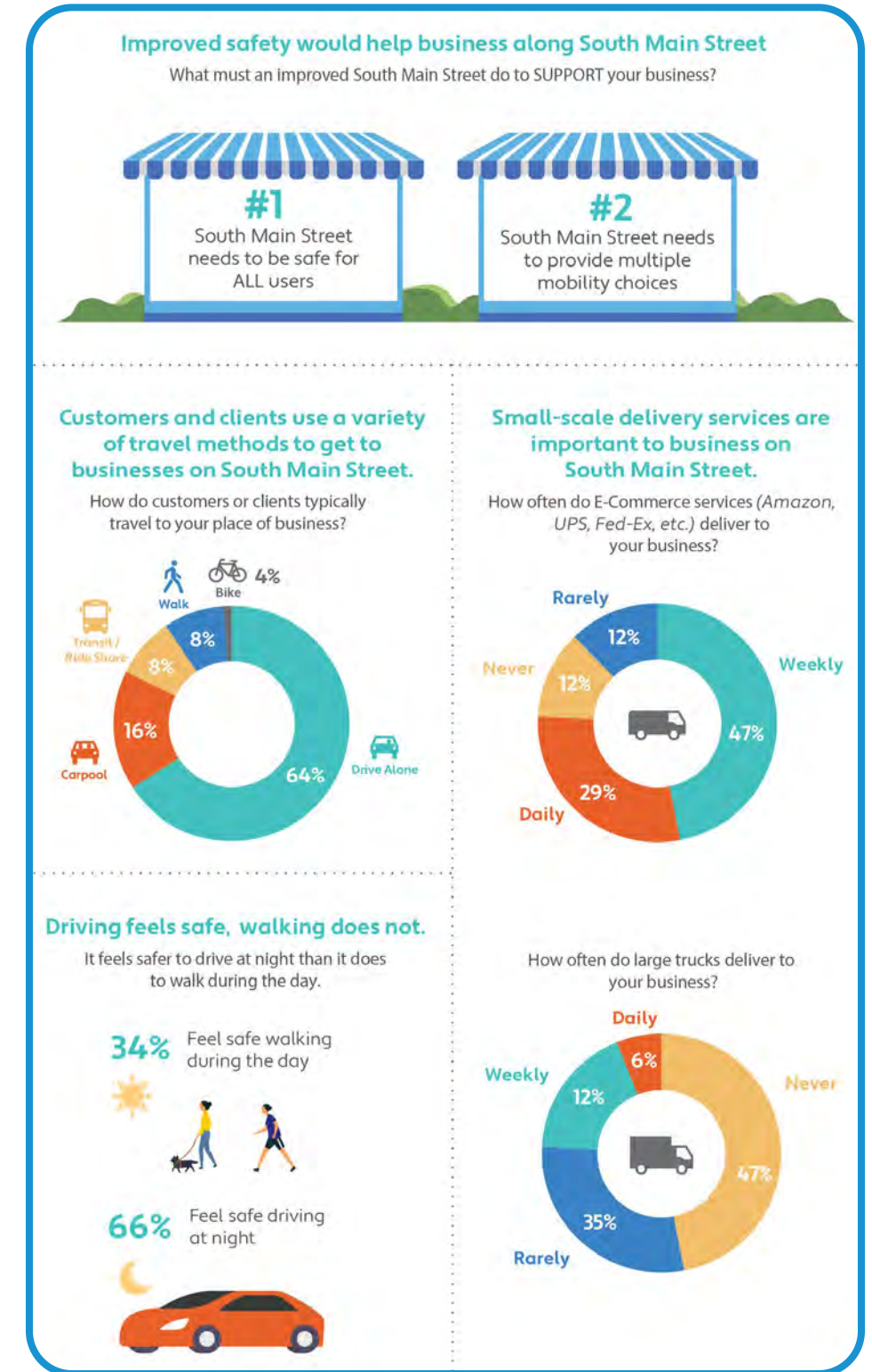


FIGURE 3-B
KEY TAKEAWAYS FROM THE BUSINESS SURVEY

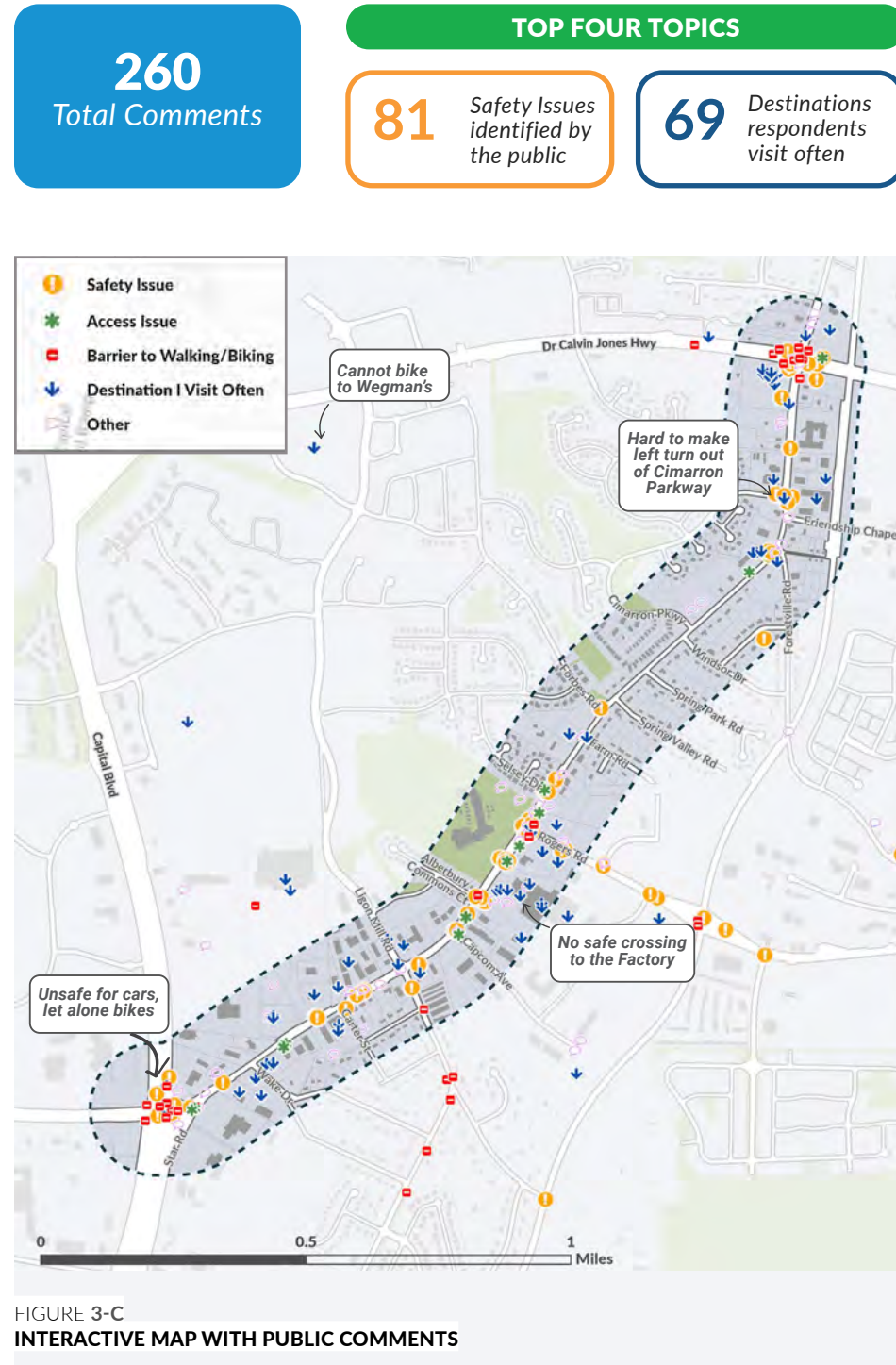
INTERACTIVE MAP

The project team deployed an interactive map in August 2023, promoted through the Town's website and via stakeholder email, as a key component of the South Main Street Corridor Study's engagement strategy. This digital tool aimed to:

- Identify locations of safety hazards,
- Highlight significant community landmarks,
- Pinpoint barriers to biking and walking, and
- Investigate access challenges.

Available until March 2024, the map received 260 responses, yielding crucial insights into community concerns and preferences. Analysis revealed 81 identified safety issues and 69 frequently visited destinations.

Notable feedback highlighted difficulties in executing left turns from Cimarron Parkway, the absence of a safe crossing to the Factory, and pronounced safety risks at the intersection of US-1/Capital Blvd and South Main Street for all modes of transport, emphasizing the urgent need for enhancements to improve the safety and accessibility of these critical areas.



STAKEHOLDER DISCUSSIONS

FOCUS GROUPS

Focus groups, structured as small group discussions led by professionals, play a crucial role in learning about the primary concerns within a community. These are instrumental in identifying critical issues, gauging community preferences for addressing these concerns, and pinpointing potential obstacles to proposed initiatives.

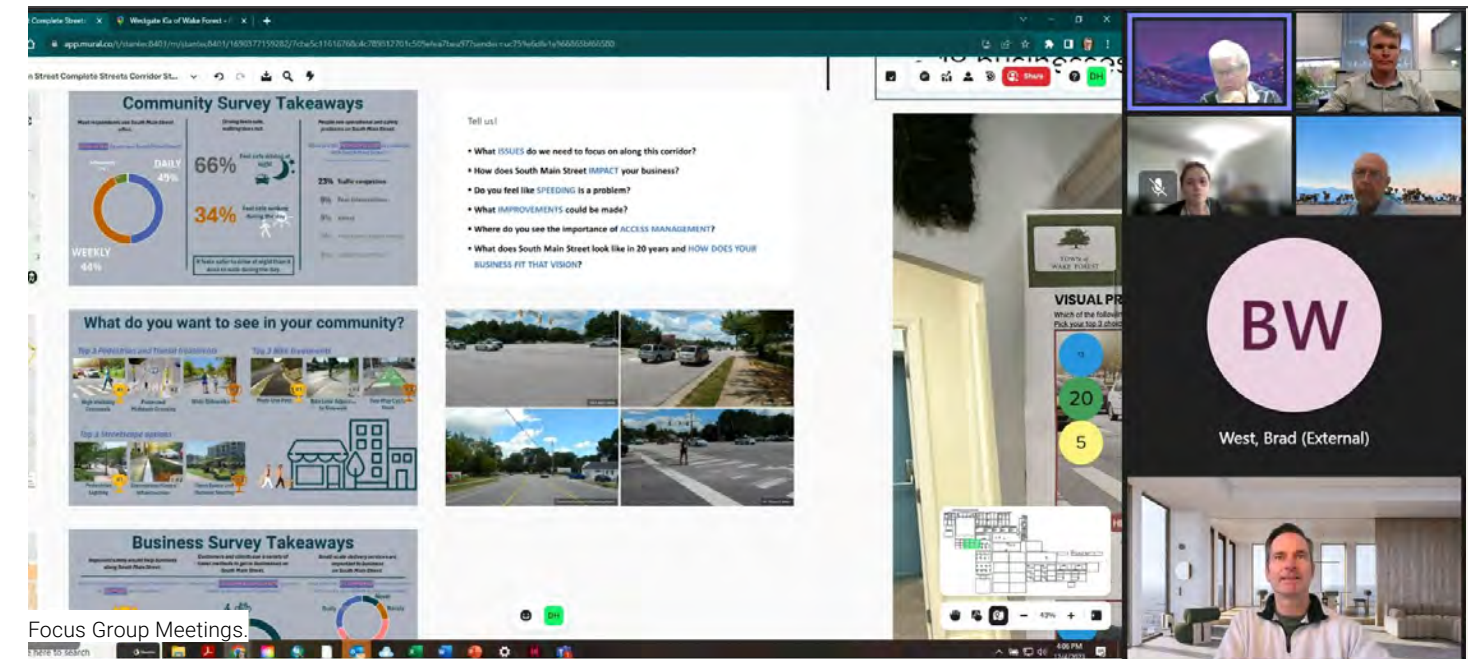
This diverse group included representatives from the North Carolina Department of Transportation

(NCDOT), local business owners, and Wake County Public Schools, among others. The discussions revealed key themes indicating a disparity in perceived safety between driving and walking along the corridor. Participants generally felt safe driving, even at night, yet expressed significant concerns regarding pedestrian safety during daytime.

BY THE NUMBERS

5 Sessions held

30 Total attendees



IN-PERSON MEETINGS

Effective community engagement shapes policies and projects that enhance livability and promote active transportation within a community's built environment. Public meetings not only facilitate insights into community preferences and concerns, but also align with its objectives of supporting vulnerable communities. To this end, the project team conducted several public meetings, recognizing these objectives as an important way to obtain detailed feedback on the Corridor Study.

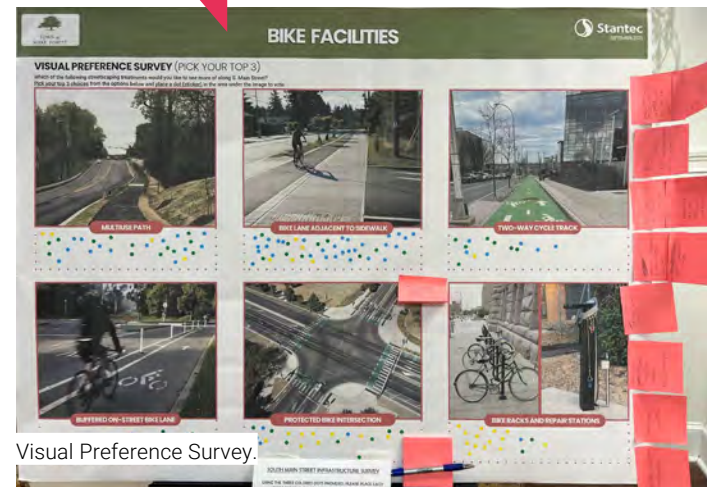
These key engagements were held on September 13th, 2023, and March 13th, 2024, marking significant milestones in the collaborative effort to refine and advance the project goals.

OPEN HOUSE #1

TOP CHOICE

SEPARATED BIKE LANES

68
Total Attendees



Visual Preference Survey.



Participants on the first Open House event.

The first Open House took place on September 13th, drawing over **60 participants**. The most favored option in the Visual Preference Survey, with 45 votes, advocated for the implementation of Separated Bike Lanes along South Main Street.

Key feedback from attendees highlighted several areas of concern and interest:

- Rogers Road is identified as a critical bottleneck.
- South Main Street is perceived as dangerous for crossing, difficult for turning onto, and notably congested.
- Access to the middle school on South Main Street is limited and unsafe for student crossings.
- The intersection at South Main Street and Capital Blvd (US-1) poses numerous challenges.
- The potential for incorporating roundabouts, specifically proposing one at Rogers Road, was discussed.
- Participants expressed a strong preference for new, protected mid-block crossings to enhance pedestrian safety on South Main Street.
- Additionally, there was significant support for establishing bike lanes adjacent to sidewalks as a top infrastructure improvement for both bicyclists and pedestrians.

OPEN HOUSE #2

The second Open House for the South Main Street Corridor Study convened on March 13th, attended by approximately **125 participants**. During this meeting, attendees were introduced to two conceptual designs for the corridor, each aiming to alleviate the challenges identified on South Main Street. The primary objective was to identify viable strategies for the corridor's issues and to solicit public input on these proposals.

The feedback collected from this session was important in refining and determining a preferred design. This design will subsequently serve as the basis for detailed engineering plans and future construction, pending the availability of funding. This iterative process emphasizes the Study's commitment to addressing South Main Street's challenges through collaborative, community-driven efforts.

125
Total Attendees



Participants in the second Open House event.



Feedback gathered during second Open House event.



Participants added comments on the Corridor Concept Design.



Attendees provided valuable information about the corridor.

KEY THEMES AND TAKEAWAYS



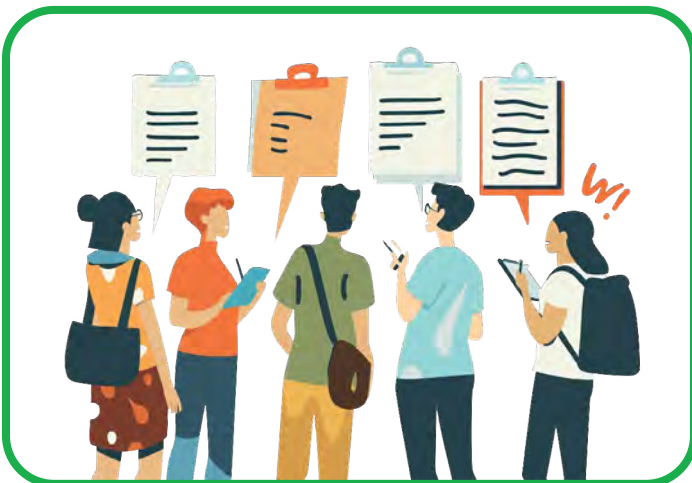
Residents want separation from traffic, both along and across the corridor.

There is agreement on the necessity for additional crosswalks and a reduction in the distance between safe crossing points. High-visibility crosswalks and mid-block crossings emerged as the top preferences for pedestrian safety enhancements, as well as separated bike lanes for bicyclists, highlighting the community's priority for secure and accessible pedestrian routes.



Congestion and speeding are significant issues for operation and safety.

Traffic patterns fluctuate significantly over the course of the day, leading to bottlenecks during peak usage times and at critical intersections. The combination of wide lanes and suboptimal signal timing contributes to prevalent speeding, imparting a "freeway" atmosphere to the corridor. These factors underscore the urgent need for targeted interventions to enhance traffic management and improve the safety of all road users.



South Main Street is vital to Wake Forest Resident's Daily Routine.

According to survey data, 93% of respondents travel on South Main Street at least once a week, with 49% using the corridor daily. The street serves dual purposes for the community—it is both a hub for shopping and a crucial thoroughfare for traveling beyond Wake Forest. This high level of utilization reflects the corridor's significance to residents' daily routines.

CHAPTER 4

RECOMMENDATIONS

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4 RECOMMENDATIONS

Today, South Main Street serves as an arterial roadway within Wake Forest, primarily accommodating private vehicles. Despite its car-centric design, there is an observable use by pedestrians and bicyclists, emphasizing the need for safer pedestrian crossings and enhanced bicycle infrastructure. The corridor serves two main purposes: facilitating local and through traffic, and acting as a hub for shopping and errands.



Example Complete Street Intersection.

In this context, retrofitting the corridor requires careful consideration of mobility trade-offs to cater to the diverse needs of various users and modes of travel. Creating metrics for evaluation and comparison is a critical step in formulating draft concepts.

By addressing the identified gaps and exploring opportunities to better balance transportation modes, South Main Street has the potential to transform into a Complete Street.

THIS CHAPTER COVERS:

- Best Practices for Complete Streets
- Design Considerations
- Concept Design
- Impacts and Validation

BEST PRACTICES FOR COMPLETE STREETS

WHAT IS A COMPLETE STREET?

A Complete Street is inclusively designed to provide safety and accessibility for all users, regardless of age or ability. It facilitates a secure environment where children can walk to school, older adults maintain independence without driving, and individuals with disabilities can navigate safely.



Example of a Complete Street.

