

Navassa Collector Street Plan

August 2022



Town of
Navassa

AECOM

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Executive Summary

The 2022 Navassa Collector Street Plan was developed collaboratively by the Town of Navassa and the Wilmington Urban Area Metropolitan Planning Organization (WMPO). Plan development was guided by a Steering Committee that included the Town Mayor, members of the Town Planning Board and Town Council, and a representative of the North Carolina Department of Transportation (NCDOT).

The Town of Navassa (Town) is a small community in Brunswick County, NC, and within the planning area of the WMPO. The Town's population of 1,367 (U.S. Census, 2020) is expected to increase more than twofold in the coming decades as a result of the completion of the I-140/Wilmington Bypass in 2017, the Town's proximity to area points of interest, its planned housing developments, and redevelopment of a waterfront Superfund site.

The *2022 Navassa Collector Street Plan* (this Plan), which will replace the *2004 Town of Navassa Collector Street Plan*, identifies future transportation needs associated with approved and proposed developments, and provides recommendations for the construction of 12 collector streets to meet existing and future roadway needs.

The proposed collector streets will enhance the Town's roadway network by connecting local roads to arterial roads. Creating these connections will increase the safety and efficiency of the transportation network by improving connectivity, reducing congestion, providing connections to future development areas, and creating redundancies. The enhanced network will also increase

resiliency and preserve the vitality of existing neighborhoods in accordance with the vision and goals established by the Steering Committee.

To develop this Plan, a project team of consultant staff from AECOM, the WMPO, and Town personnel reviewed existing plans and conditions, conducted stakeholder engagement and public outreach, and followed a six-step process to determine appropriate locations for the collector streets. The six-step process involved identifying traffic analysis zones, future land uses, and natural resources as well as establishing household density and calculating daily trips. The project team ultimately recommended proposed connections in appropriate locations to protect natural resources and conservation areas, while best serving existing needs and future growth in the Town.

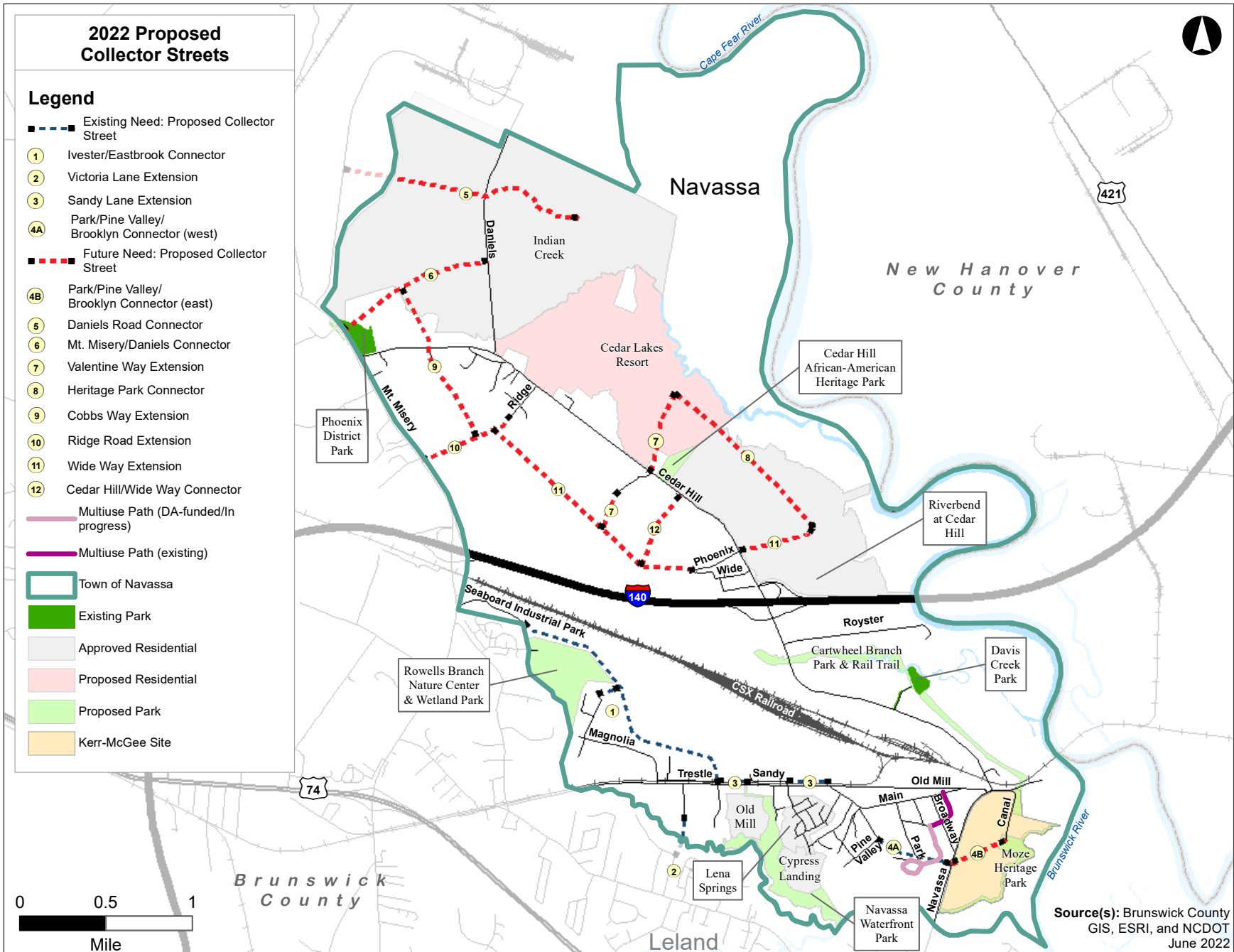
The proposed collector street network consists of the 12 collector streets listed in Table ES-1 and shown in Map ES-1. Four of the proposed collector streets are intended to meet existing needs, and eight are intended to meet future needs associated with proposed housing developments.

TABLE ES-1. 2022 PROPOSED COLLECTOR STREET NETWORK

PRIORITY	MAP LABEL	PROPOSED COLLECTOR STREET	DESCRIPTION	LENGTH (MILES)
Existing Need, Prioritize for Development	1	Ivester/Eastbrook Connector	Provides a secondary outlet for residents in the area of Magnolia Drive and Dorsey Lane by connecting to Seaboard Industrial Park Drive. Also connects to the Sandy Lane Extension.	1.7
	2	Victoria Lane Extension	Extends Victoria Lane to the Town's limits with potential connection to Sturgeon Drive NE in Leland.	0.3
	3	Sandy Lane Extension	Connects the Ivester/Eastbrook Connector to Main Street and provides a connection between Trestle Way and Sandy Lane.	0.5
	4A	Park/Pine Valley/Brooklyn Connector west of North Navassa Road	Connects Pine Valley Road, Park Avenue, and Brooklyn Street to North Navassa Road.	0.3
Future Need, Implement as Future Development Occurs	4B	Park/Pine Valley/Brooklyn Connector east of North Navassa Road	Connects Canal Drive and the proposed Moze Heritage Park to North Navassa Road.	0.5
	5	Daniels Road Connector	Connects Daniels Road to the Town's western limits and provides a connection to Daniels Road for the Indian Creek housing development. West of the Town limits, it provides a potential connection to Daniels Road NE in unincorporated Brunswick County.	1.5
	6	Mt. Misery/Daniels Connector	Connects Mt. Misery Road to Daniels Road.	1.0
	7	Valentine Way Extension	Connects the Wide Way Extension to Cedar Hill Road and Cedar Hill Road to the Heritage Park Connector.	0.7
	8	Heritage Park Connector	Connects Cedar Lakes Resort and Riverbend at Cedar Hill developments to the Valentine Way Extension and the Wide Way Extension.	1.1
	9	Cobbs Way Extension	Connects the Mt. Misery/Daniels Road Connector to the Ridge Road Extension.	1.0
	10	Ridge Road Extension	Connects Mt. Misery Road to Ridge Road.	0.6
	11	Wide Way Extension	Connects the Heritage Park Connector to the Ridge Road Extension. Provides an alternate route to Cedar Hill Road.	2.0
12	Cedar Hill/Wide Way Connector	Connects Cedar Hill Road to the Wide Way Extension.	0.5	

In support of the proposed collector street network and in light of existing local and regional policies and guidelines, this Plan recommends modifications to several existing policies and guidelines (see Table ES-2).

It also recommends four new policy topics that will complement the proposed collector street network and ensure that future collector streets satisfy the needs of the Town (see Table ES-3).



Map ES-1: 2022 Proposed Collector Streets

TABLE ES-2. ACTIONS FOR EXISTING POLICIES OR GUIDELINES

POLICY OR GUIDELINE	DESCRIPTION	PROPOSED TOWN ACTION
NCDOT Complete Streets Policy	Calls for the consideration and incorporation of multiple modes of transportation when constructing new projects or making improvements to existing infrastructure. Ensures that multimodal projects are designed to be safe and comfortable for all users.	Require new collector streets to adhere to the Complete Streets policy.
NCDOT Traditional Neighborhood Development (TND) Guidelines	Encourages walking and bicycling, enhances transit service opportunities, and improves traffic safety.	Consider in development and construction of collector streets.
Town of Navassa Phase II Stormwater Implementation Plan	Establishes and defines the Town’s compliance with its National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) Permit and the Clean Water Act.	Consider this plan when developing and constructing collector streets.
North Carolina Resilient Coastal Community Program	Facilitates a process for setting coastal resilience goals, assessing needs, and identifying and prioritizing projects to enhance resilience to coastal hazards.	Consider the program’s goals when developing and constructing collector streets.
Subdivision Ordinance	Requires connectivity for major subdivisions.	Modify existing ordinance to expand the connectivity requirements for all subdivisions and developments.
Section 4.3.6 of the Subdivision Ordinance	Outlines specific requirements that support adjoining connections and assist with broadening the existing collector street network.	Incorporate Section 4.3.6 in future ordinances.

TABLE ES-3. NEW POLICY TOPICS

POLICY TOPIC	DESCRIPTION	PROPOSED TOWN ACTION
Traffic calming	Design new collector streets to include traffic calming components where appropriate, such as maintaining lower speed limits.	Prepare new policy to support traffic calming measures
Connectivity of Collector Streets	Require private entities to coordinate across properties to allow for future connections.	Prepare new policy in support of possible future needs
Reduction of Paper Streets	Work with developers to build streets that are currently mapped as planned or proposed streets.	Prepare new policy to encourage implementing planned and proposed streets
Resiliency and Environmental Conservation	Ensure that developments and new streets minimize impacts to floodplains and wetlands.	Prepare new policy to minimize impacts to the Town’s natural resources

Effective implementation of this Plan will include prioritizing actions and obtaining funding. This Plan prioritizes the four collector streets required to meet existing needs (Ivestor/Eastbrook Connector, Sandy Lane Extension, Victoria Lane Extension, and Park/Pine Valley/Brooklyn Connector (4A), see Table ES-1) over those addressing future needs.

The remaining collector streets would be prioritized in conjunction with future housing development. Funding opportunities to directly and indirectly support construction of the proposed collector street network include Powell Bill program funds, transportation bonds, traffic impact assessments, federal transportation grants, WMPO funding

mechanisms, and local NCDOT Division 3 funding opportunities.

Table ES-4 contains key action steps to ensure that the projects, policies, and guidelines outlined in this Plan are implemented.

TABLE ES-4. ACTIONS FOR IMPLEMENTATION

ACTION STEP	DETAILS	RESPONSIBLE PARTY	TIMELINE
Adopt the Navassa Collector Street Plan	Town Council to adopt Collector Street Plan.	Town Council	Summer 2022
Update Existing Town Policies	Planning Board and Town Council to work with Town staff to evaluate existing town policies and make recommended policy changes (See Section 7.3).	Town staff, Planning Board, Town Council	2022-2023
New Town Policies	Planning Board and Town Council to work with Town staff to develop new town policies (see Section 7.3).	Town staff, Planning Board, Town Council	2022-2023
Town Budget Planning	Identify funding sources for improvements, including local matches, grant opportunities, and State funding.	Town staff (Finance and Planning), Town Council	Annually
Coordinate with NCDOT Division 3 and the WMPO	Conduct meetings with NCDOT Division 3 and the WMPO to discuss how the projects in the plan can be funded/implemented.	Town staff	Bi-annually
Conduct Feasibility Studies	Identify funding to conduct feasibility studies on the proposed collector streets that would serve existing developments.	Town staff, WMPO, NCDOT Division 3	TBD
Review of Proposed Development	Town Council to coordinate with Town staff and Planning Board to ensure inclusion of collector streets in new developments	Town staff, Planning Board, Town Council	On-going
Annual Review	Review the plan annually and report to Town Council, WMPO and NCDOT Division 3 summarizing achievements, constraints, and next steps.	Town staff	Annually

Acronyms

AADT	Annual Average Daily Traffic	NPDES	National Pollutant Discharge Elimination System
ACS	American Community Survey	PUD	Planned Unit Development
BIL	Bipartisan Infrastructure Law	QR	quick response (code)
BMP	best management practices	RAISE	Rebuilding American Infrastructure with Sustainability and Equity
DA	Direct Allocation	RCCP	Resilient Coastal Communities Program
FHWA	Federal Highway Administration	SMART	Strengthening Mobility and Revolutionizing Transportation
GIS	geographic information system	SR	State Route
IIJA	Infrastructure Investment and Jobs Act	STBGP	Surface Transportation Block Grant Program
ITS	Intelligent Transportation Systems	STIP	State Transportation Improvement Program
LEHD	Longitudinal-Employer Household Dynamics	TA	Transportation Alternatives (Program)
LEP	Limited English proficiency	TASA	Transportation Alternatives Set Aside
mph	miles per hour	TAZ	Traffic Analysis Zones
MPO	Metropolitan Planning Organization	TDM	Travel Demand Model
MS4	municipal separate storm sewer system	TMA	Transportation Management Area
MTP	Metropolitan Transportation Plan	UDO	Unified Development Ordinance
NCDEQ	North Carolina Department of Environmental Quality	U.S. DOT	United States Department of Transportation
NCDOT	North Carolina Department of Transportation	WMPO	Wilmington Urban Area Metropolitan Planning Organization

Acknowledgments

The project team would like to thank the Steering Committee and residents of the Town of Navassa for their involvement and support in this planning process. This Plan was funded by the Wilmington Urban Area Metropolitan Planning Organization.

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Introduction

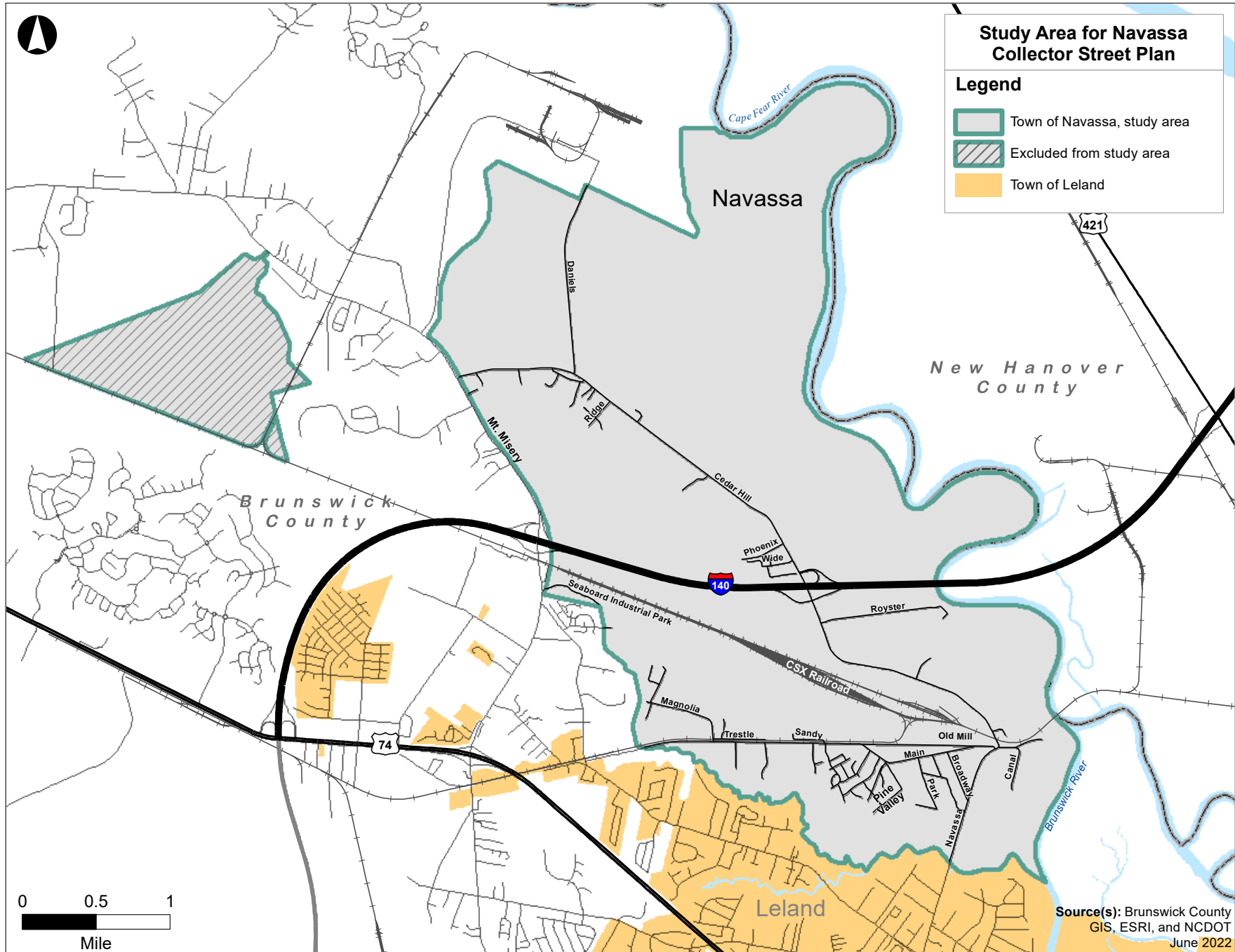
The Town of Navassa (Town) is a growing community located in Brunswick County and within the planning area of the Wilmington Urban Area Metropolitan Planning Organization (WMPO). The Town is expecting to more than double its population over the next few decades with the completion of the I-140/Wilmington Bypass in 2017, its proximity to area points of interest, and several planned housing developments within the Town limits. The Town is also anticipating growth associated with the redevelopment of the waterfront Kerr-McGee Chemical Corp – Navassa Superfund site.

In anticipation of future growth and traffic, the Town developed a Collector Street Plan in 2004 (the 2004 Plan; Martin Alexiou Bryson, 2004) to guide roadway network design. Since the completion of the 2004 Plan, there have been notable changes to the existing conditions as well as proposed developments within the Town. In response to these changes, the Town began development of a new *2022 Navassa Collector Street Plan* (this Plan). This Plan incorporates new traffic data, population estimates, land use and zoning, and planned developments. The result is a plan that accounts for existing and proposed development and ensures traffic will move efficiently to provide residents with pedestrian-friendly transportation corridors.

This Plan is the result of a collaborative effort between the Town and the WMPO. Plan development was guided by a Steering Committee that included the Town Mayor, members of the Planning Board and Town Council, and a representative from the North Carolina Department of Transportation (NCDOT). This Plan responds to development interest while preserving the vitality of the existing neighborhoods and providing a safe and efficient transportation network for residents.

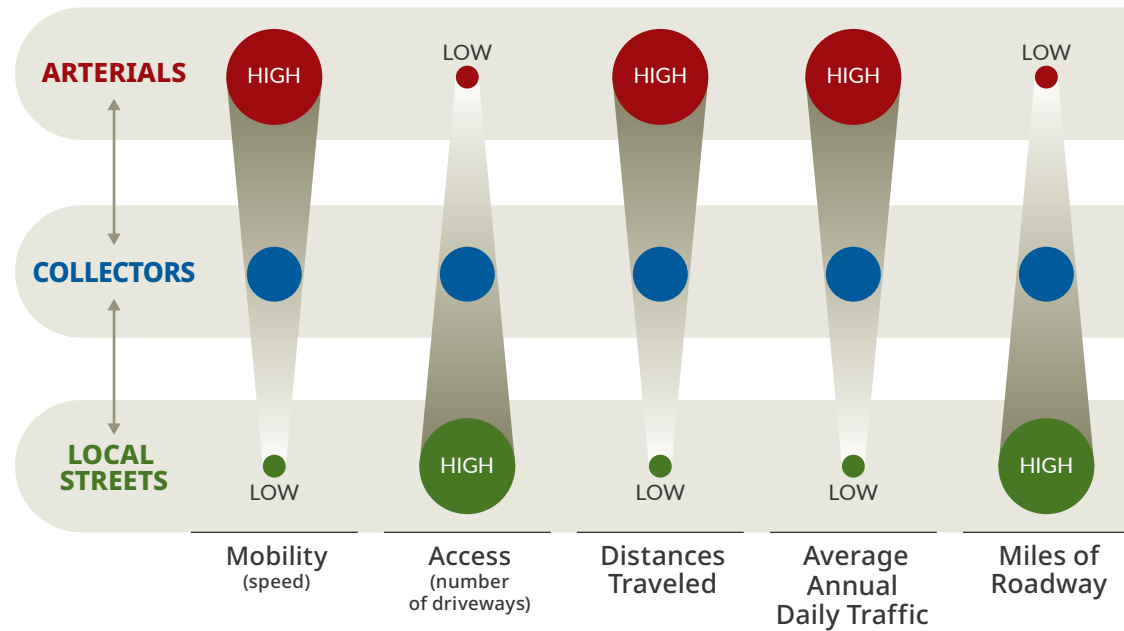
1.1 Study Area

The study area consists of the municipal boundary for the Town shown in Map 1. It is bordered to the east by the Cape Fear River and to the south by the town boundary of Leland. The I-140/Wilmington Bypass bisects the Town east to west. The annexed municipal boundary to the west of the Town is excluded from this Plan because of its lack of connectivity with existing roads, planned developments, and other local resources (hatched area in Map 1).



1.2 What is a Collector Street?

Roadways are assigned functional classifications based on the type of service they provide. The WMPO assigns the following functional classifications to roads in the region: principal arterial, minor arterial, major collector, minor collector, freeway/expressway, and interstate (WMPO, 2019). Roads that do not fall into one of these categories are local roads. Collector streets connect local roads to arterial roads. The illustration at right summarizes the characteristics of local, collector, and arterial roads. Local traffic can use a collector street in place of an arterial road, which can reduce congestion by distributing traffic across the road network. Collector streets can also provide a safe space for multimodal users if designed with bicycle, pedestrian, and/or transit facilities.



Characteristics of Local Streets, Collectors, and Arterials

Source: Modified from illustration provided by WMPO, personal communication, 5/31/2022.



Vision and Goals

The following vision and goals for this Plan were developed by the Steering Committee, taking into consideration existing conditions, priority areas, and planned development.

PLAN VISION



Provide a safe and efficient multimodal transportation network that accommodates future growth and development in the Town of Navassa. An enhanced collector street network will improve interconnectivity, taking traffic off existing congested roads, providing new routes to move traffic resulting from new developments, and creating redundancies in the transportation network for increased resiliency. The collector street network will also preserve cultural heritage and neighborhood vitality as the community grows.



PLAN GOALS

- Work with the community to develop a desirable and realistic transportation network using careful planning, appropriate design standards, and purposeful decisions.
- Involve a broad spectrum of the community in the plan development process, informing community members of the benefits of collector streets and effectively communicating recommendations while empowering decision makers.
- Improve mobility and safety for all users by incorporating Complete Street concepts into collector street design standards and by reducing conflicts between motorists, rail, bicyclists, and pedestrians.
- Reduce through traffic on local streets to preserve neighborhood vitality while decreasing congestion on existing roadways by better distributing traffic across the network, improving quality of life for Town of Navassa residents.
- Encourage economic growth by improving connectivity and access throughout the Town.
- Increase route options to improve emergency response times, decrease delays caused by trains and other obstacles, and create redundancy, which can decrease vulnerability to flooding and other extreme weather events.
- Improve access to and from subdivisions and residential streets that currently have only one entry/exit point or otherwise limited access (train tracks, etc.).
- Consider school transportation and future transit in the development of the collector street network, including future connections to local streets.
- Develop policies to manage connections from new developments to proposed collector streets.
- Be cognizant of environmental constraints (including streams, wetlands, and topography) while planning for new collector streets.
- Preserve the cultural heritage of and natural resources within the Town of Navassa in the collector street recommendations.



3

Existing Plans

Relevant local planning documents and planning efforts were reviewed to understand anticipated growth and development in the Town and the impacts it will have on the roadway network.

3.1 Local Plans and Planning

Key findings, as they relate to this Plan, are outlined in the following narrative.

2004 Town of Navassa Collector Street Plan

The 2004 Plan was developed by Martin Alexiou Bryson for the Wilmington Urban Area Metropolitan Planning Organization (WMPO) and Town of Navassa to augment the 1999 Greater Wilmington Urban Area Transportation Plan (WMPO, 1999) by designating collector streets to provide safe and efficient access to major roadways and thoroughfares. The

2004 Plan reviewed traffic and land use data to create a baseline for zoning characteristics in the newly annexed portions of the Town and applied those characteristics to project future land use. A future land use map created as part of the 2004 Plan reflected the location of existing industry and the anticipated or probable location of future Town residential

subdivisions, commercial or business development, and industry and was used to determine where future collector streets should be located.

