CONNECTING NORTHERN BRUNSWICK COUNTY

Collector Street Plan for the

Town of Leland • Town of Navassa • Brunswick County

Prepared for:

Prepared by:

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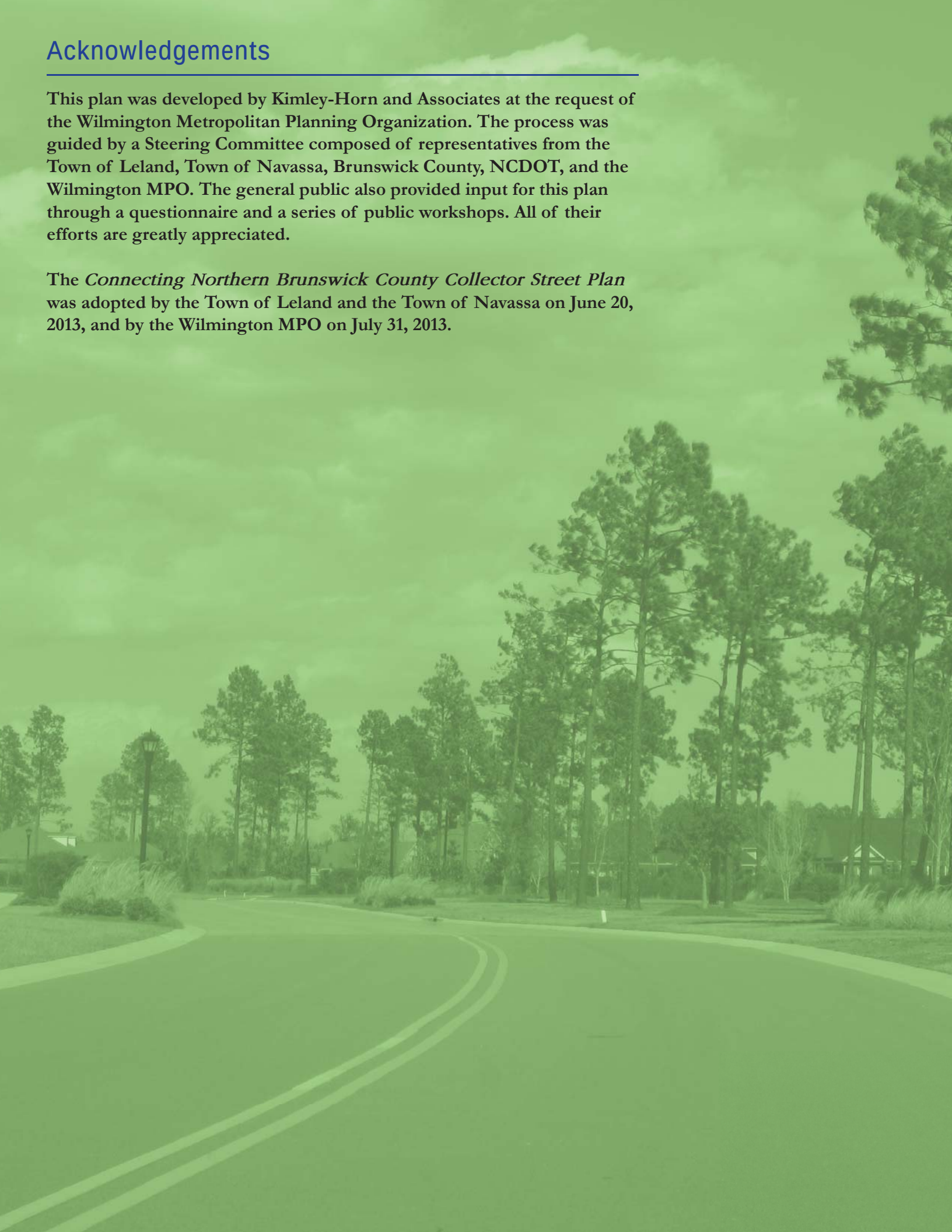
and Associates, Inc.

Acknowledgements

This plan was developed by Kimley-Horn and Associates at the request of the Wilmington Metropolitan Planning Organization. The process was guided by a Steering Committee composed of representatives from the Town of Leland, Town of Navassa, Brunswick County, NCDOT, and the Wilmington MPO. The general public also provided input for this plan through a questionnaire and a series of public workshops. All of their efforts are greatly appreciated.

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 Wilmington MPO on July 31, 2013.



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Chapter 1
Existing Conditions

The Wilmington Metropolitan Planning Organization partnered with the Town of Leland, Town of Navassa, and Brunswick County to conduct a study of the existing and future collector street needs in the northern Brunswick County area. The study area map (**Figure 1.1**) is displayed on the following page.

Collector streets are mid-level streets that link residential or local streets to major arterials. They have lower speeds and carry less traffic than major roads and typically have 2 or 3 lanes. They provide a livable alternative to traveling on major roads and better suit bicycle and pedestrian traffic. Collector streets help relieve congestion by providing alternatives for short trips connecting between neighborhoods and commercial areas.

Purpose: Chapter 1

This chapter documents the planning process for the *Connecting Northern Brunswick County* Collector Street Plan. It also outlines the vision and guiding statements of the plan, summarizes the results and findings from previous plans, describes the existing conditions of the collector street network, and discusses the public involvement process. The chapter is organized into the following sections:

- Vision
- Guiding Statements
- Previous Plans
- Data Collection
- Baseline Transportation Performance
- Future Land Use Build-Out
- Steering Committee Work Sessions
- Community Outreach

Vision

The vision and guiding statements were developed using a collaborative process with the Steering Committee.

The Vision of *Connecting Northern Brunswick County* is to create choice and foster connectivity through a recommended collector street network based on an inclusive and data-driven planning process.

Guiding Statements

Connectivity & Continuity—Document the role and operating characteristics of collector streets within the transportation network and determine collector street spacing based on anticipated land uses and the environmental constraints inherent to the region.

Constructability & Implementation—Use careful planning, appropriate design standards, and purposeful decisions to champion a desirable and realistic transportation network.

Economic Development—Maintain the character of Towns and rural areas, cultivate economic growth, and add value by making it easier and more attractive to move within and through the region.