A Complete Street:

- Considers all types of travel modes and users.
- Provides safe travel options for people of all ages and abilities.
- Accommodates both present and future needs.
- Helps a community have a resilient economy.
- Considers public spaces and development in terms of direct and indirect benefits.
- Is a vibrant, attractive place in all seasons.
- Improves the quality of life for people using it.

A Complete Streets approach is adaptable, requiring customization to meet the specific needs of a community's current and future travel patterns, surrounding development, and land use. This means that a Complete Street in Wake Forest is distinctively tailored, reflecting the unique needs of its community.

The National Complete Streets Coalition defines Complete Streets as **pathways designed and operated to allow safe access for all users, including pedestrians, bicyclists, motorists, and transit riders, encompassing a wide range of ages and abilities.**

WHAT MAKES UP A COMPLETE STREET?

A Complete Streets approach considers not only the space within the curbs but also the broader environment, including the interaction with buildings along the street, to create a cohesive and functional public realm. The graphic below (Figure 4-A) illustrates how a Complete Street integrates three primary “zones,” each serving unique functions and supporting various activities.

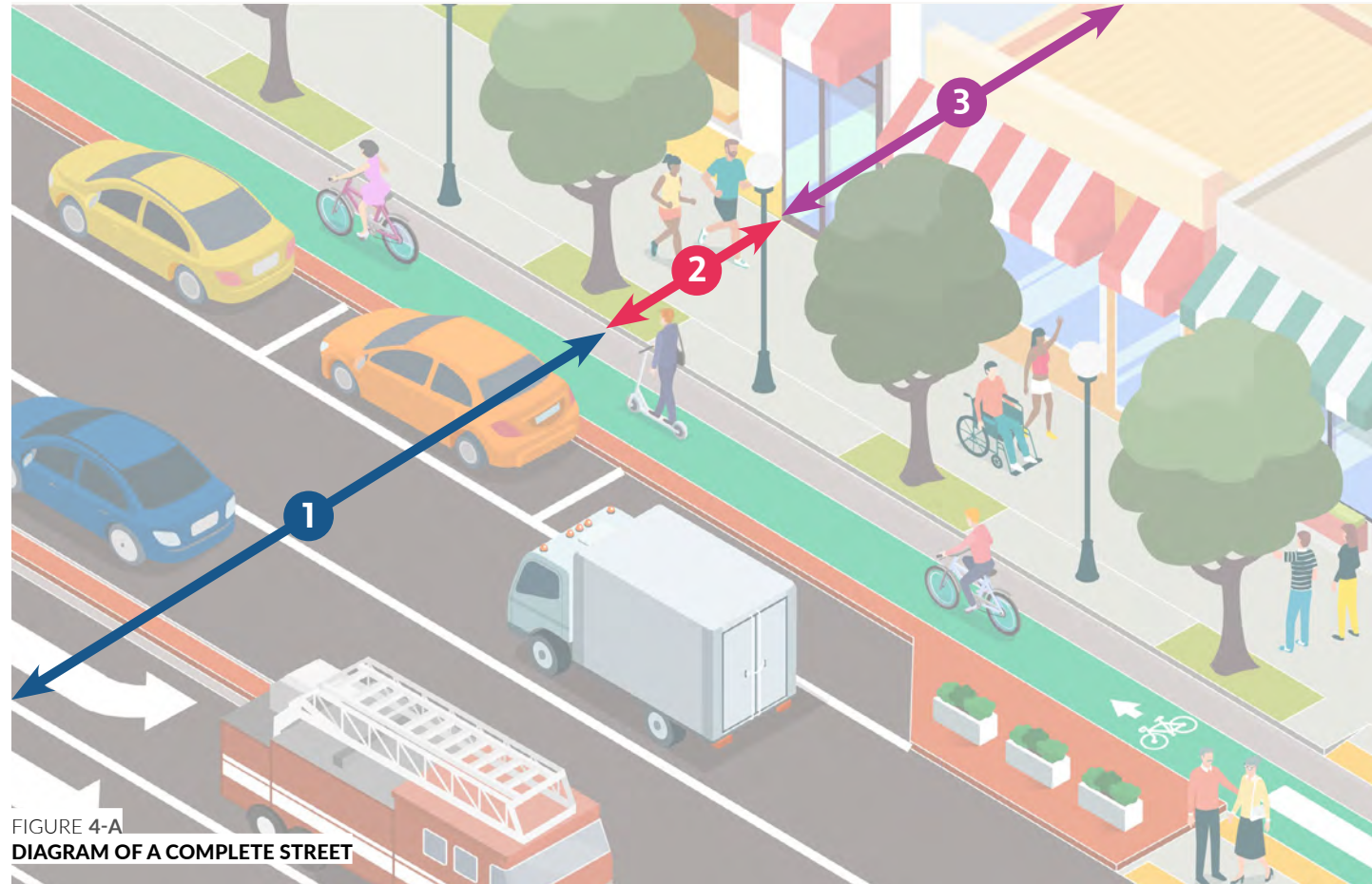


FIGURE 4-A
DIAGRAM OF A COMPLETE STREET

1

THE TRAVEL WAY:

Beyond facilitating vehicle movement, this zone accommodates other forms of travel such as bicycles and scooters, and includes street parking. Located between curbs, it embraces a broader vision of mobility.

2

THE PEDESTRIAN REALM:

Dedicated to pedestrian activities, this area features amenities like lighting, outdoor seating, and street trees. It supports curb use for activities like ridesharing and deliveries, enhancing the interface between public and private spaces.

3

THE BUILDING REALM:

This zone includes businesses, residences, and public spaces that define the community’s identity, positioned next to the pedestrian realm. It shapes the street’s character and facilitates interaction between the street and its buildings.

EXAMPLES OF COMPLETE STREET TREATMENTS

» Traffic Calming Measures

These are designed to slow down traffic and improve safety for all road users. Examples include raised crosswalks, curb extensions (bulb-outs), and traffic circles or roundabouts. These measures discourage speeding and encourage drivers to be more attentive.



» Pedestrian Crossings

Enhanced crosswalks, including those with flashing lights, high-visibility paint, raised platforms, and pedestrian refuge islands, make it safer for pedestrians to cross busy streets. Audible signals and countdown timers improve accessibility for visually impaired pedestrians.



» Separated Bike Lanes

Separating bike lanes from vehicle traffic with physical barriers offers a safer environment for cyclists, encouraging biking as a viable mode of transportation. These lanes can be delineated by curbs, planters, or parking spaces.



» Sidewalk Improvements

Widening sidewalks, improving lighting, and ensuring they are ADA-compliant enhance pedestrian safety and mobility. Keeping sidewalks well-maintained and free of obstacles is also essential.



» Road Diet

This strategy involves reducing the number of lanes for vehicles to allocate more space to pedestrians and bicyclists. It often includes adding bike lanes or parking and widening sidewalks.



» **Improved Signage and Markings**

Clear, visible signage and road markings help direct traffic, indicate pedestrian and bike lanes, and warn of upcoming crossings or changes in road conditions, contributing to overall safety.



» **Street Trees and Landscaping**

Besides their aesthetic value, street trees can act as a natural barrier between pedestrians and vehicles and contribute to traffic calming by creating a psychological narrowing of the roadway.



» **Public Lighting Upgrades**

Enhancing street lighting improves visibility for all users, making it safer for pedestrians and bicyclists at night and during low-light conditions.



» **Speed Limit Reduction**

Lowering speed limits, especially in areas with high pedestrian and cyclist traffic, significantly reduces the risk and severity of crashes.



» **Community Engagement and Education**

Programs that educate drivers, bicyclists, and pedestrians about road safety, including school-based initiatives, can foster a culture of safety and respect among all road users.



DESIGN CONSIDERATIONS

The redesign of South Main Street has been informed by Guiding Principles and the Complete Streets planning framework, drawing on insights from both data analysis—“what the data tells us”—and public input—“what we’ve heard from you.” These considerations serve as a bridge, translating identified key themes into practical design interventions along the corridor. The initial evaluation identified critical areas for design adjustments to advance mobility for all:

GUIDING PRINCIPLES

Early in the project, the team established Guiding Principles to lay the groundwork for the design process, detailed fully in Chapter 1. These principles, reiterated below, steered the redesign of South Main Street:

1 Provide Equitable Access

2 Prioritize Safety

3 Enhance Connectivity

4 Promote Sustainability

5 Engage the Community

These principles also served as a decision-making framework to navigate the necessary compromises inherent in the design process.

Challenges for users include:

- Incomplete and deteriorated sidewalks make pedestrian movement challenging.
- Lack of continuous and separated bike lanes discourages bicycling.
- Long distances between safe crossing points hinder pedestrian access across South Main Street.
- High-speed traffic and wide lanes create a perception of danger for pedestrians and bicyclists.
- The continuous center turn lane on a high-volume road encourages dangerous, unpredictable turning movements.

Opportunities to balance travel modes along South Main Street include:

- Introducing separated bike lanes and sidepaths to provide safe, dedicated spaces for bicyclists and pedestrians.
- Implementing high-visibility crosswalks, pedestrian refuge islands, and curb extensions to improve pedestrian safety and convenience.
- Using traffic calming measures, road diets, and on-street parking to reduce vehicular speeds and create a more welcoming environment for non-motorized users.
- Enhancing multimodal access through improved facilities and connections to existing pedestrian and bicycle networks.
- Expanding the urban tree canopy and green infrastructure to promote a more pleasant and environmentally sustainable corridor.

PREFERRED ACCESS PLAN

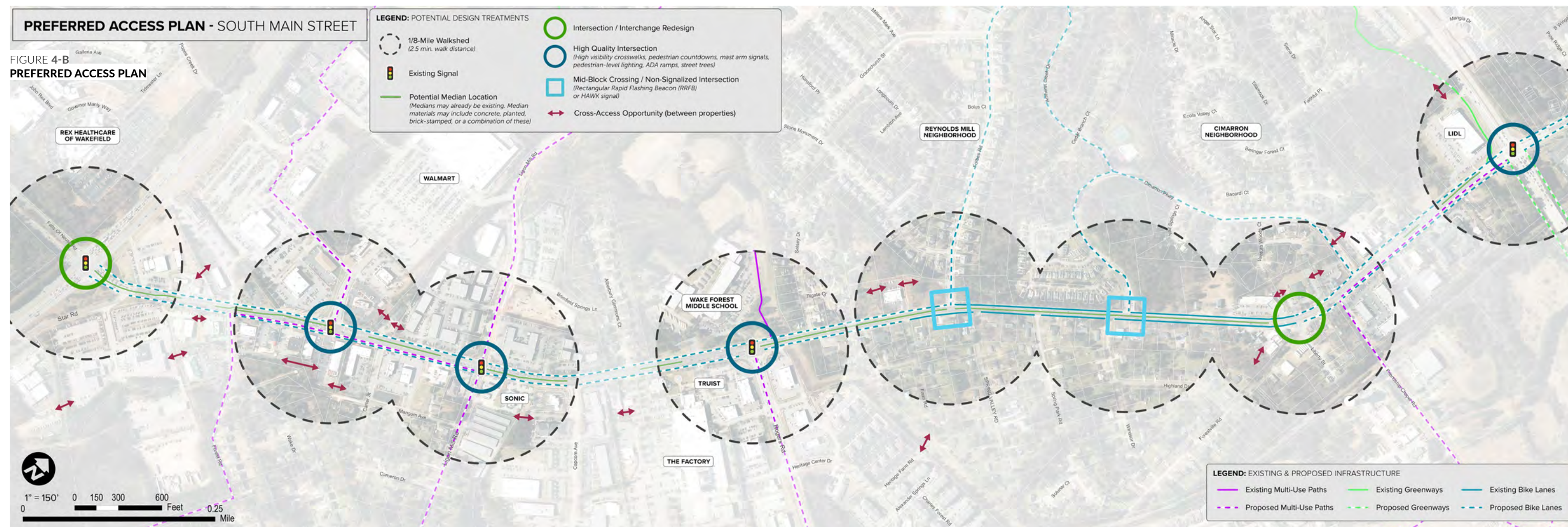
The Preferred Access Plan (PAP) serves as the foundational blueprint for the redesign of South Main Street, outlining the ideal multimodal enhancements for the corridor and marking the beginning of the journey towards a full conceptual design. It represents a corridor map (Figure 4-B) that delineates proposed treatments, access management strategies, cross-access opportunities, intersection signalization, and other measures aimed at bolstering mobility and connectivity.

The PAP examines key aspects such as:

- Intersections identified for improvements,
- The relationship with surrounding streets, neighborhoods, and public facilities,
- Connections to the existing network of sidewalks and bike paths,
- Major barriers to seamless mobility, and
- Access-management and opportunities for parcel cross-access.



The PAP outlines an integrated approach to South Main Street's corridor enhancements, harmonizing various design treatments to improve connectivity, median configurations, driveway consolidations, and strategic nodes that contribute to a cohesive pedestrian environment.



ALTERNATIVES DEVELOPMENT

The development of design alternatives for the South Main Street Corridor begins with an evaluation of potential strategies, spanning the southern segment from US-1/Capital Boulevard to Rogers Road and the northern segment from Rogers Road to NC-98. This stage establishes design criteria that define the objectives and standards the proposed designs must fulfill.



The main focus for the development of both alternatives for South Main Street was to:

- Simplify access to/from businesses along South Main Street,
- Avoid the need to buy property outside of the existing Right-of-Way,
- Provide safe space for bicyclists and pedestrians,
- Make it easier for people to cross South Main Street,
- Identify key locations to spark reinvestment along South Main Street, and
- Transition this suburban development pattern to a more walkable street.

Both alternatives align with the project's Guiding Principles, informed by the previous analysis of the existing conditions, Complete Streets best practices, and insights from public engagement efforts. While sharing common goals, the alternatives diverge in their approach to intersection design, curb adjustments, and the financial implications of these changes. Figure 4-D and Figure 4-E in the following pages provide proposed cross-sections of the corridor segments, illustrating the two design solutions developed to address the specific needs of South Main Street.

PROPOSED DESIGN - LANE MEASUREMENTS (CROSS-SECTIONS)

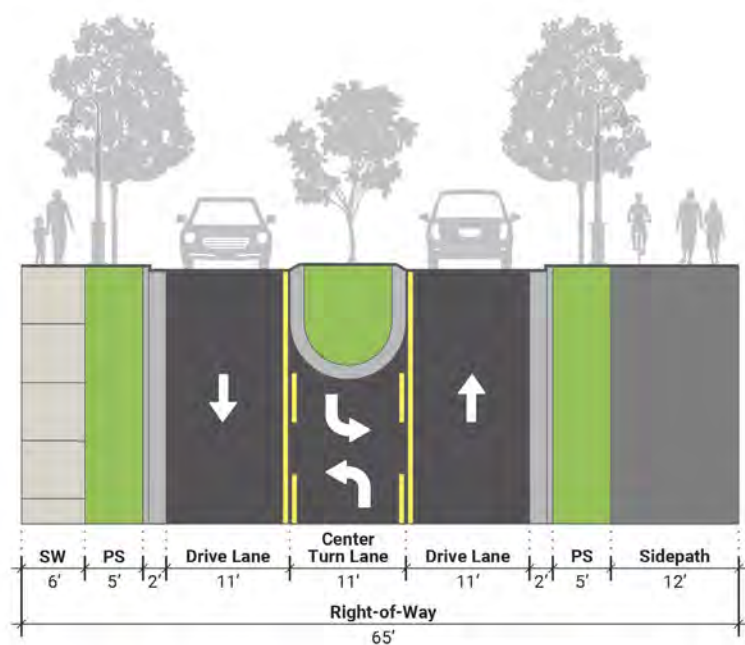
South Main Street is characterized by two distinct sections, with the area north of Rogers Road differing markedly in appearance and function from the section south of Rogers Road. The division of the road into travel lanes, medians, and turn lanes is defined as its cross-section.

Northern Section: Rogers Road to NC-98

Concept A: Partial Optimization

Key modifications in this approach include:

- Introduction of a center median for improved traffic delineation, and
- Relocation of bike facilities to a Sidepath above the curb and further from vehicles.



Southern Section: US-1/Capital Boulevard to Rogers Road

Concept A: Partial Optimization

This concept retains the road's general layout while introducing several modifications:

- Installation of planted medians to improve safety and traffic flow,
- Narrowing of lanes to 11' wide, and
- Addition of a Sidepath to accommodate both pedestrians and bicyclists.

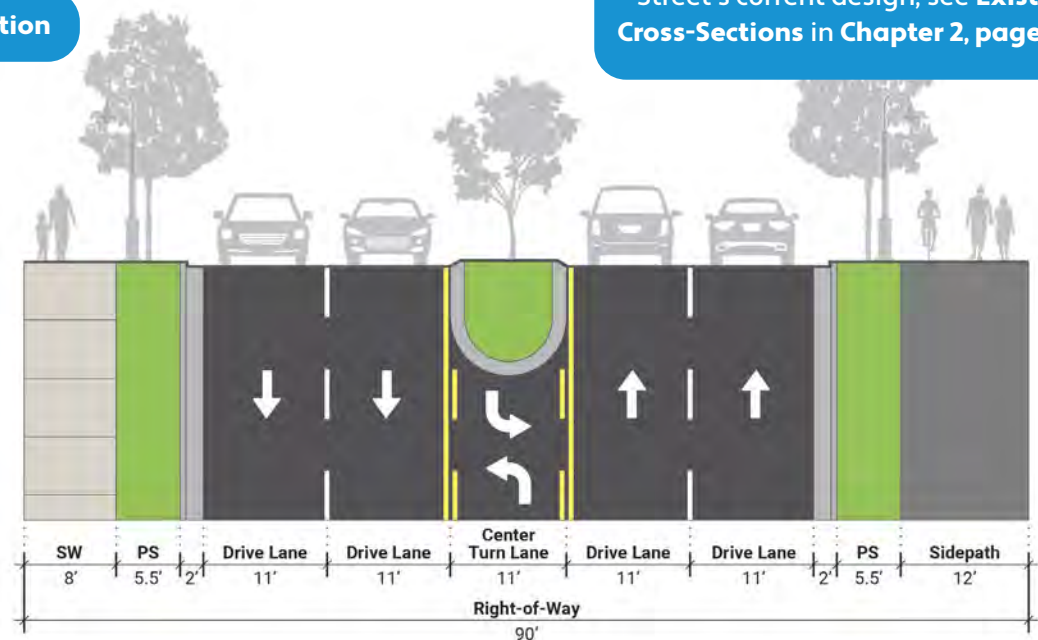


FIGURE 4-D PROPOSED CROSS-SECTIONS (NORTHERN AND SOUTHERN SEGMENTS)

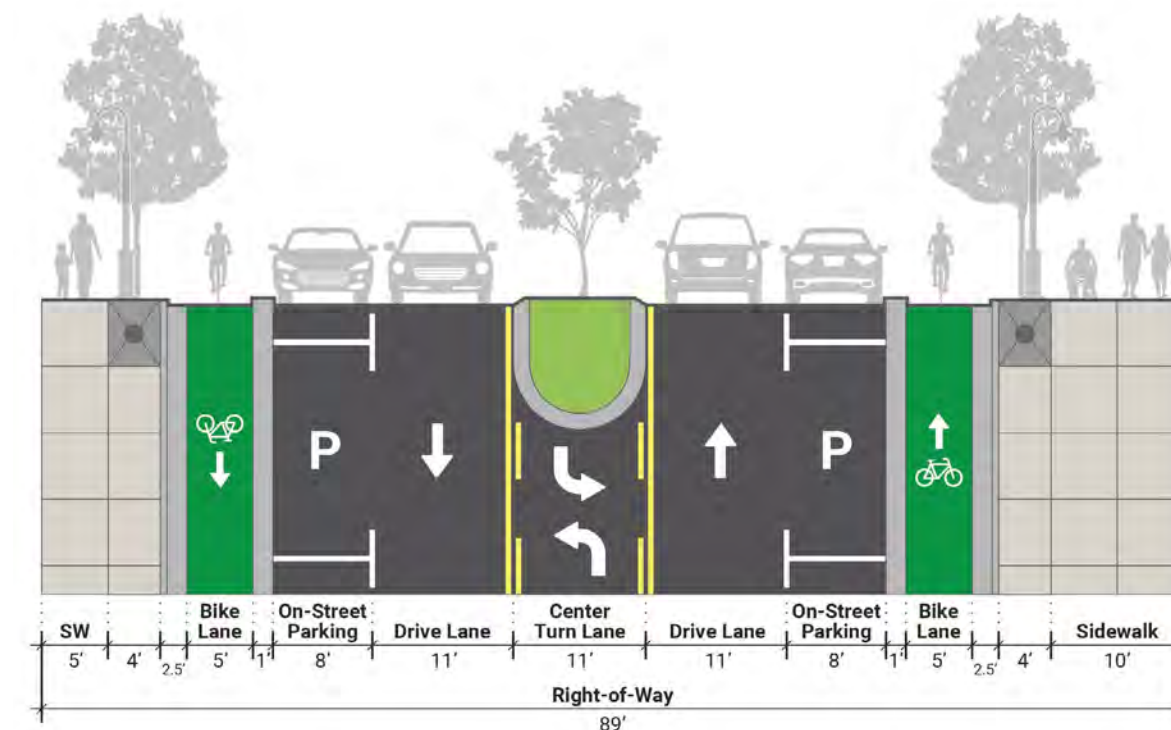
For an overview of South Main Street's current design, see **Existing Cross-Sections in Chapter 2, page 18.**

Northern Section: Rogers Road to NC-98

Concept B: Full Optimization

This approach proposes a significant redesign to include:

- Implementation of parallel parking on both sides to support local commerce,
- Slow traffic down with optical narrowing/peripheral friction,
- Provide an additional barrier to better protect pedestrians and cyclists from vehicular traffic,
- Provide emergency response vehicles adequate pull-off space to deal with emergencies and traffic stops,
- Establishment of a concrete barrier separating vehicle traffic from bike lanes, and
- Wide sidewalks on both sides to facilitate pedestrian movement.