The 2004 Plan identified 12 collector streets, which were examined and re-evaluated as part of the 2022 plan development process.

Approved and Proposed Developments

Five housing developments and five parks have been approved for construction within Town limits (Map 2). A sixth housing development is proposed, but not yet approved.

The Kerr-McGee Chemical Corp – Navassa Superfund site (Kerr-McGee Site) is a 150-acre property that will be remediated and redeveloped as part of the U.S. Environmental Protection Agency’s Superfund program. The Moze Heritage Park is proposed within the Site, along with commercial and industrial uses.

Approved Housing Developments

- **Indian Creek:** A 1,057-acre development located along the northwest border of the Town that includes 2,184 single-family residential units, 1,460 multifamily units, storage units, and space for an elementary school.
- **RiverBend at Cedar Hill:** A 900-acre mixed-use development located east of Cedar Hill Road, just north of I-140 that includes 2,190 total residential units. Residential areas include both single-family and

residential units over commercial units. The development also includes light industrial use space, conservation areas, and open space.

- **Cypress Landing:** A 33-acre housing development located in the southern portion of the Town, south of Old Mill Road, that will include 100 single-family homes.
- **Lena Springs:** A 44-acre housing development located in the southern portion of the Town, south of Old Mill Road, just north of Cypress Landing. The

development will include 182 single-family homes.

- **Old Mill:** A 28-acre housing development located in the southern portion of the Town, south of Old Mill Road, just west of Cypress Landing and Lena Springs. The development will include 68 single-family homes.

Proposed Housing Developments

- **Cedar Lakes Resort:** A proposed 463-acre resort community that would be located in the northern portion of the Town between the approved Indian Creek and Riverbend at Cedar Hill developments. The resort would contain 1,200 housing units consisting of mixed-use neighborhood areas and waterfront housing.

Approved Parks

- **Navassa Waterfront Park:** A 90-acre park located along the southern limit of the Town, south of Cypress Landing, that will include walking trails, water access to Mill Creek, fishing, and a picnic area.
- **Cartwheel Branch Park and Rail Trail:** Located on Royster Road, the 54-acre park will include two dog parks, a splash pad, an amphitheater, open air shelters, and a boardwalk.
- **Moze Heritage Park:** Located along the Brunswick River on a portion of the Kerr-

McGee Site, this 108-acre park will include a Gullah Geechee Cultural Center and Museum, nature trails, a fishing pier, and a kayak launch.

- **Rowells Branch Park:** A 70-acre wetland park and nature preserve that will provide stormwater storage for the Town as well as boardwalk access along a large pond and access to a small upland park that will include a nature center, classroom, birdwatching overlooks, and an outdoor ropes course.
- **Cedar Hill African American Heritage Park:** Located east of Cedar Hill Road, just north of RiverBend at Cedar Hill, this approximately 11-acre park will include a replica of Phoenix Colored School, the historic Reaves Chapel Church, and Cedar Hill Cemetery. The Gullah Geechee Heritage Trail will traverse the park. The Gullah Geechee Heritage Trail will begin near Mill Creek, pass through the Moze Heritage Park, and then turn north and pass through Cartwheel Branch Park and Rail Trail. The trail will continue along Indian Creek, terminating at Phoenix Park.

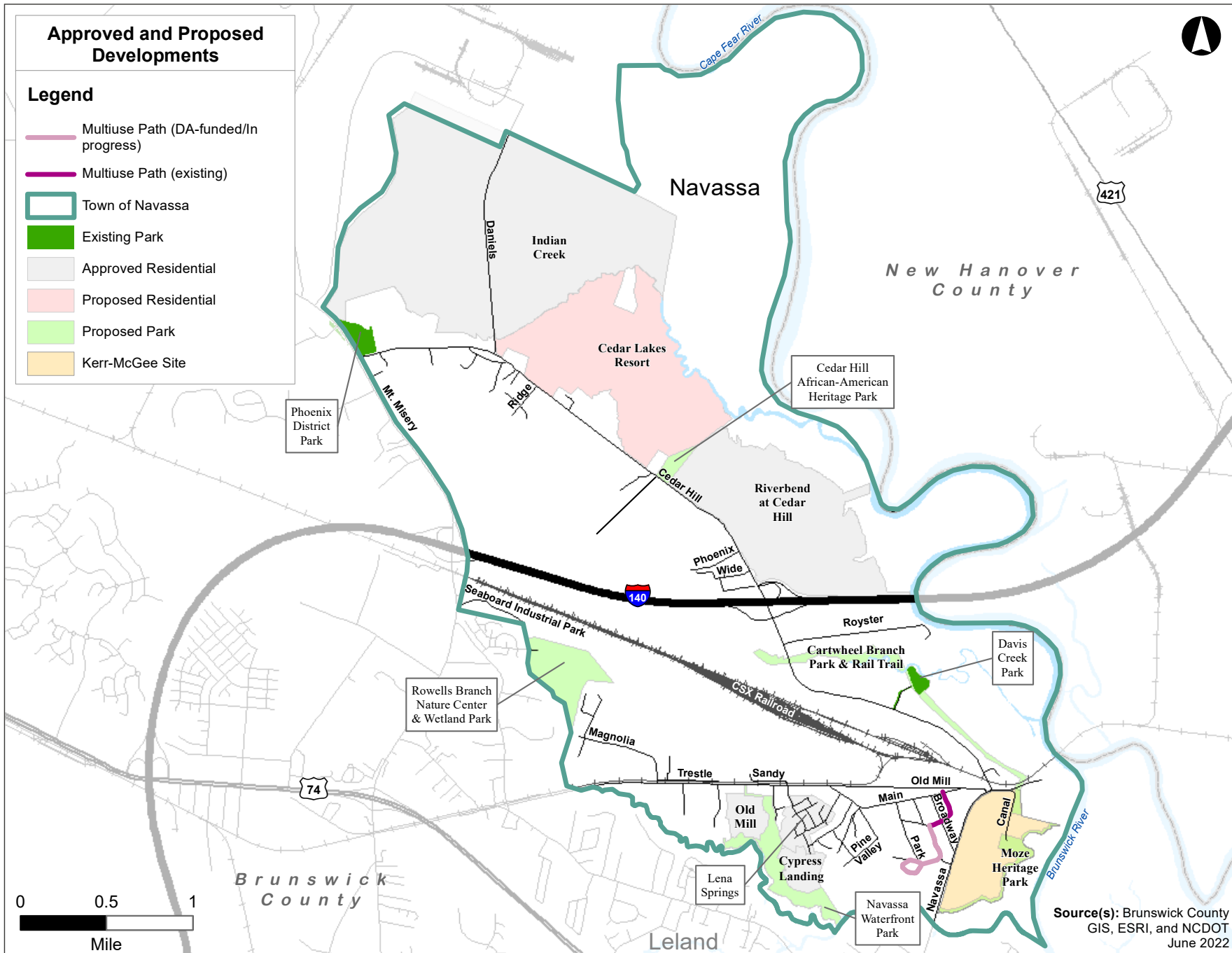
Project In Progress

- **Multiuse Path at Navassa Park:** The Town received federal funding through the



Reaves Chapel is currently undergoing renovation

WMPO for Surface Transportation Block Grant Program (STBGP) funds to construct a multiuse path at Navassa Park. The multiuse path project will construct bicycle lanes on both sides of Brooklyn Street, connecting Brooklyn Street to Navassa Park, and a multiuse path through Navassa Park forming a loop within the park.



Map 2. Approved and Proposed Developments

Town of Navassa Future Land Use Plan 2011–2030

The Town of Navassa Future Land Use Plan 2011–2030 (Land Use Plan) evaluates growth and development that occurred between its adoption in 2012 and the Town’s previous update in 1999 (North Carolina Department of Commerce, 2012). The Land Use Plan

identifies trends as well as issues and impacts associated with the community profile, natural environment, community resources and public facilities, transportation and circulation, current and future land use, actions, goals, and policies.

The Land Use Plan predicts that residential development will be the most common development type in the immediate future and states that the planned development will result in population growth.

2017 Town of Navassa Gateway Plan

The North Carolina Department of Commerce prepared the *2017 Town of Navassa Gateway Plan* (Gateway Plan) to guide future development decisions around the I-140/Wilmington Bypass interchanges at Mt. Misery Road and Cedar Hill Road (Exits 8 and 10, respectively) to promote economic development within the Town (North Carolina Department of Commerce, 2017). The plan’s vision statement cites the Town’s desire to improve its character and quality of life through new commercial, industrial, and residential developments.

The Gateway Plan evaluates zoning and subdivision ordinances and identifies aspects of those ordinances that should be

amended to better align with its stated vision. Requiring sidewalks for all new residential and commercial land uses was one of the recommended amendments.

Using the *Town of Navassa Future Land Use Plan 2011–2030* (North Carolina Department of Commerce, 2012) as a guide, the Gateway Plan also identifies the following regulations that should be implemented for new development at the two interchanges:

- Discourage commercial strip development and encourage development within nodal areas.
- Relate buildings to the street to encourage pedestrian circulation.

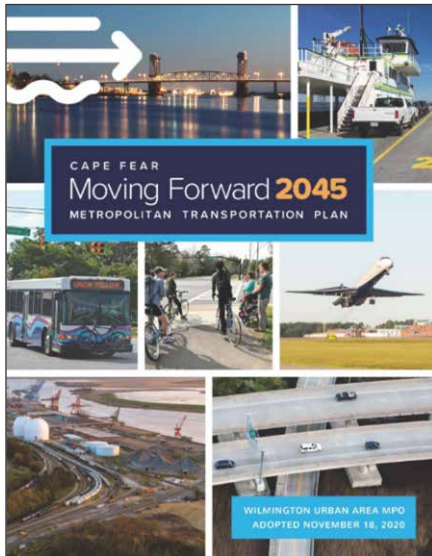
- Line streets with sidewalks to build safe, comfortable connections between buildings, the street, and parking.
- Limit the number, size, and height of free-standing signs to reduce sign clutter.
- Provide site landscaping and retain as many existing site trees as possible to create a sustainable environment.
- Prohibit cul-de-sacs so that connectivity and site access is preserved for all users, while mitigating traffic congestion.
- Manage driveway access to limit conflicts and promote orderly land use patterns.

3.2 Regional Planning Documents

Relevant regional planning documents were reviewed to understand anticipated growth and development in the vicinity of the Town

and the impacts it will have on the roadway network. Key findings, as they relate to this Plan, are outlined in the following narrative.

Cape Fear Moving Forward 2045 Metropolitan Transportation Plan

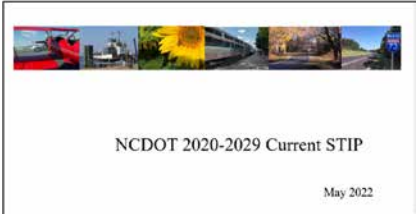


The *Cape Fear Moving Forward 2045 Metropolitan Transportation Plan* (MTP; WMPO, 2020), which was adopted by the WMPO in November 2020, is the plan that federal, state, and local governments will use to guide transportation projects in the region over the next 25 years. The MTP includes an evaluation of potential aviation, bicycle and pedestrian, ferry and water transportation, freight and freight rail, public transportation, and roadway projects to meet the needs of the region. The vision for the MTP is to plan for a safe, realistic, efficient, and reliable multimodal transportation network that embraces innovation and is environmentally and socially responsible.

The MTP supports the application of NCDOT's Complete Streets policy (NCDOT, 2019a), which requires the consideration and incorporation of multimodal facilities in the design and construction of new transportation facilities as well as improvements to existing facilities. The MTP also identifies projects and policies that encourage increased ridership and improved service of public transportation within the WMPO planning boundary. From a roadway perspective, the MTP proposes to address congestion in the region by providing redundancy in the current transportation network. It recommends investments in alternative routes as well as improvements to existing roadways to increase resiliency.

The MTP does not include any roadway projects within the Town of Navassa.

NCDOT 2020-2029 State Transportation Improvement Program Projects



The *NCDOT State Transportation Improvement Program (STIP)* is a 10-year state and federally mandated plan that identifies the construction funding for and scheduling of transportation projects throughout the state (NCDOT, 2022).

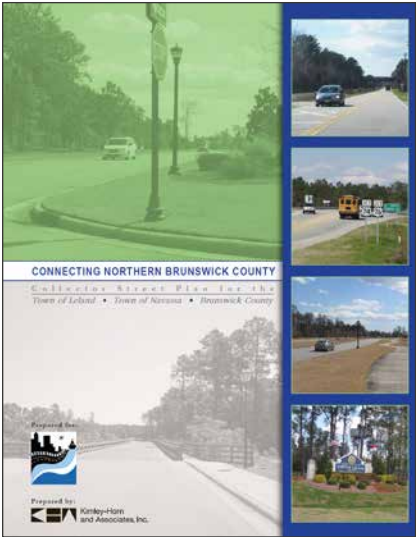
The 2020–2029 STIP includes two projects within the Town, both of which pertain to the I-140/Wilmington Bypass (Table 1).

TABLE 1. STIP PROJECTS IN THE TOWN OF NAVASSA

STIP ID	LOCATION	DESCRIPTION	CONSTRUCTION YEAR (FISCAL YEAR)
I-6038	I-140	US 421 to US 74/US 76. Pavement rehabilitation	2029
R-2633D	I-140 / US 17 Wilmington Bypass	Implementation of Intelligent Transportation Systems (ITS)	Under construction

Source: NCDOT, 2022

2013 Connecting Northern Brunswick County Collector Street Plan



The *Connecting Northern Brunswick County Collector Street Plan* was adopted by the Town of Leland and the Town of Navassa on June 20, 2013, and by the WMPO Board on July 31, 2013 (Kimley Horn and Associates Inc., 2013). The Brunswick County plan, which includes feedback from a steering committee, community stakeholders, and the public, provides a review of existing conditions, facility recommendations, and existing policies and practices.

The Brunswick County plan recommends the following collector streets for construction within the Town of Navassa:

- Wide Way Extension to the west to connect to Mt. Misery Road
- Magnolia Drive Extension to the west to connect to Mt. Misery Road via Playground Way
- Valentine Way Extension to the south to connect to the proposed Wide Way Extension southwest of Cedar Hill Road
- Cedar Hill/Wide Way Extension Connector from Cedar Hill Road south to the Wide Way Extension
- Ivester/Eastbrook Connector from the Old Mill Road/Ivester Court intersection to Eastbrook Street
- Victoria Lane Extension to the south into Leland



4

Existing Conditions

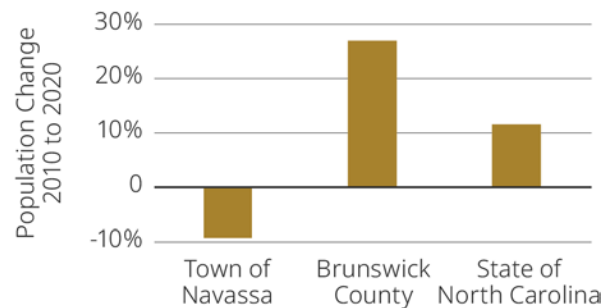
Existing demographic and socioeconomic conditions were used in conjunction with data pertaining to the natural and built environment to help guide the development of the recommendations presented in this Plan. GIS data, traffic counts, travel demand modeling, traffic analysis zones (TAZs), and origin-destination data were also used to develop baseline mapping for this Plan.

Demographics, socioeconomic conditions, the natural and built environments, and commuting patterns were evaluated to gain a better understanding of the Town’s population and its transportation needs. Data tables associated with this section can be found in Appendix A.

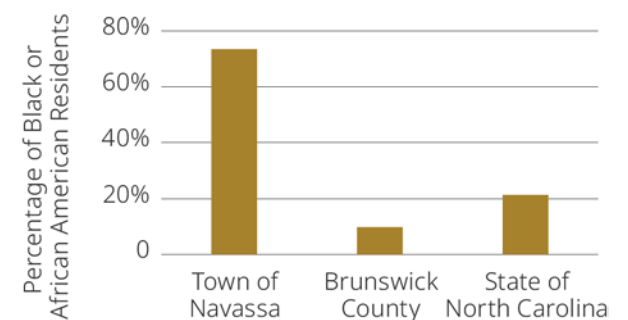
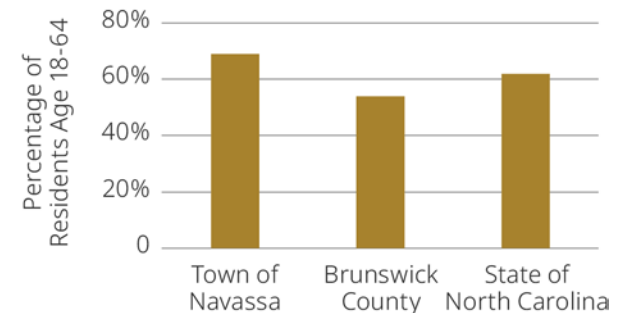
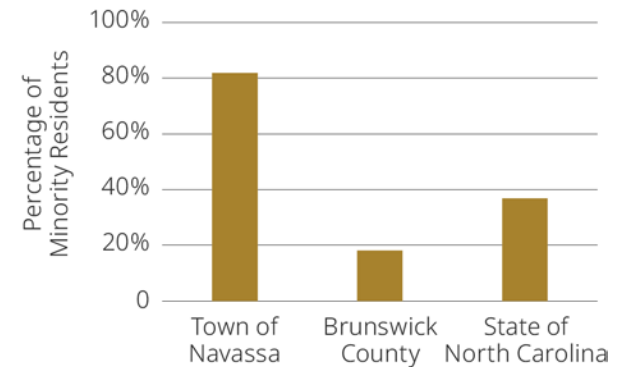
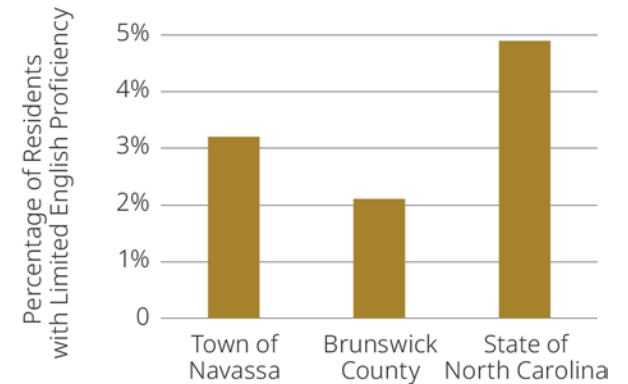
4.1 Population and Demographics

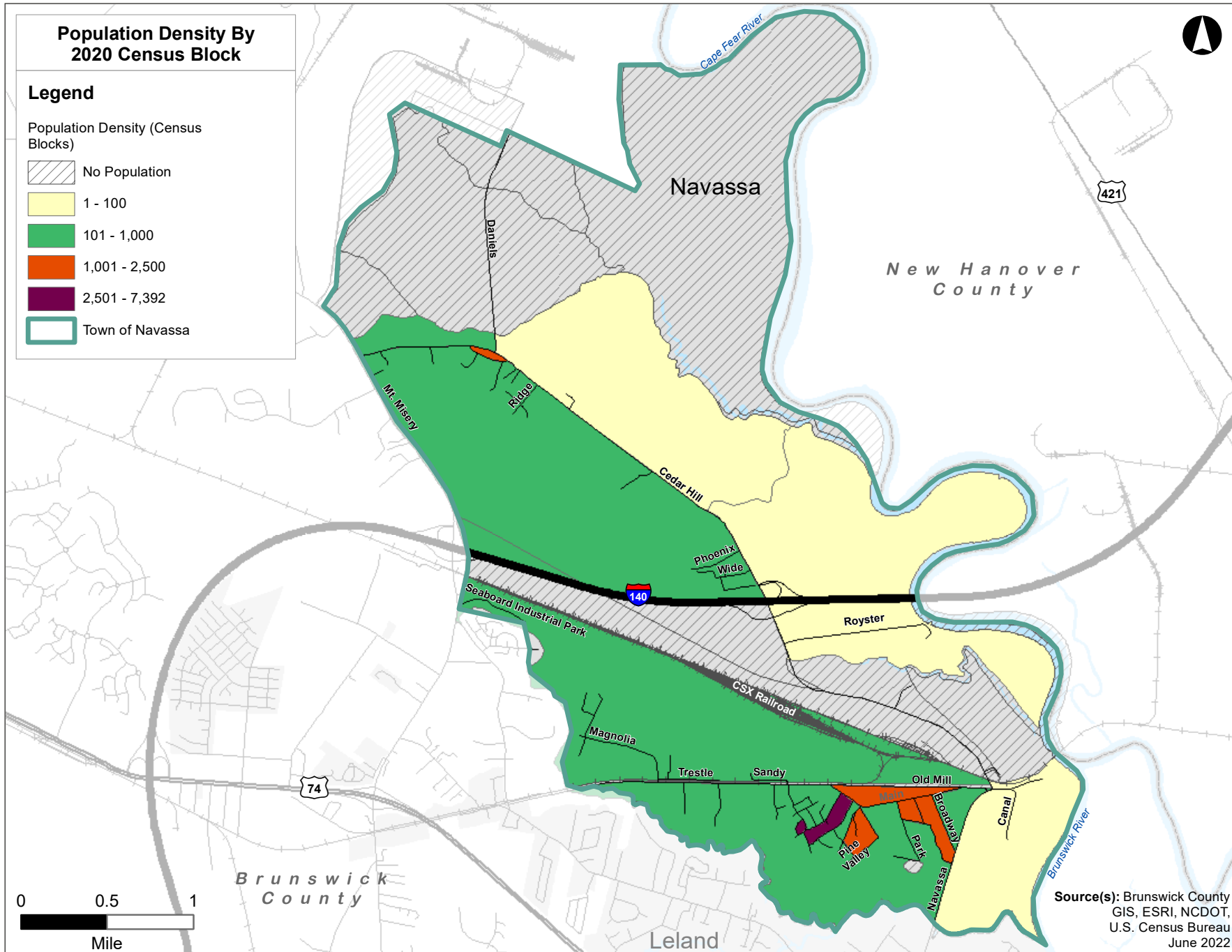
According to the 2020 U.S. Census, the population of the Town is 1,367 (U.S. Census Bureau, 2021b). However, the 2021 ACS 5-year estimate shows an increase in population to 1,525.¹ The Spanish-speaking population is the only Limited English Proficiency (LEP) population in the Town (U.S. Census Bureau, 2020). The Town’s population and demographics are summarized in the graphs below and the 2020 population density by census block is shown in Map 3.

¹ US Census Bureau 2021, 5-Year Estimate 2017-2021, 2021 ACS B01003, “Total Population.”



Note: In 2010, 78% of town residents participated in the Census, while in 2020, only 48.4% participated (U.S. Census Bureau, 2010; U.S. Census Bureau, 2021a)



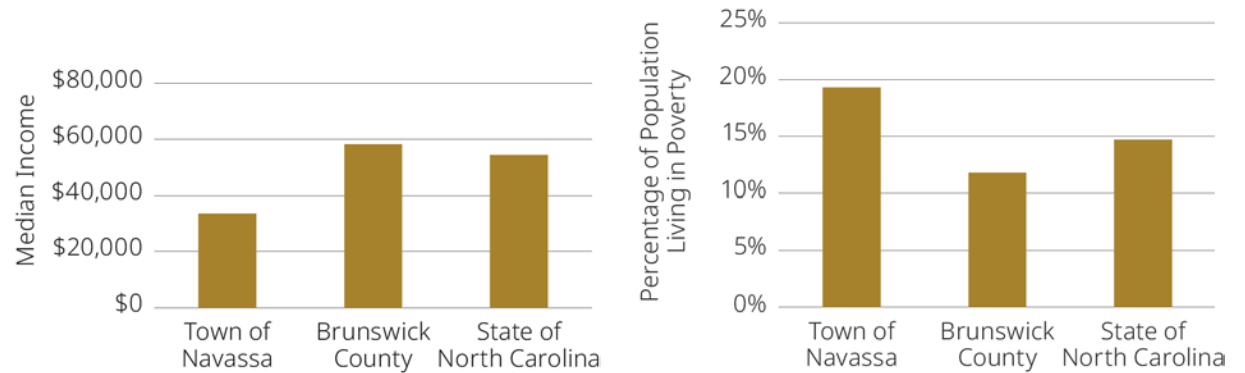


Map 3. Population Density by 2020 Census Block

4.2 Socioeconomic Conditions

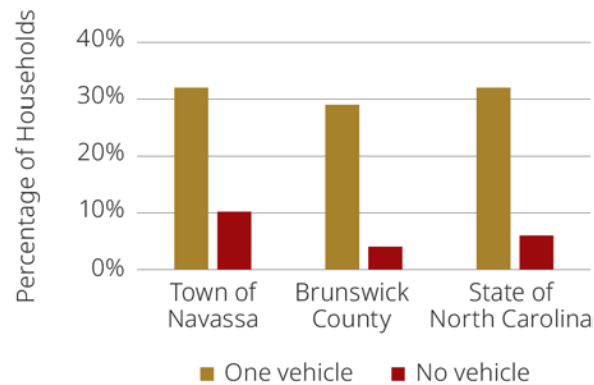
Poverty

Income level plays a large role in the modes of transportation available to individuals or households. In 2018, the annual income defining the poverty threshold for a family of four with two children in the United States was \$25,465 (U.S. Census Bureau, 2019b).