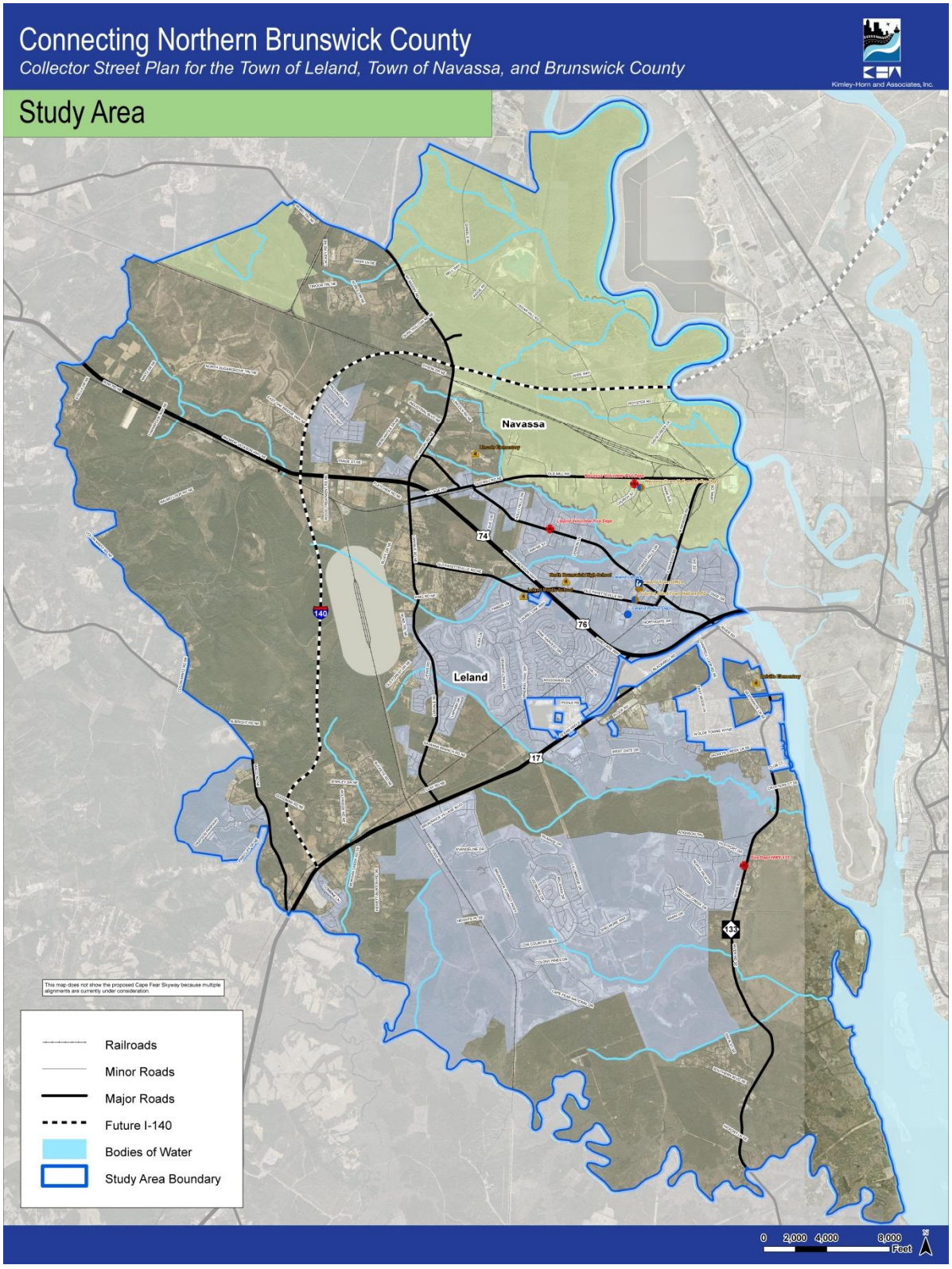
Multimodal Connectivity—Enhance connections between homes and activity centers with bicycle and pedestrian facilities tailored to the intended user.

Public Awareness & Education—Involve a broad spectrum of the community, teach them about collector streets, effectively communicate recommendations, and empower decision makers.

Quality of Life—Improve choice and ease of access, make transportation more livable, and enhance aesthetics within neighborhoods and across the region by enriching the way we live.

Safety—Reduce conflicts for motorists, bicyclists, and pedestrians with special attention to intersections, improve emergency response, and protect evacuation routes with a balanced, multimodal network.

Figure 1.1: Study Area



Previous Plans

The *Connecting Northern Brunswick County* plan builds on the goals and recommendations of several previously adopted plans. A brief synopsis of these plans is provided here.

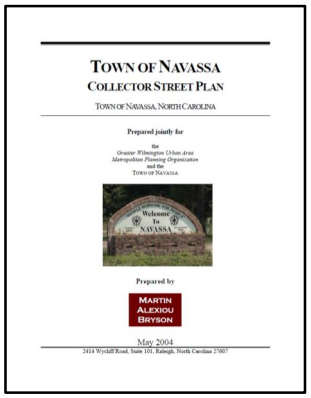
Town of Navassa Collector Street Plan

Date: May 2004

Purpose: The provision of collector streets in a planned fashion can help to reduce cut-through traffic on local streets, thus preserving neighborhood vitality.

Recommendations:

- Wide Way Extension – will connect Mount Misery Road to Cedar Hill Road
- Valentine Way Extension – will connect Wide Way Extension to Cedar Hill Road
- Daniels Road Connector – will connect Daniels Road to the Town's western limits

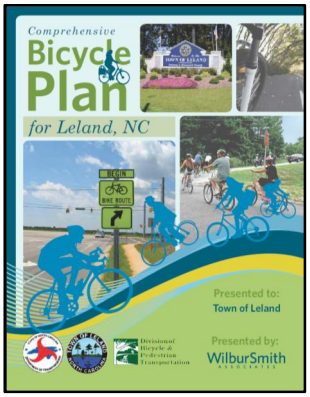


- Cobbs Way Extension – will connect Daniel Roads Connector to Wide Way Extension, crossing Cedar Hill Road
- Mount Misery/Daniels Connector – will connect Mounty Misery Road to Daniels Road
- Royster Road Connector – will connect Cobbs Way Extension to Wide Way Extension and I-140 Bypass to Royster Road
- Ridge Road Extension – will connect Mount Misery Road to the Royster Road Connector
- Cedar Hill/Wide Way Extension Connector – will connect Cedar Hill Road to Wide Way Extension
- Ivester/Eastbrook Connector – will connect Old Mill Road to two ends of the Town's limits
- Sandy Lane Extension – will connect the Ivester/Eastbrook Connector to Main Street
- Victoria Lane Extension – will extend Victoria Lane to the Town's limits
- Park/Pine Valley/Brooklyn Connector – will connect the intersection of Park Avenue and Pine Valley Road to Brooklyn Street

Comprehensive Bicycle Plan for Leland, NC

Date: 2008

Purpose: The purpose of this Comprehensive Bicycle Plan is to develop a dynamic and comprehensive bicycle planning tool for the Town of Leland. This Plan will provide the Town with a planning tool which will assist in the expansion, promotion and funding of safe and efficient bicycle facilities and programs and initiatives through the Town.