Southern Section: US-1/Capital Boulevard to Rogers Road

Concept B: Full Optimization

Recommendations for a full redesign include:

- Parallel parking to enhance local business access,
- Separated bike lanes for bicyclist safety,
- Wide sidewalks on both sides, enhancing pedestrian accessibility, and
- Like A, B also recommends narrowing lanes to 11' wide and installing planted medians to prevent dangerous and unpredictable turn movements.

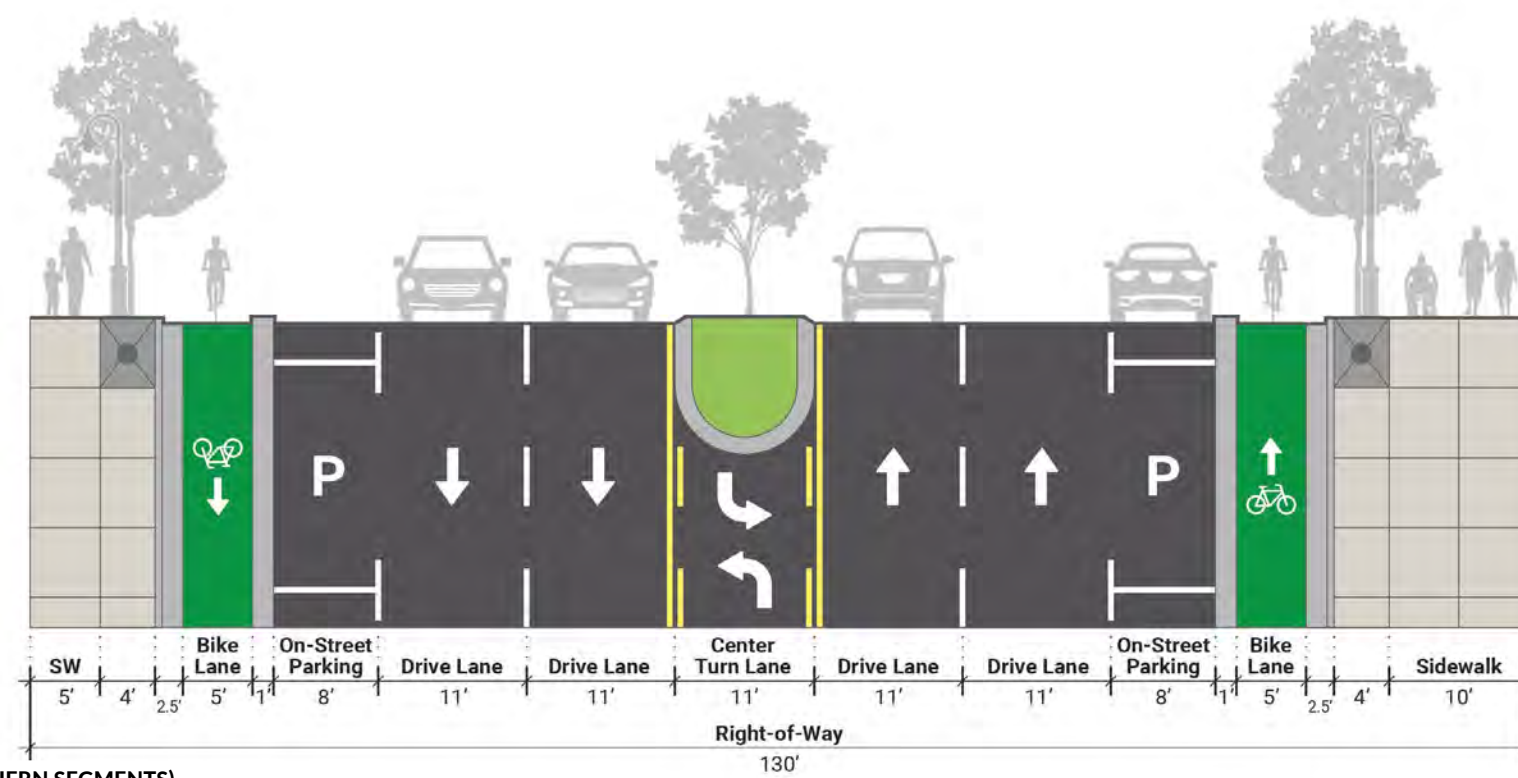
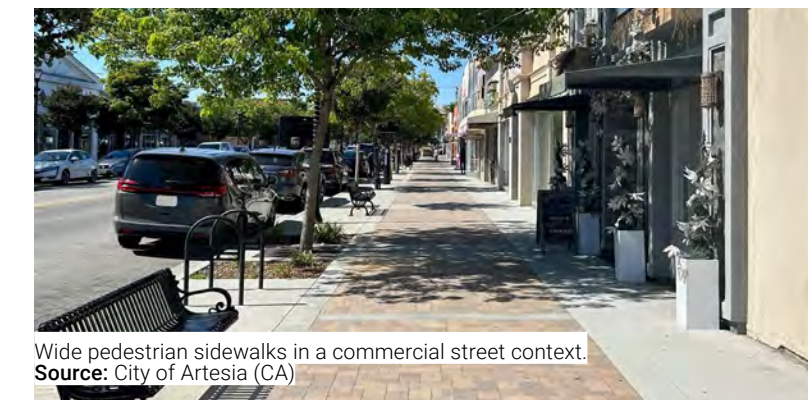
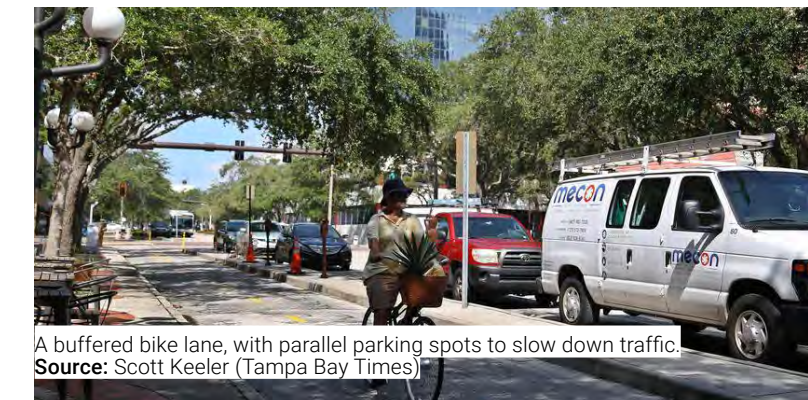


FIGURE 4-E PROPOSED CROSS-SECTIONS (NORTHERN AND SOUTHERN SEGMENTS)



DESIGN CRITERIA

Design criteria consist of guidelines and specifications that a design must meet. They are the “what” and “why” of the design process, providing a framework for what needs to be achieved. Their primary purpose is to set clear, measurable goals and limitations that guide the design process.

For the proposed redesign of the South Main Street corridor, four key criteria have been defined to address both present and anticipated challenges:

- **Safety:** Does the design make South Main Street safer for all users?
- **Bicycle & Pedestrian:** Does the design enhance the experience and usability of the corridor for biking and walking?
- **Capacity:** How does the design impact the surrounding natural and built environment?
- **Impacts:** How does the design impact traffic flow and capacity on South Main Street?

These criteria inform the development of design alternatives that enhance safety, promote active transportation, optimize traffic flow, and minimize adverse impacts on the community and environment.

"Cars speed way too fast here to beat the light (@ NC 98)"

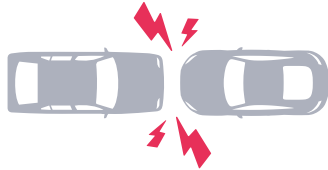
"Cannot bike to Wegmans"

"There needs to be traffic control near Walmart entrance (signalized)"

- Public Feedback Comments

SAFETY ←.....

Evaluates whether the design contributes to a safer environment for all corridor users.



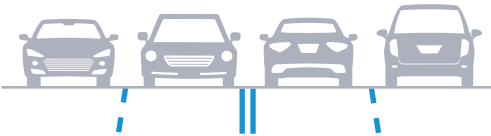
BICYCLE & PEDESTRIAN ←.....

Assesses the design's effectiveness in improving the corridor's functionality and appeal for bicyclists and pedestrians.




CAPACITY ←.....

Considers the design's impact on traffic flow and overall capacity of South Main Street.



IMPACTS ←.....

Examines the potential effects of the design on the local natural and built environments.



DESIGN ELEMENTS

Design elements are the “how” of the design process, focusing on the creation and composition of the design itself. As part of the approach towards concept development, the design team selected specific design elements that will be used to realize these concepts.

Feedback from residents, stakeholders and team members at this stage helped make adjustments to these elements, so that the outcome of this iterative process gives way to a full concept design.

ROUNDAABOUTS

Modern roundabouts accommodate large vehicles, including fire trucks and ambulances, without causing delays, featuring:

- **Aprons:** Provide traversable sections for large vehicles to pass over.
- **Design Vehicle Standards:** Accommodate large truck turning radii within the roundabout's dimensions.
- **Curb-to-Curb Width:** Widen entrance and exit curb widths for easier navigation.
- **Roll Curbs:** Facilitate transition from roadway to apron with sloped curbs.

Compared to signalized intersections, roundabouts offer:

- **Continuous Traffic Flow:** Avoid complete vehicle stops by yielding at entry.
- **Traffic Calming:** Reduce entry speeds to between 15 and 20 mph, improving safety.
- **Predictable Movement:** Minimize severe collision types with counterclockwise flow.



Example of a roundabout.



Roundabouts can accommodate large trucks.



Aerial view of a roundabout design.

HIGH-QUALITY INTERSECTIONS

To improve pedestrian and bicyclist crossings on South Main Street:

- **Curb Extensions:** Shorten crossing distances and provide green infrastructure opportunities, like stormwater curb extensions.
- **High-Visibility Crosswalks:** Improve visibility and potentially reduce pedestrian crashes by up to 40%, according to Federal Highway Administration (FHWA) studies.
- **Pedestrian Refuge Islands:** Offer a safe midway point for crossing wider intersections.



Example of a high-quality intersection.

SEPARATED BIKE FACILITIES

Feedback highlighted a preference for separation from traffic:

- **Separated Bike Lanes:** Use curbing or parked cars to horizontally and vertically separate bicyclists from traffic, enhancing safety.
- **Sidepath:** Combine bikeway and walkway for bicyclists and pedestrians, raising them above street level.
- **Intersection Treatments:** Enhance visibility with green paint and markings for bike lanes; sidepaths allow bicyclists and pedestrians to share crosswalks.



Example of a separated bike lane at an intersection.

URBAN TREE CANOPY

Trees along South Main Street serve multiple purposes:

- **Traffic Calming:** Serve as vertical elements and perceived enclosure slow vehicle speeds.
- **Cooling Effect:** Provide shade that can significantly reduce surface temperatures, cooling the area.
- **Stormwater Management:** Absorb excess stormwater through the roots, reducing runoff.
- **Enhanced Safety:** Provide a buffer between pedestrians/bicyclists and vehicular traffic, improving overall safety and experience.



Example of a tree-lined typical street.

ENHANCED ACCESSIBILITY IMPROVEMENTS

To provide an inclusive and accessible experience for all users:

- **Universal Design Principles:** Apply universal design principles to ensure transportation infrastructure accommodates all users, including elderly individuals and those with disabilities.
- **Ensure American with Disabilities Act (ADA) Compliance:** Make all infrastructure compliant with ADA, including accessible sidewalks and crossings.



Example of an ADA-compliant curb ramp.

GREEN INFRASTRUCTURE FOR STREETS

To enhance transportation supportive sustainability and resilience efforts:

- **Bioswales and Rain Gardens:** Incorporate bioswales and rain gardens along streets to manage stormwater, improve water quality, and enhance the aesthetic appeal of transportation corridors.
- **Permeable Surfaces:** Increase use of hardscape materials in paved areas used for walking or parking that are permeable allowing for better management of stormwater on site.



Example of a bioswale integrated into a suburban street.



Example of permeable pavers in a pedestrian-friendly streetscape. Source: Unilock



Example of rain gardens planted with native plants. Source: Ballard Green Streets Project



Participants during the first Open House event.



Existing conditions on the corridor.



Participants providing feedback on the corridor design during the second Open House event.

CONCEPT DESIGN

This section introduces two, high-level concept design alternatives for the South Main Street corridor, offering strategies focused on access management, intersection improvements, and enhanced multi-modal connectivity. Leveraged from previous data analysis and community feedback, each of these two distinct concept designs is crafted to address the challenges identified along the corridor effectively.

The following pages will show a more detailed exploration of these proposed design alternatives, laying the groundwork for the future development of detailed engineering plans once a preferred design is selected and the necessary funding is secured.

WHAT WE LOOKED AT:

- Concept A: Partial Optimization
- Concept B: Full Optimization
- Ligon Mill Road Intersection
- Rogers Road Intersection
- Forbes Road Roundabout
- Cimarron Parkway Roundabout
- Forestville Road Roundabout

Corridor Concept Design Options: Visualize these designs on Fig. 4-F and Fig. 4-L ➔

CONCEPT A: PARTIAL OPTIMIZATION

Concept A focuses on optimizing the existing roadway within the current right-of-way boundaries to enhance South Main Street's overall functionality. By leveraging the public land surrounding the corridor, this concept minimizes the need for extensive right-of-way acquisitions, making strategic use of the available space. Despite its constraints, Concept A ambitiously addresses the corridor's existing challenges by incorporating new multi-use paths, roundabouts, enhanced crosswalks, and medians enriched with a lush tree canopy. This approach maintains the current

roadway configuration—five lanes in the southern segment and three lanes in the northern segment—while introducing a central median that, in specific sections, transitions to a center turning lane or dedicated left-turn lanes near key intersections. This median enhances pedestrian safety and provides opportunities for greenery, contributing to the corridor's aesthetic appeal. The design also proposes a reduction in vehicle lane widths from 12-13 feet to 11 feet, a measure intended to calm traffic and improve vehicular safety.

Sidewalks are widened on one side, complemented by a sidepath on the opposite side, with both flanked by a 5-foot planting strip that acts as a buffer between pedestrians, bicyclists, and vehicular lanes. While preserving its car-centric characteristics, Concept A introduces significant improvements for pedestrian and bicyclist safety, promoting incremental changes that refine rather than redefine the street's identity.

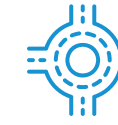
BY THE NUMBERS



1.9 Miles of continuous sidepath



457 Added street trees



4 New roundabouts to reduce vehicle speeds



Southern Section: US-1/Capital Blvd to Rogers Rd
South Main Street: Proposed 5-Lane Section



Northern Section: Rogers Rd to 98 Bypass
South Main Street: Proposed 3-Lane Section



Conceptual only: not for construction.