Vehicle Ownership and Availability

Vehicle availability is another key factor when determining how much of the population may rely on public transportation services or walking or biking. Although income is often a key factor in vehicle ownership, there are various other reasons for not having access to a vehicle, including age, physical or mental limitations, or choice.

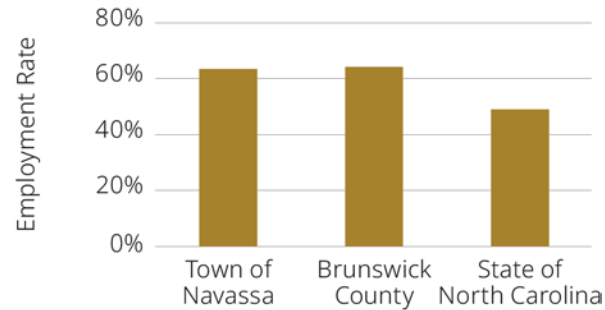


Employment

The economy within the Town employs more than 1,000 people. Pacon Manufacturing employs more than 300 people (Brunswick Business & Industry Development, 2022). The largest industries are auto repair, the Fire Department, and church and religious associations and organizations (Chamber of Commerce, 2022). The largest area employers are located outside the Town in Brunswick County.

According to the North Carolina Department of Commerce (2021 Quarter 1), the top employers in Brunswick County are the Brunswick County Board of Education, Brunswick County, Wal-Mart Associates Inc., Progress Energy Service Co., and Food Lion (North Carolina Department of Commerce, 2021). Both the Brunswick County Board of Education and Brunswick County employ more than 1,000 individuals. However, more than 50 percent of the Town is employed outside of Brunswick County (U.S. Census Bureau, 2019a).

Employment density in Brunswick County is highest south of the Town in the Belville area. This is one of the primary job centers in Brunswick County, with several areas of concentrated jobs exceeding 5,000 jobs per square mile. High concentrations of jobs are



Town Fire Department

also present in the Town of Leland and along US 74 between Sandy Creek and Belville (U.S. Census Bureau, 2019a).

4.3 Natural Environment

Natural Resources

The Town is located on the Cape Fear River and contains large areas of undeveloped forested lands and wetlands associated with the Cape Fear River and its tributaries (see Map 4).

Two conservation areas lie within the Town:

- The Brunswick River/Cape Fear River Marshes, managed by the North Carolina Department of Environmental Quality, are located in the southern portion of the Town.
- The Reaves Chapel Preserve owned by the North Carolina Coastal Land Trust is located near the intersection of Cedar Hill Road and Valentine Way.

Streams and Wetlands

Streams and wetlands are scattered throughout the Town. The Cape Fear River acts as the eastern boundary for the Town. Nine named streams as well as numerous unnamed tributaries flow within the limits of the Town. Wetlands are concentrated along

the Cape Fear River and other large stream systems within the Town, including Indian Creek and Cartwheel Branch. The Town has more than 3,400 acres of wetlands, with riverine swamp forest, pocosin, and freshwater marsh representing the largest of the wetland systems.

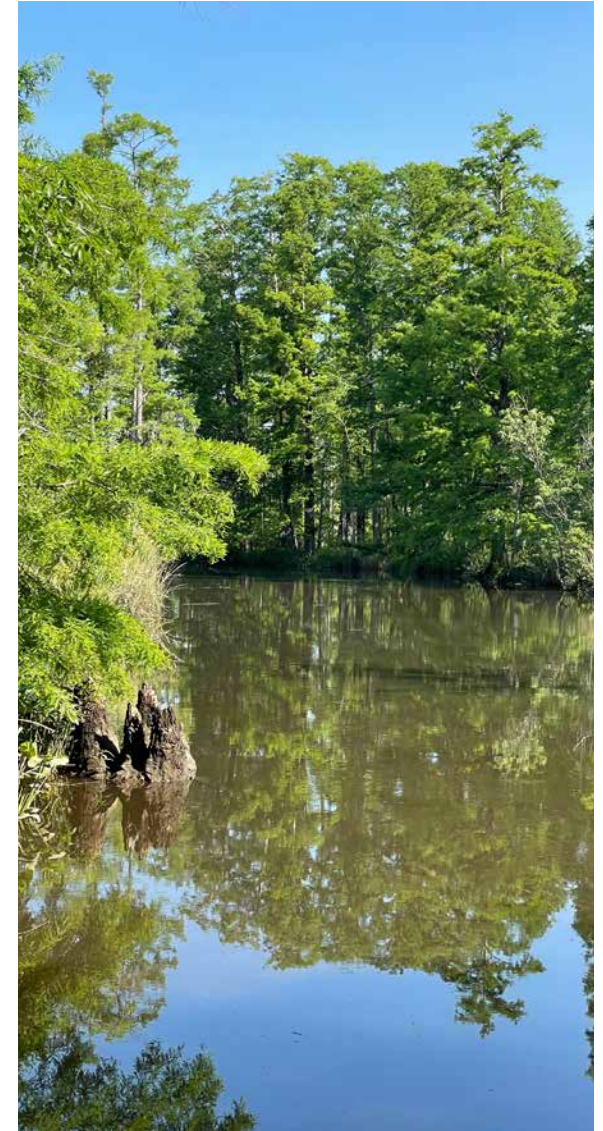
Floodplains

The Town limits include more than 2,800 acres of floodplains, which are concentrated along the Cape Fear River and major stream systems such as Indian Creek and Cartwheel Branch.

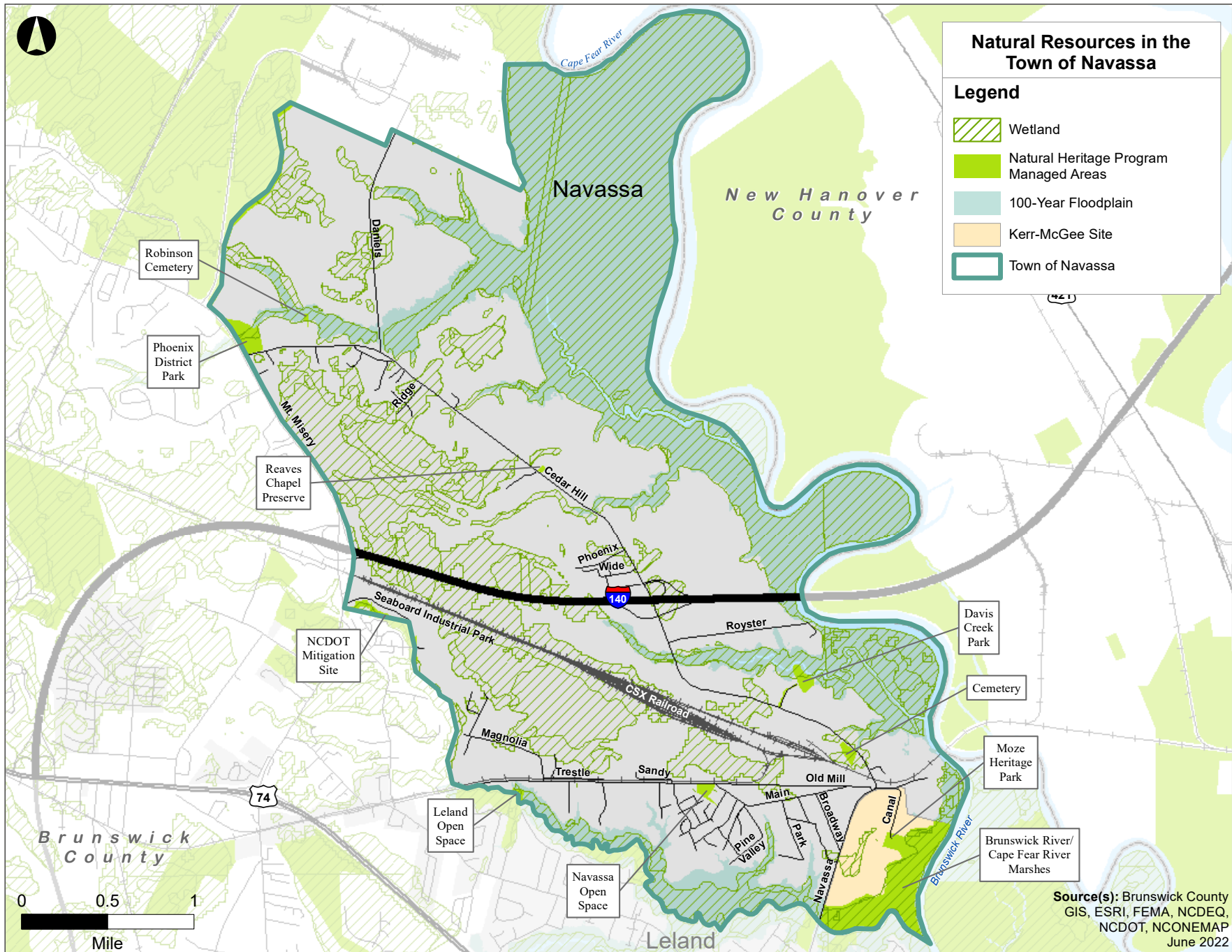
Flooding

Flooding is a recognized problem within the Town. Its elevation and proximity to the Cape Fear River and associated tributaries lends the Town to frequent flooding events during both minor and major storms such as hurricanes.

The Town recently identified six sites for implementation of stormwater best management practices (BMPs). The largest site is contained within the Kerr-McGee Site where a park and wetland conservation area are planned. The other sites are located along Cedar Hill Road and south of Old Mill Road near the Navassa Town Hall building.



Cape Fear River at Davis Creek Park



Map 4. Natural Resources

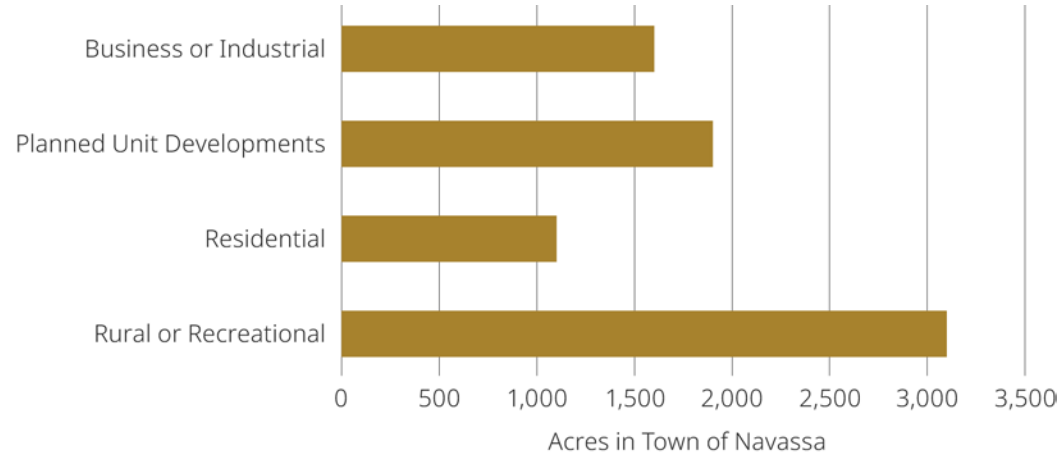
4.4 Built Environment

Understanding the existing built environment is critical when determining the location of new connections. This Plan considers current land use and zoning and the existing road network, as well as current annual average daily traffic (AADT) counts that provide information on road use. The non-motorized transportation network is limited but offers insight on the importance of local roads.

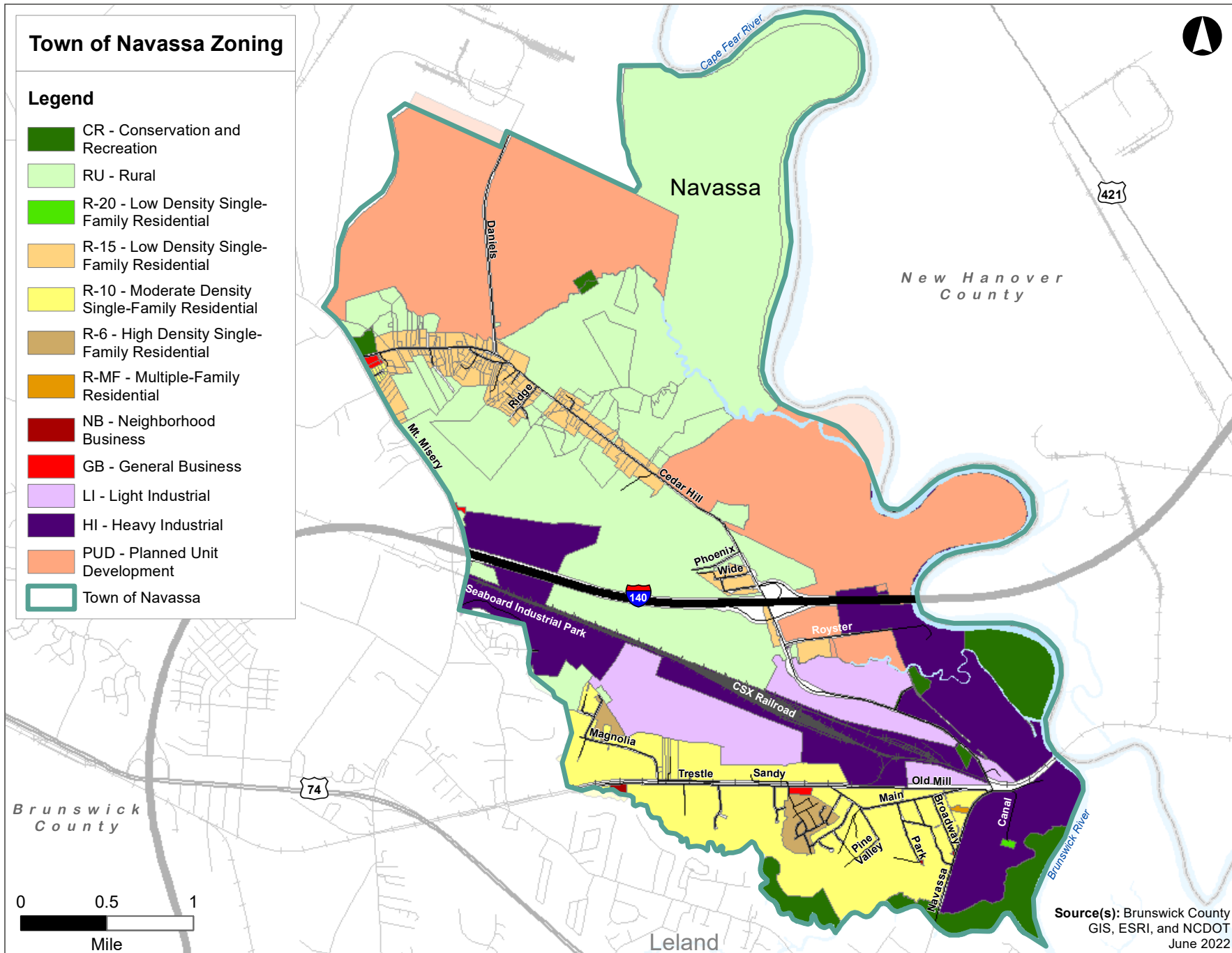
Land Use and Zoning

The Town limits include nearly 7,700 acres, 3,100 of which are zoned as rural or recreational. While much of the Town is forested with large wetland areas, residential areas are present along Cedar Hill Road and south of Old Mill Road. Industrial properties are present in the southeast portion of the Town, near Davis Yard. The I-140/Wilmington Bypass bisects the Town east to west, with Davis Yard and its rail lines just south of the interstate.

The Town is divided into the 12 zoning districts as shown in Map 5.



Davis Chapel Missionary Baptist Church on Main Street in Navassa



Map 5. Zoning

Roadway Network

Apart from I-140/Wilmington Bypass, the majority of the Town's roads have speed limits that range from 20 miles per hour (mph) to 45 mph. Many low-speed roads (less than 35 mph) are located south of Old Mill Road in residential areas.

The Town's major roadways, assigned WMPO functional classifications, and speed limits are presented in Table 2. All other roadways within the Town, unless private, are classified as local roads. The speed limits were extracted from Brunswick County GIS data (Brunswick County, n.d.).

TABLE 2. TOWN OF NAVASSA WMPO ROADWAY FUNCTIONAL CLASSIFICATIONS

STREET NAME	WMPO FUNCTIONAL CLASSIFICATION	SPEED LIMIT
I-140	Interstate	70
Mt. Misery Road NE (SR-1426)	Minor Arterial	55
North Navassa Road (SR-1435)	Major Collector	45
Old Mill Road NE (SR-1432)	Major Collector	45

WMPO = Wilmington Urban Area Metropolitan Planning Organization
Source: WMPO, 2019; Brunswick County, n.d.

Traffic Count

Table 3 presents 2019 annual average daily traffic (AADT) for the Town.

TABLE 3. ANNUAL AVERAGE DAILY TRAFFIC

ROUTE NAME	LOCATION OF COUNT	AADT
Mt. Misery Road (SR 1426)	South of Cedar Hill Road (SR 1430)	6,200
Mt. Misery Road (SR 1426)	North of Cedar Hill Road (SR 1430)	6,900
Cedar Hill Road (SR 1430)	North of Royster Road (SR 1431)	2,700
Cedar Hill Road (SR 1430)	North of Old Mill Road (SR 1432)	2,900
Cedar Hill Road (SR 1430)	East of Mt. Misery Road (SR 1426)	1,400
Royster Road (SR 1431)	East of Cedar Hill Road (SR 1430)	220*
Old Mill Road (SR 1432)	East of Lincoln Road (SR 1455)	1,300
Main Street (SR 1434)	South of Old Mill Road (SR 1432)	1,600
North Navassa Road (SR 1435)	South of Old Mill Road (SR 1432)	3,100
South Navassa Road (SR 1435)	North of Village Road (SR 1472)	5,100
Broadway Street (SR 1443)	North of North Navassa Road (SR 1435)	1,600
Daniels Road (SR 1453)	North of Cedar Hill Road (SR 1430)	100*

Table note: All AADT counts are as of 2019 unless otherwise noted

*Data is from 2015 count

Source: NCDOT, 2015 and NCDOT, 2019c

Non-Roadway Transportation Network

Freight

CSX Transportation operates a freight rail route between the Port of Wilmington, Davis Yard, and points west of the Town. The rail line runs in an east-west direction through the Town and is located north of Old Mill Road.

Davis Yard is a rail yard and transload facility located within the Town that provides freight



Railroad tracks running from Davis Yard along Old Mill Road

transportation and serves as the base for switching operations. The facility is 3 miles long and has 55 separate tracks. Davis Yard offers long and short-haul truck service and has transloading ability for dry and liquid bulk products, warehouses for lumber, paper and packaged products, and steel centers for ferrous and non-ferrous materials.

Public Transportation

There has been no fixed-route transit service available in the Town since September of 2020. On-demand public transportation is made available to Town residents by Wave Transit and the Brunswick Transit System. On-demand service is available through Brunswick Transit System Dial-a-Ride and RideMICRO.

Brunswick Transit System

Dial-a-Ride. Operates in Brunswick County on weekdays from 8:00 am to 5:00 pm and requires 2 hour advanced reservation.

RideMICRO. Allows residents to book an on-demand ride from a virtual stop within a set of zones. The Town is located within Zone 1 for this service. The ride connects users to Wave Transit's fixed route service. Runs weekdays from 7:00 am to 10:00 am and noon to 7:30 pm.

Bicycle and Pedestrian

Facilities for use by bicyclists and pedestrians are limited within the Town. No sidewalks are present on any major roads in the Town. The only sidewalks within the Town are located in some of the newer housing developments such as Lena Springs.

The only dedicated bicycle facilities consist of paved shoulders and bicycle lanes on Cedar Hill Road and Mt. Misery Road near the I-140 interchange areas. One multiuse path in the Town runs 0.3 miles from Water Street/ Brooklyn Street to Main Street. A current NCDOT State Transportation Improvement Program (STIP) project (U-5534U) will extend the multiuse path to Navassa Park, forming a loop within the park. The project will also construct bicycle lanes on both sides of Brooklyn Street.



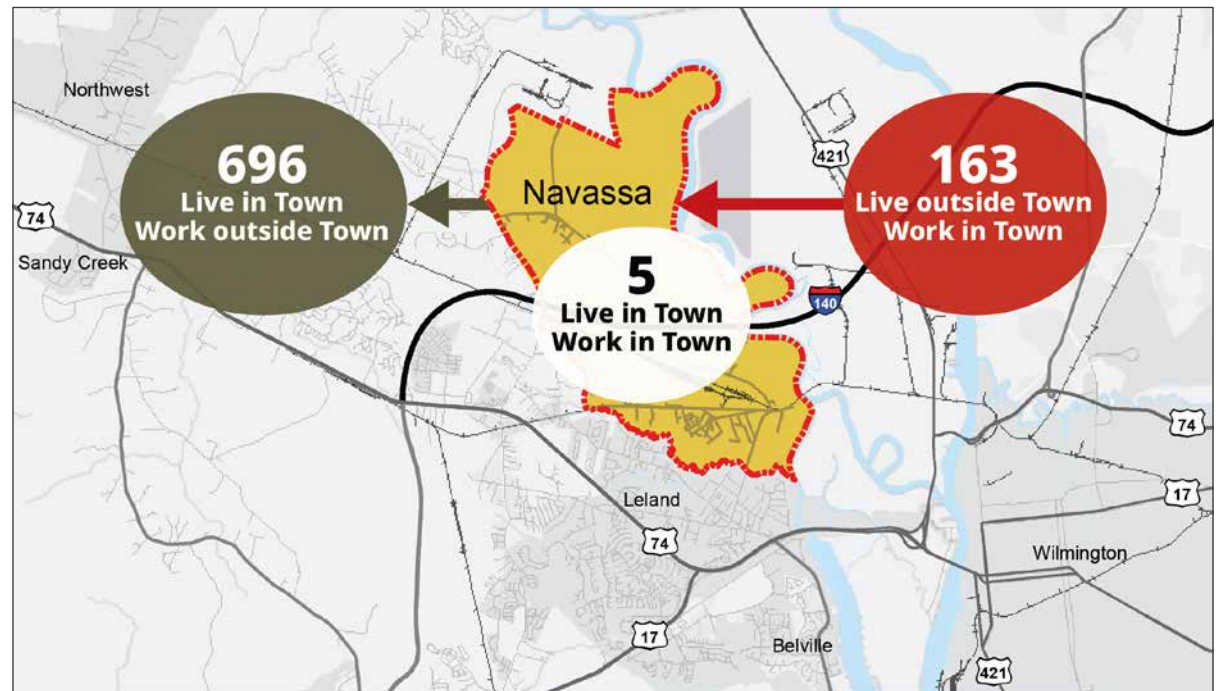
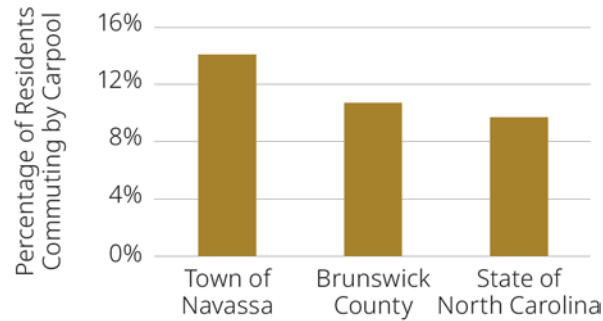
Paved shoulders on Cedar Hill Road near I-140

4.5 Commuting Patterns and Characteristics

Commuting patterns into and out of the Town were analyzed as part of evaluating collector street need and optimal locations. Commuting modes for the Town include alone by auto, carpooling, public transportation, and bicycle/ pedestrian.

According to the Longitudinal-Employer Household Dynamics (LEHD) dataset, in 2019, 168 workers were employed in the Town and, of those workers, 163 lived outside the Town. Only five Town residents in the workforce both lived and worked within the Town limits (U.S.

Census Bureau, 2019a). Far more workers live in the Town and leave it for work (696 workers) than the 163 who commute into the Town from areas outside of Navassa. Workers travel to and from Brunswick and New Hanover County as shown in the bar chart below.



Inflow/outflow of Town of Navassa workers



5

Stakeholder Engagement and Public Outreach

Stakeholder engagement and public outreach were key components of the planning process.

5.1 Stakeholder Engagement

The project team identified a Steering Committee of project stakeholders early in the planning process. The Steering Committee worked with the project team to identify appropriate methods for public outreach. Including local officials and town staff as well as Wilmington Urban Area Metropolitan Planning Organization (WMPO) and North Carolina Department of Transportation (NCDOT) staff, the Steering Committee met three times throughout the planning process with the objectives outlined in Table 4.