Vision: To establish bicycling as a viable, convenient and safe transportation choice throughout Leland.

Goals:

- Safety – increase and enhance the safety of bicyclists
- Public awareness – enhance public awareness and education of bicycling in the Town of Leland
- Connectivity, coordination, and continuity – adopt policies that promote connectivity, coordination and continuity through the Town of Leland

- Quality of life – enhance quality of life of the citizens of Leland
- Maintenance and implementation – develop a maintenance and implementation plan

Recommendations:

- Short-term priorities (improve bicycle access and safety in "Old Leland" and make connection between existing facilities to open up larger portions of the Town to bicycle travel within neighborhoods and local roads)
  - Village Road Loop
  - Old Leland Loop
  - Fletcher Road / Northwest District Park Connection
  - US 17 Superstreet Connections
  - Leland Greenway
  - Wayne Street / Royal Street Connection
  - Night Harbour Drive / Old Town Wynd Connection
  - Grandiflora / Palm Ridge Drive Connection
  - Ploof Road
- Medium-term priorities
  - Holly Hills Drive / Sturgeon Drive Connection
  - Eagle Island Connection
  - NC 133
  - Lanvale Road
- Long-term priorities (the projects lie almost solely outside of the Town limits and serve primarily medium to advanced recreation cyclists)
  - Chappell Loop
  - Cedar Hill Loop
  - Green Hill Loop
  - Old Fayetteville Road
- Policy and program recommendations
  - Update the Town's land development code
  - Coordinate with NCDOT regarding on-going projects
  - Provide education to the public
  - Promote bicycle safety
  - Develop a maintenance plan
  - Increase enforcement for motorists and cyclists
  - Apply grant money to implement Plan recommendations

US 17/NC 133 Collector Street Plan

Date: May 2005

Purpose: The US 17/NC 133 Area Collector Street Plan was developed to complement the existing arterial system and planned development. The purpose of the CSP is to inventory the existing collector street network and develop standards and policies that will promote future connectivity and accommodation for automobiles, transit, pedestrians, and bicycles as collector streets are constructed.

Objective: The objective of the consultants' work is to prepare a map showing a network of existing and future interconnected, paved streets that will accommodate vehicles, bicycles, buses and pedestrians and to recommend adoption of the map by the Town of Leland, Town of Belville, County of Brunswick, the Rural Planning Organization and the Wilmington Area Metropolitan Planning Organization.

Recommendations:

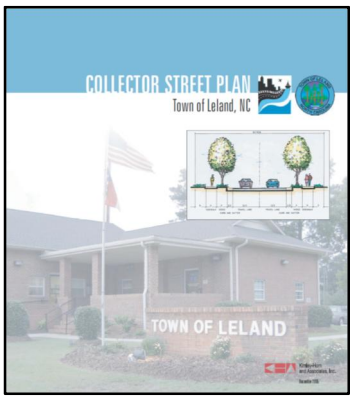
- Increase the number of collector streets to better facilitate travel between local streets and arterials
- Improve accessibility to high-density residential areas and activity centers such

as Brunswick Forest, activity nodes, and other planned retail centers
- Integrate design standards and provisions for residential collector streets through the residential development process
- Amend the Collect Street Plan as necessary to include new streets as they are identified during the development review process
- Use the plan as a tool to review proposed development projects and plans as they locate and design future collector streets
- Integrate future bikeway, greenway, and trail networks with the Collector Street Plan to create an interconnected network
- Avoid and/or minimize impacts to environmentally sensitive areas to preserve the natural environment
- As the transportation system is improved and expanded, minimize impacts that negatively affect the character and integrity of neighborhoods
- Require that new developments reserve right-of-way for, and in some cases construct, future collector street
- Incorporate the Collector Street Plan as an addendum to the Comprehensive Plan and subdivision regulations
- Pursue NCDOT Enhancement grant funding to install bike lanes on existing facilities
- Promote alternative modes of transportation through better street design and developer participation
- Promote interconnectivity between existing and proposed developments

Leland Collector Street Plan

Date: December 2005

Mission: In coordination with the Navassa Collector Street Plan and the US 17/NC 133 Collector Street Plan, the mission of the Leland CSP is to develop a comprehensive street system that sustains a high quality of life through a well-designed and maintained interconnected system of streets. The Leland CSP seeks to reinforce the goals of improved traffic flow, expanded multimodal services, enhanced maintenance and appearance of roadways, increased travel ways for pedestrians and bicyclists, and increased traffic safety.



Purpose: The purpose of the Leland CSP is to inventory the existing collector street network, develop standards and policies that will promote future connectivity, and provide multimodal accommodations as collector streets are constructed.

Goals/Objectives:

- Define a functional classification system that is appropriate for the Town of Leland planning area
- Adopt design guidelines, standards, and policies for collector streets that are consistent with their functional environment
- Define operation characteristics for proposed collector streets that address posted speed, lane width, intersection spacing, access characteristics, and other appropriate parameters
- Prepare a plan for the horizon year 2030 for collector streets that will improve connections between local streets and arterials
- Plan for future collector street connections that support the arterial system and increase access opportunities for emergency vehicles through an interconnected system of streets

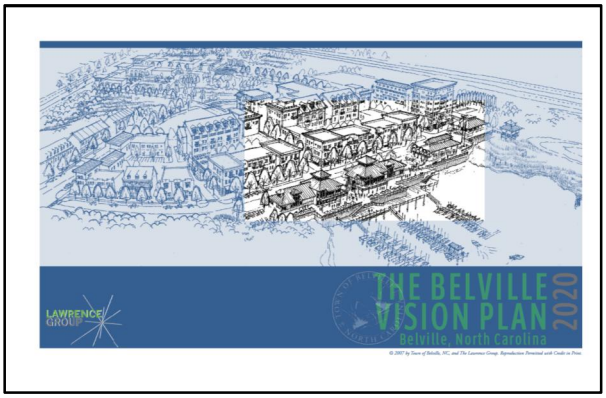
Recommendations:

- Improve accessibility to high-density residential areas and activity centers such as Brunswick Forest, activity nodes, and other planned retail centers
- Integrate future bikeway, greenway, and trail networks with the Collector Street Plan to create an interconnected network
- Avoid and/or minimize impacts to environmentally sensitive areas to preserve the natural environment
- As the transportation system is improved and expanded, minimize impacts that negatively affect the character and integrity of neighborhoods
- New non-residential developments located adjacent to each other should be encouraged to provide cross-access so that parking lots and driveways are connected and shared
- Minimum lot frontages should be considered for non-residential developments along major arterials, including Lanvale Road, Village Road, NC 133, and US 17
- Lanvale Road, Village Road and NC 133 are heavily traveled facilities, so right-of-way (100 feet) should be protected for each facility to accommodate future widening to 4-lane divided median
- Larger developments, such as shopping centers, should be required to provide internal access to outparcels and direct access to arterials should be prohibited, when possible
- Right-in/right-out only driveways should be encouraged as secondary access on major arterials for non-residential developments
- For new developments that front major arterials and side streets, primary access via the side street should be encouraged
- Increase the number of collector streets to better facilitate travel between local streets and arterials
- Integrate design standards and provisions for residential and commercial collector streets through the development process
- Amend the Collector Street Plan as necessary to include new streets as they are identified during the development review process
- Work with development community and real estate companies to increase public awareness of future collector street connections through enhanced signage
- Provide temporary turnaround to collector street stub-outs to allow access by maintenance and emergency access vehicles; right-of-way needed for turnaround would revert back to property owners once connection is made
- Use the plan as a tool to review proposed development projects and plans as they locate and design future collector streets
- Local jurisdictions should consider dedicating collector streets as public right-of-way to allow proper design and maintenance of facility
- Require that new developments reserve right-of-way for, and in some cases construct, future collector streets
- Incorporate the Leland Collector Street Plan and the US 17/NC 133 Collector Street Plan as an addendum to the Comprehensive Plan and subdivision regulations

The Belville Vision Plan 2020

Date: 2007

Goal: This plan seeks to answer the questions posed to it by the Town's residents. Namely, where should development go, what form should it take, and how do we improve the overall community for the next generation?



Recommendations:

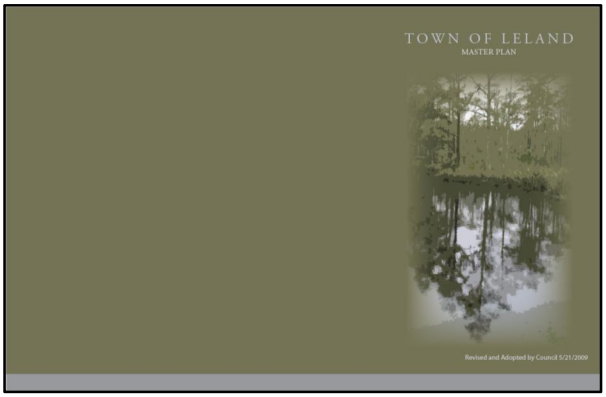
- Lincoln Business Park/US 17
  - Provide a connection to Grandiflora Drive from Olde Waterford Way
- Blackwell Road
  - Align Blackwell Road with Ploof Road to provide an east-west corridor for local traffic from NC 133 to Grandiflora Drive
- NC 133 South
  - Improve the capacity of the NC 133/River Road corridor while maintaining a high priority on its overall aesthetics as a gateway to Belville and southern Brunswick County
  - Request that the NCDOT Urban Municipal Operations Unit conduct an access and circulation study around the elementary school
- The Riverfront Village
  - Adjust the signal timing and phasing around the interchange
  - Support the completion of the Village Road improvements north of the interchange
  - Realign Blackwell Road approximately 650 feet south of the current intersection with NC 133 to provide adequate separation between the southbound ramps
  - Construct a "square loop" ramp for northbound ingress and egress in combination with Blackwell Road
  - Make the Riverfront Village area bicycle and pedestrian-friendly
- General
  - All new streets should provide facilities for the bicyclist and pedestrian as well as the automobile

Town of Leland Master Plan

Date: May 2009

Highways and Transportation Vision: Leland's imaginative transportation planning has alleviated congestion, provided for public safety, and has not destroyed neighborhoods.

- We have interconnectivity between neighborhoods.
- We are implementing our Collector Street Plan.
- The local system of sidewalks, bike trails, traffic lights, and road access are working extremely well in this community.



Guiding Principles for Transportation Policy:

- Coordinate land use and transportation as a means to preserve the quality-of-life cherished by residents of the Town
- Ensure street interconnectivity

- Use "context-sensitive" street design techniques
- Enhance Leland as a walkable community
- Create the infrastructure for bicycle as a viable means of transportation

Recommendations:

- Linking land use and transportation decisions
  - Coordinate land use planning regionally
  - Require transportation impact analyses
- Improved street connectivity
  - Apply the Collector Street Plan principles
  - Revise the Collector Street network Plan
  - Develop and enhance the collector street network
  - Space collector streets based on land use context
  - Update collector street requirements
- Context sensitive street design
  - Allow on street parking
  - Require sidewalks
  - Require street trees
  - Allow appropriate drainage infrastructure
- Walkable community
  - Complete a pedestrian master plan
  - Make changes to the development ordinances
  - Fund pedestrian facilities through the CIP
- Enhance bicycle infrastructure
  - Include bicycle facilities in transportation plans and projects
  - Improve connectivity
- Expanded public transit
  - Require transit appropriate land development
  - Determine appropriate future routes and stops
  - Expand transit service
- Major roadway network
  - Monitor crash problem on Lanvale Road
  - Improve safety conditions on Village Road
  - Implement other traffic management techniques
  - Revise Village Road Phase I plans
  - Study/revise Village Road Phase II plans
  - US 17 Access Management: extend frontage roads and collector streets
  - Study Old Fayetteville/US 74/US 76 Interchange
  - Implement demand-side congestion and access strategies
- Village Road-US 17/US 74/US 76 Interchange
  - Adjust the signal timing and phasing around the interchange
  - Complete the improvements to Village Road north of the interchange
  - Realign Blackwell Road approximately 650 feet south of the current intersection with NC 133 to provide adequate separation between the southbound ramps
  - Construct a "square loop" ramp for northbound ingress and egress in combination with Blackwell Road

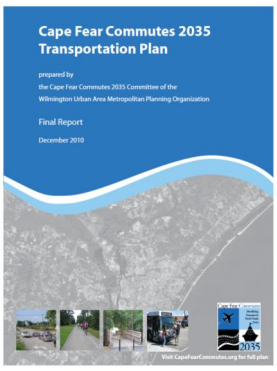
Cape Fear Commutes 2035 Transportation Plan

Date: December 2010

Vision: Cape Fear Commutes 2035 Transportation Plan will plan for a safe, efficient, appropriate, responsible, integrated, multimodal transportation system through the Wilmington Urban Area over the next 25 years.