CONCEPT A: LIGON MILL ROAD INTERSECTION

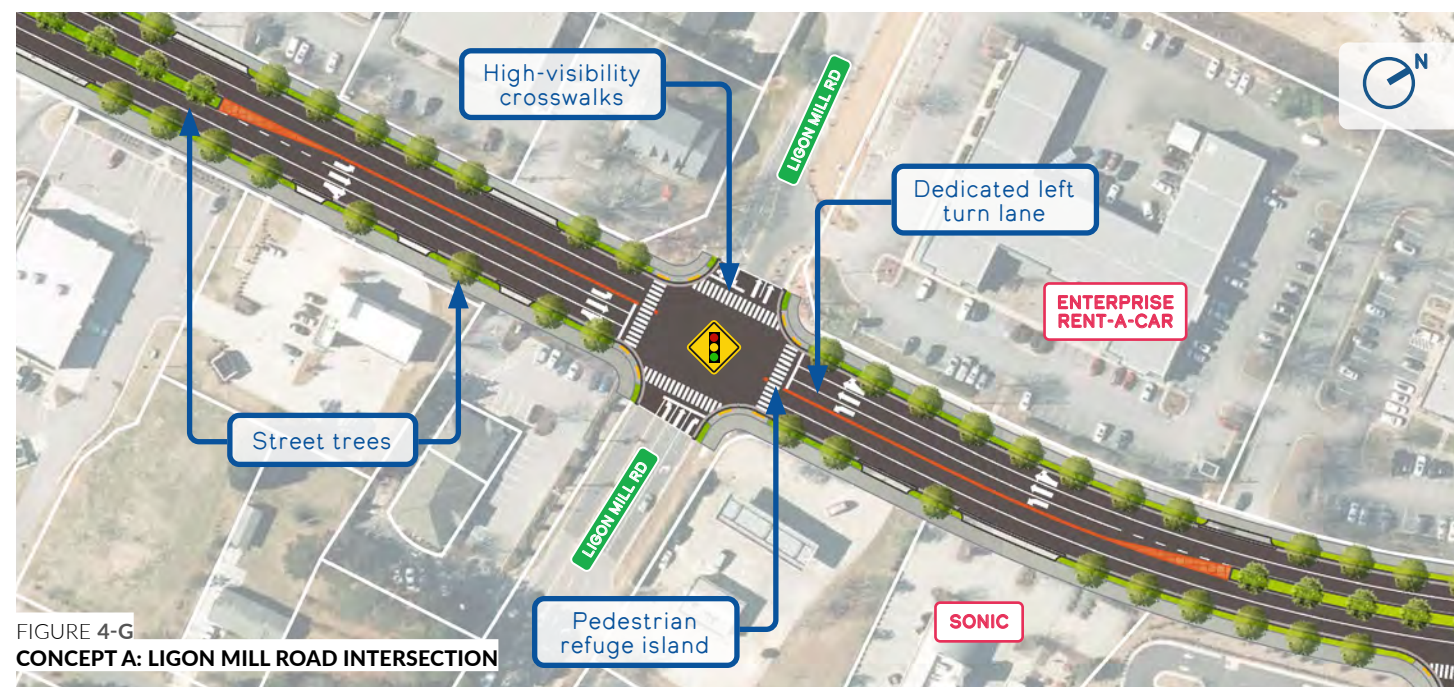
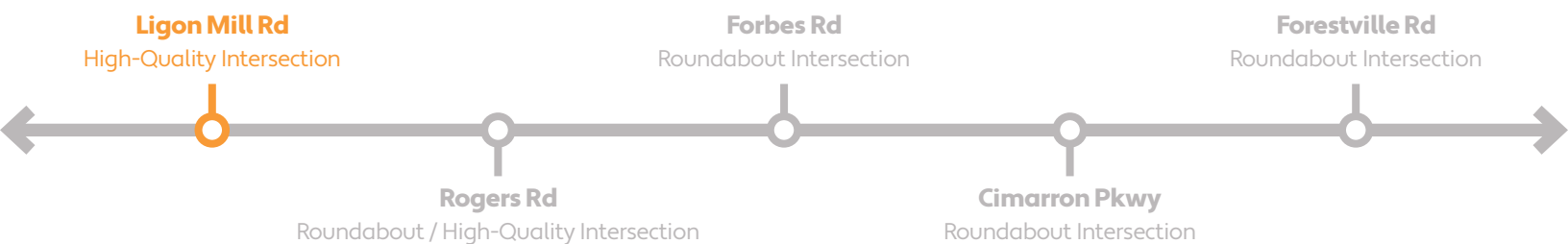


FIGURE 4-G
CONCEPT A: LIGON MILL ROAD INTERSECTION

RECOMMENDATIONS

- **Cross-Section:** Four-lane divided/five-lane section, with median islands where indicated.
- **Lane Width:** 11 ft travel lanes.
- **Bike Facilities:** Continuous 12 ft sidepath on one side (northbound), with a 5.5 ft planting strip buffer.
- **Pedestrian Facilities:** Continuous sidewalks (minimum 8 ft width) along southbound side, with a 5.5 ft planting strip buffer. High-visibility crosswalks with a narrow pedestrian refuge island.
- **Traffic Calming/Speed Management:** 11 ft wide center median island to reduce speeds and allow for left turn movements as it approaches intersection.
- **Streetscaping & Lighting:** Street trees planted in accordance with NCDOT Guidelines for Planting within Highway Right-of-Way, and pedestrian-level lighting. Small canopy street trees proposed for the center median.
- **Other Features:** ADA-compliant curb ramps at all approaches.

SNAPSHOT: 5-LANE SECTION (BETWEEN LIGON MILL RD & ROGERS RD)



Existing 5-Lane Section along South Main Street.

This segment of the corridor envisions a transformation of the southern section of South Main Street from the existing five-lane section to a proposed four-lane divided/ five-lane section with median islands that allow for turning movements in key access areas.

The proposed design includes a continuously buffered sidewalk and a sidepath, further enhancing the public realm and creating walking-friendly environments through the integration of street trees, landscaping, and quality streetscapes to bring multiple benefits that extend well beyond simply improving pedestrian safety.



Proposed 5-Lane Section along South Main Street (Photosim).

CONCEPT A: ROGERS ROAD INTERSECTION

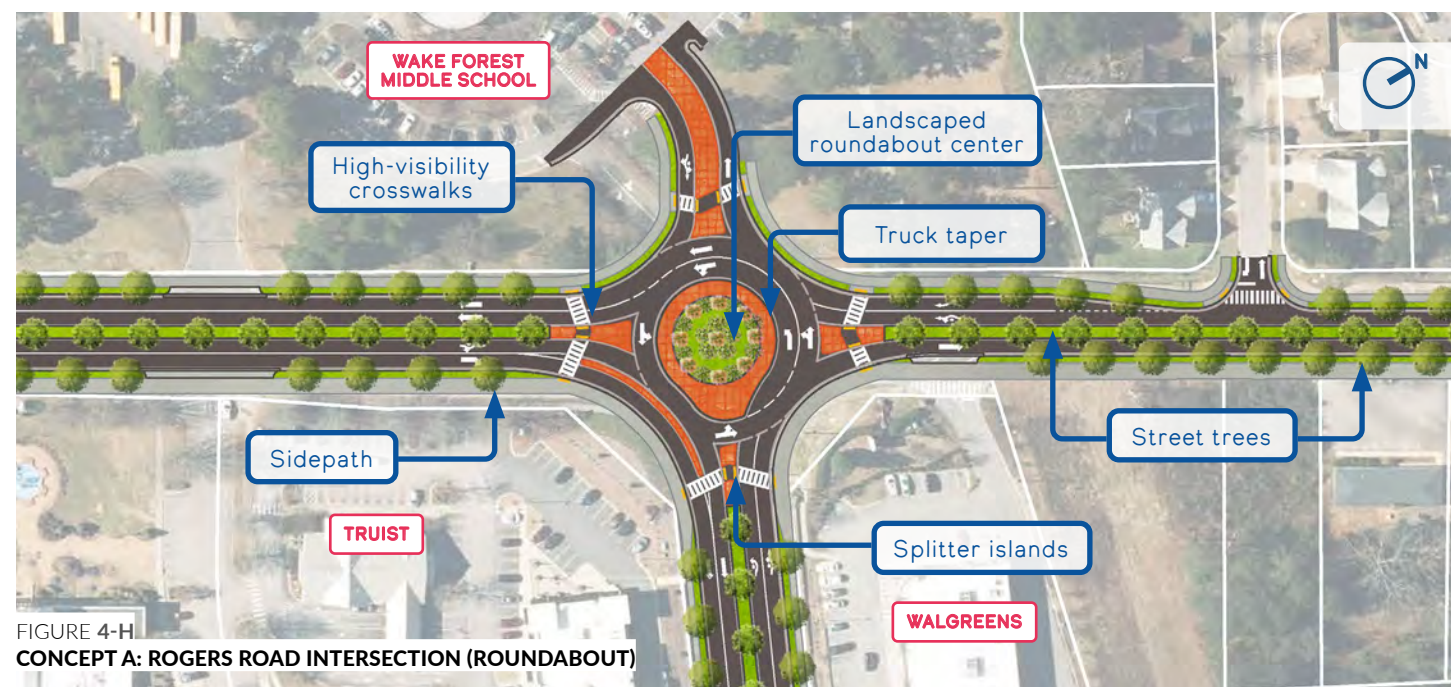
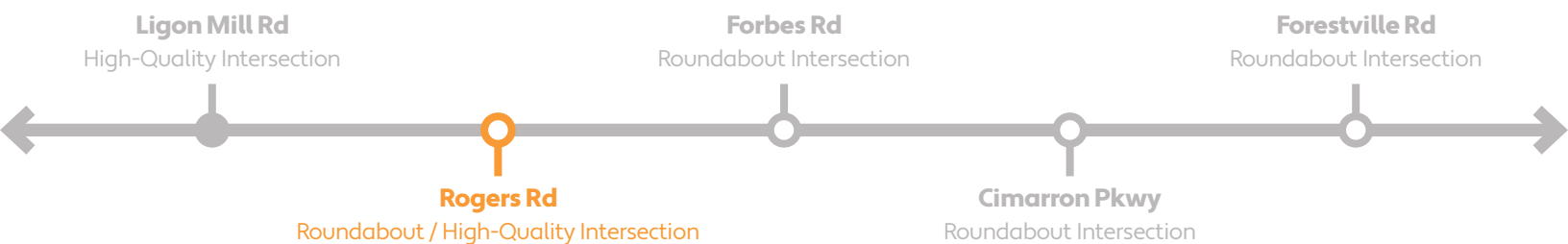
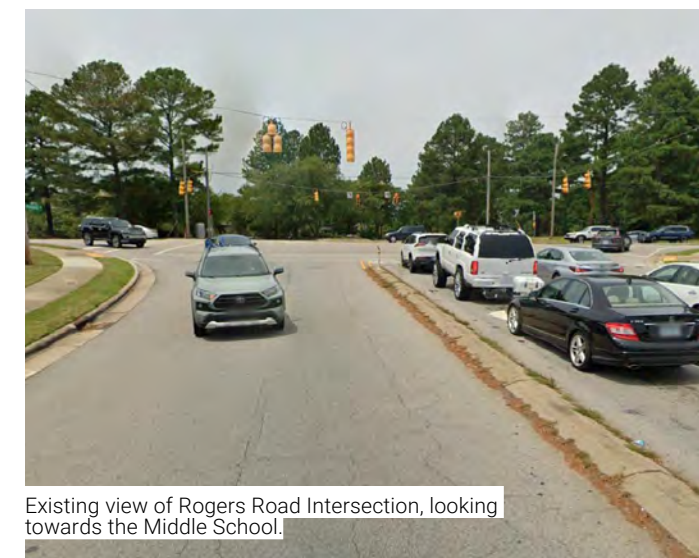


FIGURE 4-H
CONCEPT A: ROGERS ROAD INTERSECTION (ROUNDAABOUT)

RECOMMENDATIONS

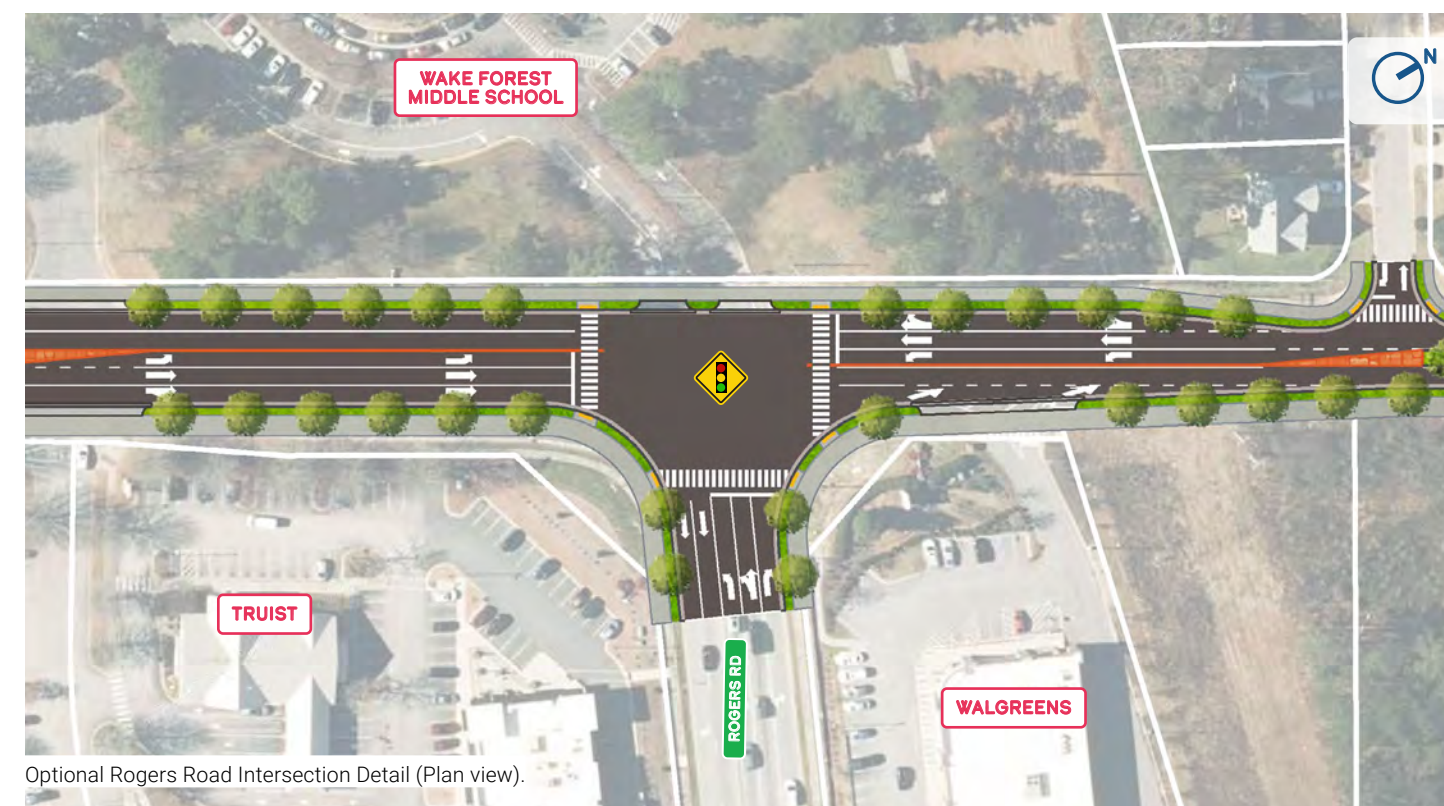
- **Cross-Section:** Four-lane divided/five-lane section, with median islands where indicated. This treatment gives way to the roundabout intersection elements.
- **Lane Width:** 11 ft travel lanes.
- **Bike Facilities:** Continuous 12 ft sidepath on one side (northbound), with a 5.5 ft planting strip buffer. Bicyclists traveling through the roundabout will share sidewalk with pedestrians when crossing.
- **Pedestrian Facilities:** Continuous sidewalks (minimum 8 ft width) along southbound side. High-visibility crosswalks with splitter islands.
- **Traffic Calming/Speed Management:** Drivers travel counterclockwise around the central island, yielding to traffic already in the circle and to pedestrians and cyclists in crosswalks.
- **Streetscaping & Lighting:** Street trees and pedestrian-level lighting before the roundabout. Landscaped roundabout center.
- **Other Features:** ADA-compliant curb ramps at all approaches. Truck apron around the central island to allow for turning movements.

SNAPSHOT: OPTIONAL ROGERS RD INTERSECTION ALTERNATIVE



Two primary redesign alternatives have been considered: the introduction of a roundabout, as depicted in **Figure 4-H**, versus a traditional signalized intersection, illustrated below. Roundabouts are known to reduce the incidence of high-speed collisions and serious injuries by allowing a continuous, slower traffic flow and reducing vehicular conflict points. Conversely, even with enhanced signal timing, traditional intersections often grapple with the risk of right-angle and left-turn accidents.

Although roundabouts need considerable space, traditional intersections tend to be more familiar to drivers and might be perceived as simpler to navigate, especially by those who are unfamiliar with roundabouts.



Optional Rogers Road Intersection Detail (Plan view).

Note: Alignment in this section does not reflect final engineering design. Final design subject to further review.

CONCEPT A: FORBES ROAD INTERSECTION

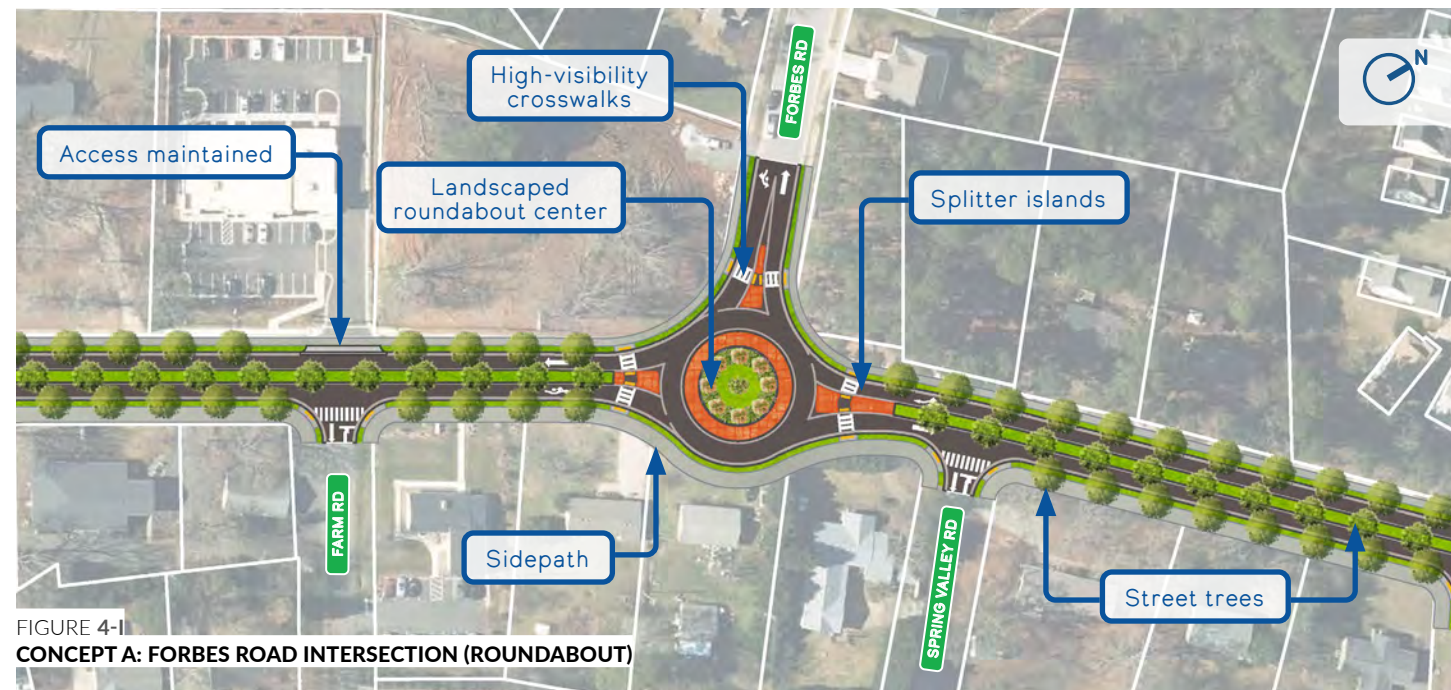
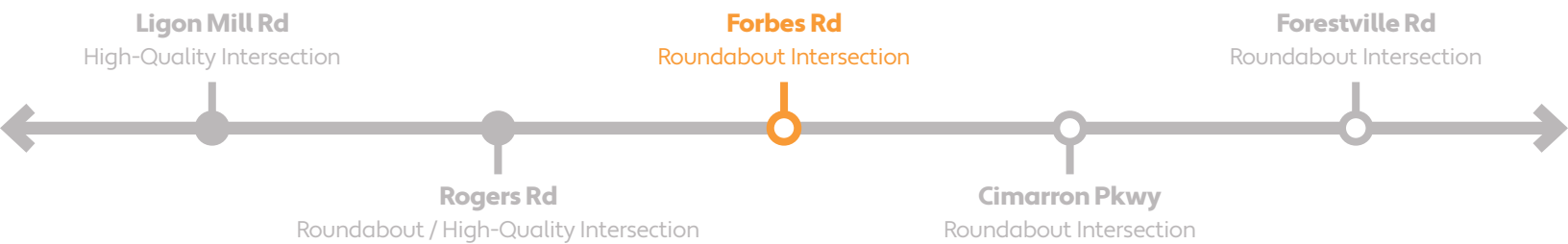


FIGURE 4-1
CONCEPT A: FORBES ROAD INTERSECTION (ROUNDAABOUT)

RECOMMENDATIONS

- **Cross-Section:** Two-lane divided/three-lane section, with median islands. This treatment gives way to the roundabout intersection elements.
- **Lane Width:** 11 ft travel lanes.
- **Bike Facilities:** Continuous 12 ft sidepath on one side (northbound), with a 5 ft planting strip buffer. Bicyclists can use sidepath following same rules as pedestrians, crossing at designated crosswalks.
- **Pedestrian Facilities:** Continuous sidewalks (minimum 6 ft width) along southbound side. High-visibility crosswalks to be easily noticeable by drivers.
- **Traffic Calming/Speed Management:** Single-lane configuration encourages a steady but slower pace that facilitates safer merges and turns, efficiently managing varying volumes of traffic and easing congestion during peak travel times.
- **Streetscaping & Lighting:** Landscaped central island that can include low-height shrubs, flowers, and groundcovers. LED lighting fixtures recommended.
- **Other Features:** ADA-compliant curb ramps at all approaches. Truck apron around the central island to allow for turning movements.