TABLE 4. STEERING COMMITTEE MEETINGS

MEETING	DATE	OBJECTIVES
Meeting 1	December 8, 2021	<ul style="list-style-type: none"> • Review the role of the Steering Committee • Establish a set of vision and goals for this Plan • Discuss existing conditions • Review the 2004 collector streets • Identify known development areas, problem areas, and needs of the Town
Meeting 2	February 16, 2022	<ul style="list-style-type: none"> • Finalize the vision and goals for this Plan • Present and review preliminary results from the public survey • Review proposed collector streets • Review proposed typical sections • Review and provide input on potential policy recommendation themes
Meeting 3	June 23, 2022	<ul style="list-style-type: none"> • Present the draft plan and draft plan presentation materials to the Steering Committee for their review and comment prior to presenting to Town Council for approval

STEERING COMMITTEE

Town of Navassa

- Eulis Willis, Mayor
- Marcell Hatten, Planning Board
- Claudia Bray, Town Administrator
- William Ballard, Town Councilman
- Marvin Ballard, Planning Board
- Barnes Sutton, Former Town Planner

WMPO

- Rachel McIntyre, PLA, Associate Transportation Planner

NCDOT District 3

- Ben Hughes, PE, District Engineer

5.2 Public Outreach

Public outreach for this Plan included an online survey, an in-person public meeting, and a virtual public meeting. A summary of the public outreach undertaken for this Plan follows. The survey and a full summary of results are presented in Appendix B.

Public Survey

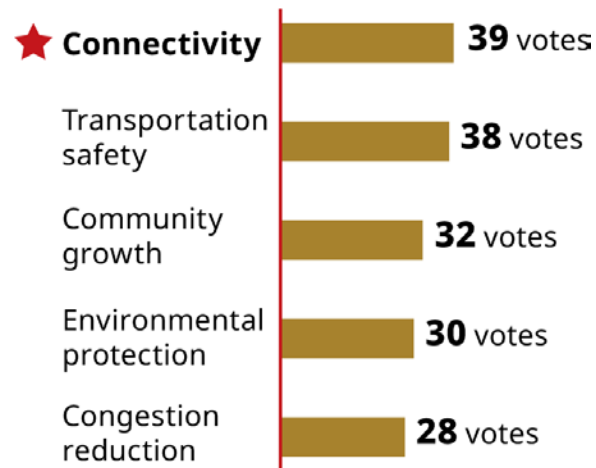
Using the online engagement platform MetroQuest, the project team developed a survey to solicit feedback from the public regarding their priorities. Participants were asked to rank their top five priorities from the following: environmental protection, congestion reduction, equity, connectivity, resiliency, transportation safety, community growth, and multi-modal options.

The survey was advertised on the Town's website, on the WMPO's website, and using the Town's phone notification system. Flyers containing a quick response (QR) code for the survey were available at the Town's Community Center. A hardcopy version of the survey was also available at the Town's Community Center for those who were unable to take the survey online. Additionally, Mayor Eulis Willis and Marcell Hatten (Town of Navassa

Planning Board) distributed hardcopy surveys to community members at churches and other public places.

The MetroQuest survey was available from January 25, 2022 through March 20, 2022. During this time, 198 individuals visited the MetroQuest survey site, 52 individuals completed the online survey, and 4 individuals completed hardcopy surveys.

The top five priorities for collector streets, based on the 56 responses, are:



Public Meetings

The project team held two public meetings to present the vision and goals of this Plan, its recommended collector streets, and proposed typical sections to residents. An in-person, open house style meeting was held on March 9, 2022, at the Town's Community Center and a virtual meeting was held on March 10, 2022 via Zoom. Both meetings were scheduled from 5:00 pm to 7:00 pm.

At the in-person meeting, the project team gave a narrated presentation and had boards with information on this Plan, table maps, surveys, and copies of the vision and goals for the Plan available for the public to view. Copies of the meeting materials are provided in Appendix C.

Two individuals attended the in-person public meeting. No members of the public joined the virtual meeting.



6

Methodology

Using a combination of source data and the six-step process outlined in this section, the project team determined the need for, and placement of, proposed collector streets for the Town.

6.1 Source Data

Existing and modeled traffic data were used to evaluate transportation needs within the Town. The data and methodology used are described in the sections below.

TRAVEL DEMAND MODELS

Travel Demand Models (TDMs) use current travel behavior to project travel demand based on projected population and employment levels. TDMs are often used to forecast the transportation needs of a community and help planners assess the pros and cons of different options for meeting those needs.

The Wilmington Urban Area Metropolitan Planning Organization's (WMPO's) adopted TDM was last updated in November 2020. The TDM projects travel demand based on projected population and employment levels in 2045, assuming the infrastructure improvements listed in the Cape Fear Moving Forward 2045 Metropolitan Transportation Plan (WMPO, 2020). The TDM-based travel projections were used in conjunction with the traffic projections generated through the use of Annual Average Daily Traffic (AADT) data, described in Section 4.4 (see Table 3), to determine future traffic volumes.

The project team used the AADT data (NCDOT, 2019c) to develop future traffic projections along existing arterial roads. The historical AADT values at various locations were projected to future year 2045 using a straight-line projection method. The resulting values were compared to the roadway capacity and TDM-based travel projections to help determine where future collector streets should be proposed.

TRAFFIC ANALYSIS ZONES

Traffic Analysis Zones (TAZs) are areas delineated by state or local transportation officials, typically using census blocks, block groups, or census tracts, to tabulate traffic-related data.

The seven TAZs for the Town of Navassa, shown in Map 6, are used to illustrate current traffic patterns and show where future collector streets could be proposed.

STREETLIGHT DATA INC.

StreetLight Data Inc. is an on-demand mobility analytics platform used to generate anonymous data from location-based services on smart phones. The platform provides current travel trends to help determine where immediate improvements can be made.

Existing traffic patterns and volumes were derived from data obtained from StreetLight Data Inc. (StreetLight) and from NCDOT AADT data. The StreetLight data extracted for this analysis present traffic volumes on an average day in the months of March and October 2019, when traffic volumes are typically representative of normal traffic patterns. The AADT data present the traffic volumes of an average day in 2019, without accounting for seasonal or daily fluctuations. Because of atypical travel patterns in 2020,

as a result of the coronavirus pandemic, the project team selected 2019 as the analysis year.

Because NCDOT AADT data do not indicate the distribution of traffic, StreetLight data were used to provide traffic distribution information. Tables 5 and 6 present the number of trips entering and exiting each TAZ, respectively. The data collection locations and a summary of entering and exiting trips are shown in Map 6.

TABLE 5. ENTERING TRIPS FROM STREETLIGHT DATA

ENTRY POINT	TAZ 1	TAZ 2	TAZ 3	TAZ 4	TAZ 5	TAZ 6	TAZ 7	TOTAL
Dogwood Road (A) ¹	330	91	340	40	2	3	3	809
Mt. Misery Road (B)	1,868	617	1887	347	100	103	96	5,018
Cedar Hill Road (C)	262	241	215	100	86	97	97	1,098
Old Mill Road (D)	38	10	49	68	175	64	6	410
Navassa Road (E)	230	686	648	780	1,059	1,759	868	6,030

Trip data from StreetLight Data, Inc.

TAZ = Traffic Analysis Zones

1. Letters correspond to Streetlight Data in Map 7.

TABLE 6. EXITING TRIPS FROM STREETLIGHT DATA

EXIT POINT	TAZ 1	TAZ 2	TAZ 3	TAZ 4	TAZ 5	TAZ 6	TAZ 7	TOTAL
Dogwood Road (A) ¹	372	117	411	63	17	13	13	1,006
Mt. Misery Road (B)	2,144	626	2,117	522	214	213	201	6,037
Cedar Hill Road (C)	482	443	421	190	190	211	210	2,147
Old Mill Road (D)	27	15	46	36	192	90	17	423
Navassa Road (E)	113	761	733	873	1,034	1769	957	6,240

Trip data from StreetLight Data, Inc.

TAZ = Traffic Analysis Zones

1. Letters correspond to Streetlight Data in Map 7.

6.2 Six-Step Process

Using the data sources previously described, the project team undertook the following six-step process to determine the Town's need for collector streets, and where those collector streets would most improve traffic conditions or provide needed access alternatives.

Step 1: Identify Traffic Analysis Zones

The study area incorporates seven TAZs as shown in Map 6. For each TAZ, the project team evaluated housing, trips, and income and how those factors may affect potential future trips.

Step 2: Map Future Land Use

The project team used the *Town of Navassa Future Land Use Plan 2011-2030* (North Carolina Department of Commerce, 2012) to identify and map areas targeted for residential and mixed-use development, shown in Map 7.

Step 3: Remove Natural Resources

Natural resource areas, including wetlands and conservation areas, were removed to maintain and protect the resources and because they are unlikely to be developed. The results are shown in Map 8. Specifically, the eastern portion of the Town, closest to the Cape Fear River, is designated as conservation or conservation wetland area. Conservation areas have varying levels of protection against

development, but generally, conservation areas and wetlands would not support residential or mixed-use development.

Step 4: Create a Grid with Households per 10 Acres

The remaining residential and mixed-use development areas were used to predict future trips based on a household density grid. The land area was broken into 10-acre subunits. The project team used the Brunswick County Unified Development Ordinance (UDO; Brunswick County, 2015) in conjunction with the future land use designations to determine the number of future households within each 10-acre subunit, as shown in Map 9.

The UDO designates the allowable density of housing based on zoning districts. The allowable density for residential and mixed-use development areas was applied to each subunit to predict future household density.

Step 5: Identify Trip Generators – Daily Trips per 10 Acres

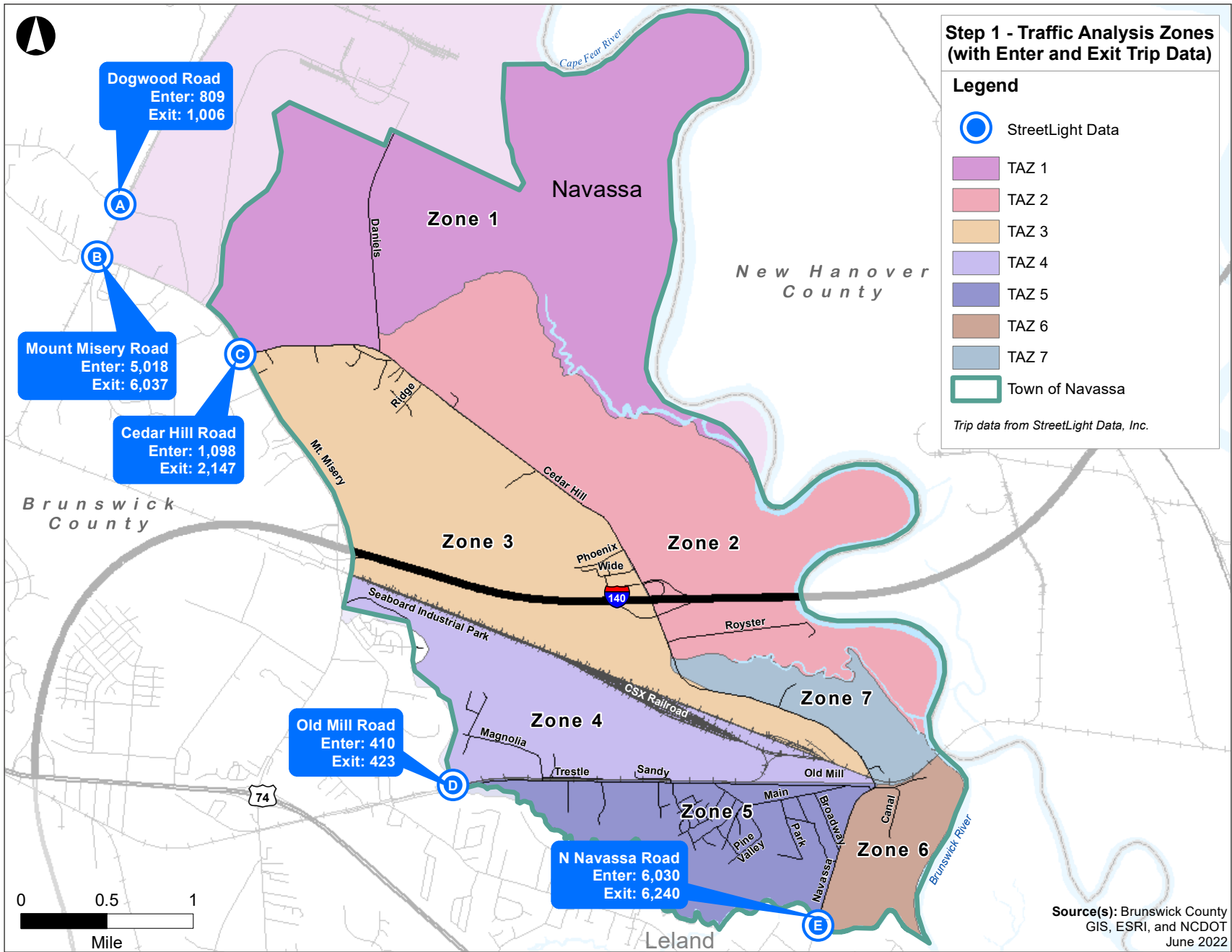
Step 5 used the WMPO's TDM to calculate the number of trips a given household would likely make using the grid created in Step 4. The TDM provides household characteristics such as household size, income, and vehicles. Based on this information, the project team

estimated three trips per day per household, on average. This rate was applied to each 10-acre subunit in the study area to help determine how many daily trips would be generated per land use type for the Town. The results are shown in Map 10.

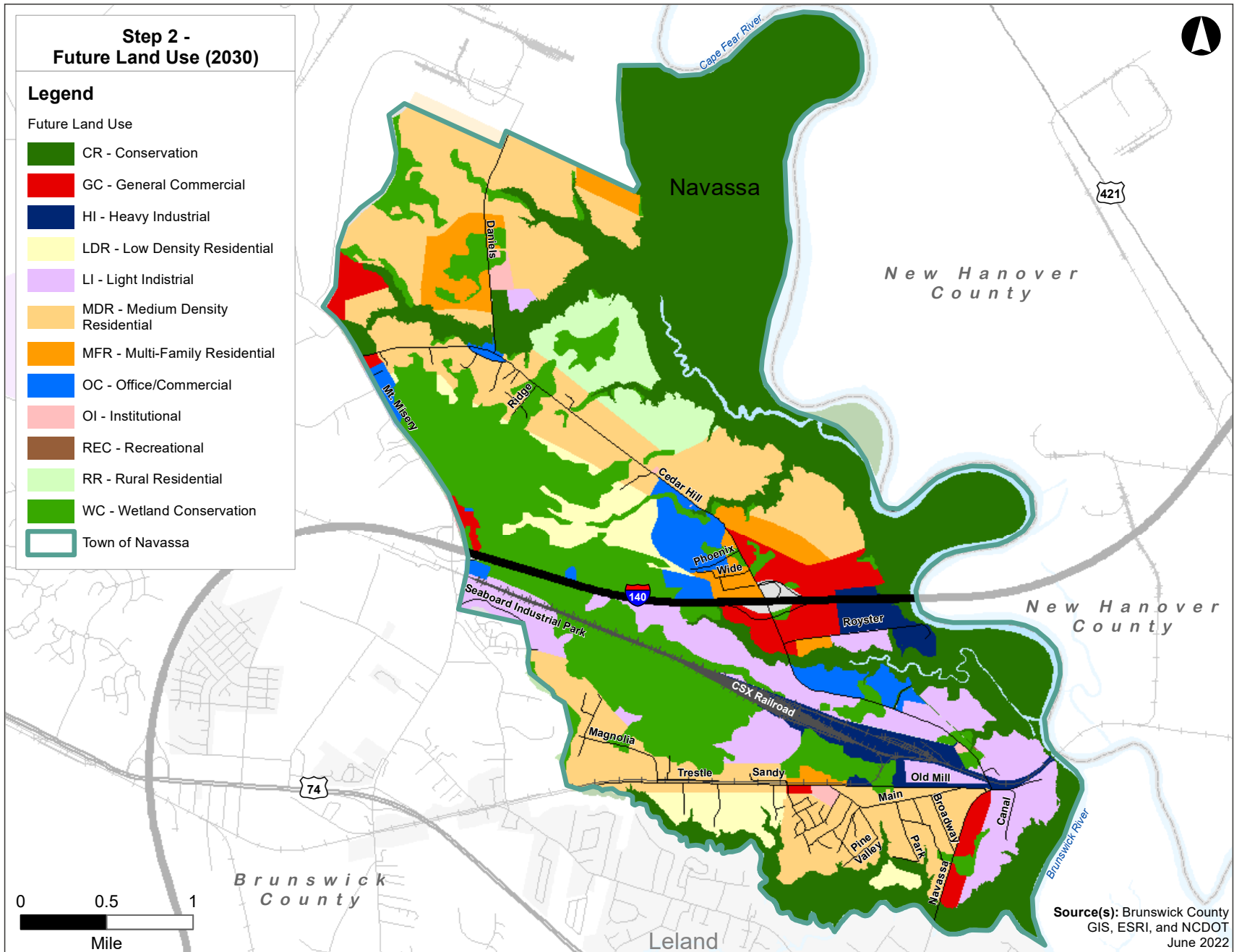
Step 6: Determine 2022 Proposed Collector Streets

The final step in developing the 2022 proposed collector streets consisted of overlaying the 2004 proposed collector streets on a map containing wetlands, the approved and proposed future developments (housing and parks) shown in Map 2 (see Section 3.1), and the daily trips per 10-acre subunit estimated in Step 5 and shown in Map 10.

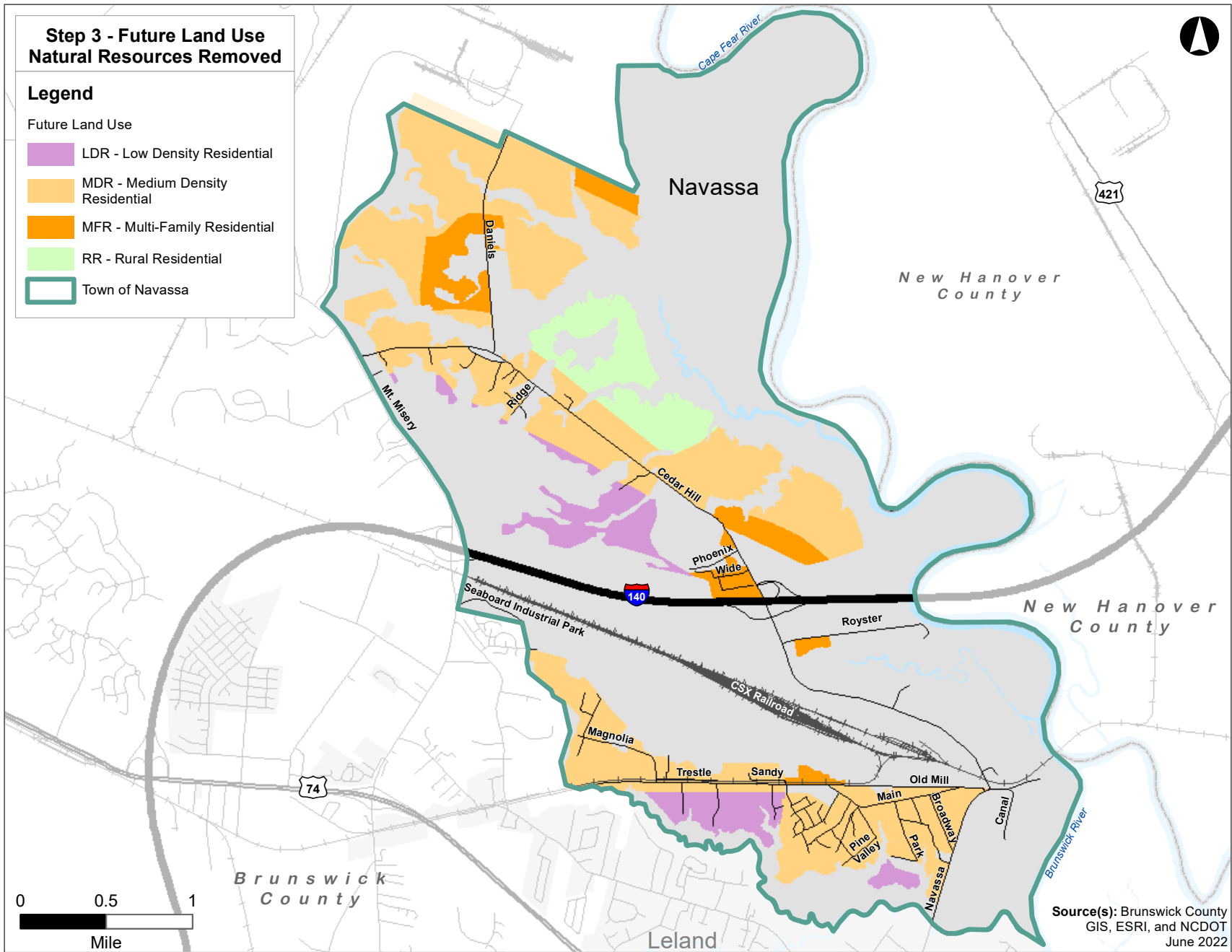
Proposed roadway networks within the approved housing developments were taken into consideration during this process. Using the data collected in this Plan, the proposed collectors from the 2004 Plan were re-evaluated and a new network was developed, as presented in Map 11. The most notable difference between the two plans is that this Plan avoids the proposed Cedar Lakes Resort and Indian Creek housing developments, and large wetlands in the western portion of the Town.



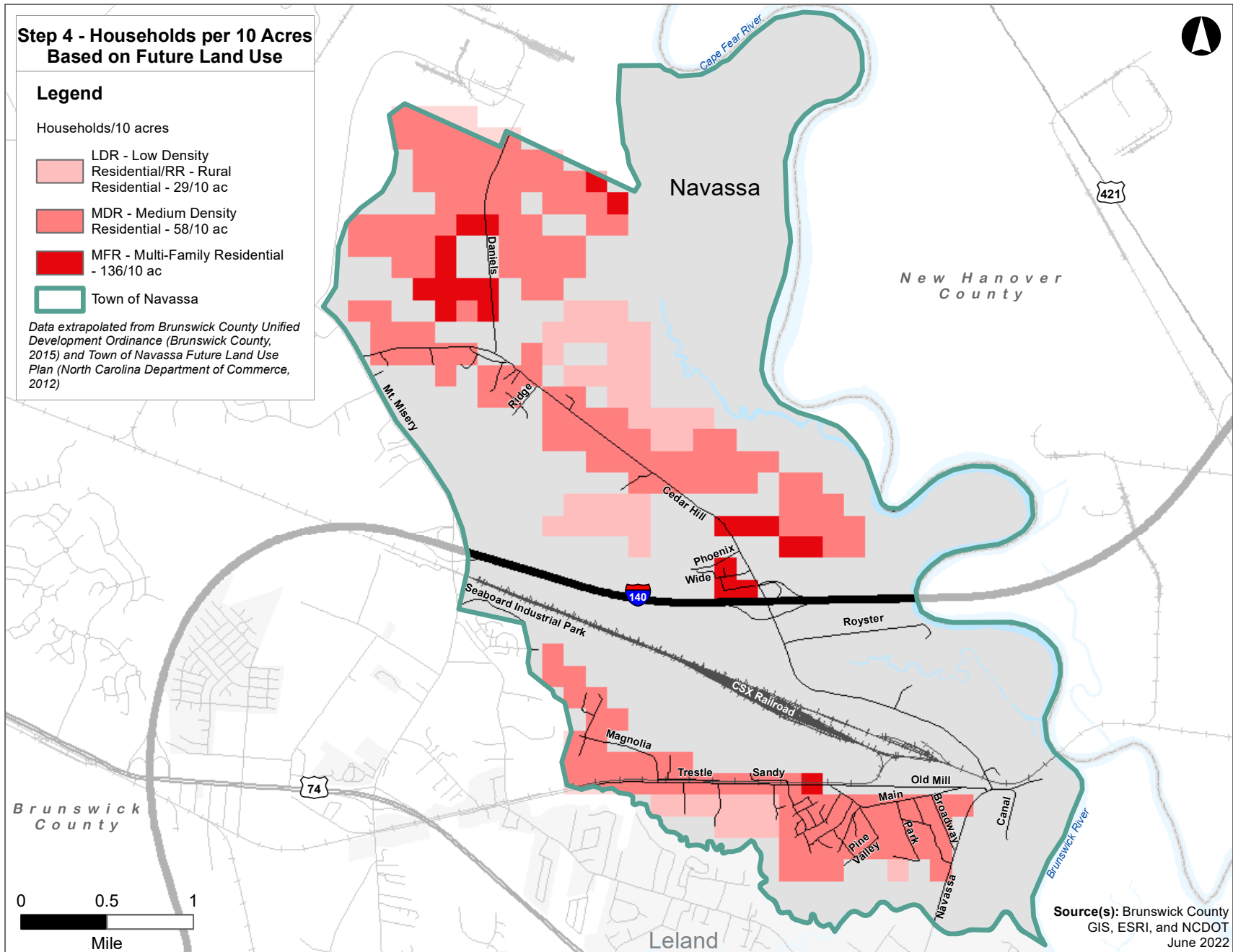
Map 6. Step 1 - Traffic Analysis Zones (with Enter and Exit Trip Data)