Recommendations:

- Roadway projects
  - R-2633B – Wilmington Bypass Section B (I-140-US 17) from US 74/US 76 to US 421
  - R-4732 – Ocean Highway (US 17) access management (WMPO component)
  - R-4063 – Village Road Widen from South Navassa Road to Lanvale Road
  - U-3337 – Convert grade separation at US 74/US 76 at Old Fayetteville Road to an interchange



  - R-3601 – US 17/US 74/US 76-NC 133 widen from River Road SE (NC 133) to US 421
  - Q07 – Ocean Highway (US 17) improvements between Lanvale Road and Andrew Jackson Highway (US 74/US 76)
  - Q28 – River Road (NC 133) streetscape between US 17/US 74/US 76 and Old River Road
  - W14 – River Road roundabout at Sanders Road
  - W06 – Navassa Road roundabout at Old Mill Road
  - Proposed Cape Fear Skyway
- Transit projects
  - T09 – Riegelwood to Wilmington Express (serving Acme, Delco, and Leland to New Hanover Medical Center via Downtown Station)
  - T10 – Southport to Wilmington Express (serving Boiling Springs Lakes and Winnabow to Central Station via Downtown Station)
  - T11 – Shallotte to Wilmington Express (serving Supply, Bolivia, and Winnabow to Central Station via Downtown Station)
  - T12 – Southport to Wilmington Express Alternate (serving Boiling Springs Lakes and Winnabow via I-140/Cape Fear Skyway)
  - T13 – Shallotte to Wilmington Express Alternate (serving Supply, Bolivia, and Winnabow to New Hanover Regional Medical Center via I-140/Cape fear Skyway to New Hanover Regional Medical Center)

2012-2018 Metropolitan Transportation Improvement Program

Projects:

- R-3601 – US 17/US 74/US 76, NC 133/SR 1472 (Village Road) Interchange to the US 421/NC 133 Interchange. Add additional lanes on north and southbound lanes and widen bridge no. 107 and bridge no. 108 (1.5 miles)
- R-4002 – SR 1472 (Village Road), west of SR 1437 (Old Fayetteville Road) to east of US 17 interchange ramps with dual left turn lanes on north ramp to US 17. Widen to multi-lanes (0.9 mile)
- R-4063 – SR 1472 (Village Road), west of SR 1437 (Old Fayetteville Road) to SR 1438 (Lanvale Road). Widen to multi-lanes (3.4 miles)
- R-2633 – I-140/US 17 Wilmington Bypass, US 17 south of NC 87 in Brunswick County to I-40 in New Hanover County. Four lane divided freeway on new location (20.2 miles)
- U-3337 – US 74/US 76, SR 1437 (Old Fayetteville Road). Convert grade separation to an interchange
- U-4738 – New Route (Cape Fear Skyway), US 17 to Independence Boulevard-Carolina Beach Road intersection.

Construct a new facility with structure over the Cape Fear River (9.5 miles)

- FS-0803A – US 17, proposed I-140 to NC 133 (Village Road). Add additional lanes (6 miles)
- BD-5103 – Division 3 purchase order contract bridge replacement projects at selected locations
- BF-5303 – Screen and evaluate potential federal funded bridge projects Division 3
- BL-5503 – Bridge improvements in Division 3
- BS-5403 – Screen and evaluate potential state funded bridge projects Division 3.
- B-4928 – Mill Creek. Replace bridge no. 28
- EE-4903 – Ecosystems enhancement program for Division 3 project mitigation.
- F-5301 – Cedar Island, Southport and Fort Fisher docks. Replace dolphins
- W-5203 – Division 3 rumble strips, guardrail, safety and lighting improvements at selected locations

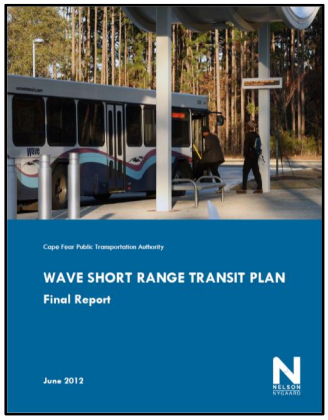
Wave Short Range Transit Plan

Date: June 2012

Purpose: This report provided an overview of the study process and analysis and provides the final recommended plan for future service in the next five years, including specifications for the recommended service redesign, a financial management plan, a capital plan, and additional recommendations to support execution of high-quality transit services.

Findings:

- Existing services are an essential part of a livable, accessible, equitable community in Wilmington.
- Transit services could be improved if they were more direct and consistent.
- There are some areas where ridership is very low, while other markets are underserved.
- Service frequency, hours of service, and days of operation are a challenge.
- Challenging walking conditions have major impacts on ability to use transit.



Advantages of Recommended Transit Service Design:

- Maintains coverage to most existing areas of service.
- Makes service more direct and simple to understand, and reduces duplication.
- Results in shorter travel times for many riders.
- Preserves strong connections at Downtown Station and Forden Station.

Town of Navassa Future Land Use Plan 2011-2030

Date: Draft submitted June 2012

Vision: The Town of Navassa will work to promote and support the orderly economic and aesthetically attractive growth and development of the community, in accordance the adopted Land Use Plan and development ordinances, while continuing to maintain the town's historic identity and unique characteristics. The Town will grow with a healthy mixture of residential, commercial, and priority for clean industrial development in order to create a strong, inclusive community. The Town, with the adopted land use plan, desires to serve its citizens and make the community a desirable place to live and work with well-planned roads, sidewalks, parks, trails, adequate water and sewer infrastructure, and controlled septic systems. The Town also recognizes that it coexists with the environment and wildlife such as the fragile Cape Fear and

Brunswick Rivers, associated creeks, and wetlands, and it shall seek to conserve these areas. The Town values being responsive to the public and improving the quality of life for all its citizens. To this end, the Town shall continually seek the involvement, input, and various viewpoints of its citizens during the Town's official consideration of land use and development decisions.