SNAPSHOT: FORBES RD ROUNDAABOUT



Existing Forbes Road & South Main Street intersection (aerial).

The proposed redesign for the Forbes Road intersection features a single-lane, three legged roundabout. This type of roundabout features a single circulating lane around a landscaped central island and three approaches (or legs).

This treatment aims to simplify entry and exit decisions for drivers, reducing the potential for collisions. Entry points are gently curved to slow incoming traffic, promoting safety as vehicles merge into the circular flow. This configuration also supports pedestrian and bicyclist movements through clearly defined crosswalks and paths.



Proposed Forbes Road & South Main Street roundabout (aerial render).

CONCEPT A: CIMARRON PARKWAY INTERSECTION

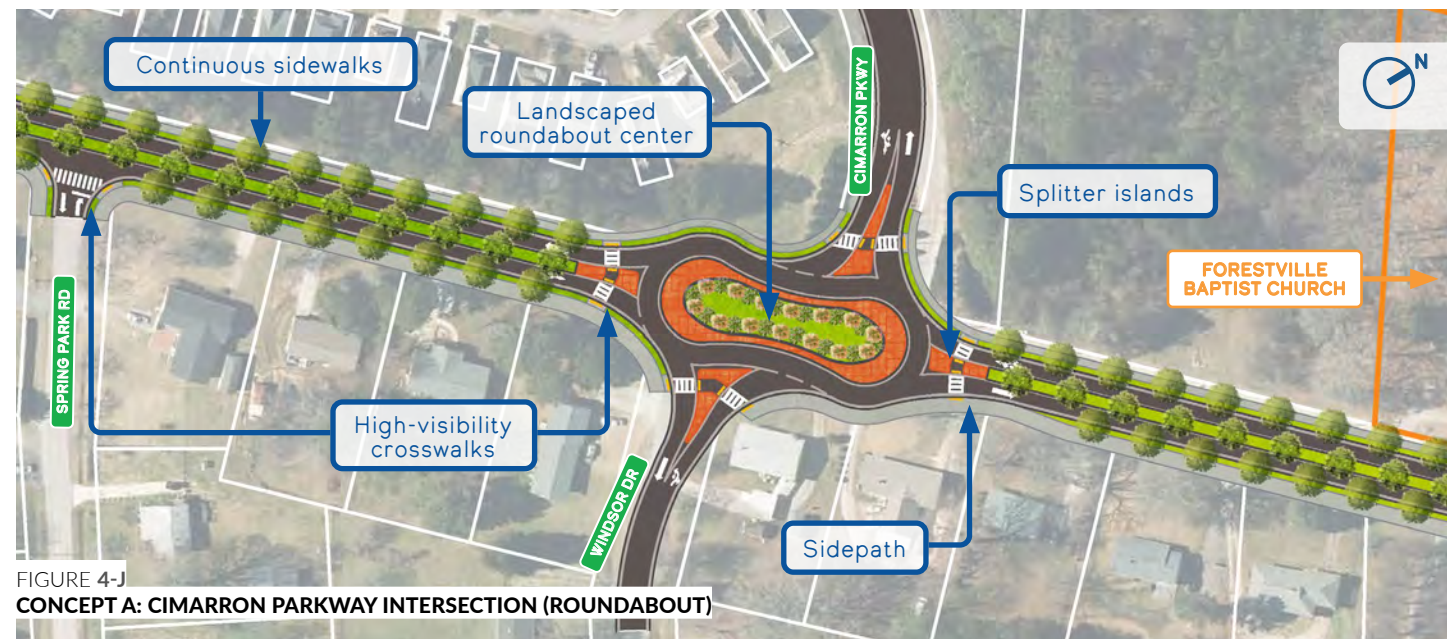
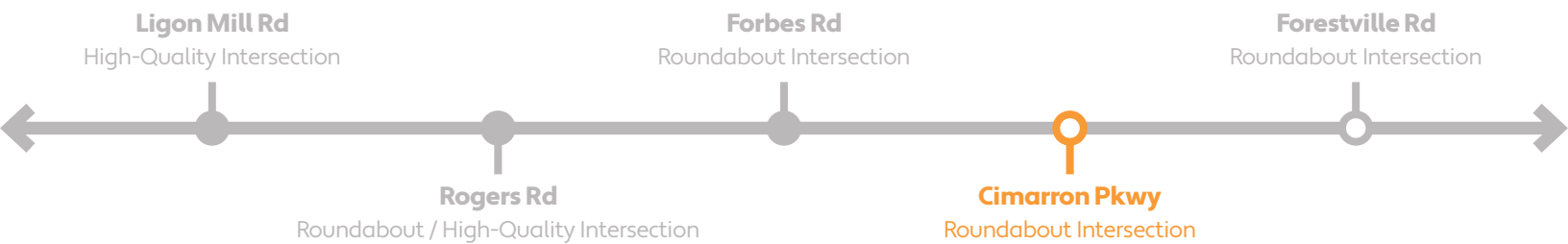
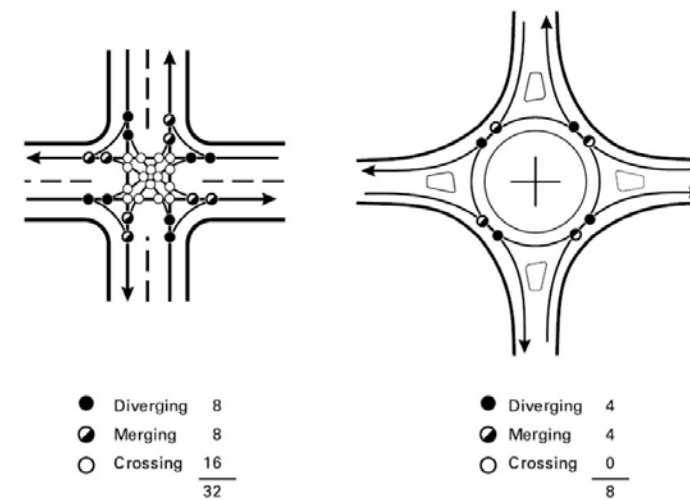


FIGURE 4-J
CONCEPT A: CIMARRON PARKWAY INTERSECTION (ROUNDAABOUT)

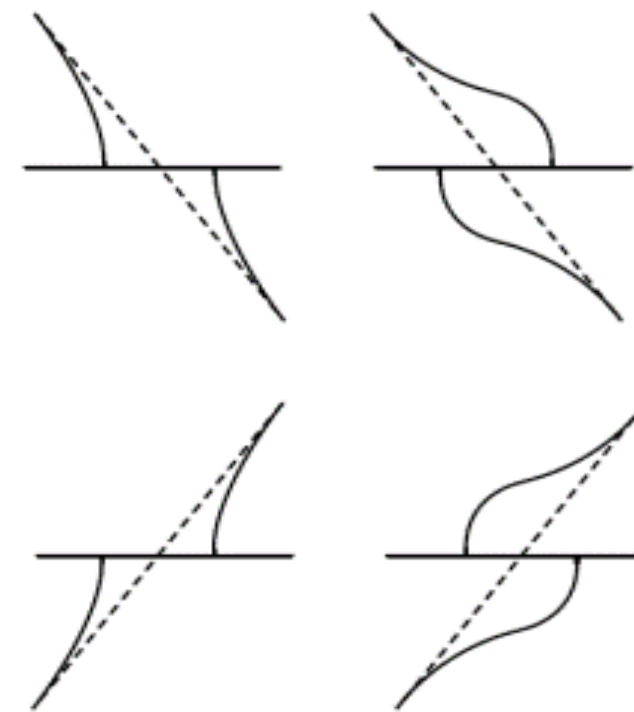
RECOMMENDATIONS

- **Cross-Section:** Two-lane divided/three-lane section, with median islands.
- **Lane Width:** 11 ft travel lanes.
- **Bike Facilities:** Continuous 12 ft sidepath on one side (northbound), with a 5 ft planting strip buffer before the Windsor Drive crossing.
- **Pedestrian Facilities:** Continuous sidewalks (minimum 6 ft width) along southbound side. High-visibility crosswalks and splitter islands at each approach provide safety refuge to reduce crossing distance.
- **Traffic Calming/Speed Management:** Roundabouts are effective at slowing traffic while maintaining flow and minimizing delay. The proposed peanut roundabout addresses the unsafe offset of side streets, essentially blending two intersections into a single roundabout.
- **Streetscaping & Lighting:** Landscaping and decorative paving materials (bricks, stamped concrete or cobblestones) to provide durable surfaces. Bollard lights or other lower-height fixtures can provide illumination without contributing to light pollution in this mostly residential segment.
- **Other Features:** ADA-compliant curb ramps at all approaches.

SNAPSHOT: PEANUT ROUNDAABOUTS



Skewed Roadway and Roundabout Conflict Points Comparison.



Geometric Realignment of Skewed Roadways.

Roundabouts bring together two or more crossing roadways along a shared circular roadway, not only moving vehicular traffic in the same direction, but also at similar speeds. This results in significant reduction in conflict points and collision severity at those points. Whereas a traditional 4-way, signalized intersection has 32 conflict points, a roundabout in the same location only has 8 conflict points – including 0 crossing (the most dangerous) conflict points:

Skewed intersections are exceptionally dangerous. They require drivers to contort their bodies to judge on-coming traffic, divert drivers' vision and attention from their intended direction of travel, allow higher turning movement speeds, and create longer crossing distances for pedestrians. By connecting two consecutive roundabouts, peanut roundabouts address both safety and intersection operation.

- Horizontal curves on the primary route reduces the speed of thru traffic.
- Offsetting entrance and exits for side streets reduces construction cost and property impacts.
- Vehicles are accommodated, but forced to lower speeds, improving bike and pedestrian safety.
- The unique design creates a landmark, defining the intersection and a neighborhood gateway.

When upfitting existing intersections, construction is always constrained by existing geometry. Realigning skewed roadways to intersect at perpendicular angles (into a "T" shape) increases safety but causes the crossings to become offset and create two 3-way intersections in rapid succession. This reduces the operational performance of the intersection.

CONCEPT A: FORESTVILLE ROAD INTERSECTION

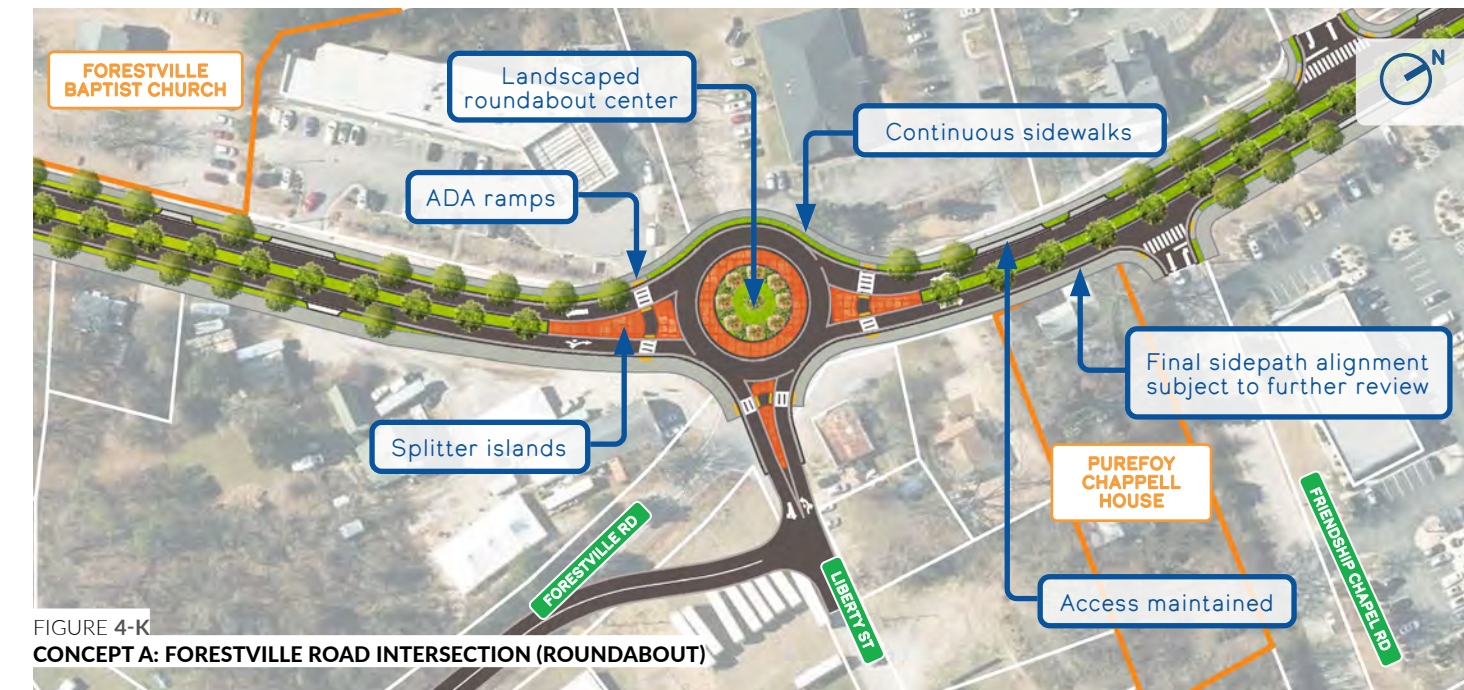
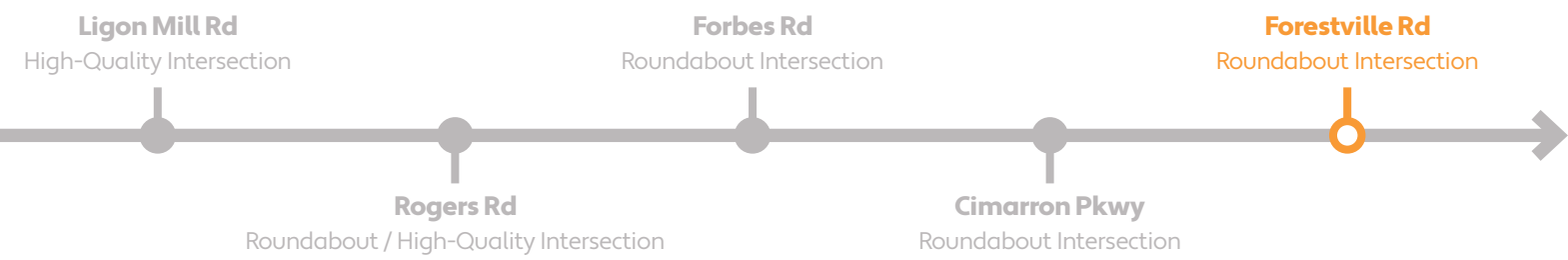


FIGURE 4-K
CONCEPT A: FORESTVILLE ROAD INTERSECTION (ROUNDBOUT)

RECOMMENDATIONS

- **Cross-Section:** Two-lane divided/three-lane section, with median islands. This treatment gives way to the roundabout intersection elements.
- **Lane Width:** 11 ft travel lanes.
- **Bike Facilities:** Continuous 12 ft sidepath on one side (northbound), before the Liberty Street crossing and reduction to a 5 ft sidewalk for the segment before Friendship Chapel Road to accommodate for historic properties.
- **Pedestrian Facilities:** Continuous sidewalks (minimum 6 ft width) along southbound side.
- **Traffic Calming/Speed Management:** Increased safety due to lower speeds and fewer conflict points, reduced congestion, and enhanced aesthetics. Simplified traffic flow for drivers.
- **Streetscaping & Lighting:** Opportunity to incorporate public art into central island to celebrate local culture or history. Native and seasonal plantings recommended. Aesthetic lighting can be used to highlight landscaping and other features.
- **Other Features:** All hardscaping and landscaping features to comply with accessibility standards.

CONCEPT B: FULL OPTIMIZATION

Concept B: Full Optimization aims to fully transform South Main Street into a walkable, green gateway into the heart of Wake Forest, without being constrained by existing right-of-way boundaries. This ambitious concept suggests widening the right-of-way to 130 feet in the southern section and to 89 feet in the northern section of the corridor. It features a holistic enhancement of bicycle and pedestrian pathways, the introduction of roundabouts, high-visibility crosswalks, and medians filled with lush greenery. Additionally, it integrates green

infrastructure within curb bump-outs, significantly bolstering stormwater management while supporting local biodiversity, thereby infusing unique charm into the corridor. Concept B plans for 5-foot-wide bicycle lanes that are physically separated from vehicular lanes by barriers, such as a 1-foot monolithic curb adjacent to an on-street parking lane, or by differences in elevation. This includes curb-level 10-foot-wide sidepaths to provide safer navigation through roundabouts. It also proposes the expansion of sidewalks and the strategic placement of

on-street parking, which serves not only to facilitate access, but also to create an 8-foot-wide buffer zone enhancing safety for pedestrians and bicyclists. This buffer, positioned between the separated bicycle lanes or sidewalks and the roadway, also serves to calm traffic by creating a visual narrowing of the road. The thoughtful incorporation of on-street parking provides designated areas for disabled vehicles and emergency services, aimed at reducing interruptions to traffic flow.

BY THE NUMBERS

- 305** On-street parking spots
- 434** Added street trees
- 3.8** Miles of new separated bike lanes



Southern Section: US-1/Capital Blvd to Rogers Rd
South Main Street: Proposed 5-Lane Section



Northern Section: Rogers Rd to 98 Bypass
South Main Street: Proposed 3-Lane Section



Conceptual only: not for construction.