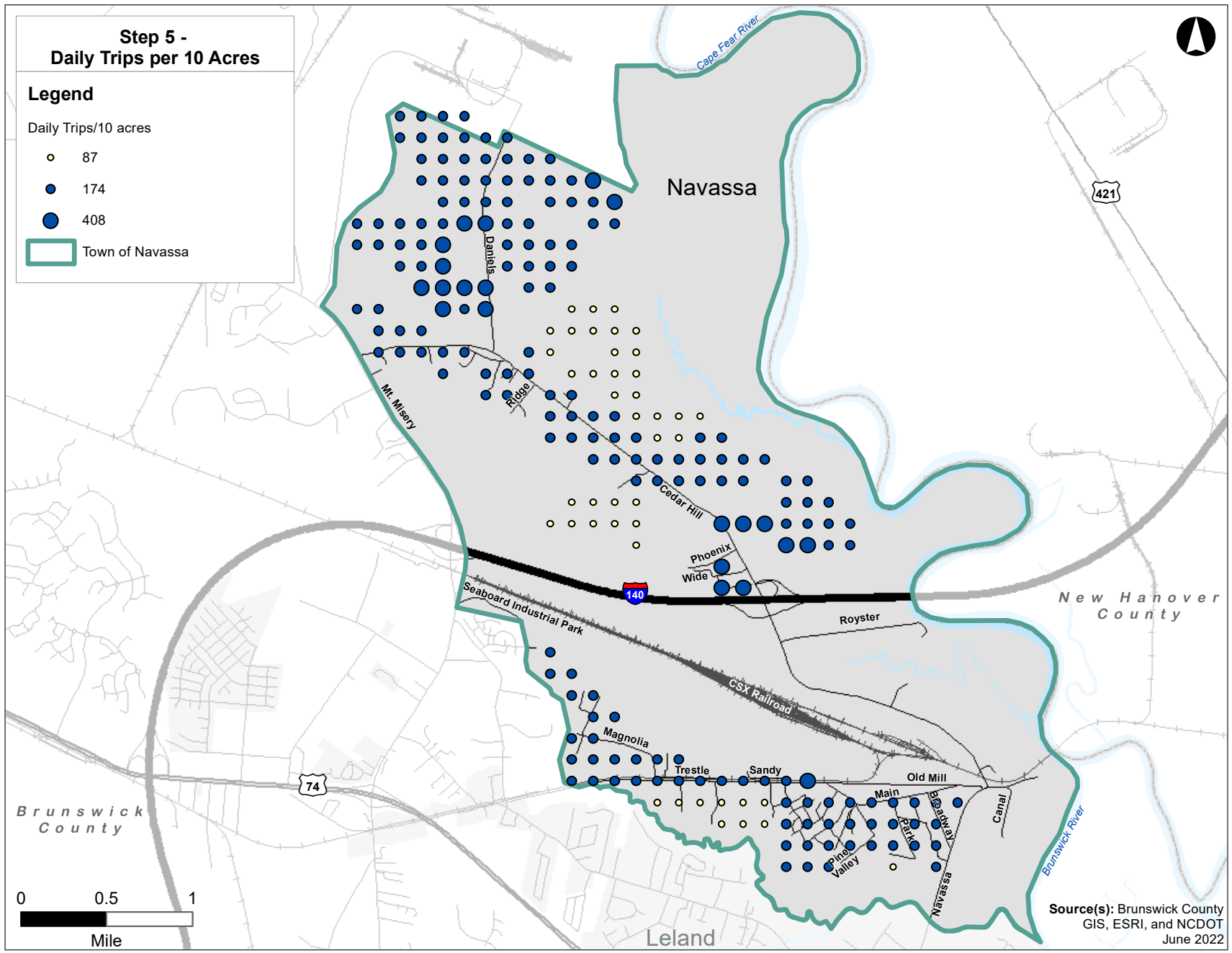
Map 7. Step 2 - Future Land Use (2030)



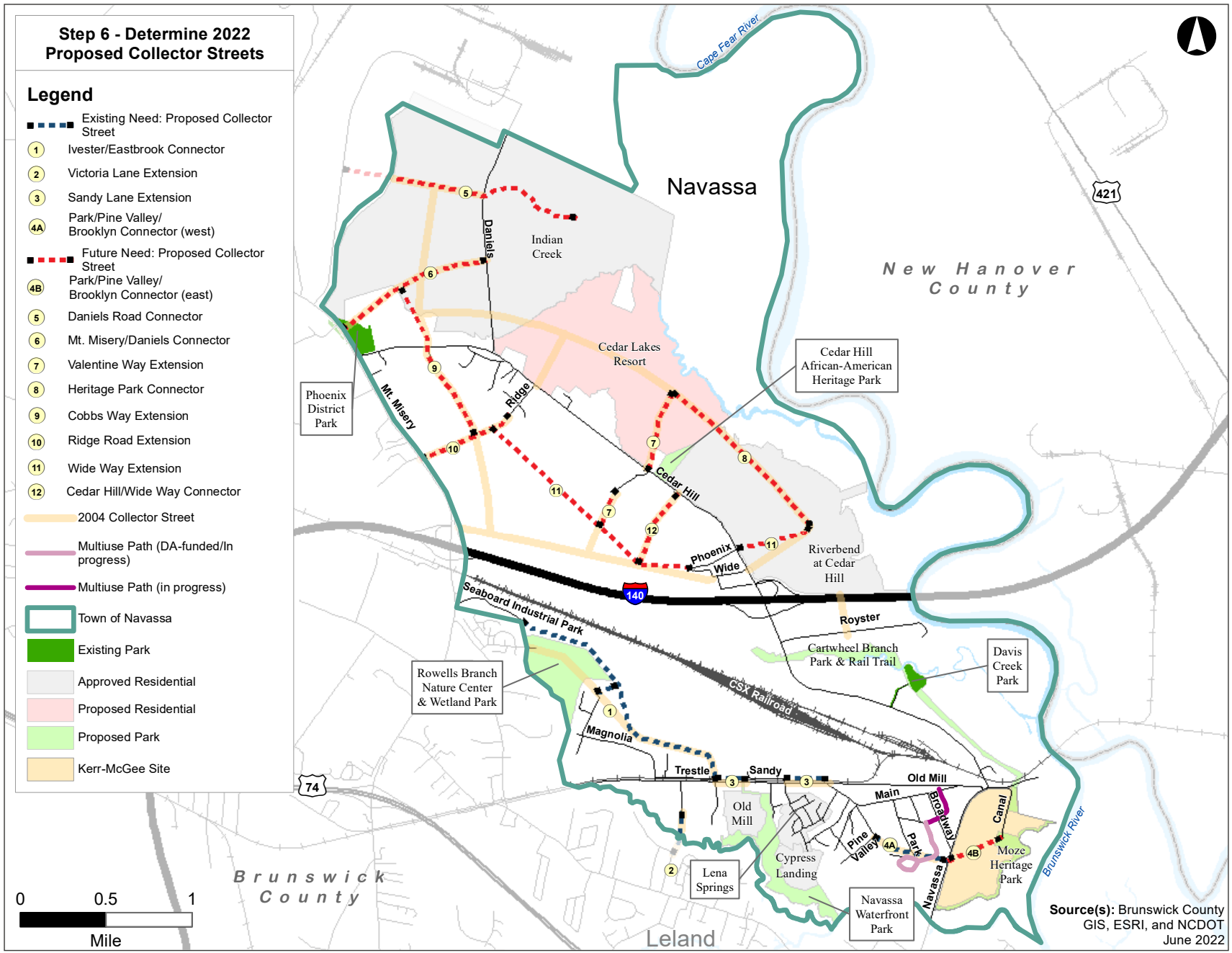
Map 8. Step 3 - Future Land Use - Natural Resources Removed



Map 9. Step 4 - Households per 10 Acres Based on Future Land Use



Map 10. Step 5 - Daily Trips per 10 Acres



Map 11. Step 6 - Determine 2022 Proposed Collector Streets



7

Recommendations

The project team used the six-step process outlined in Section 6 to re-evaluate the collector streets proposed in the 2004 Plan. The resulting 12 proposed collector streets account for known constraints, including future anticipated growth and natural resources.

The 12 proposed collector streets recommended in this Plan were presented to the Steering Committee for review and comment during the second Steering Committee meeting. Minor adjustments were made based on the meeting discussions. Map 12 shows the resulting proposed collector streets.

7.1 Proposed Collector Streets

The proposed collector streets fall into two categories: existing needs and future needs. Table 7 assigns a number, No. 1 to No. 12, to uniquely identify each proposed collector street and identifies the type of need, description, and approximate length of each. Note that collector No. 4 is both an existing and future need, as designated by No. 4a and 4b.

Existing Needs

The following four proposed collector streets are considered necessary to meet existing needs.

- **Ivester/Eastbrook Connector (No. 1).** The Ivester/Eastbrook Connector would provide a much needed second access at Seaboard Industrial Park Drive for homes along Magnolia Drive, Franklin Lane, Beulah Lane, and Dorsey Lane. Currently, residents must cross CSX railroad tracks to enter or exit Magnolia Drive. If a train is stopped or delayed at Magnolia Drive, residents are stranded, causing inconvenience and potential safety concerns. This connector would also provide access to Main Street via the Sandy Lane Extension.
- **Victoria Lane Extension (No. 2).** The Victoria Lane Extension would provide residents a second entrance and exit into Leland. Currently, Victoria Lane connects only to Old Mill Road. The proposed collector street would extend Victoria Lane to the south, providing connection into Leland and taking traffic off Old Mill Road.
- **Sandy Lane Extension (No. 3).** The Sandy Lane Extension would provide a connection between Sandy Lane and Trestle Way and extend existing Sandy Lane to the intersection of Old Mill Road and Main Street. This proposed collector would also help move traffic to residences north of Old Mill Road while removing traffic from Old

Mill Road via its connection to the Ivester/Eastbrook Connector.

- **Park/Pine Valley/Brooklyn Connector (No. 4).** The Park/Pine Valley/Brooklyn Connector is both an existing and future need. The existing need portion of this collector (4a) would connect residences on and near Pine Valley Drive, Park Avenue, Brooklyn Street, and Broadway Street to North Navassa Road. The future need portion of this collector (4b) extending beyond North Navassa Road to Canal Drive would serve a future need to connect to development associated with the Moze Heritage Park and a proposed water access within the park. Canal Drive will be extended as part of the park development and the proposed collector would connect into that extension once constructed.

Future Needs

The remaining eight proposed collector streets are considered necessary to meet future needs based on proposed and approved developments:

- **Daniels Road Connector (No. 5) and Mt. Misery/Daniels Connector (No. 6).** The Daniels Road Connector and Mt. Misery/Daniels Connector should be constructed as part of the Indian Creek housing development.
- **Valentine Way Extension (No. 7) and Heritage Park Connector (No. 8).** Similarly,

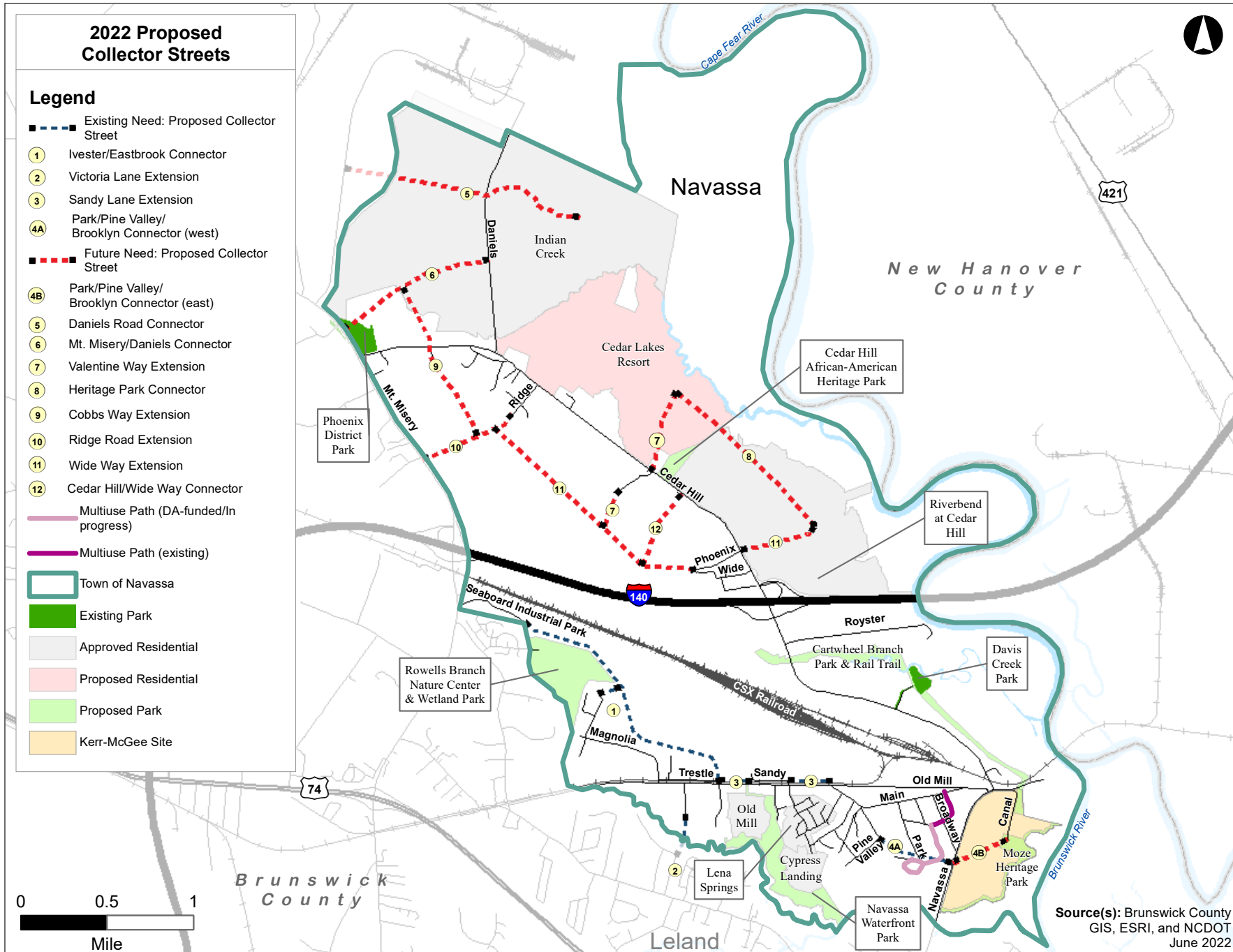
the Valentine Way Extension and Heritage Park Connector would be needed to serve the Cedar Lakes Resort, Cedar Hill African American Heritage Park, and Riverbend at Cedar Hill.

- **Cobbs Way Extension (No. 9), Ridge Road Extension (No. 10), Wide Way Extension (No. 11), and Cedar Hill/Wide Way Extension Connector (No. 12).** Without the construction of the proposed developments

north and east of Cedar Hill Road, the need for the Cobbs Way Extension, Ridge Road Extension, Wide Way Extension, or Cedar Hill/Wide Way Extension Connector would be limited.

TABLE 7. PROPOSED COLLECTOR STREET NETWORK

MAP LABEL	NEED	PROPOSED COLLECTOR STREET	DESCRIPTION	APPROXIMATE LENGTH (MILES)
1	Existing	Ivester/Eastbrook Connector	Provides a secondary outlet for residents in the area of Magnolia Drive and Dorsey Lane by connecting to Seaboard Industrial Park Drive. Also connects to the Sandy Lane Extension.	1.7
2	Existing	Victoria Lane Extension	Extends Victoria Lane to the Town's limits with potential connection to Sturgeon Drive NE in Leland.	0.3
3	Existing	Sandy Lane Extension	Connects the Ivester/Eastbrook Connector to Main Street and provides a connection between Trestle Way and Sandy Lane.	0.5
4A	Existing	Park/Pine Valley/Brooklyn Connector west of North Navassa Road	Connects Pine Valley Road, Park Avenue, and Brooklyn Street to North Navassa Road.	0.3
4B	Future	Park/Pine Valley/Brooklyn Connector east of North Navassa Road	Connects Canal Drive and the proposed Moze Heritage Park to North Navassa Road.	0.5
5	Future	Daniels Road Connector	Connects Daniels Road to the Town's western limits and provides a connection to Daniels Road for the Indian Creek housing development. West of the Town limits, it provides a potential connection to Daniels Road NE in unincorporated Brunswick County.	1.5
6	Future	Mt. Misery/Daniels Connector	Connects Mt. Misery Road to Daniels Road.	1.0
7	Future	Valentine Way Extension	Connects the Wide Way Extension to Cedar Hill Road and Cedar Hill Road to the Heritage Park Connector.	0.7
8	Future	Heritage Park Connector	Connects Cedar Lakes Resort and Riverbend at Cedar Hill developments to the Valentine Way Extension and the Wide Way Extension.	1.1
9	Future	Cobbs Way Extension	Connects the Mt. Misery/Daniels Road Connector to the Ridge Road Extension.	1.0
10	Future	Ridge Road Extension	Connects Mt. Misery Road to Ridge Road.	0.6
11	Future	Wide Way Extension	Connects the Heritage Park Connector to the Ridge Road Extension. Provides an alternate route to Cedar Hill Road.	2.0
12	Future	Cedar Hill/Wide Way Connector	Connects Cedar Hill Road to the Wide Way Extension.	0.5



Map 12. 2022 Proposed Collector Streets

7.2 Proposed Use of Roadway Typical Sections

NCDOT's published highway typical sections includes 57 typical cross-sections for use in road planning (NCDOT, 2019b). Using the minimum design standards in accordance with NCDOT highway typical sections 2F and 2P, this Plan presents six typical sections for use in designing the collector streets for the Town. The typical sections presented in this Plan include roadways both with and without curb and gutter, for use as follows:

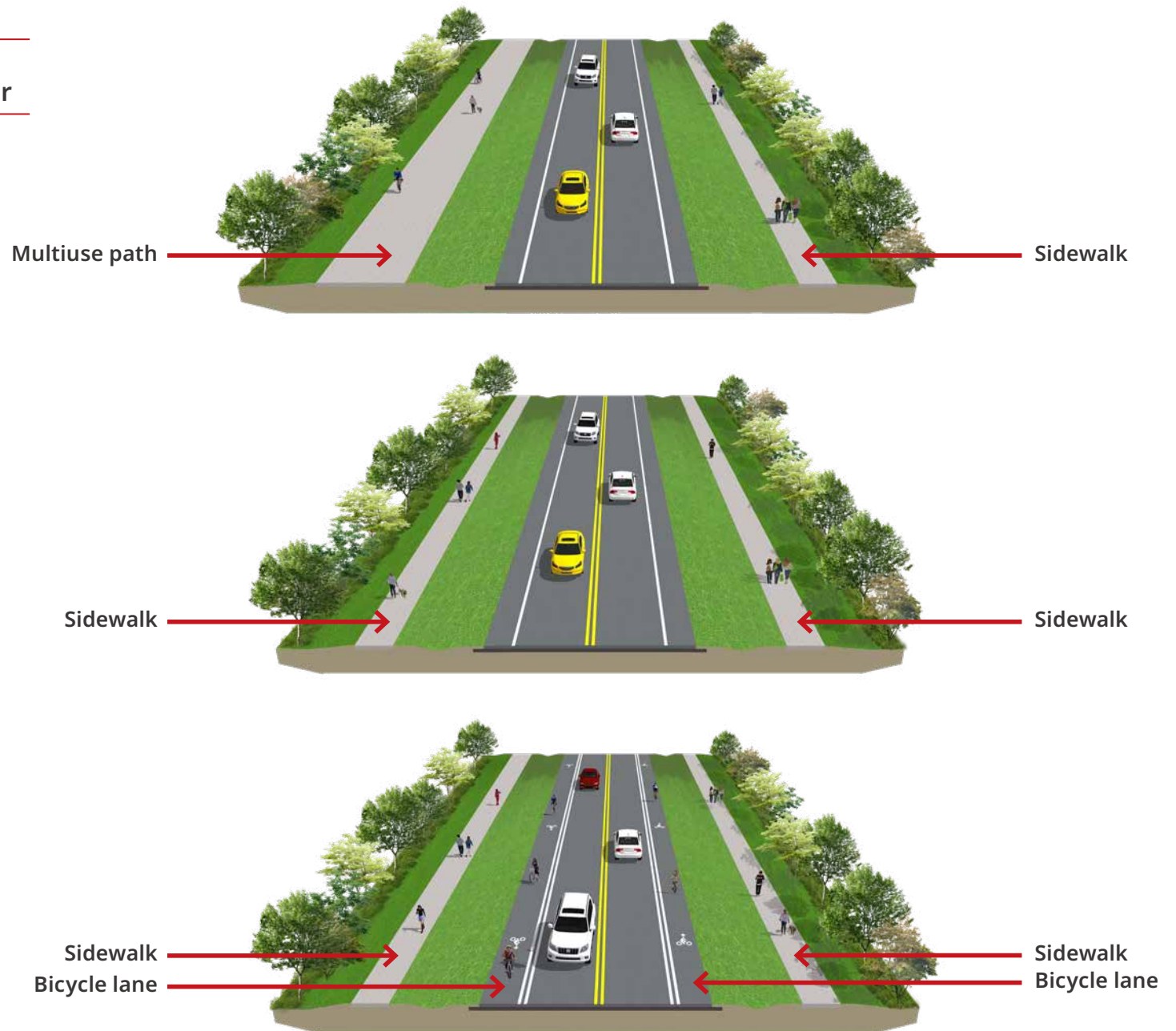
- **Without curb and gutter.** Typical sections without curb and gutter use wide grassy areas or ditches to carry and infiltrate stormwater. Illustrations of three variations are shown on page 45.
- **With curb and gutter.** Curb and gutter typical sections would most likely be used in residential developments where stormwater drainage can be carried through a closed system to a stormwater storage area or a stormwater pond. Illustrations of three variations are shown on page 46.

These typical sections are specifically for use within Coastal Area Management Act counties and prescribe design speeds of 25 to 45 miles per hour (mph). Details and specifications for each of the six typical sections are presented in Appendix D.

The selection and/or assignment of typical sections for future collector streets should align with future bike/ped plan recommendations.

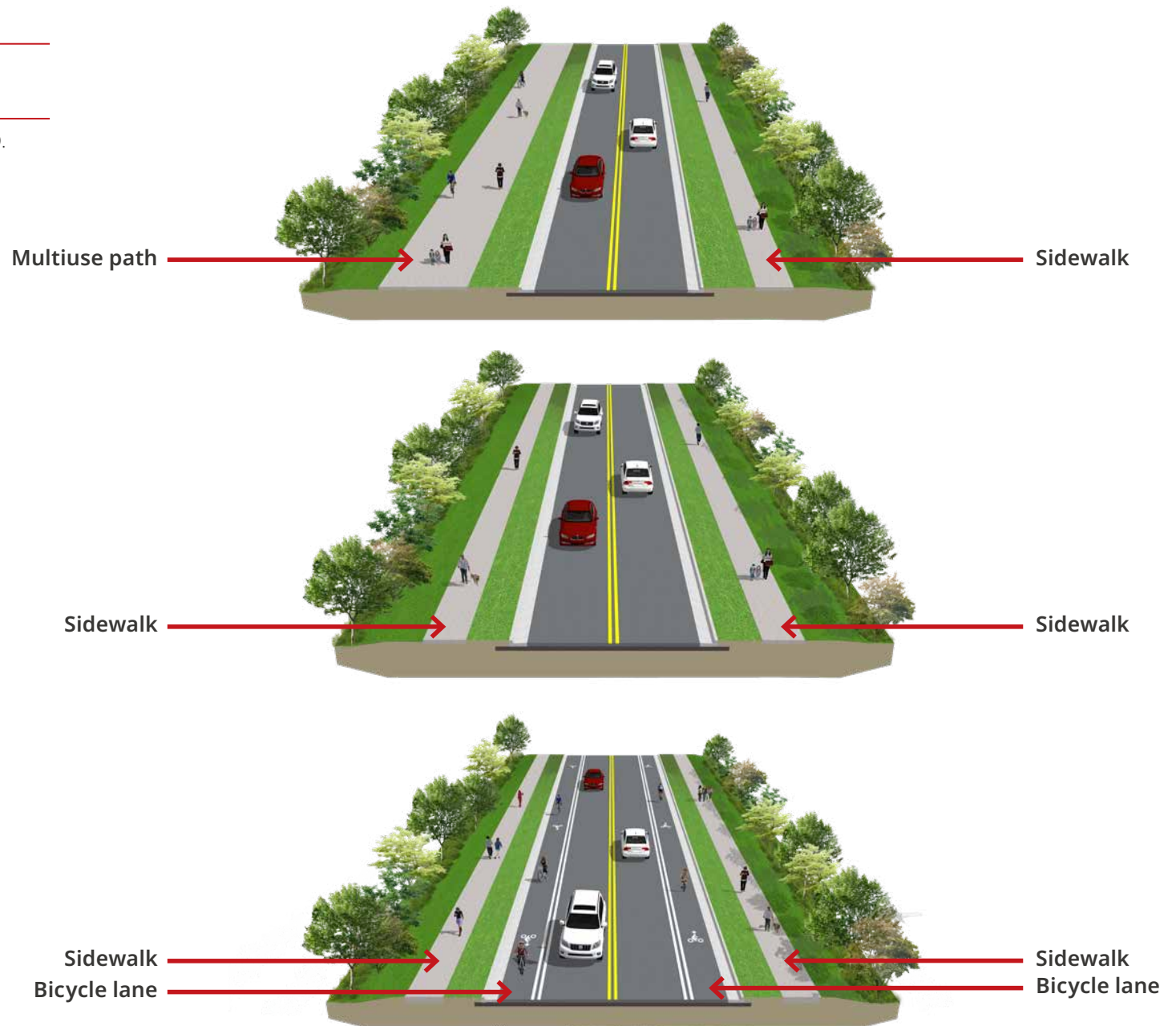
Typical Sections without Curb and Gutter

For details, refer to Appendix D.