Priority Issues:

- Ensure a good quality of life for the citizens of the town
- Ensure high quality new residential, commercial and industrial development
- Create more job opportunities for Navassa residents with enhanced land use planning
- Increase the number of businesses including commercial and industrial, with a priority for clean industrial
- Improve the appearance and attractiveness of the town
- Enhance government's professional capacity to manage the town
- Improve road connectivity and sidewalks
- Promote sustainable practices with new development and redevelopment

Data Collection

A variety of data sources were gathered at the outset of this plan. Key sources are summarized here.

Crash Data Review

The project team requested three years of intersection and corridor-level crash data from NCDOT. Upon receiving this information the team performed an intersection level crash analysis. The intersections are ranked based on their equivalent property damage only (EPDO) rating. The EPDO rating converts different crash types to property damage only by multiplying the number of crashes by a severity factor. Fatal crashes are assigned a higher severity index than property damage only crashes.

Analysis of this data for the study area shows significant crash issues along the major arterials. Corridor-level data was added to this analysis to identify roads performing above or below the state average. This process concluded that Village Road, Old Fayetteville Road, and Cedar Hill Road all have crash rates above the state average, meaning they are less safe than the average roadway of those types in North Carolina. Results of the crash analyses are shown in **Figure 1.2**.

GIS Data Review

The project team requested Geographic Information System (GIS) data from the participating agencies early in this study. There are many different data items that can be obtained and analyzed in GIS. Information was obtained from all municipalities, Brunswick County, NCDOT, and WMPO. This data helped the team understand the existing conditions and what data sources are priorities for certain agencies. **Figure 1.3** displays the environmental features within the study area. **Figure 1.4** displays existing transportation features within the study area.

Field Review

All of the mapping and photographs in the world cannot replace the value of actually visiting a transportation facility that you are studying. In order to ensure the recommendations would provide realistic and implementable strategies, the project team spent time in the field reviewing the existing transportation network. That review had three main focuses:

1. Document the existing collector street network.
2. Visually assess the performance of major highways.

3. Qualitatively evaluate the presence and performance of multimodal amenities within the street network.

While in the field, the project team also visited the sites of development that were either approved or underway. This field review re-emphasized the need for cohesive collector street planning in the area, as well as the appetite for growth being demonstrated.

Baseline Transportation Performance

A comprehensive understanding of existing conditions is necessary to plan for the future. The following sections further describe these conditions.

Travel Demand Model Results

Travel demand model results were received from the WMPO regional model. These results are displayed graphically in the following pages. **Figure 1.5** shows existing (2008) congestion levels in the study area. **Figure 1.6** shows future (2035) congestion levels with future traffic levels and the construction of financially committed projects.

The results of these congestion analyses are striking. Existing conditions show congestion at major crossings of arterials, such as where US 17/US 74/US 76 intersects with NC 133 and Village Road, where US 17 splits off from US 74/US 76, and where US 74/US 76 intersects with Lanvale Road/Mount Misery Road. However, by 2035 congestion levels have expanded to cover most of the major arterials in the study area, with all or most of I-140, US 74/US 76, US 17, NC 133, Navassa Road, Old Fayetteville Road, Lanvale Road, Mount Misery Road, and Cedar Hill Road either approaching, at, or above capacity. Additions to the supporting collector street network will help to mitigate the congestion issue.