CONCEPT B: LIGON MILL ROAD INTERSECTION

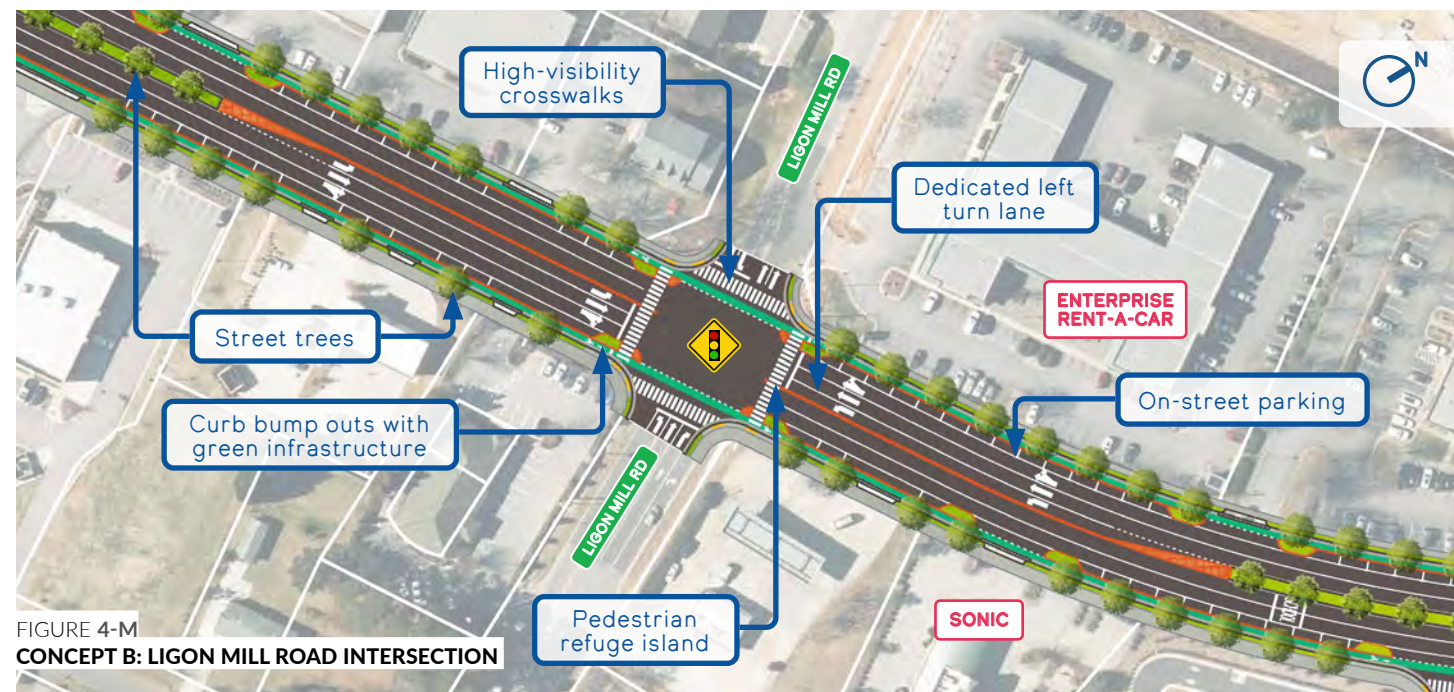
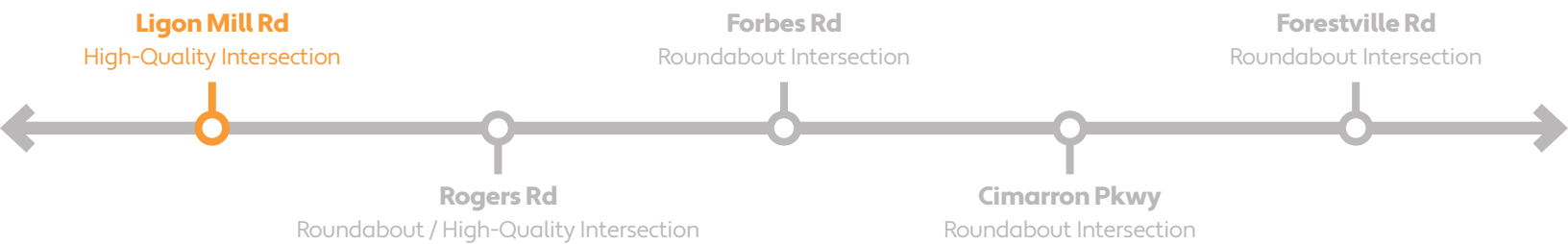


FIGURE 4-M
CONCEPT B: LIGON MILL ROAD INTERSECTION

RECOMMENDATIONS

- **Cross-Section:** Four-lane divided/five-lane section, with median islands where indicated. On-street parking (8 ft wide) on both sides.
- **Lane Width:** 11 ft travel lanes.
- **Bike Facilities:** Continuous 5 ft separated bike lanes with a 1 ft wide curb between the bike lane zone and on-street parking for both sides of the road.
- **Pedestrian Facilities:** Continuous sidewalks (10 ft wide along northbound side and 5 ft wide on southbound side), with a 4 ft planted or brick pavers buffer. High-visibility crosswalks on all sides of intersection.
- **Traffic Calming/Speed Management:** 11 ft wide center median island to reduce speeds and allow for left turn movements as it approaches intersection.
- **Streetscaping & Lighting:** Street trees every 20 feet line both sides of the roadway on the planting strip buffer, and pedestrian-level lighting. Smaller street trees proposed for the center median.
- **Other Features:** ADA-compliant curb ramps. Green infrastructure integrated into curb bump outs to enhance pedestrian safety and manage stormwater.

SNAPSHOT: LIGON MILL RD INTERSECTION



View of Ligon Mill Road intersection (Existing).

For the area around the Ligon Mill Road intersection, public feedback highlighted a strong desire for improved and expanded sidewalks, bike lanes, and paths that are safely separated from vehicular traffic. Featuring separated 5 ft bike lanes on each side of the road, buffered by a 1 ft raised curb and adjacent to on-street parking the proposed redesign for this section includes more walkable and bike-friendly environments that encourage active transportation and recreation. Additionally, curb bump outs integrated with green infrastructure serve to enhance pedestrian safety and manage stormwater more effectively. These considerations aim to support a more resilient and ecologically friendly urban environment.



Photosim of Ligon Mill Road intersection (Proposed).

CONCEPT B: ROGERS ROAD INTERSECTION

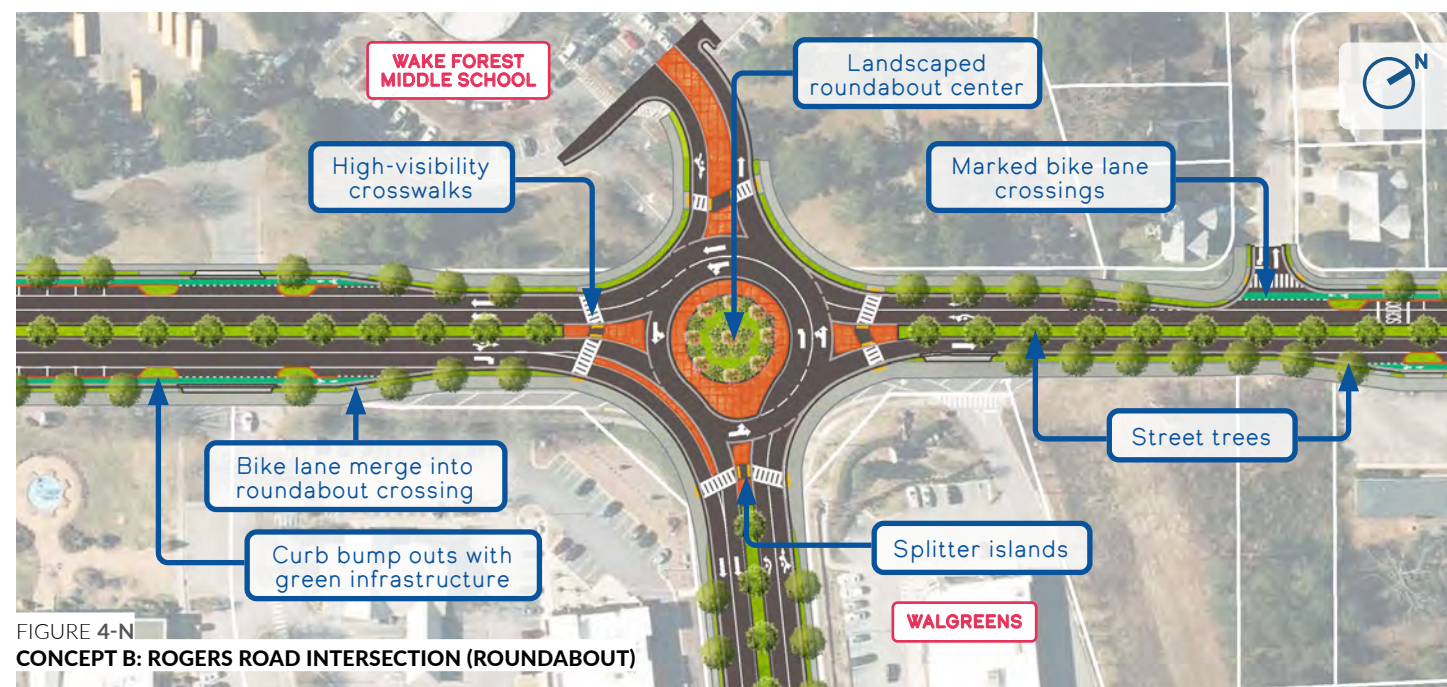
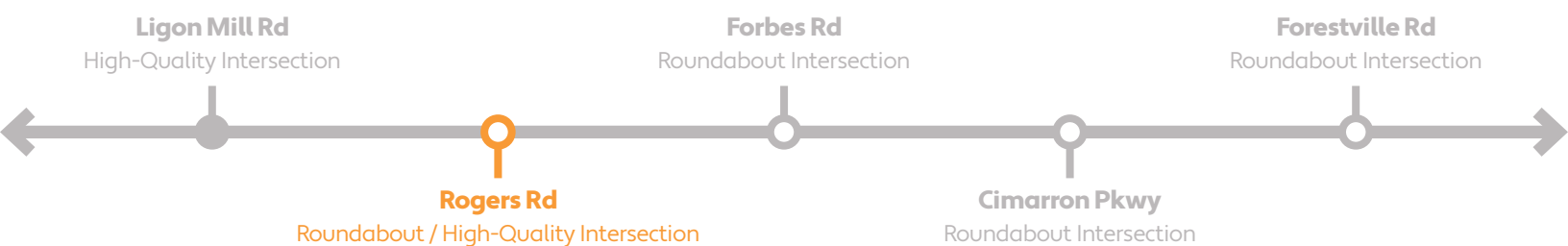


FIGURE 4-N
CONCEPT B: ROGERS ROAD INTERSECTION (ROUNDAABOUT)

RECOMMENDATIONS

- **Cross-Section:** Four-lane divided/five-lane section, with median islands where indicated. This treatment gives way to the roundabout intersection elements.
- **Lane Width:** 11 ft travel lanes.
- **Bike Facilities:** Continuous 5 ft separated bike lanes with a 1 ft wide curb for both sides of the road. Bicyclists traveling through the roundabout will share sidewalk with pedestrians when crossing.
- **Pedestrian Facilities:** Continuous sidewalks (10 ft wide along northbound side and 5 ft wide on southbound side), with a 4 ft planted or brick pavers buffer. High-visibility crosswalks with splitter islands.
- **Traffic Calming/Speed Management:** Drivers travel counterclockwise around the central island, yielding to traffic already in the circle and to pedestrians in crosswalks.
- **Streetscaping & Lighting:** Street trees and pedestrian-level lighting before the roundabout. Landscaped roundabout center.
- **Other Features:** ADA-compliant curb ramps at all approaches. Truck apron around the central island to allow for turning movements. Green infrastructure integrated into curb bump outs.

SNAPSHOT: DIRECT TRANSITION TO SIDEPATH BEFORE THE ROUNDAABOUT (BIKE LANE MERGE)



Example of a bike lane transition into a sidewalk or sidepath.
Source: Maricopa Association of Governments

Navigating roundabout efficiently and safely with a combination of bike lanes and sidepaths requires careful design to accommodate all users while minimizing conflicts and maintaining flow. For the proposed Concept B redesign alternative, bike lanes can transition into a sidepath well before the roundabout. This design diverts bicyclists off the roadway, merging them with pedestrians on a shared path that circumnavigates the roundabout externally. This treatment aims to reduce conflicts between bicyclists and motor vehicles within the roundabout; as well as providing a clearer and safer route for bicyclists who may not be comfortable navigating the roundabout with motor traffic.



Diagram of proposed bike lane transition into sidepath for navigation along roundabout intersection.

CONCEPT B: FORBES ROAD INTERSECTION

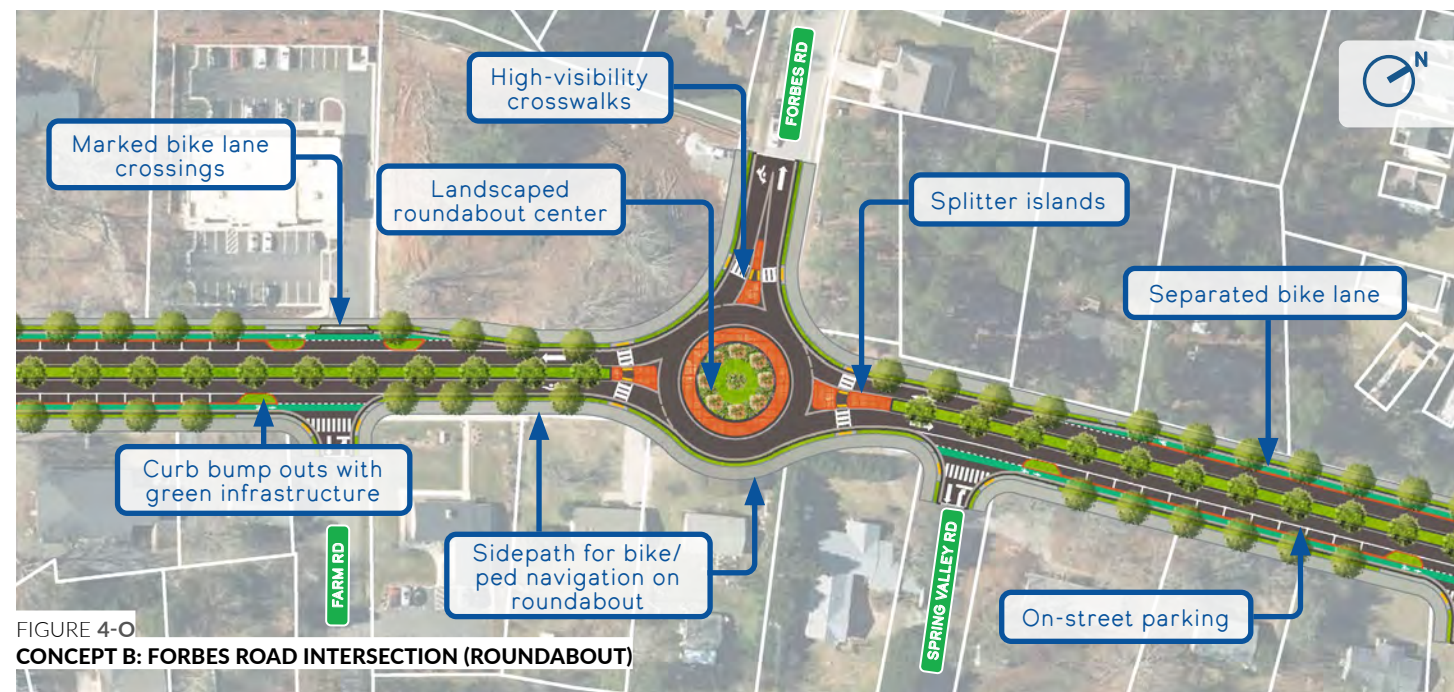
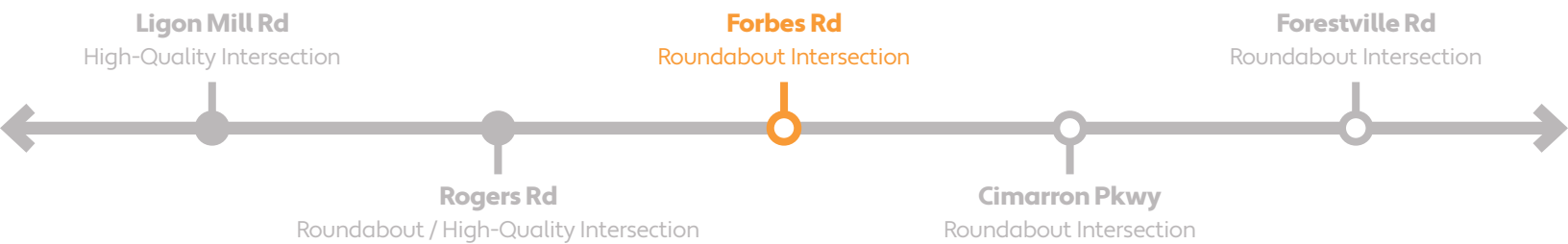
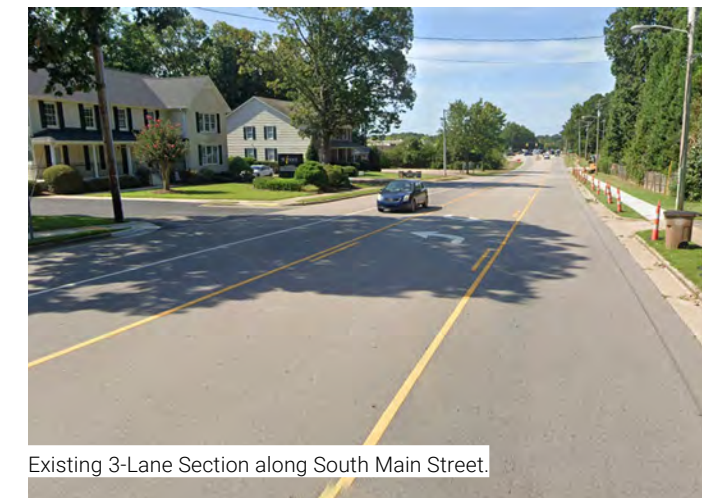


FIGURE 4-0
CONCEPT B: FORBES ROAD INTERSECTION (ROUNDAABOUT)

RECOMMENDATIONS

- **Cross-Section:** Two-lane divided/three-lane section, with median islands. This treatment gives way to the roundabout intersection elements.
- **Lane Width:** 11 ft travel lanes.
- **Bike Facilities:** Continuous 5 ft separated bike lanes with a 1 ft wide curb for both sides of the road. Bicyclists can use 10 ft sidewalk following same rules as pedestrians, to cross at designated crosswalks.
- **Pedestrian Facilities:** Continuous sidewalks (10 ft wide on both sides), with a 4 ft planted buffer. High-visibility crosswalks to be easily noticeable by drivers.
- **Traffic Calming/Speed Management:** Single-lane configuration encourages a steady but slower pace that facilitates safer merges and turns, efficiently managing varying volumes of traffic and easing congestion during peak travel times.
- **Streetscaping & Lighting:** Landscaped central island that can include low-height shrubs, flowers, and groundcovers. LED lighting fixtures recommended.
- **Other Features:** ADA-compliant curb ramps at all approaches. Truck apron around the central island to allow for turning movements.