Typical Sections with Curb and Gutter

For details, refer to Appendix D.



7.3 Policies and Guidelines

Existing local and state policies and guidelines with the potential to influence the development and construction of collector streets were reviewed. Those relevant to collector streets for the Town are outlined below. Additionally, the project team developed recommended modifications to existing policies and guidelines that could be implemented by adding these modifications to local policies and/or ordinances. Lastly, the project team proposes four new policy topics that will support the Town meeting its goals for this Plan. The inclusion of the existing policies and guidelines, modifications to policies and guidelines, and new policies in Town ordinances is an integral part of accomplishing the goals outlined in this Plan.

Existing Policies and Guidelines

Several local and state policies and programs related to roadway design and stormwater management are described in the following subsections. These include the *NCDOT Complete Streets Policy* (2019a), the *NCDOT Traditional Neighborhood Development (TND) Guidelines* (2000), the *Town of Navassa Phase II Stormwater Implementation Plan* (North Carolina Department of Commerce, 2007), and the North Carolina Resilient Coastal Communities Program (RCCP).

NCDOT Complete Streets Policy

NCDOT adopted a Complete Streets policy in 2009 that was later updated in 2019. Complete Streets incorporate all modes of transportation when building new projects or making improvements to existing infrastructure. Complete Streets are designed to be safe and comfortable for all users, including pedestrians, bicyclists, transit riders, motorists, and individuals of all ages and capabilities. NCDOT also developed the *P6.0 Complete Streets Project Sheet*, which requires project submitters to note multimodal elements that are to be evaluated as a part of a proposed transportation project.

Designing with Complete Street principles in mind requires consideration of the impact of street patterns on trip length, connectivity between resources, intersection use, and the overall experience of the user. Both cyclists and pedestrians can benefit from a street that has been designed in accordance with the Complete Streets policy. Additional benefits include improvements for children and individuals with accessibility needs, health advantages, improved public transportation services, economic revitalization, safety enhancements, roadway equity, and a more livable community. Collector streets should be designed using Complete Streets principles.

NCDOT Traditional Neighborhood Development Guidelines

The *NCDOT Traditional Neighborhood Development (TND) Guidelines* (2000) aim to encourage walking and bicycling, enhance transit service opportunities, and improve traffic safety by promoting low speed and cautious driving while fully accommodating the needs of pedestrians and bicyclists. Roadway design may help guide or inform the character of future nearby roads. Planning efforts for collector streets should consider *Traditional Neighborhood Development (TND) Guidelines*.

Town of Navassa Phase II Stormwater Implementation Plan

The *Town of Navassa Phase II Stormwater Implementation Plan* (North Carolina Department of Commerce, 2007) establishes and defines the Town's compliance with its National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) Permit and the applicable provisions of the Clean Water Act to meet the federal standard of reducing pollutants in stormwater runoff to the maximum extent practicable. In 2010, the Town adopted the *Town of Navassa Phase II Stormwater Ordinance* (Town of Navassa, 2010), which establishes minimum requirements and procedures to control the adverse effects of increased post-development stormwater runoff and nonpoint and point source pollution associated with new development and redevelopment. Built-upon areas, such as roads, contribute to impervious surfaces that affect stormwater runoff. Roadway design considerations for future collector streets must mitigate stormwater impacts.

Resilient Coastal Community Program

In March 2021, the North Carolina Department of Environmental Quality's (NCDEQ's) Division of Coastal Management announced that \$675,000 would be granted through the new RCCP. This initiative is funded through the North Carolina State Legislature and the National Fish and Wildlife Foundation. The RCCP aims to facilitate a community-driven process for setting coastal resilience goals, assessing existing and needed local capacity, and identifying and prioritizing projects to enhance community resilience to coastal hazards. Local governments throughout the 20 coastal counties are eligible to apply for direct technical assistance to complete a community engagement process, risk and vulnerability assessment, and resiliency project portfolio.

The four phases of the program include:

- Phase 1: Community Engagement and Risk & Vulnerability Assessment
- Phase 2: Planning, Project Selection, and Prioritization
- Phase 3: Engineering and Design
- Phase 4: Implementation

The Town of Navassa is a 2021 RCCP participant and is currently in the first two phases of the program. This Plan includes resiliency as a goal, and as the Town moves into the design phase, it should consider local resiliency and enhancing resiliency to coastal hazards.

Proposed Modifications of Existing Town Policies and Guidelines

Based on the feedback received from the Steering Committee and general best practices, the following modifications to policies and guidelines are recommended for adoption by the Town to ensure proper implementation of this Plan.

Subdivision Road Connections

The Subdivision Ordinance, adopted in 2009 and most recently amended in 2015, currently requires connectivity for major subdivisions (Town of Navassa, 2009). To further enhance connectivity, the Town should consider expanding the connectivity requirements for all subdivisions and developments.

- **Recommendation:** Modify the Town's Subdivision Ordinance to include all subdivisions and developments.
- **Purpose:** To ensure the distribution of site trips across the transportation network to help manage traffic operations and safety. Connecting subdivisions can also help multimodal trips better align with their trip destination and the arterial road system.

Adjoining Property Connections

Adjoining property connections are addressed in Section 4.3.6 of the Town's Subdivision Ordinance. The ordinance spells out specific requirements that support adjoining

connections and assist with broadening the existing collector street network. Joining properties also re-ensures street stub connections to adjoining undeveloped property and connections with existing street stubs.

- **Recommendation:** The existing requirement in Section 4.3.6 should be carried forward in any future ordinances and applied to all subdivisions and developments.
- **Purpose:** To allow for orderly and efficient development of an integrated transportation system. The requirement provides future access to landlocked parcels and offers transportation choices, improved traffic circulation, and enhanced accessibility to community features and points of interest. The connections provided per this ordinance improve access for emergency responders, improve community connectivity, and enhance mobility for non-motorized trips and recreation.

Adherence to NCDOT Complete Streets Policy

The NCDOT Complete Streets policy and related NCDOT P6.0 Complete Streets Project Sheet provide guidance and information on multimodal design. The benefits of adhering to the Complete Streets policy include:

- Making it easier for travelers to get where they need to go
- Encouraging the use of alternative forms of transportation
- Building more sustainable communities
- Increasing connectivity between neighborhoods, streets, and transit systems
- Improving safety for pedestrians, cyclists, and motorists

Refer to previous section ("NCDOT Complete Streets Policy") for a more detailed description.

- **Recommendation:** Require that new roads that become part of the collector street network adhere to the NCDOT Complete Streets policy, which includes multimodal design considerations.
- **Purpose:** To provide a comprehensive, consistent collector street network that provides alternative transportation options that will assist in alleviating roadway congestion. Design components that are included in the Complete Streets policy would allow multimodal users to easily transition along collector streets throughout the Town regardless of ownership.

Proposed Development of New Town Policies

Based on the feedback received from the Steering Committee and general best practices, the following new policies and guidelines are recommended for adoption by the Town to ensure proper implementation of this Plan.

Traffic Calming

- **Recommendation:** Design new collector streets to include traffic calming components where appropriate, such as maintaining lower speed limits.
- **Purpose:** To make roadways safer by prioritizing humans over vehicles. Traffic calming uses the road design to slow traffic and in turn improve the compliance with traffic laws, making the road safer for all users. This also encourages the use of bicycle and pedestrian facilities as user safety is less of a concern than with traditional designs.

Connectivity of Collector Streets

- **Recommendation:** Require private entities to coordinate across properties to allow for future connections.
- **Purpose:** To guarantee that collector streets are viewed in their entirety and considered during development activities by private entities. Corridors would be developed for planned collector streets that cross property lines, while new collectors would be constructed to provide connections between the local and arterial systems.

Reduction of Paper Streets

- **Recommendation:** Paper streets or paper roads are facilities that may be shown on maps as planned or proposed but have never been built. If and when these paper streets exist, it is important to work with developers to get these streets built as planned.
- **Purpose:** To create roadways that are or were intended to be built to improve the network.

Resiliency and Environmental Conservation

- **Recommendation:** Ensure that developments and new streets minimize impacts to floodplains and wetlands.
- **Purpose:** To preserve the existing natural environment in the Town and maintain enough floodplain and wetland surface area to sufficiently store floodwaters from hurricanes and other storm events. New streets would be required to avoid or minimize impacts to sensitive areas such as wetlands, floodplains, and areas with endangered flora and/or fauna and would be built at elevations that are above the 100-year floodplain to improve resiliency for the future while assisting with public evacuation abilities.



Implementation Plan

Transportation plans are successful only if they are implemented. The following sections prioritize the proposed collector streets and identify funding sources for their construction. As noted in Section 7.1, some of the proposed collector streets would be constructed by developers as part of new developments. Through adherence to the policies outlined in Section 7.3, those collectors could be easily incorporated into the development plans, which would leave the Town only needing funding for a portion of the proposed collector streets in this Plan.

8.1 Project Prioritization

A key aspect of getting proposed collector streets built is close coordination with developers. Multiple planned developments in the Town will increase the population of the area as well as the strain on the existing roadway network. The development of collector streets as part of these developments is crucial. Construction of new collector streets as well as improvements to existing roadways should be coordinated with future development schedules.

Some of the recommended collector streets are important to meeting the existing needs of the Town for connectivity and resiliency, with or without future development. Those collector streets need to be prioritized as their absence is already affecting the transportation network and the ability of the community to travel as needed. These facilities are described as existing needs in Section 7.1 and shown in Table 8.

New development will drive the need for the remaining proposed collector streets. These projects are described as future needs and shown in Table 8.

8.2 Funding Opportunities

While local funds and Powell Bill funding provide some resources for roadway and transportation network improvements, they are not adequate on their own to initiate most improvements needed within communities. Numerous funding resources can be used to assist in implementing the facilities and strategies to improve the Town's collector street network.

NC State Street-Aid (Powell Bill) Program Funds

Powell Bill funding is made available by the state of North Carolina to municipalities for use on municipally maintained roads or bike and pedestrian facilities. The funds are appropriated annually and distributed twice during the year. Historically, the funds have been used primarily to resurface municipal streets, but they can also be used to maintain, repair, construct, or widen streets, bridges, and drainage areas. Municipalities can also use Powell Bill funds to plan, construct, and maintain bike paths, greenways, or sidewalks.

**TABLE 8. PROPOSED COLLECTOR STREETS
PRIORITIZED AS EXISTING OR FUTURE NEED**

PRIORITY	PROPOSED COLLECTOR STREET	DESCRIPTION	LENGTH (MILES)
Existing Need, Prioritize for Development	Ivester/Eastbrook Connector	Provides a secondary outlet for residents in the area of Magnolia Drive and Dorsey Lane by connecting to Seaboard Industrial Park Drive. Also connects to the Sandy Lane Extension.	1.7
	Victoria Lane Extension	Extends Victoria Lane to the Town's limits with potential connection to Sturgeon Drive NE in Leland.	0.3
	Sandy Lane Extension	Connects the Ivester/Eastbrook Connector to Main Street and provides a connection between Trestle Way and Sandy Lane.	0.5
	Park/Pine Valley/Brooklyn Connector west of North Navassa Road	Connects Pine Valley Road, Park Avenue, and Brooklyn Street to North Navassa Road.	0.3
Future Need, Implement as Future Development Occurs	Park/Pine Valley/Brooklyn Connector east of North Navassa Road	Connects Canal Drive and the proposed Moze Heritage Park to North Navassa Road.	0.5
	Daniels Road Connector	Connects Daniels Road to the Town's western limits and provides a connection to Daniels Road for the Indian Creek housing development. West of the Town limits, it provides a potential connection to Daniels Road NE in unincorporated Brunswick County.	1.5
	Mt. Misery/Daniels Connector	Connects Mt. Misery Road to Daniels Road.	1.0
	Valentine Way Extension	Connects the Wide Way Extension to Cedar Hill Road and Cedar Hill Road to the Heritage Park Connector.	0.7
	Heritage Park Connector	Connects Cedar Lakes Resort and Riverbend at Cedar Hill developments to the Valentine Way Extension and the Wide Way Extension.	1.1
	Cobbs Way Extension	Connects the Mt. Misery/Daniels Road Connector to the Ridge Road Extension.	1.0
	Ridge Road Extension	Connects Mt. Misery Road to Ridge Road.	0.6
	Wide Way Extension	Connects the Heritage Park Connector to the Ridge Road Extension. Provides an alternate route to Cedar Hill Road.	2.0
	Cedar Hill/Wide Way Connector	Connects Cedar Hill Road to the Wide Way Extension.	0.5

Transportation Bonds

Many communities across the state of North Carolina have had success funding transportation projects through transportation bonds. Transportation bonds provide communities with funding that can be used on local roadways for improvements such as roadway extensions, roadway connections, sidewalk construction, and new road construction. While they do require voter approval, they also give the public opportunity to identify what is important for their community.



NC Department of Transportation road project funding through the Build NC program

Source: <https://www.ncdot.gov/about-us/how-we-operate/finance-budget/Pages/build-nc.aspx>

Traffic Impact Assessments

The Town of Navassa Subdivision Ordinance addresses several required improvements that assist with the Town's access and connections to the local road network and adjoining properties. This allows for fewer dead-end roads and more extensions of existing roads, in turn improving the collector street network. Included, when applicable, is a North Carolina Department of Transportation (NCDOT) Traffic Impact Study or Assessment as required in the NCDOT "Policy on Street and Driveway Access to North Carolina Highways." Currently, the NCDOT policy only requires assessments for developments estimated to create 3,000 trips per day, however, the town could consider lowering the trip threshold in order to have more information on potential impacts from developments and make more educated decisions regarding traffic needs and effects on the collector street network. This would further quantify and expand requirements by the Town to install additional travel lanes or connections based on the trips expected to be generated as a result of the new development, thereby further improving the network and reducing impacts on existing facilities.

Grants

Federal transportation grants are more accessible to local governments now than ever before. Historically, these grants have been open to state departments of transportation and Metropolitan Planning Organizations (MPOs), but not as open for local governments and municipalities. Currently, programs like the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) and the more recent Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL), offer billions of dollars of funding opportunities to local governments, including municipalities. These are competitive grants, but they offer funding that is often difficult for local governments to procure otherwise. Some of the specific grant opportunities for local governments include:

- **Safe Streets for All.** Designed to support "vision zero" efforts, along with other improvements, to reduce crashes and fatalities; this grant provides funding directly to local and tribal governments.
- **Federal Highway Administration (FHWA) competitive grants for nationally significant bridges and other bridges.** A new competitive grant available to state, local, federal, and tribal entities to

rehabilitate or replace bridges, including culverts.

- **Strengthening Mobility and Revolutionizing Transportation (SMART) Grant Program.** A new competitive grant program available to states, local governments, and tribes for projects that improve transportation safety and efficiency.
- **Rural Surface Transportation Grant Program.** Given Navassa's inclusion in the Wilmington Urban Area Metropolitan Planning Organization (WMPO), eligibility may need to be determined, but this new competitive grant is also available to rural areas for projects that increase connectivity, improve safety and reliability of the movement of people and freight, and generate regional economic growth.

WMPO

Because the WMPO is a Transportation Management Area (TMA), it receives a direct allocation of Surface Transportation Block Grant Program (STBGP) and Transportation Alternatives Set Aside (TASA) funds on an annual basis. The WMPO uses a competitive funding request process to determine which projects are selected for funding. A minimum local commitment of 20 percent for a local match is required.

In addition to these recurring funds, as part of the IJJA, the WMPO will receive Carbon Reduction Funding over the next five years. The state of North Carolina is receiving \$170,984,555 over the five year window for Carbon Reduction projects, which will be suballocated to Transportation Management Areas based on their relative share of population. The funds must be used on projects within the State Transportation Improvement Program (STIP) and must support the reduction of transportation emissions.

STBGP-Direct Allocation (DA)

The STBGP-DA funds provide the Wilmington Urbanized Area with annual funding to be used within the WMPO boundary. A wide range of metropolitan transportation planning and project activities are eligible for the funding and requests are submitted directly to the WMPO.

Transportation Alternatives (TA)

The TA Program does not directly support the construction and maintenance of roadways, but it does allow for the implementation of alternative modes of transportation. The presence of effective alternative modes of transportation in the Town may help relieve congestion on existing collector streets. The program plays an important role in the funding of active transportation improvements, including sidewalks, greenways, and bicycle lanes, as well as Safe Routes to School.

Strategic Prioritization Process

Strategic prioritization is the process by which NCDOT selects projects to include in the NCDOT STIP for funding. Projects submitted for the WMPO region are derived from the *Cape Fear Moving Forward 2045 Metropolitan Transportation Plan* (WMPO, 2020). Submitted projects go through an internal quantitative scoring process. If a project scores well enough, that project can be selected for

funding and included in the STIP. The drawback of using this mechanism for funding is that it is often several years before a funded project is scheduled for construction.

NCDOT Division 3

The local NCDOT Division offices across the state provide a great resource for assistance to local communities. In addition to managing multiple projects that come through the STIP, the divisions also have some additional funding for safety, maintenance, and other projects that may be beneficial to localities. Communication with the local NCDOT Division Engineer, in this case in Division 3, can be beneficial to learning more about potential funding opportunities within the division.

Table 9 contains key action steps to ensure that the projects, policies, and guidelines outlined in this Plan are implemented.

TABLE 9. ACTIONS FOR IMPLEMENTATION

ACTION STEP	DETAILS	RESPONSIBLE PARTY	TIMELINE
Adopt the Navassa Collector Street Plan	Town Council to adopt Collector Street Plan.	Town Council	Summer 2022
Update Existing Town Policies	Planning Board and Town Council to work with Town staff to evaluate existing town policies and make recommended policy changes (See Section 7.3).	Town staff, Planning Board, Town Council	2022–2023
New Town Policies	Planning Board and Town Council to work with Town staff to develop new town policies (see Section 7.3).	Town staff, Planning Board, Town Council	2022–2023
Town Budget Planning	Identify funding sources for improvements, including local matches, grant opportunities, and State funding.	Town staff (Finance and Planning), Town Council	Annually
Coordinate with NCDOT Division 3 and the WMPO	Conduct meetings with NCDOT Division 3 and the WMPO to discuss how the projects in the plan can be funded/implemented.	Town staff	Bi-annually
Conduct Feasibility Studies	Identify funding to conduct feasibility studies on the proposed collector streets that would serve existing developments.	Town staff, WMPO, NCDOT Division 3	TBD
Review of Proposed Development	Town Council to coordinate with Town staff and Planning Board to ensure inclusion of collector streets in new developments	Town staff, Planning Board, Town Council	On-going
Annual Review	Review the plan annually and report to Town Council, WMPO and NCDOT Division 3 summarizing achievements, constraints, and next steps.	Town staff	Annually



9

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Appendices

Appendix A: Demographics

TABLE A-1. ESTIMATED POPULATION IN NAVASSA AND SURROUNDING AREAS

GEOGRAPHY	CENSUS 2010 POPULATION	CENSUS 2020 POPULATION	DIFFERENCE	PERCENT CHANGE	ANNUALIZED GROWTH RATE
Town of Navassa	1,505	1,367	-138	-9.2%	-1.0%
Brunswick County	107,431	136,693	29,262	27.2%	2.4%
North Carolina	9,535,483	10,587,440	1,051,957	11.0%	1.1%

Source: US Census Bureau

TABLE A-2. PROJECTED COUNTY POPULATION GROWTH

GEOGRAPHY	2010 ESTIMATE BASE	2020	PROJECTIONS			GROWTH 2020-2050	GROWTH 2020-2050 (%)
			2030	2040	2050		
Brunswick County	107,429	147,644	180,778	213,371	245,966	98,322	66.6%
North Carolina	9,535,751	10,587,440	11,677,603	12,821,708	13,967,473	3,380,033	31.92%

Source: NC OSBM: County/State Population Projections

TABLE A-3. RACE

RACE	TOWN OF NAVASSA	BRUNSWICK COUNTY	NORTH CAROLINA
White	19.1%	84.2%	68.7%
Black or African American	73.5%	9.8%	21.4%
American Indian and Alaska Native Alone	0.7%	0.7%	1.2%
Asian	0.0%	0.6%	2.9%
Native Hawaiian/Pacific Islander	0.0%	0.0%	0.1%
Some Other Race	4.7%	2.3%	3.1%
Two or More Races	2.0%	2.4%	2.7%
Total Non-White	80.9%	15.8%	31.3%

Source: US Census Bureau, American Community Survey 5-year Estimates (2015-2019), Table B02001, "Race."

TABLE A-4. MINORITY POPULATIONS

	TOWN OF NAVASSA	BRUNSWICK COUNTY	NORTH CAROLINA
White, Non-Hispanic	18.2%	81.9%	63.1%
Minority Population	81.8%	18.1%	36.9%

Source: US Census Bureau, American Community Survey 5-year Estimates (2015-2019), Table B03002, "Hispanic or Latino Origin by Race."

TABLE A-5. AGE GROUPS

AGE GROUPS	TOWN OF NAVASSA	BRUNSWICK COUNTY	NORTH CAROLINA
Under 18 Years	15.9%	15.6%	22.4%
18 to 64 Years	69.0%	53.8%	61.8%
65 Years or Older	15.1%	30.5%	15.9%

Source: US Census Bureau, American Community Survey 5-year Estimates (2015-2019), Table B01001, "Sex by Age."

TABLE A-6. INCOME, POVERTY, AND EMPLOYMENT

	TOWN OF NAVASSA	BRUNSWICK COUNTY	NORTH CAROLINA
Persons Below Poverty Level	19.3%	11.8%	14.7%
Median Household Income	\$33,571	\$58,236	\$54,602
In Civilian Labor Force (age 16+)	63.5%	49.1%	64.2%

Source: US Census Bureau American Community Survey (ACS) 5-year estimates for 2015-2019. Table C17002, "Ratio of Income to Poverty Level in the Past 12 Months."; Table B19049 "Median Household Income"; and Table DP03 "Selected Economic Characteristics"

TABLE A-7. LEP

LANGUAGE GROUP*	TOWN OF NAVASSA	BRUNSWICK COUNTY	NORTH CAROLINA
Spanish	3.2%	1.5%	3.4%
Other Indo-Euro	0.0%	0.2%	0.5%
Asian/Pacific	0.0%	0.2%	0.8%
Other	0.0%	0.1%	0.2%

* Primary language group of persons who speak English less than very well.

Source: US Census Bureau, American Community Survey 5-year Estimates (2015-2019), Table B16004, "Age by Language Spoken at Home by Ability to Speak English for the Population 5 Years and Over."

TABLE A-8. VEHICLE AVAILABILITY

VEHICLE AVAILABILITY	TOWN OF NAVASSA	BRUNSWICK COUNTY	NORTH CAROLINA
No vehicle available	10.2%	3.8%	5.8%
One vehicle available	31.8%	29.2%	31.6%
Two or more vehicles available	58.0%	67.0%	62.5%

Source: US Census Bureau, American Community Survey 5-year Estimates (2015-2019), Table B25044, "Tenure by Vehicles Available."

TABLE A-9. COMMUTING MODES

COMMUTE MODE	TOWN OF NAVASSA	BRUNSWICK COUNTY	NORTH CAROLINA
Commute alone by auto	83.2%	86.2%	85.9%
Commute by carpool	14.1%	10.7%	9.7%
Commute by public transportation	0.7%	0.4%	1.1%
Commute by bike/ped	0.6%	1.1%	2.1%
Commute by other mode	1.3%	1.5%	1.2%

Source: US Census Bureau American Community Survey (ACS) 5-year estimates for 2015-2019.