Figure 1.2: Crash Analysis

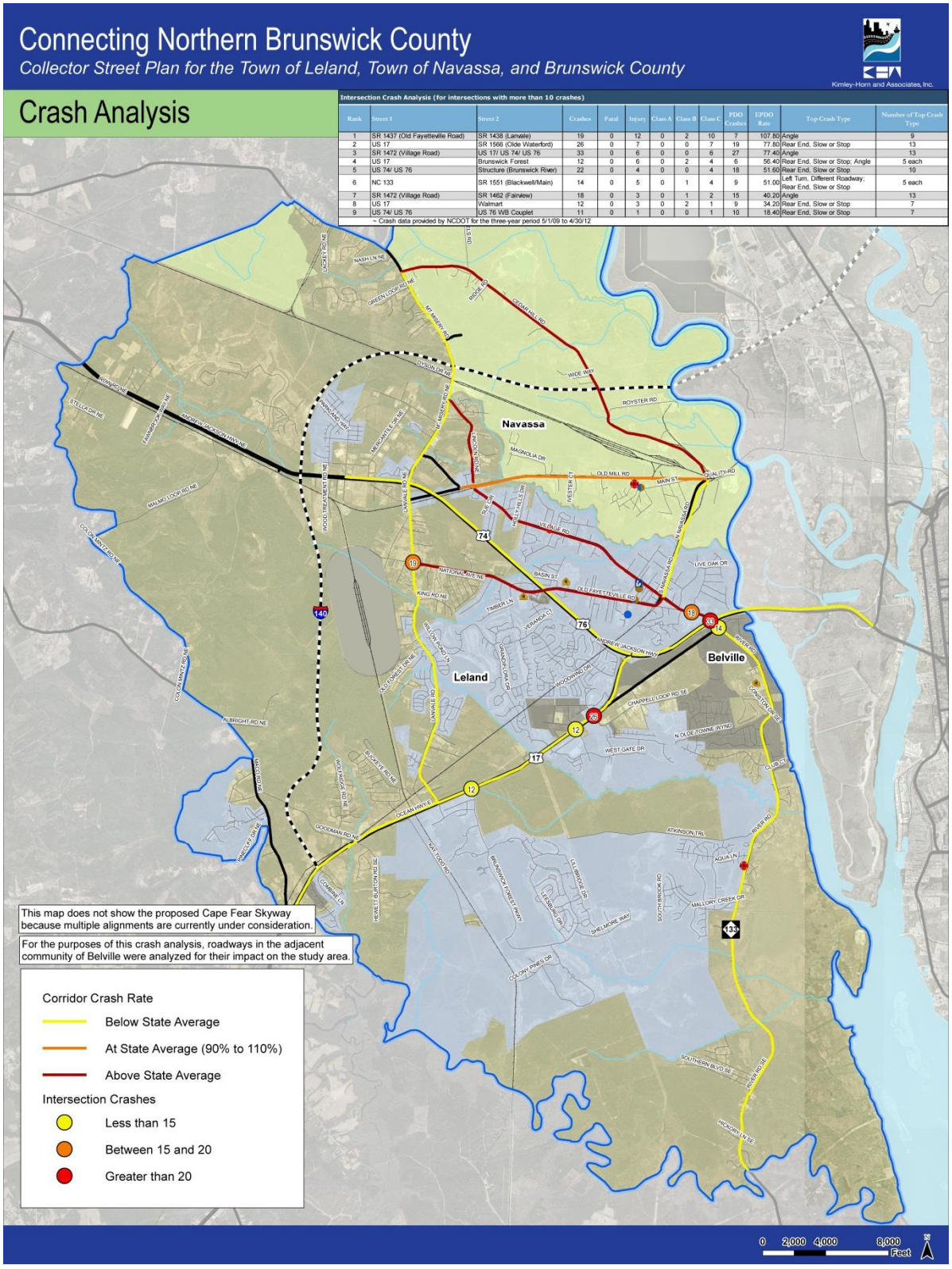


Figure 1.3: Environmental and Social Features

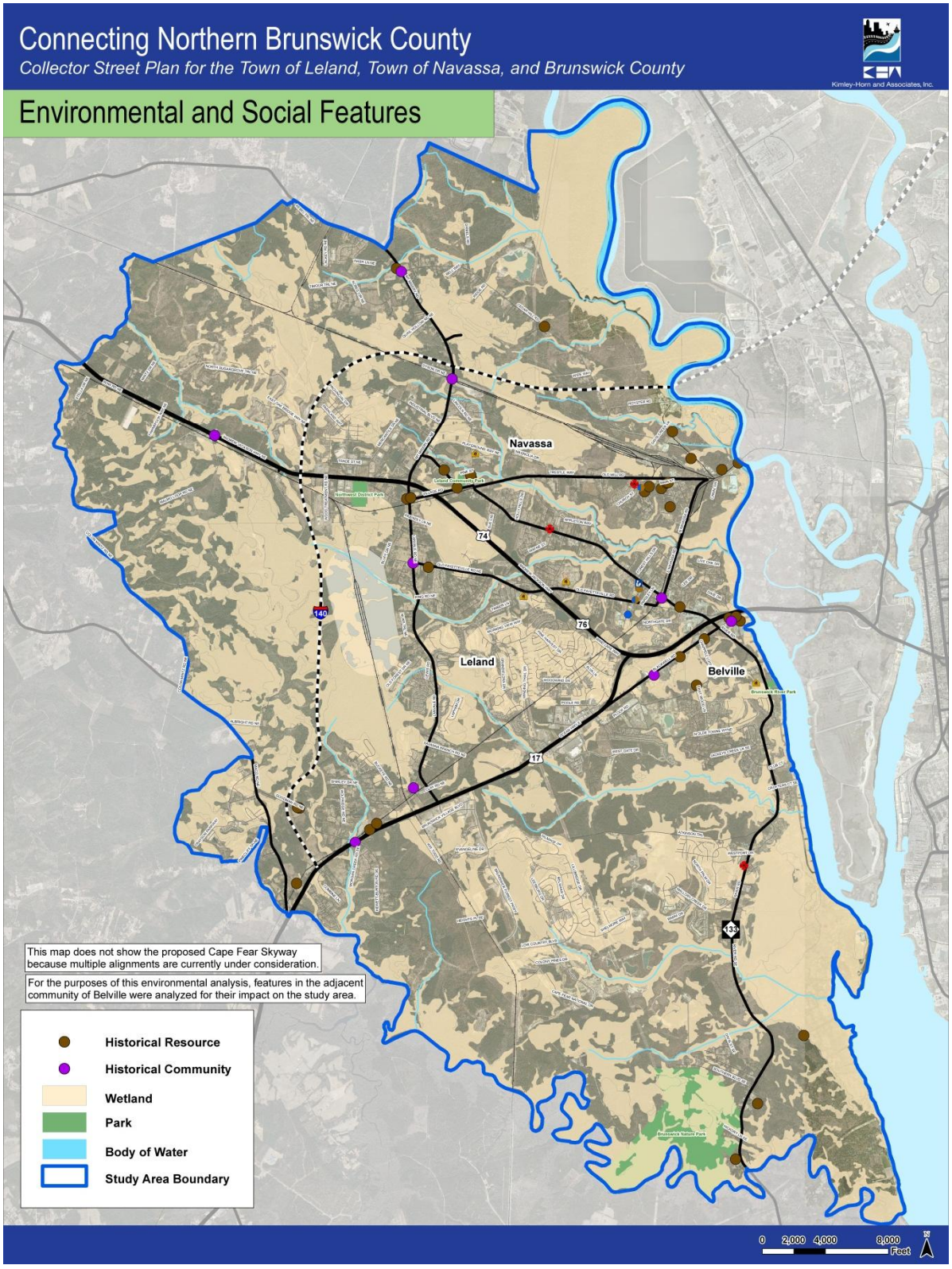