SNAPSHOT: 3-LANE SECTION (BETWEEN ROGERS RD & FORBES RD)



Existing 3-Lane Section along South Main Street.

The act of walking or cycling in pleasant, tree-lined areas increases the likelihood of engaging in exercise routines. As such, in the northern segment of the corridor, the proposed two-lane divided/three-lane section with median islands, still allows for turning movements in areas identified as a priority to maintain access. Between the bike lane raised curb buffer and the on-street parking, there is a 9 ft of separation between the bike lanes and the road, further enhancing the level of protection for both bicyclists and pedestrians. These improvements seek to support a higher quality of life for residents, offering both immediate and long-term benefits for communities.



Proposed 3-Lane Section along South Main Street (Photosim).

CONCEPT B: CIMARRON PARKWAY INTERSECTION

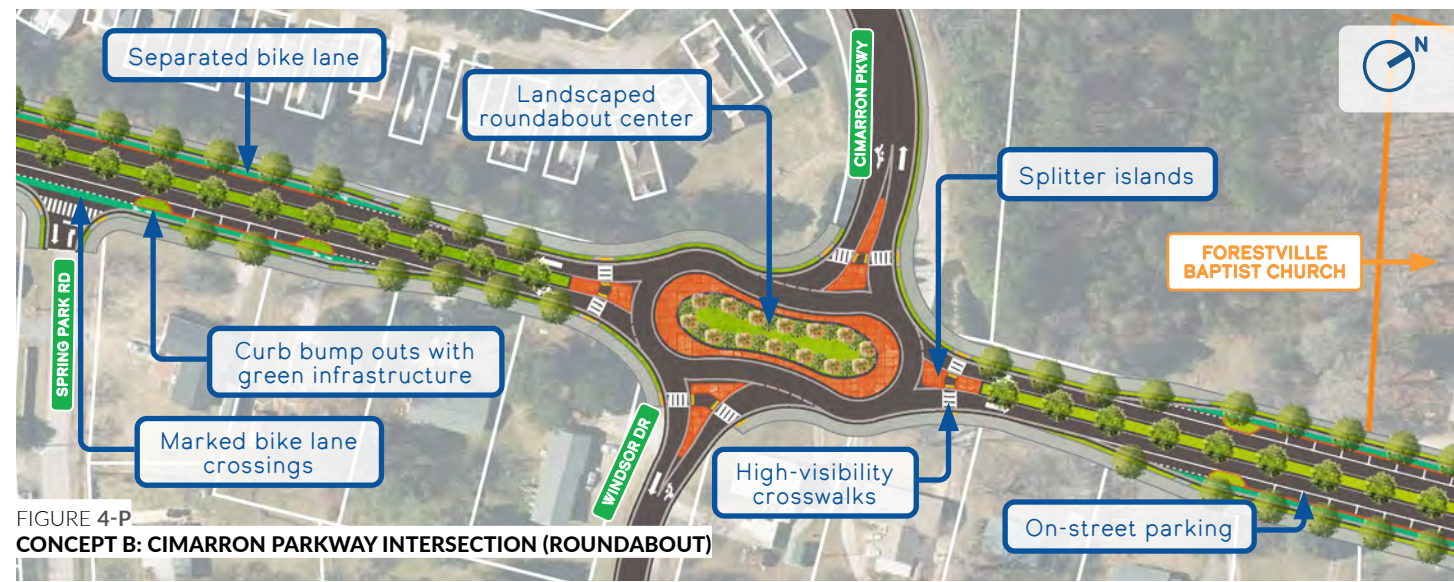
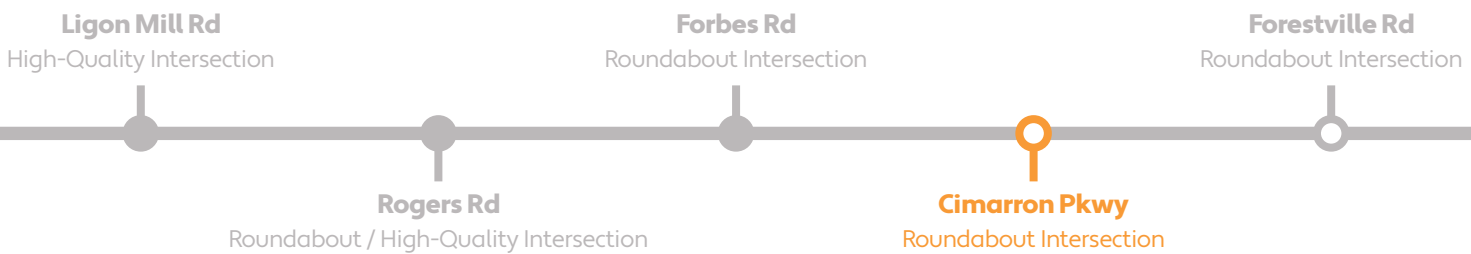


FIGURE 4-P
CONCEPT B: CIMARRON PARKWAY INTERSECTION (ROUNDAABOUT)

RECOMMENDATIONS

- **Cross-Section:** Two-lane divided/three-lane section, with median islands. On-street parking (8 ft wide) on both sides (ahead and past the intersection).
- **Lane Width:** 11 ft travel lanes.
- **Bike Facilities:** Continuous 5 ft separated bike lanes with a 1 ft wide curb for both sides of the road. Bicyclists can use 10 ft sidewalk following same rules as pedestrians, to cross at designated crosswalks.
- **Pedestrian Facilities:** Continuous sidewalks (10 ft wide on both sides), with a 4 ft planted buffer before the Windsor Drive crossing. High-visibility crosswalks.
- **Traffic Calming/Speed Management:** Roundabouts are effective at slowing traffic while maintaining flow, and minimizing delay. The proposed peanut roundabout is necessary because of the offset intersections, essentially blending two roundabouts into one.
- **Streetscaping & Lighting:** Landscaping and decorative paving materials (bricks, stamped concrete or cobblestones) to provide durable surfaces. Bollard lights or other lower-height fixtures can provide illumination without contributing to light pollution in this mostly residential segment.
- **Other Features:** ADA-compliant curb ramps at all approaches. Green infrastructure integrated into curb bump outs.

CONCEPT B: FORESTVILLE ROAD INTERSECTION

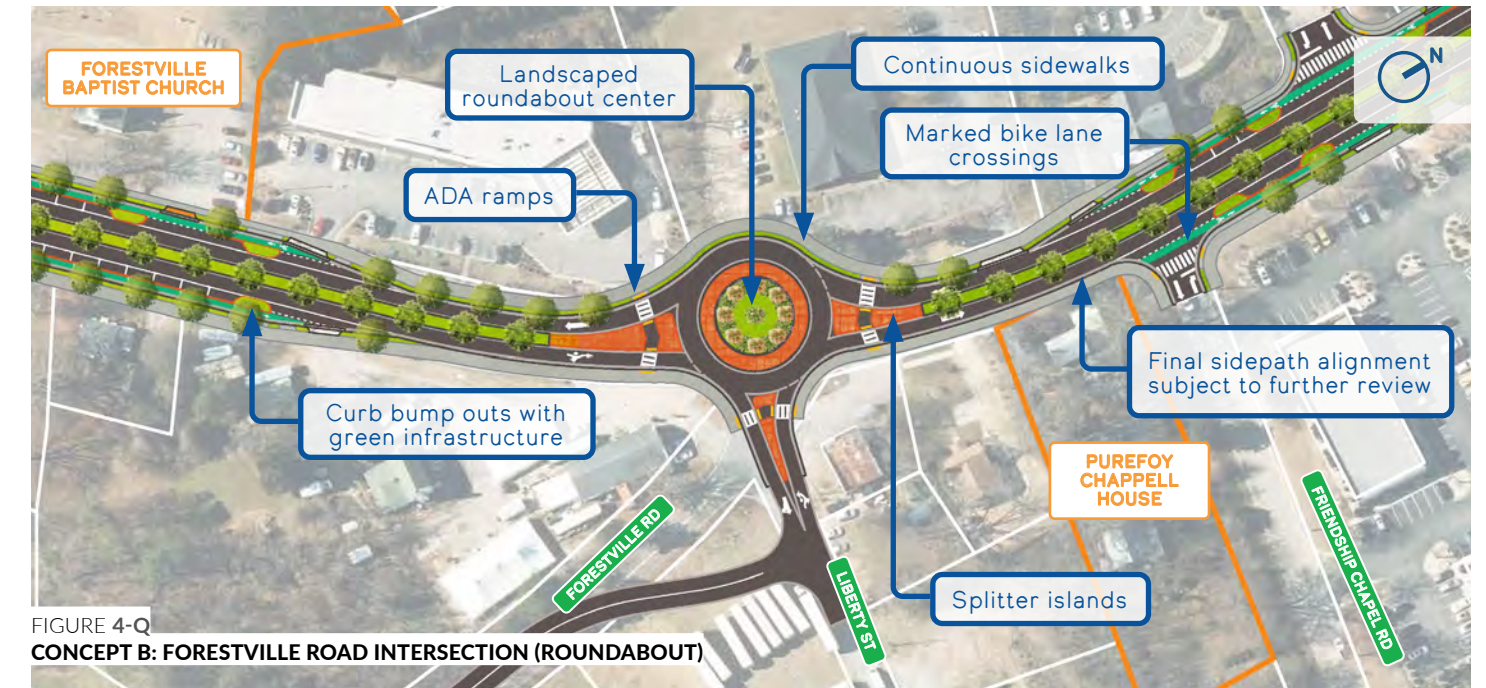
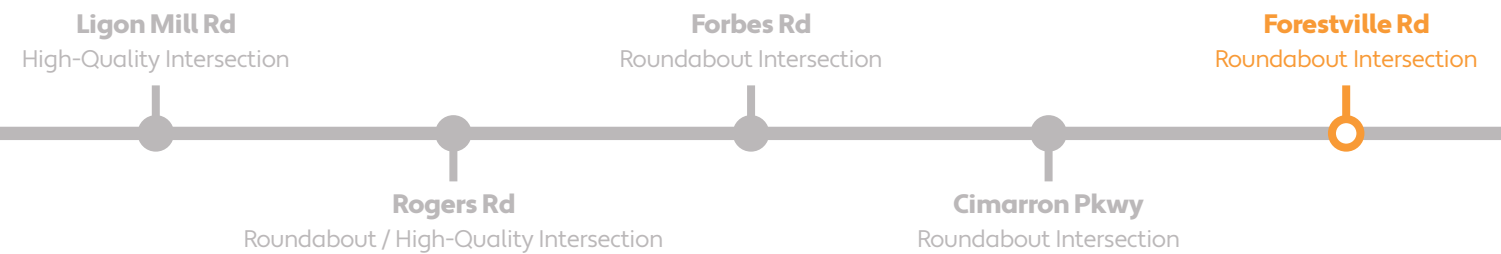


FIGURE 4-Q
CONCEPT B: FORESTVILLE ROAD INTERSECTION (ROUNDAABOUT)

RECOMMENDATIONS

- **Cross-Section:** Two-lane divided/three-lane section, with median islands. On-street parking (8 ft wide) on both sides (ahead and past the intersection).
- **Lane Width:** 11 ft travel lanes.
- **Bike Facilities:** Continuous 5 ft separated bike lanes with a 1 ft wide curb for both sides of the road, and bicyclists can use 10 ft sidewalk following same rules as pedestrians, to cross at designated crosswalks.
- **Pedestrian Facilities:** Continuous sidewalks (10 ft wide on both sides), and transition to a 5 ft sidewalk for the segment before Friendship Chapel Road to accommodate for historic properties.
- **Traffic Calming/Speed Management:** Increased safety due to lower speeds and fewer conflict points, reduced congestion, and enhanced aesthetics. Simplified traffic flow for drivers.
- **Streetscaping & Lighting:** Opportunity to incorporate public art into central island to celebrate local culture or history. Native and seasonal plantings recommended. Aesthetic lighting can be used to highlight landscaping and other features.
- **Other Features:** All hardscaping and landscaping features to comply with accessibility standards.

IMPACTS AND VALIDATION

HOW DO THESE CONCEPTS COMPARE TO EACH OTHER?

Upon comparison, the two concepts present a discernible trade-off between spatial demands and the scope of infrastructural adjustments required. **Concept A: Partial Optimization** aims to integrate pedestrians and bicyclists within the right-of-way by incorporating a median and pathways, representing a minimally invasive design. However, this method might provide less comprehensive bikeway than entirely separated lanes.

Conversely, **Concept B: Full Optimization** introduces separated bike lanes and on-street parking, significantly enhancing safety and convenience for both bicyclists and motorists, albeit at the cost of more extensive alterations to the current street layout. This approach potentially offers greater support to commercial uses by creating parking options while fostering a bike-friendly environment. Through this comparison, we aim to highlight the distinct trade-offs, benefits, and opportunities presented by each design.

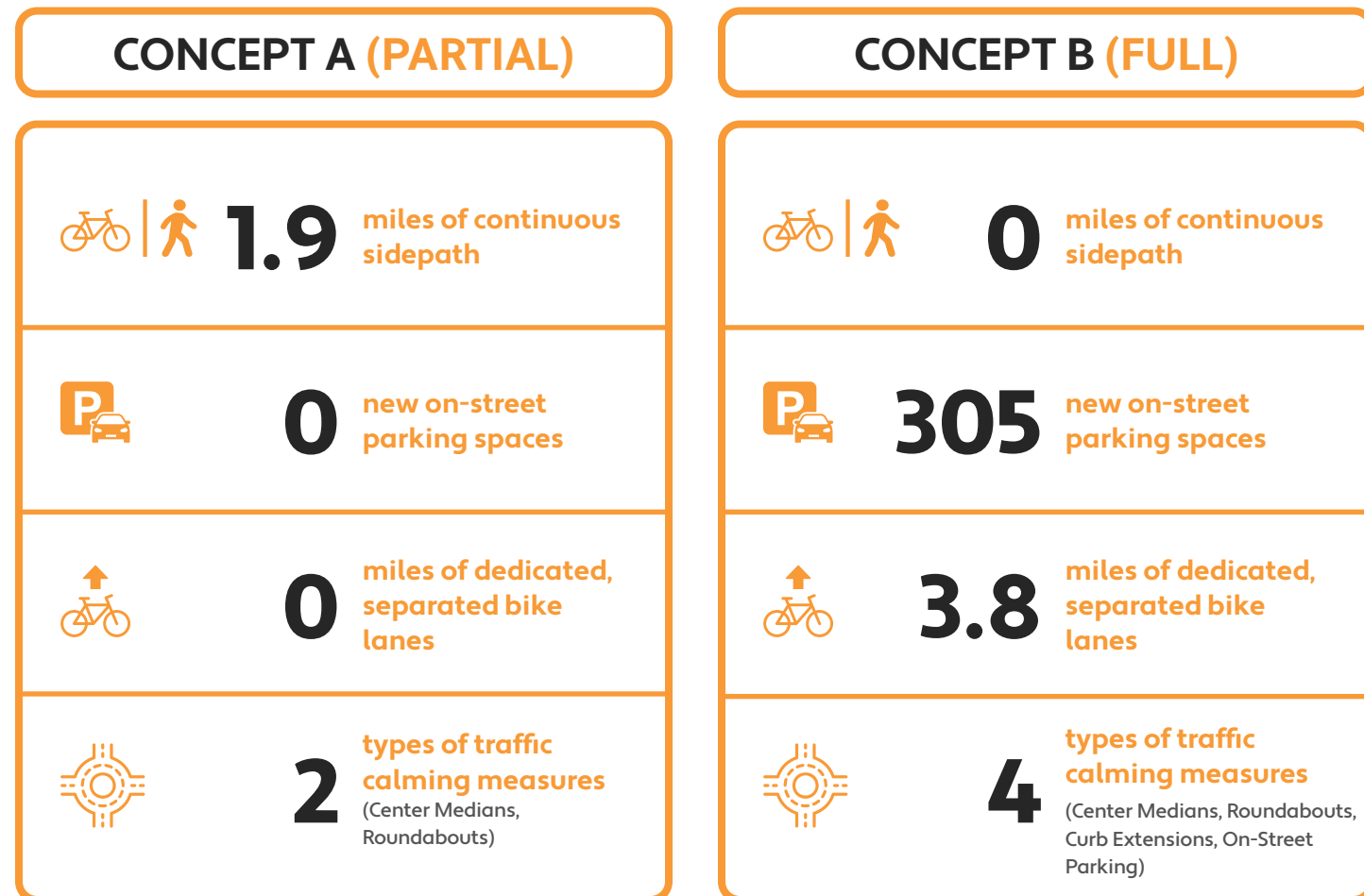


FIGURE 4-R
KEY FEATURES OF EACH DESIGN ALTERNATIVE

The ultimate decision must balance community preferences, spatial constraints, and long-term visions for South Main Street.



Both options reflect a deep commitment to improving safety, accessibility, and the overall quality of the public space. For its significant improvement of the corridor experience, both for drivers, bicyclists and pedestrians, as well as its potential for economic development and sustainability, **Concept B: Full Optimization** was chosen by the Board of Commissioners as the preferred alternative.

FIGURE 4-S
CONCEPT DESIGN ALTERNATIVES COMPARISON MATRIX

Legend

- Significant Improvement
- ◐ Partial Improvement
- No Improvement

	Concept A Limited ROW Acquisition	Concept B Acquire Additional ROW
Safety <i>Does the design make South Main Street safer for all users?</i>		
Conflict Points <i>Reduces points where two vehicles can collide with each other or bicyclists & pedestrians.</i>	●	●
Traffic Speeds <i>Includes design treatments like roundabouts and "side friction" to reduce traffic speeds.</i>	◐	●
Bike & Pedestrian Safety <i>Includes separation from traffic for biking & walking with physical barriers for ease of use.</i>	◐	●
Emergency Response <i>Includes pulloff areas for emergency services & disabled vehicles to allow uninterrupted traffic flow.</i>	○	●
Bike & Pedestrian Improvements <i>Does the design enhance the experience & usability of the corridor for biking walking?</i>		
Sidewalk Gaps & Usability <i>Filling in missing sidewalk links, dead-ends, and sharing space with bicyclists.</i>	◐	●
Bike Gaps & Usability <i>Filling in missing bikeway links, dead-ends, and sharing space with pedestrians.</i>	◐	●
Crosswalk Enhancement <i>Includes visibility, pedestrian refuges, and opportunities for signal improvements.</i>	●	●
Capacity <i>How does the design impact traffic flow and capacity on South Main Street?</i>		
Intersection Wait Times <i>How long it takes to pass through an intersection or turn onto a street?</i>	●	●
Automobile Volume Capacity <i>How many automobiles can the design support?</i>	◐	◐
Bike & Pedestrian Capacity <i>How many bicyclists and pedestrians can the design support?</i>	◐	●
Parking Capacity <i>Are there opportunities to increase parking for existing & future development?</i>	○	●
Impacts <i>How does the design impact the surrounding natural and built environment?</i>		
Adjacent Properties <i>Minimizes the physical impacts to properties along the corridor.</i>	●	◐
Stormwater Infrastructure <i>Provides opportunities for rain gardens, bioretention swales, and underground retention.</i>	◐	●
Increased Tree Canopy & Vegetation <i>Provides opportunities for shade trees and plantings.</i>	●	●

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CHAPTER 5 IMPLEMENTATION

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5 IMPLEMENTATION



Example of redesign strategies along the corridor.