TABLE A-10. TOP 5 LARGEST EMPLOYERS IN BRUNSWICK COUNTY

RANK	EMPLOYER	NUMBER OF EMPLOYEES	PRODUCT/INDUSTRY
1	Brunswick County Board of Education	1000+	Educational Services
2	County of Brunswick	1000+	Public Administration
3	Wal-Mart Associates Inc.	500-999	Retail Trade
4	Progress Energy Service Co	500-999	Utilities
5	Food Lion	500-999	Retail Trade

Source: <https://d4.nccommerce.com/qcewlargestemployers.aspx>

TABLE A-11. WHERE TOWN OF NAVASSA WORKERS LIVE, BY COUNTY

COUNTY	COUNT	SHARE (%)
All Counties	168	100.0
Brunswick County	57	33.9
New Hanover County	48	28.6
Pender County	18	10.7
Mecklenburg County	8	4.8
Bladen County	4	2.4
Columbus County	4	2.4
Gaston County	4	2.4
Cumberland County	3	1.8
Sampson County	3	1.8
Wake County	3	1.8
All Other Locations	16	9.5

Source: US Census Bureau OnTheMap: <https://onthemap.ces.census.gov/>

TABLE A-12. WHERE TOWN OF NAVASSA RESIDENTS WORK, BY COUNTY

COUNTY	COUNT	SHARE (%)
All Counties	701	100.0
New Hanover County	367	52.4
Brunswick County	141	20.1
Wake County	33	4.7
Pender County	15	2.1
Columbus County	13	1.9
Mecklenburg County	13	1.9
Cumberland County	12	1.7
Guilford County	9	1.3
Onslow County	5	0.7
Wayne County	5	0.7
All Other Locations	88	12.6

Source: US Census Bureau OnTheMap: <https://onthemap.ces.census.gov/>

TABLE A-13. TOWN OF NAVASSA EMPLOYMENT INFLOW/ OUTFLOW (PLACE OF WORK)

DESCRIPTION	COUNT	SHARE (%)
Employed in the Town of Navassa (Navassa workers)	168	100.0
Employed in the Town of Navassa but living outside	163	97.0
Employed and living in the Town of Navassa	5	3.0

Source: US Census Bureau OnTheMap: <https://onthemap.ces.census.gov/>

TABLE A-14. TOWN OF NAVASSA EMPLOYMENT INFLOW/ OUTFLOW (PLACE OF RESIDENCE)

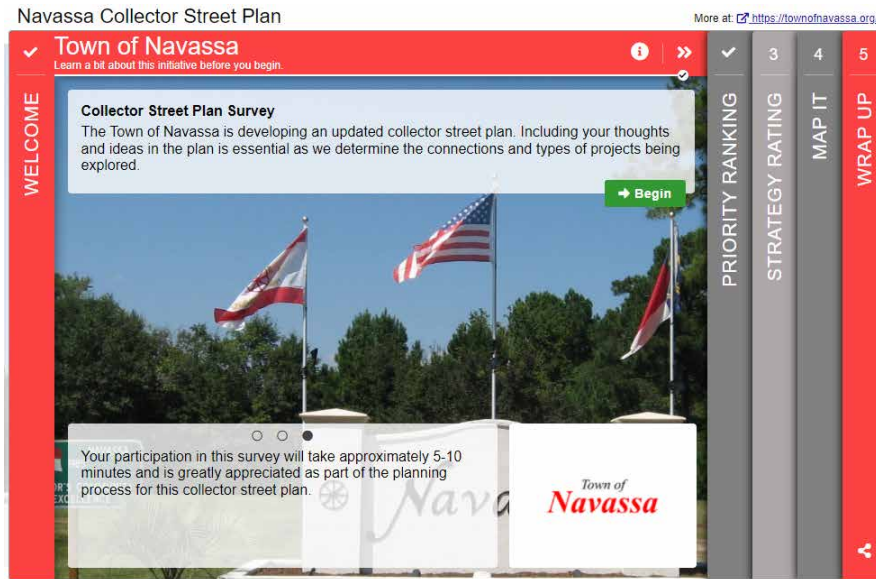
DESCRIPTION	COUNT	SHARE (%)
Living in the Town of Navassa	701	100.0
Living in the Town of Navassa but employed outside	696	99.3
Living and employed in the Town of Navassa	5	0.7

Source: US Census Bureau OnTheMap: <https://onthemap.ces.census.gov/>

Appendix B: MetroQuest Survey

Welcome to the Survey

The first page of the survey provided a brief overview of the project and the purpose of the survey.



Priority Ranking

Next, respondents were asked to rank their top 5 priorities as they relate to the Plan. Respondents could select five priorities from a total of eight options (see below).

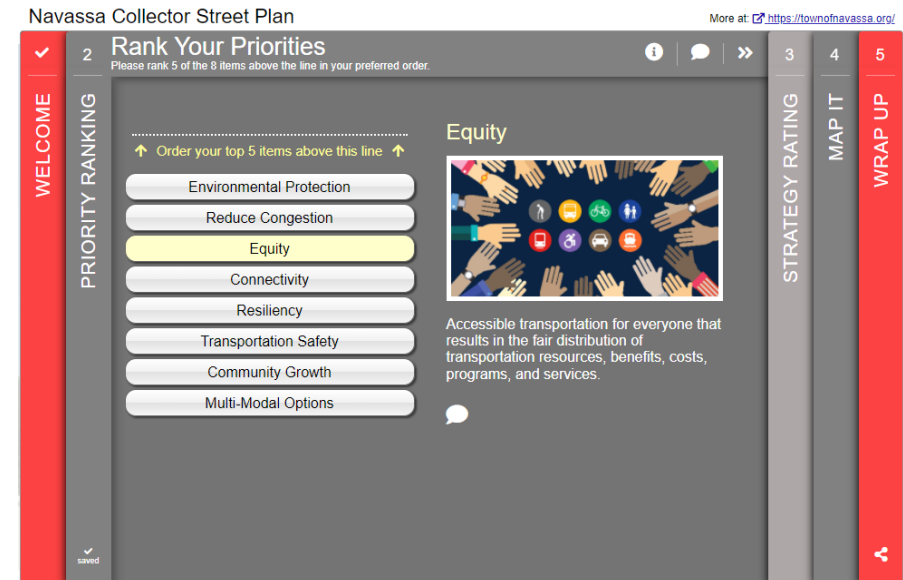


Figure 4-1 contains the top five priorities identified by the survey respondent. Connectivity, transportation safety, and community growth were the top three priorities. In addition to the standard survey responses, three unique comments were submitted:

- The plan should ensure that properties don't become devalued for eminent domain purposes.
- Replace bridge on Old Mill Road and emergency outlet for Magnolia Drive residents.
- Restricting large trucks from travelling residential streets because of safety hazards (speeding) and loud noises.

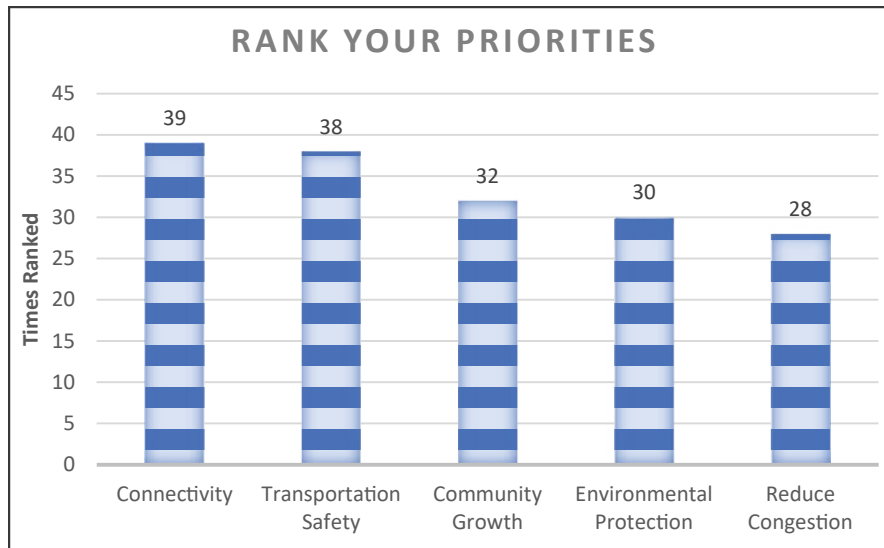
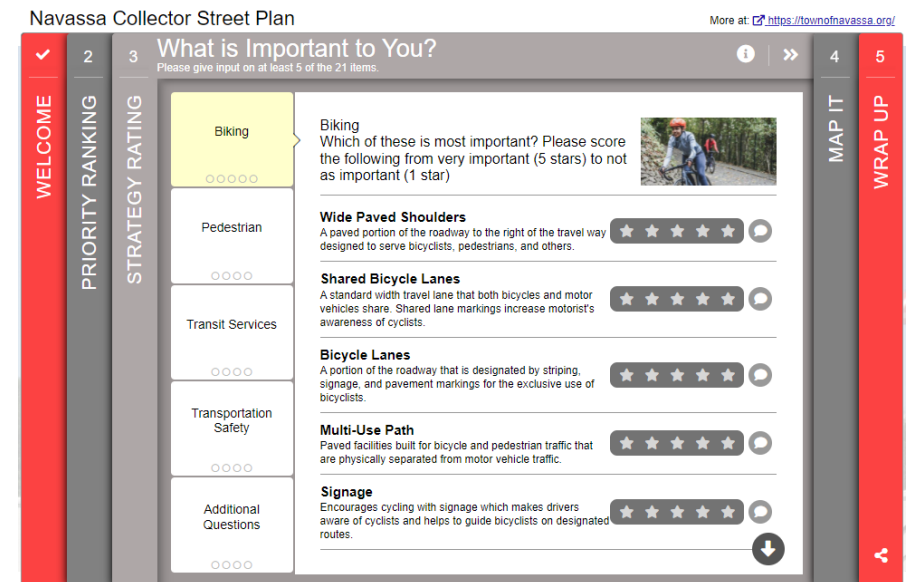


Figure 4-1. Rank Your Priorities

Strategy Ranking

On the third page of the survey, respondents were asked to provide input on preferences (primarily facilities and/or amenities) related to the following focus areas: biking, pedestrian mobility, transit services, transportation safety, and others. Respondents could rank each preference (options varied between 1 and 4 and 1 and 5 depending on the number of items) within each focus area.



Preference results are provided below (based on the number of times rated).

BIKING

PREFERENCE	DESCRIPTION	AVERAGE RATING
Multi-use Path	Paved facilities built for bicycle and pedestrian traffic that are physically separated from motor vehicle traffic.	★★★★★
Wide Paved Shoulders	A paved portion of the roadway to the right of the travel way designed to serve bicyclists, pedestrians, and others	★★★★☆
Signage	Encourages cycling with signage which makes drivers aware of cyclists and helps to guide bicyclists on designated routes	★★★☆☆
Bicycle Lanes	A portion of the roadway that is designated by striping, signage, and pavement markings for the exclusive use of bicyclists	★★★☆☆
Shared Bicycle Lanes	A standard width travel lane that both bicycles and motor vehicles share. Shared lane markings increase motorist's awareness of cyclists	★★☆☆☆

PEDESTRIAN MOBILITY

PREFERENCE	DESCRIPTION	AVERAGE RATING
New or Improved Sidewalks	Provide better access to local businesses, recreation, and neighborhoods.	★★★★★
Multi-use Path	Paved facilities built for bicycle and pedestrian traffic that are physically separated from motor vehicle traffic	★★★☆☆
Schools and Transit	Provide better access to schools, transit, and the existing network	★★☆☆☆
Signage	Increase driver awareness and pedestrian safety	★★☆☆☆

TRANSIT SERVICES

PREFERENCE	DESCRIPTION	AVERAGE RATING
Bus Service	Provide new mass transit options.	★★★★★
Bus Stops	Provide new mass transit options	★★★☆☆
On Demand Transit	Improve ADA – Americans with Disabilities Act – transit opportunities	★★☆☆☆
Microtransit	Technology-enabled transit service that typically uses multi-passenger/pooled shuttles or vans to provide on-demand or fixed-schedule services with either dynamic or fixed routing	★☆☆☆☆

TRANSPORTATION SAFETY

PREFERENCE	DESCRIPTION	AVERAGE RATING
Multi-modal Safety	Improve safety for all modes. Reduce conflicts between motorists, rail, bicyclists, and pedestrians.	★★★★★
Intersection Improvements	Add roundabouts, traffic signals, improve signal timing	★★★☆☆
Turning Lanes	Additional turning lanes to decrease lane stoppage and driver confusion	★★☆☆☆
Other	Speeds, crossings, and sight distance	★☆☆☆☆

OTHER

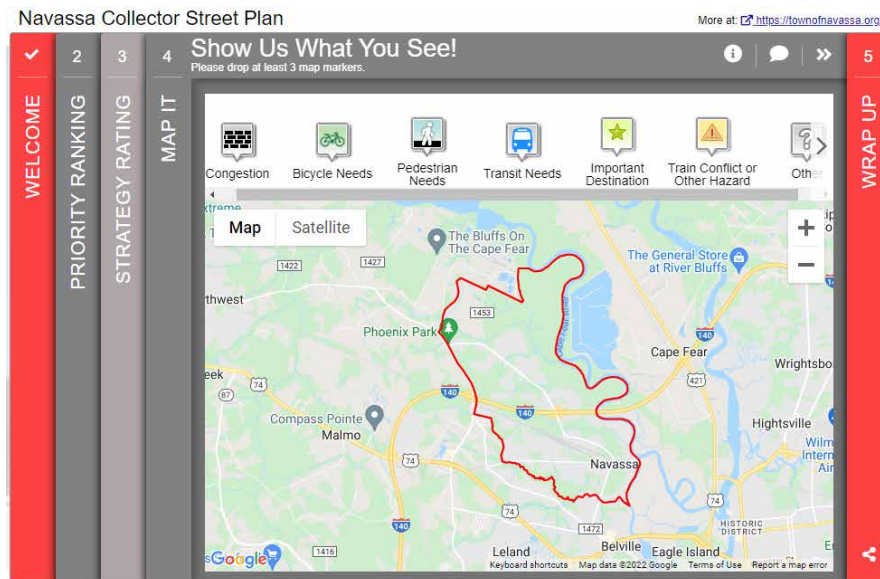
PREFERENCES	DESCRIPTION	AVERAGE RATING
Roadway Flooding	Creating a more resilient infrastructure to withstand roadway flooding.	★★★★★
Railroad Crossroads	Grade separated crossings where railroads intersect roadways to improve safety and reduce delay	★★★☆☆
Park-and-Ride Lots	Determine centralized locations for ride-sharing and transit options	★★☆☆☆
Other	Is there anything else that is important to you that is not listed?	★☆☆☆☆

In addition to the standard survey responses, four unique comments were submitted:

- I think streetlights are needed when new developments are placed.
- Turnabout and stoplight at Broadway and Main.
- Turnabout at Navassa Road and Cedar Hill Road intersection.
- Turnabout at Navassa Road/Cedar Hill Road/Quality Drive; Stoplight at Broadway and North Navassa Road.

Mapping Exercise

The fourth page of the survey allowed respondents to drop markers in and around the Town with accompanying comments. The survey asked for comments specifically related to congestion, bicycle needs, pedestrian needs, transit needs, key destinations, train conflicts or other hazards, and others.



Major comment topics are provided below and are organized by comment focus areas.

Congestion

- Future development
- Traffic flow
- Wider roads
- Congestion
- Vegetation
- Stoplights
- Flooding
- Lighting
- Signage

Bicycle Needs

- Wider shoulders
- Multi-use paths
- Bicycle lanes
- New trail connections
- Connections to the “new” downtown

Pedestrian Needs

- Sidewalks
- Parks
- Safety
- Wide shoulders
- Access
- Multi-use paths
- Complete streets
- Neighborhoods

Transit Needs

- Bus routes
- Connection to Wilmington
- WAVE services
- Funding
- Bus shelters
- Access to convenience stores
- Rural connectivity

Important Destinations

- Gullah-Geechee Preservation
- Mixed-use shopping plaza
- Movie theaters

Train Conflict or Other Hazard

- Drainage
- Flooding
- Street-level crossings
- Train conflicts
- I-140/Raise the overpass
- School buses
- Entrances/exits to neighborhoods

Other Comments

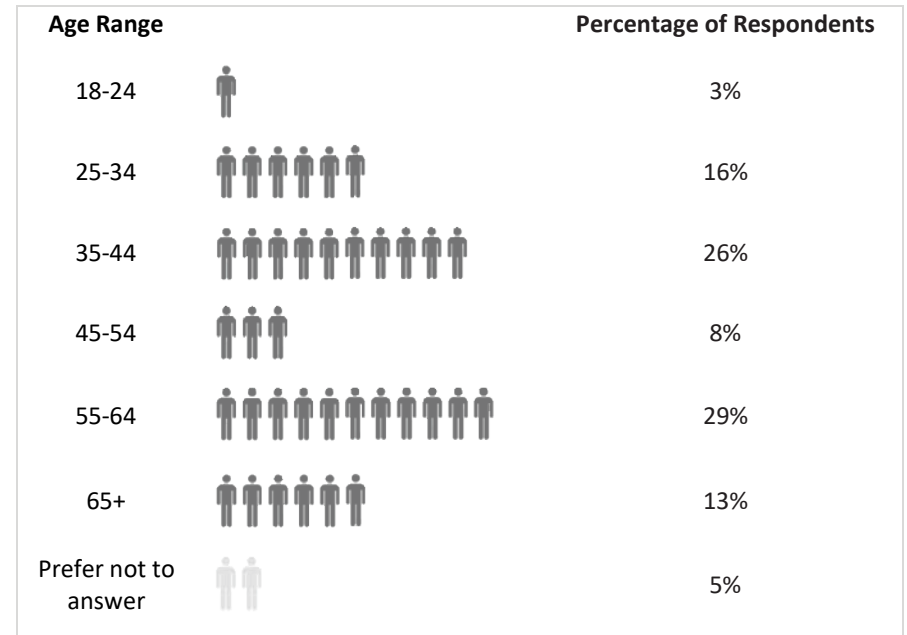
- Local/county connections
- Train wrecks resulting in traffic
- CSX Davis Yard
- Safety
- Outlets

Demographic Questions

The fifth and final page of the survey contained optional demographic-related questions. The questions were related to age, race/ethnicity, place of residency, and place of work.

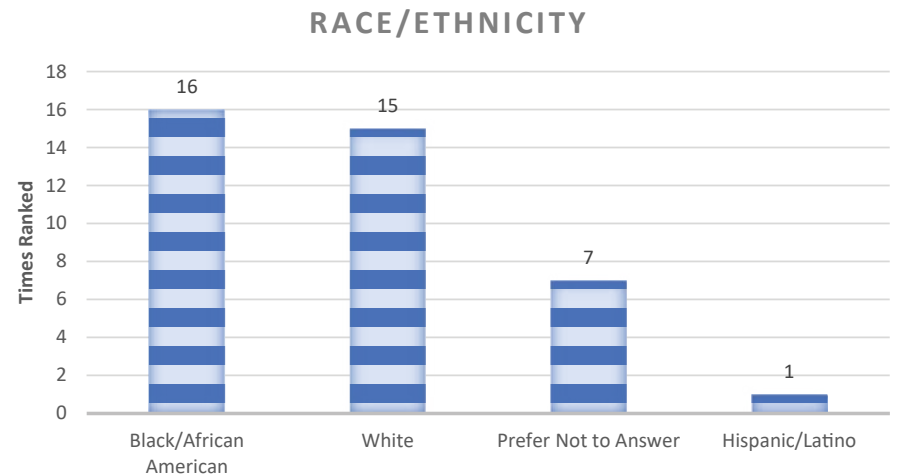
Most respondents fell within the 55-64 age bracket, followed closely by 35-44 (Figure 4-2).

Figure 4-2. Age Ranges



The race/ethnicity of survey respondents is shown in Figure 4 3.

Figure 4 3. Race/Ethnicity



Residency and employment location of respondents is shown in Figure 4-4 and Figure 4-5, respectively.

Figure 4-4. Do You Live in Navassa?

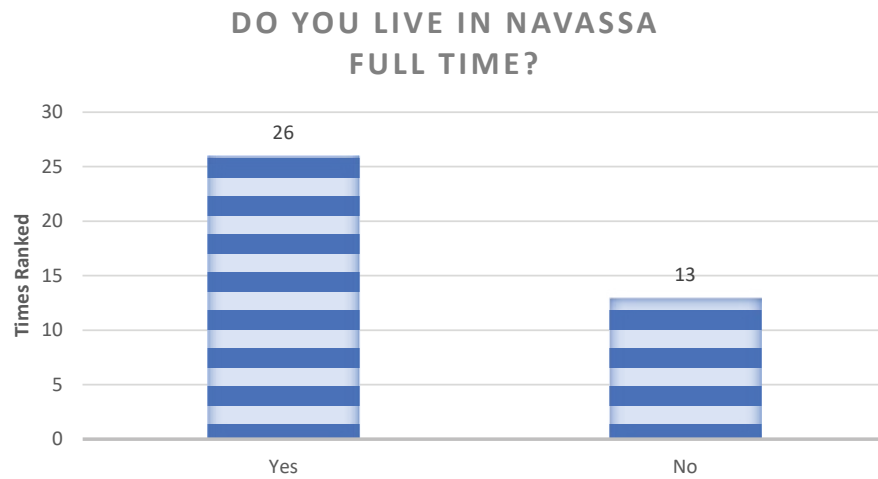
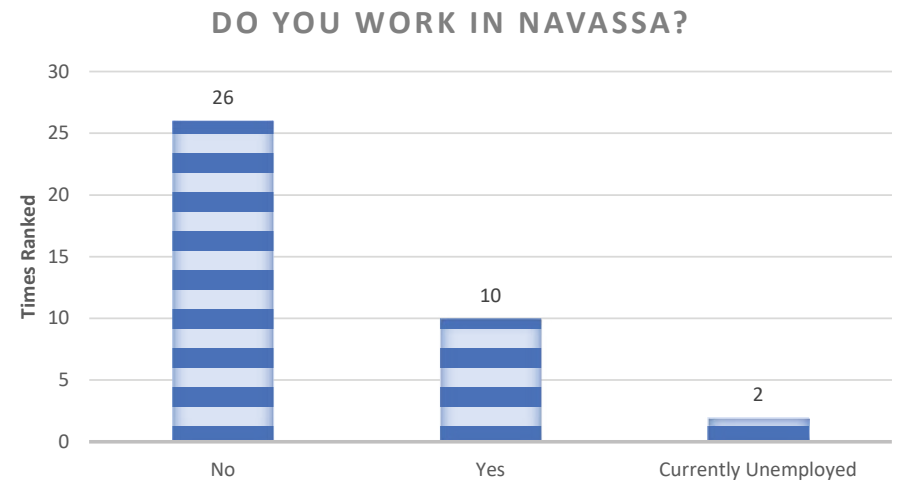


Figure 4-5. Do You Work in Navassa?



The final survey question asked respondents for their home zipcode. The majority of respondents live south of Navassa in the Town of Leland (zipcode 28451).

Town of
Navassa

Please take our survey!

The Town of Navassa is developing an updated Collector Street Plan and is looking for your input! The Plan, which will serve as an update to the 2004 Navassa Collector Street Plan, will provide a safe and efficient multimodal transportation network that accommodates future growth and development in the Town.



Please take a few minutes and respond to the survey by using the QR code shown above or by visiting:

<https://metroquestsurvey.com/dp8l8s>.

Your feedback will help the design team as they draft recommendations, both for a proposed collector street network and for collector street design standards, as well as policy recommendations. A public meeting, during which draft recommendations will be presented, is planned for early March.

If you have any questions about the plan update or the survey, please contact:

Rachel McIntyre - WMPO
Rachel.McIntyre@wilmingtonnc.gov
910-341-3234.



Welcome

2022 Town of Navassa Collector Street Plan

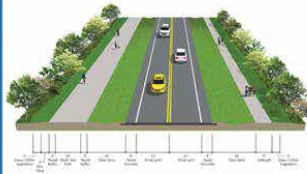
Town of Navassa | Wilmington Urban Area Metropolitan Planning Organization | AECOM

What is a collector street?

- ▶ Collector streets are major and minor roads that connect local roads and streets with arterials.
- ▶ Collector streets provide less mobility than arterials at lower speeds and for shorter distances.
- ▶ The posted speed limit on collectors is usually between 25 and 45 miles per hour.
- ▶ Collector streets balance mobility with land access.