◀ **The success of the South Main Street Corridor Study ultimately rests on Wake Forest and NCDOT leaders' ability to turn its vision into a reality.**

This chapter outlines the roadmap for the implementation phase and breaks down the process into actionable stages, necessary steps, timelines, resources, and stakeholder responsibilities required. Additionally, this section presents potential funding sources, partnerships, and regulatory considerations critical for a successful implementation. By providing a clear and structured implementation strategy, this chapter guides the redevelopment of the South Main Street corridor from concept to completion with the continued involvement of the Wake Forest community.

THIS CHAPTER COVERS:

- Cost Estimates
- Funding Strategies

COST ESTIMATES

This section provides an overview of Concept B, the chosen design for further development. This decision reflects a choice to pursue a full transformation of the corridor, enhancing its functionality and public realm appeal. The following tables (Figure 5-A and Figure 5-B) break down the projected expenses associated with elements of the redesign.

CONCEPT B: COST ESTIMATE

Construction Total	\$ 14,703,000
Mobilization (5%)	\$ 740,000
Preliminary Engineering Design (15%)	\$ 2,210,000
Construction Engineering Inspections (15%)	\$ 2,210,000
Contingency (30%)	\$ 4,410,000
TOTAL	\$ 24,273,000

FIGURE 5-A
CONCEPT B: COST ESTIMATE

The quantities shown here, rounded up to the nearest 10,000 dollars, have formed the basis for construction cost estimates, using standard unit cost values from similar corridor projects.

- There will be unforeseen site conditions, right-of-way acquisition costs, and additional material costs identified during the engineering design stage.
- **Right-of-way acquisition costs were not included in developing this estimate** as they may vary greatly based on local real estate conditions and individual property owners at the time of construction.
- A 15% design fee and 30% contingency are assumed.
- These estimates are for 2024 costs and subject to change following full surveys and final design.

CONCEPT B: CONSTRUCTION COST BREAKDOWN

LINE ITEM	QUANTITY	UNIT COST	LINE ITEM COST
Concrete Sidewalk	11,200 sf	\$ 40	\$ 448,000
Concrete Median	33,500 sf	\$ 50	\$ 1,675,000
Curb and Gutter Construction	40,500 lf	\$ 85	\$ 3,442,500
Drainage Improvements	1.9 mi	\$ 400,000	\$ 760,000
Thermoplastic Markings	1.9 mi	\$ 25,000	\$ 47,500
ADA Curb Ramp	66 each	\$ 5,000	\$ 330,000
Pavement Resurfacing	53,000 sy	\$ 100	\$ 5,300,000
Utility Relocations	40 each	\$ 20,000	\$ 800,000
Utility Relocations below ground	1.9 mi	\$ 1,000,000	\$ 1,900,000

CONSTRUCTION TOTAL \$ 14,703,000

FIGURE 5-B
CONCEPT B: CONSTRUCTION COST BREAKDOWN


FUNDING STRATEGIES

This Study is just the first step in the process to improve South Main Street. Moving this project from planning phases to design and construction requires the coordinated efforts of many stakeholders from Wake Forest, the Capital Area Metropolitan Planning Organization (CAMPO), NCDOT, and others, and a well thought-out strategy to fund each stage. There are three main categories of transportation funding available for this project:

STATE FUNDING: THE COMPLETE STREETS PROCESS

One option for design and construction of these improvements is through the **State Transportation Improvement Program (STIP)**. Updated every two years, this program schedules and provides funding for all transportation projects that receive State or Federal funding. Projects are selected through a process called Prioritization, which evaluates all projects for their benefits to overall mobility and cost-effectiveness.

Once a project is programmed for funding through prioritization, Complete Streets elements of the design are vetted through the **States Complete Streets Evaluation Methodology**.



STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)

A 10 year State and Federal-mandated plan that identifies the construction funding for and scheduling of transportation projects throughout the state.

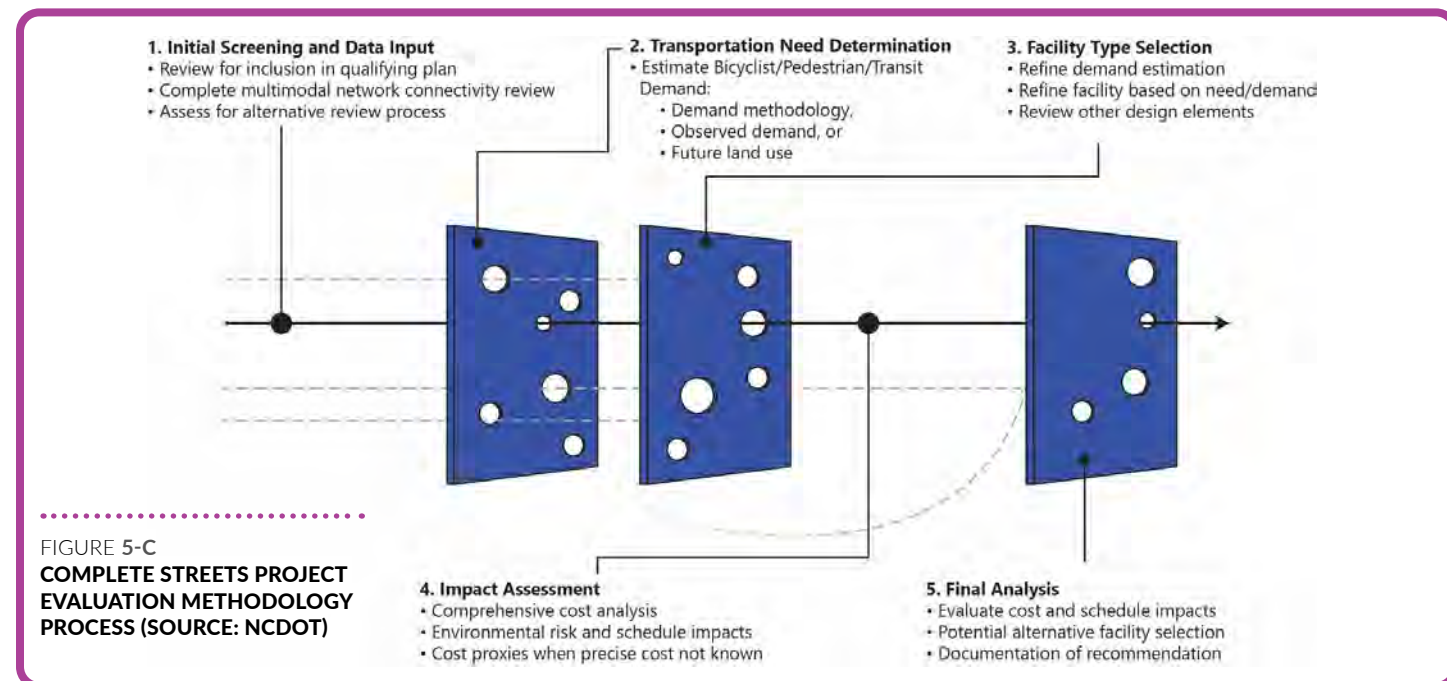


FIGURE 5-C
COMPLETE STREETS PROJECT EVALUATION METHODOLOGY PROCESS (SOURCE: NCDOT)

HOW ARE BICYCLE AND PEDESTRIAN IMPROVEMENTS EVALUATED AND CONSTRUCTED?

Bike and pedestrian elements of transportation projects are evaluated through the **Complete Streets Evaluation Methodology**. Depending on results, NCDOT may pay for some – or even all – multimodal elements as part of a project. There are four main requirements:

1. The project must be part of an adopted Comprehensive Transportation Plan;
2. The project's design must meet NCDOT standards: the Roadway Design Manual, AASHTO standards and eligible bike or pedestrian facility types;
3. The project must have a clear transportation purpose; and
4. There must be a local maintenance agreement in place.

Steps to get this project built through State funding:

- **Step 1:** Endorse this plan and amend the local Comprehensive Transportation Plan.
- **Step 2:** Coordinate with CAMPO to amend the Metropolitan Transportation Plan.
- **Step 3:** Amend local bike and pedestrian or other mobility plans to reference this Plan's recommendations.

WHAT'S THE LOCAL MATCH REQUIREMENT?

Federal and State formula funds typically require a 20% local match. For bike and pedestrian improvements, the NCDOT's cost-share depends upon whether the facilities are (1) in a plan (CTP or other locally adopted plan), (2) need is identified, or (3) a "betterment".

- **In a plan and need identified:** NCDOT pays 100% of cost.
- **Not in a plan and need identified:** Town pays 15% of cost.
- **Betterment:** Town pays 100% of cost.



A typical example of a one way traffic jam in North Carolina.



Example of walkable mixed use area (Raleigh, NC).



Example of bicycle and pedestrian improvement projects.

REGIONAL FUNDING: LOCALLY ADMINISTERED PROJECTS PROGRAM (LAPP)

The Locally Administered Projects Program (LAPP) is a funding program of the Capital Area MPO (CAMPO) that allocates certain federal funding program dollars to implement local transportation projects. Each year, the MPO identifies the proportions of investments in different project categories, like Roadways, Bike & Pedestrian, and Transit projects - all of which require Complete Streets elements.



LOCALLY ADMINISTERED PROJECTS PROGRAM (LAPP)

The LAPP was first adopted by the CAMPO on October 20, 2010. The program is used by the MPO to prioritize and program local transportation projects in the region that utilize federal funding and are the responsibility of the MPO (such as Surface Transportation Block Grant Program – Direct Allocation (STBGP-DA), Congestion Mitigation for Air Quality (CMAQ), etc.).

WHAT PROJECTS ARE ELIGIBLE?

- **Roadways:** Roadway projects must be eligible for federal aid, meaning major collector or higher on the federal aid system.
- **Safety:** Any road is eligible for safety projects.
- **Bike & Pedestrian:** Projects must show a clear transportation purpose, transporting users from one place to another.

WHAT OTHER CONDITIONS ARE REQUIRED?

- **MTP-compliant:** the project must be included in the Metropolitan Transportation Plan.
- **Local sponsorship:** the NCDOT division or Town must be responsible for all reporting requirements.

WHAT'S THE LOCAL MATCH?

LAPP funded projects require a minimum 20% local match, with higher contributions improving competitiveness. Local matches must be committed in order to receive LAPP funding.



Example of walkable & bikeable mixed use area (Raleigh, NC).



Example of bicycle improvement projects.

GRANT OPPORTUNITIES

Grant programs may be one source of funding. At both the federal and state levels, grant programs exist for the planning, design, and construction of transportation improvements. These grants are largely competitive in nature, and are not guaranteed, so the Town should research carefully which grant programs to target for funding, and communicate with agencies in advance to ensure the project is a good fit. Due to the complexity of these grant programs, outside consultation may be necessary.

ACTIVE TRANSPORTATION INFRASTRUCTURE INVESTMENT PROGRAM (ATIIP)

- **Funding Type:** Grant, 20% local match
- **Funding Entity:** United States Department of Transportation, Federal Highway Administration
- **Application Link:** <https://www.transportation.gov/rural/grant-toolkit/active-transportation-infrastructure-investment-program-atiip>
- **Application Entity:** CAMPO, Town of Wake Forest
- **Additional Details:** The Active Transportation Infrastructure Investment Program (ATIIP) is a new competitive grant program created by the Bipartisan Infrastructure Law to construct projects to provide safe and connected active transportation facilities in active transportation networks or active transportation spines. ATIIP projects will help improve the safety, efficiency, and reliability of active transportation networks and communities; improve connectivity between active transportation modes and public transportation; enhance the resiliency of on- and off-road active transportation infrastructure; help protect the environment; and improve quality of life in disadvantaged communities through the delivery of connected active transportation networks and expanded mobility opportunities.
- **Making Wake Forest Competitive:** The Active Transportation Infrastructure Investment Program (ATIIP) favors large, transformative multimodal projects. Emphasize South Main Street's importance as a part of Wake Forest's mobility spine.



THE ACTIVE TRANSPORTATION INFRASTRUCTURE INVESTMENT PROGRAM (ATIIP)

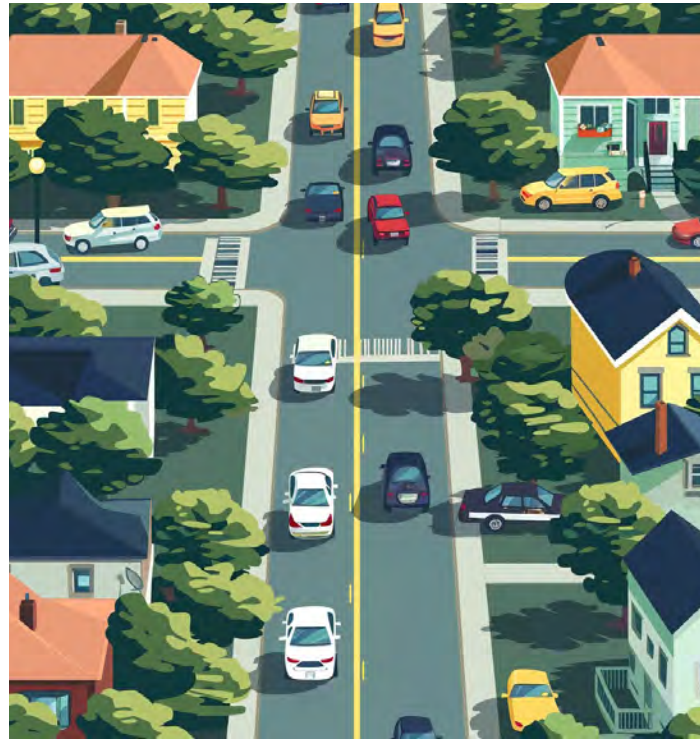
The ATIIP grants will allow communities to identify, prioritize, and implement improvements to the largest barriers to safe, accessible, and equitable pedestrian and bicycle network connectivity through the development of infrastructure that will provide substantial additional opportunities for walking and bicycling.



Bike and pedestrian infrastructure allow for less carbon intensive trips.

ECONOMIC ADJUSTMENT ASSISTANCE AND PUBLIC WORKS

- **Funding Type:** Grant, often requires 20% local match. The office has discretion to pay 100%, however.
- **Funding Entity:** United States Department of Commerce: United States Economic Development Administration
- **Application Link:** <https://www.eda.gov/economic-adjustment-assistance>
- **Application Entity:** Wake County, Town of Wake Forest
- **Additional Details:** Assists state and local interests in designing and implementing strategies to adjust or bring about change to an economy. This is a flexible program, and aims to help hundreds of communities plan, build, and put people back to work through construction or non-construction projects designed to meet local needs.
- **Making Wake Forest Competitive:** Emphasize how this project improves economic diversity and resilience. Discuss downtown development and catalyst sites.



PROMOTING RESILIENT OPERATIONS FOR TRANSFORMATIVE, EFFICIENT, AND COST-SAVING TRANSPORTATION (PROTECT)

- **Funding Type:** Grant
- **Funding Entity:** United States Department of Transportation, Federal Highway Administration
- **Application Link:** <https://www.transportation.gov/rural/grant-toolkit/promoting-resilient-operations-transformative-efficient-and-cost-saving>
- **Application Entity:** North Carolina, Wake County, Town of Wake Forest, CAMPO
- **Additional Details:** This program emphasizes creating resilient infrastructure in the face of extreme weather and climate change.
- **Making Wake Forest Competitive:** Emphasize how the complete streets process will include items that improve stormwater management. For example: curb and gutter, street trees, and other relevant items.



REBUILDING AMERICAN INFRASTRUCTURE WITH SUSTAINABILITY AND EQUITY (RAISE)

- **Funding Type:** Grant
- **Funding Entity:** United States Department of Transportation, Office of the Secretary
- **Application Link:** <https://www.transportation.gov/RAISEgrants>
- **Application Entity:** North Carolina, Wake County, Town of Wake Forest
- **Additional Details:** RAISE funding is much more flexible than other grant programs, so this makes it highly competitive. Rural communities tend to do better at securing money, because half of the RAISE money is dedicated to rural communities.
- **Making Wake Forest Competitive:** When the Notice of Funding Opportunity is released, read the information to learn what the grant is emphasizing this year. Last year, local impact, persistent poverty, and historically disadvantaged communities were emphasized.



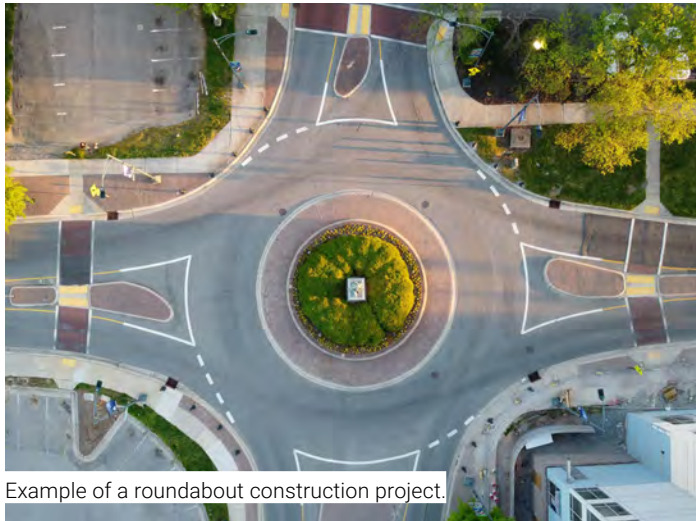
SAFE STREETS FOR ALL (SS4A)

- **Funding Type:** Grant
- **Funding Entity:** United States Department of Transportation
- **Application Link:** <https://www.transportation.gov/grants/SS4A>
- **Application Entity:** CAMPO, Town of Wake Forest
- **Additional Details:** This grant seeks to eliminate roadway deaths and serious injuries. The grant seeks to prioritize locations that see a disproportionate number of roadway deaths/injuries.
- **Making Wake Forest Competitive:** A safety action plan is required to apply for implementation funding. The grant program also offers grants to develop a safety action plan.



BONDS

Finally, Wake Forest can consider bond issuance to fund construction of the project. Bonds are a common method for municipalities to raise capital for large-scale infrastructure projects by borrowing money from investors that will be repaid with interest over time. These bonds may be structured in a number of ways to finance all or part of a project.



Example of a roundabout construction project.

TYPES OF BONDS

- **General Obligation Bonds (GO):** These bonds are backed by the full faith and credit of the Town and may require voter approval. They are typically used for projects that benefit the public at large, such as roadway improvements. In North Carolina, only GO Bonds may be used to fund transportation projects (except for public transportation facilities).
- **Revenue Bonds:** These bonds are repaid from a specific revenue source linked to the project, such as increased tax revenues from enhanced commercial activities along the redesigned South Main Street.

BENEFITS

- **Stable Funding Source:** Bonds provide a significant upfront sum that can cover substantial project costs without immediate fiscal strain on the jurisdiction's budget.
- **Community Investment:** By investing in critical infrastructure, the project can stimulate economic growth, enhance property values, and improve quality of life.
- **Flexibility:** Different types of bonds can be tailored to match the funding needs of the project with appropriate repayment strategies based on the anticipated economic benefits.



Example of a Complete Streets project.

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SOUTH MAIN STREET CORRIDOR STUDY

TOWN OF WAKE FOREST | NORTH CAROLINA