FHWA Road Function Classifications: https://safety.fhwa.dot.gov/speedmgmt/data_facts/docs/rd_func_class_1_42.pdf

Typical Sections



Typical Section #1
2-Lane Road with
Multi-Use Path
(Without Curb and Gutter)



Typical Section #2
2-Lane Road
with Sidewalks
(Without Curb and Gutter)



Typical Section #3
2-Lane Road with
Sidewalks and Bike Lanes
(Without Curb and Gutter)

Typical Sections



Typical Section #4
2-Lane Road with
Multi-Use Path
(With Curb and Gutter)

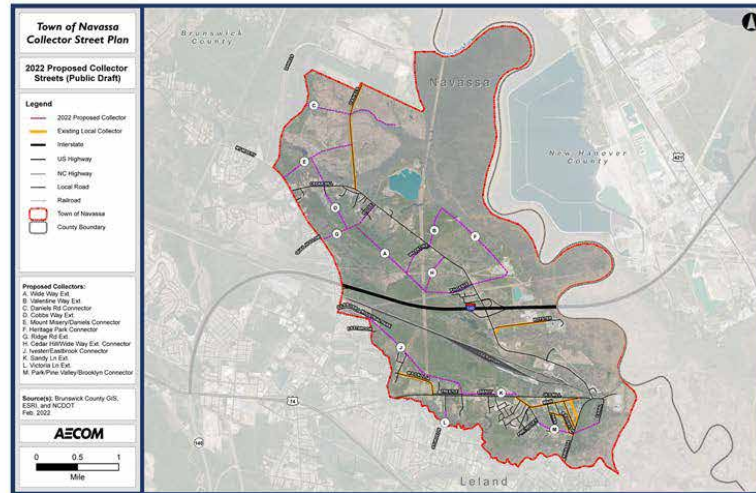


Typical Section #5
2-Lane Road
with Sidewalks
(With Curb and Gutter)

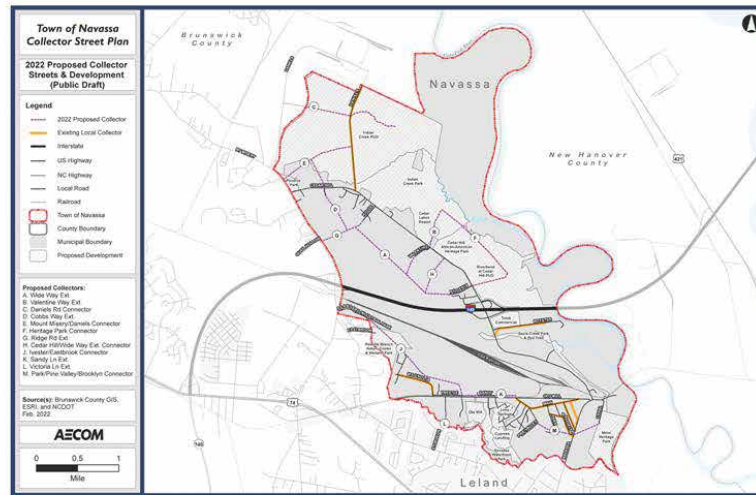


Typical Section #6
2-Lane Road with
Sidewalks and Bike Lanes
(With Curb and Gutter)

Proposed Collector Streets



Proposed Development



Project Schedule

December 2021
Steering
Committee
Meeting #1

February 2022
Steering
Committee
Meeting #2

May 2022
Steering
Committee
Meeting #3



January 2022
Public Survey
Opens

March 2022
Public Meeting
& Public
Survey Closes

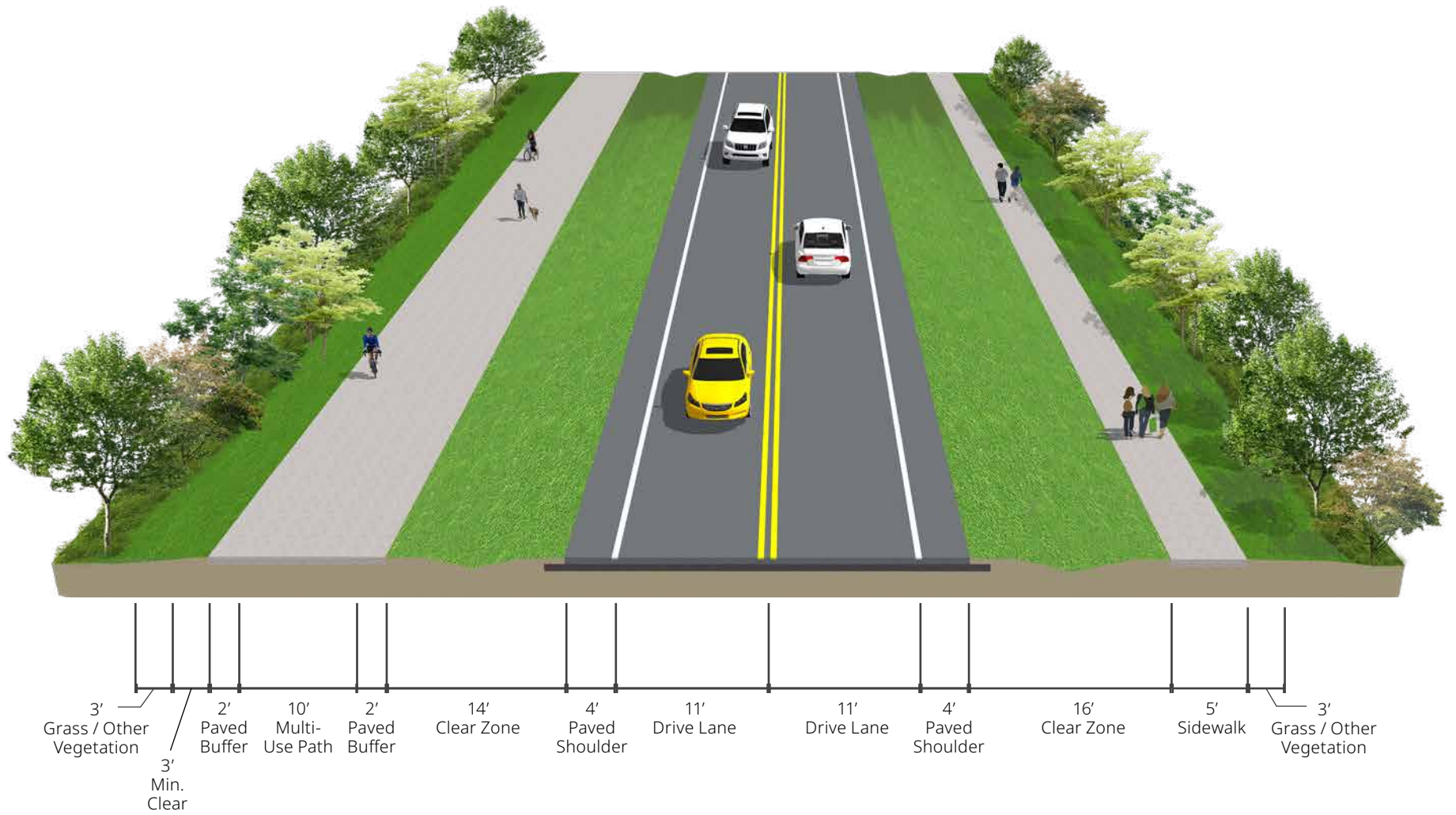
June 2022
Final Plan

Appendix D: Proposed Use of Roadway Typical Sections

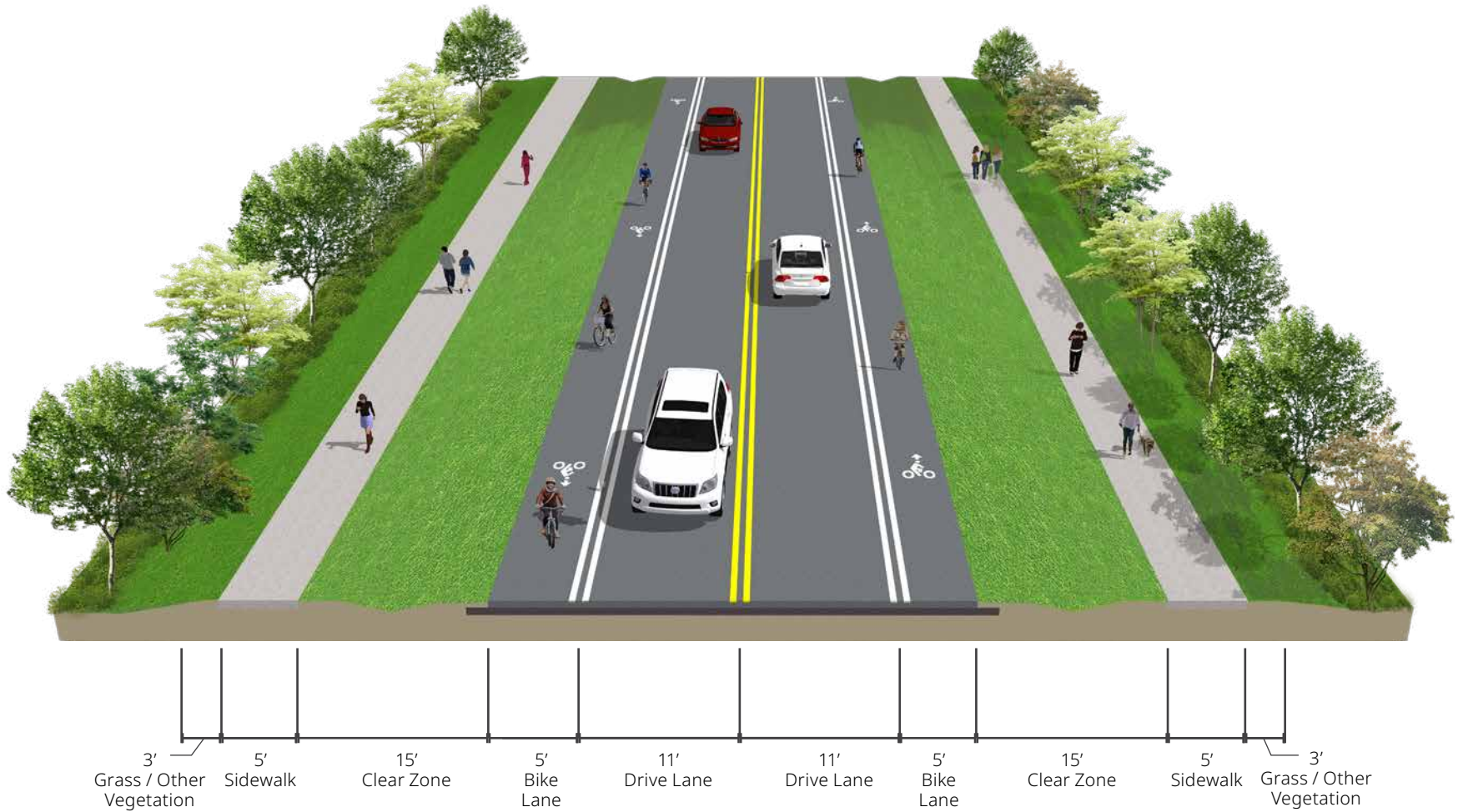
NCDOT's published highway typical sections includes 57 typical cross-sections for use in road planning (NCDOT, 2019b). Using the minimum design standards in accordance with NCDOT highway typical sections 2F and 2P, this Plan presents six typical sections for use in designing the collector streets for the Town. The typical sections presented in this Plan include roadways both with and without curb and gutter, for use as follows:

- **Without curb and gutter.** Typical sections without curb and gutter use wide grassy areas or ditches to carry and infiltrate stormwater. Illustrations of three variations are shown on page D-1.
- **With curb and gutter.** Curb and gutter typical sections would most likely be used in residential developments where stormwater drainage can be carried through a closed system to a stormwater storage area or a stormwater pond. Illustrations of three variations are shown on page 49.

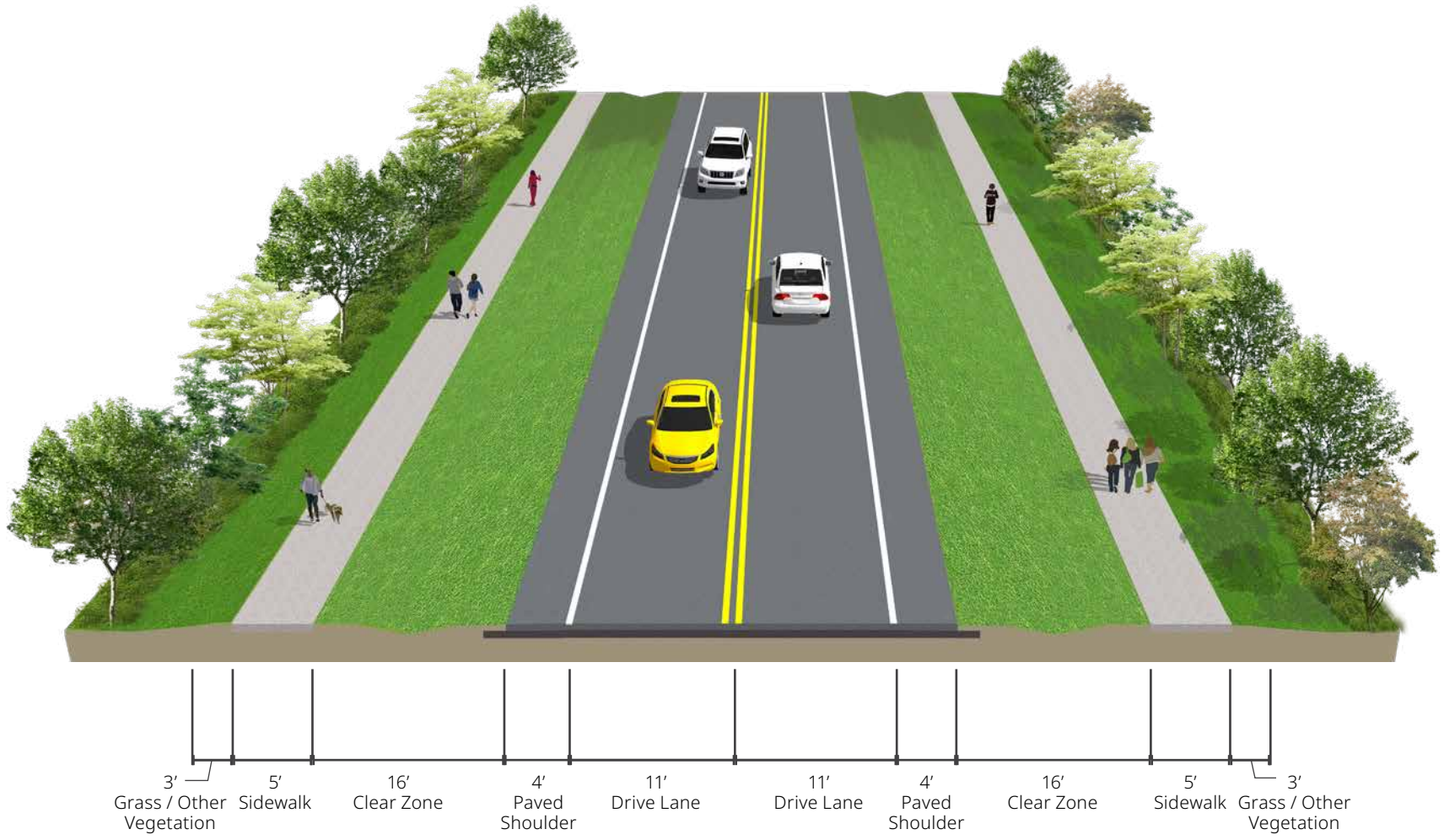
These typical sections are specifically for use within Coastal Area Management Act counties and prescribe design speeds of 25 to 45 miles per hour (mph).



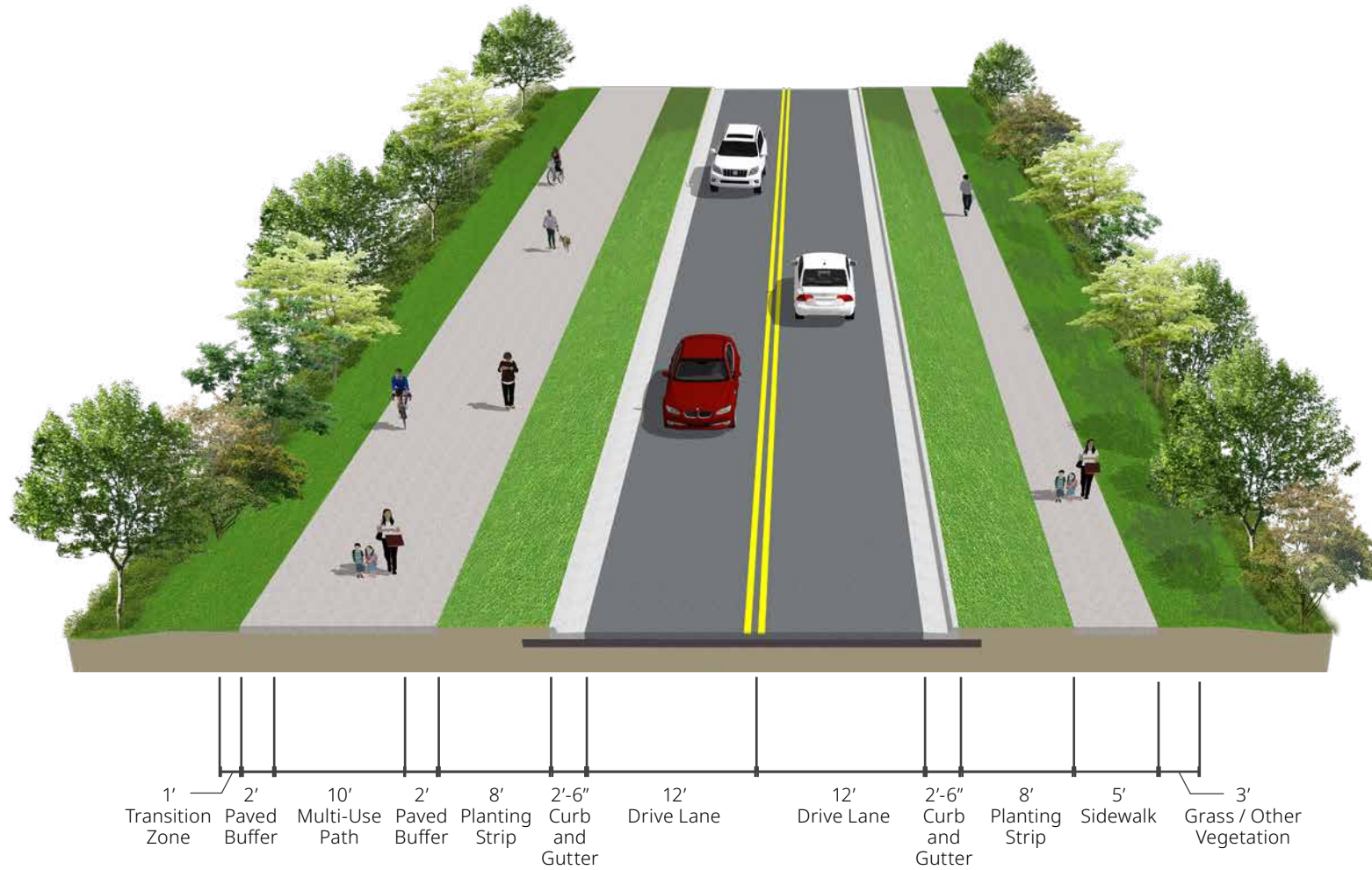
| 2-Lane Road with Multi-Use Path (Without Curb and Gutter)



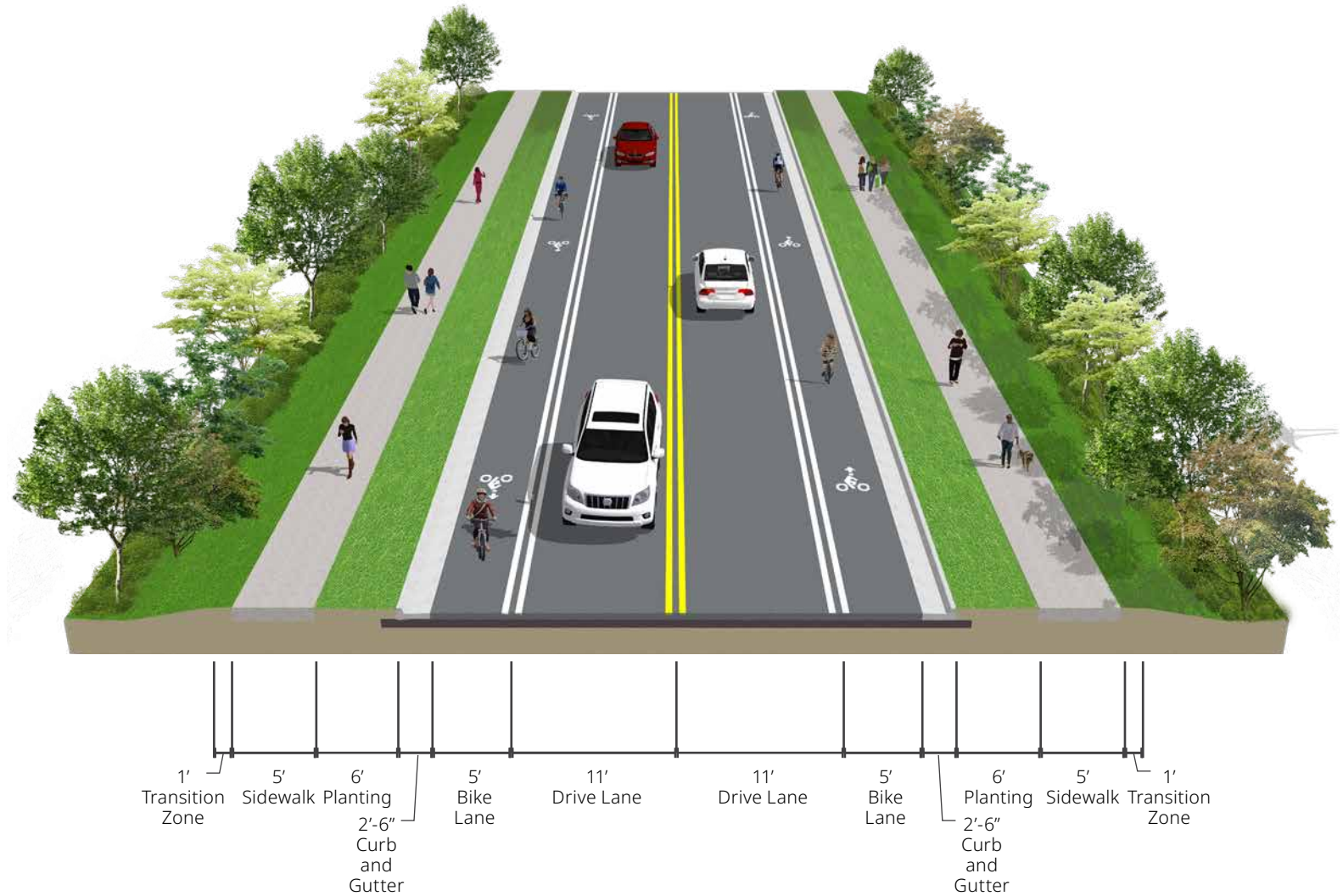
| 2-Lane Road with Sidewalks and Bike Lane (Without Curb and Gutter)



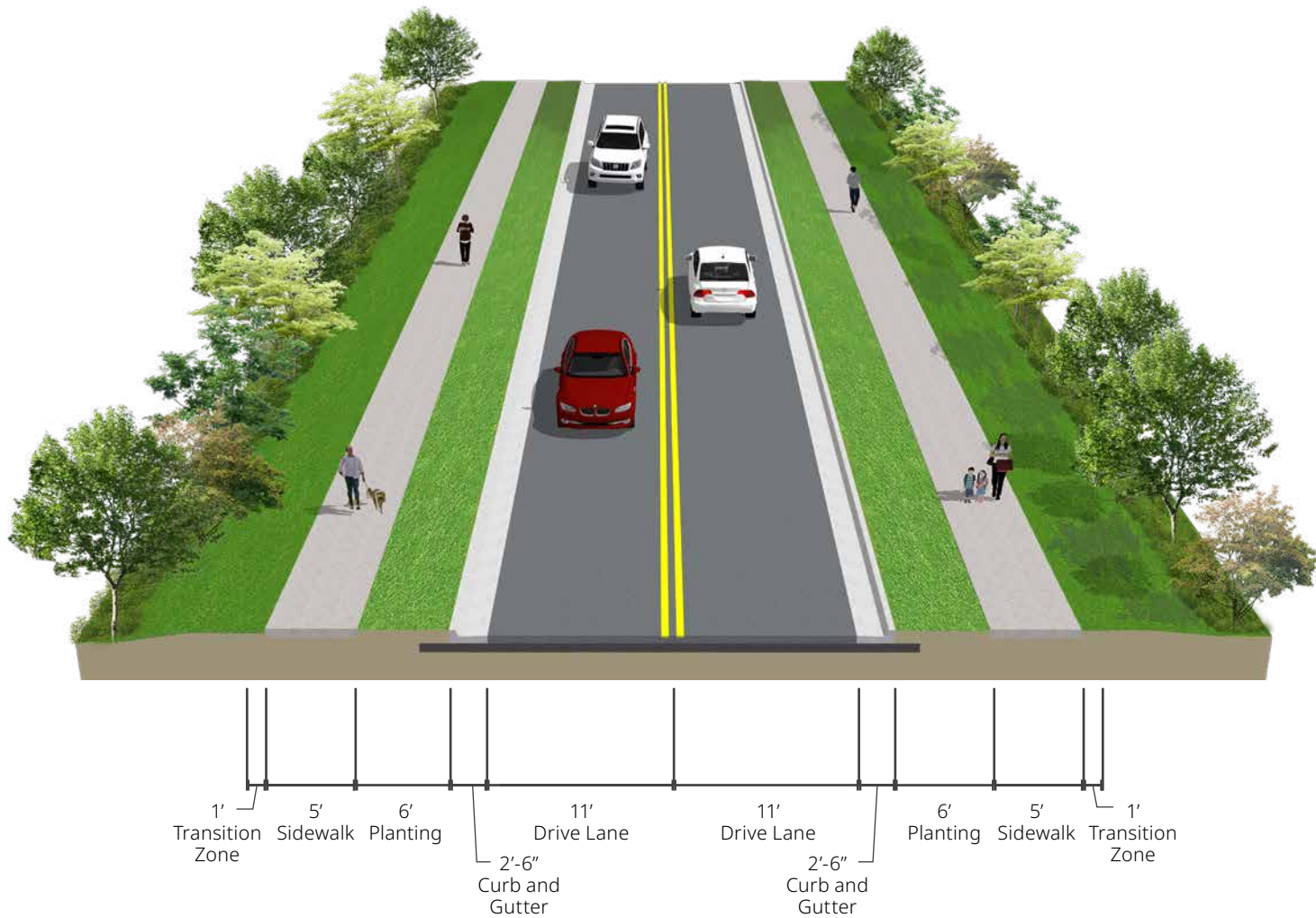
| 2-Lane Road with Sidewalks (Without Curb and Gutter)



| 2-Lane Road with Multi-Use Path (With Curb and Gutter)



| 2-Lane Road with Sidewalks and Bike Lane (With Curb and Gutter)



| 2-Lane Road with Sidewalks (With Curb and Gutter)

Town of Navassa, North Carolina

<https://townofnavassa.org/>