Figure 1.4: Transportation Facilities

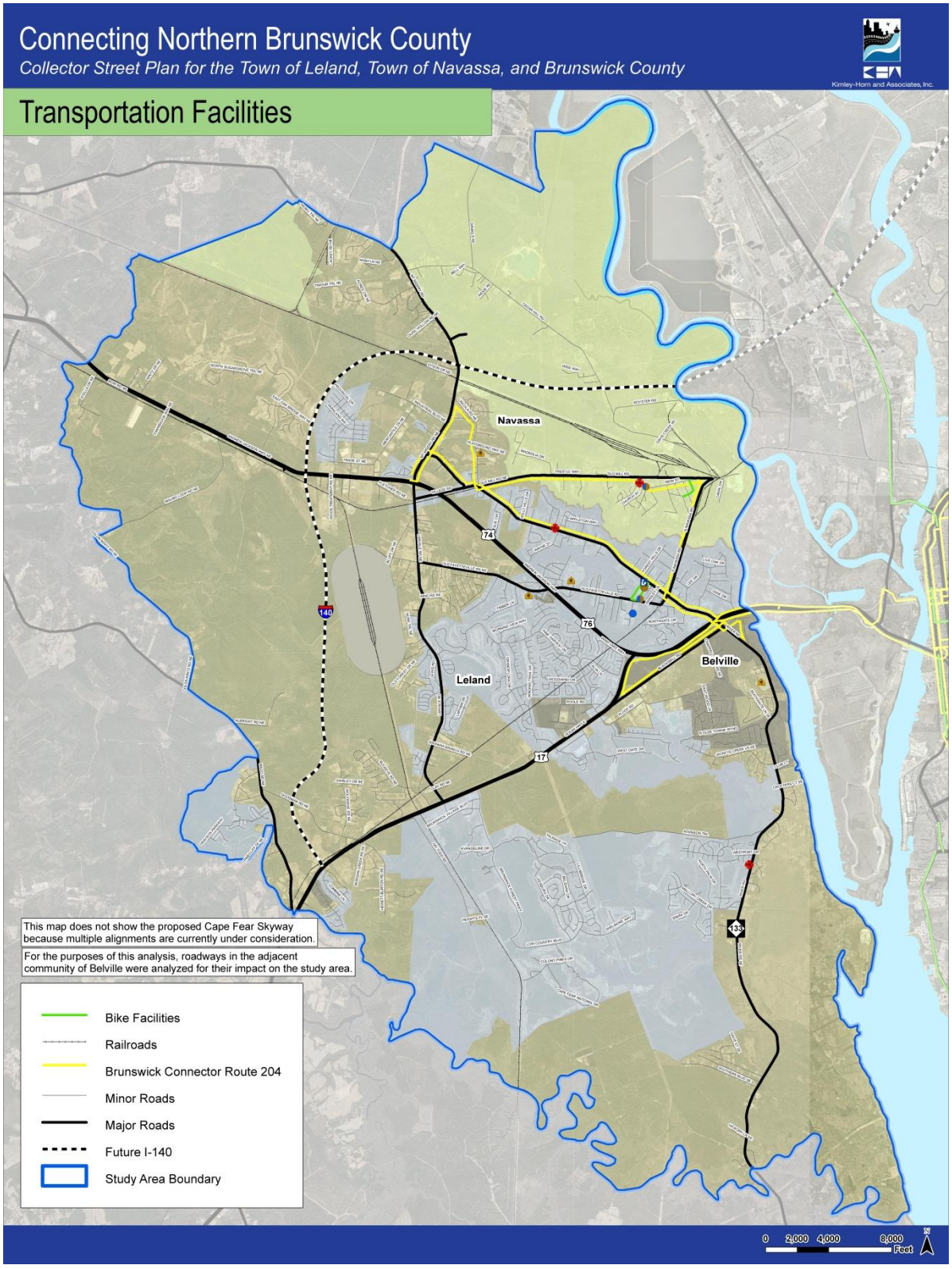


Figure 1.5: Existing Congestion

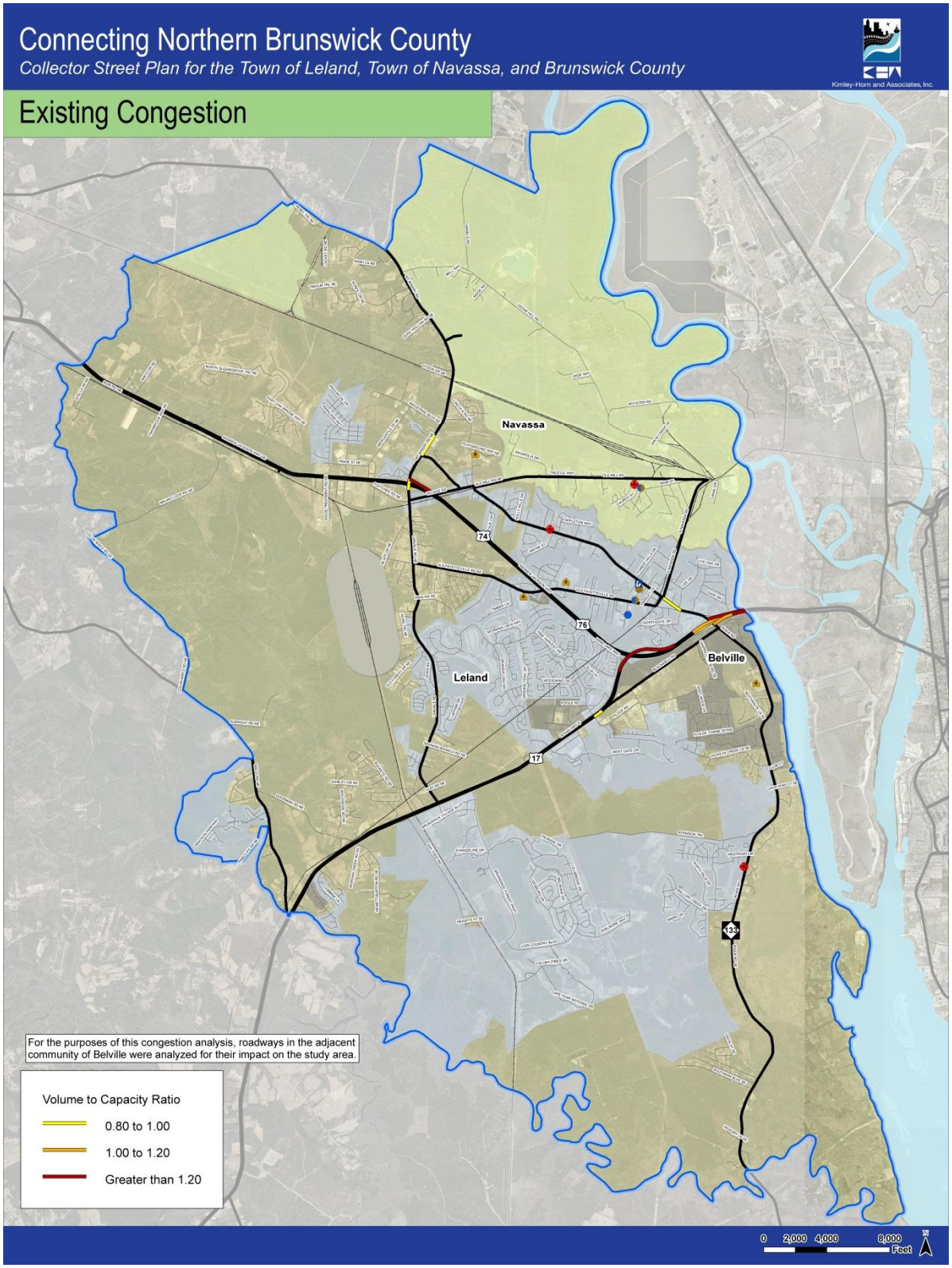
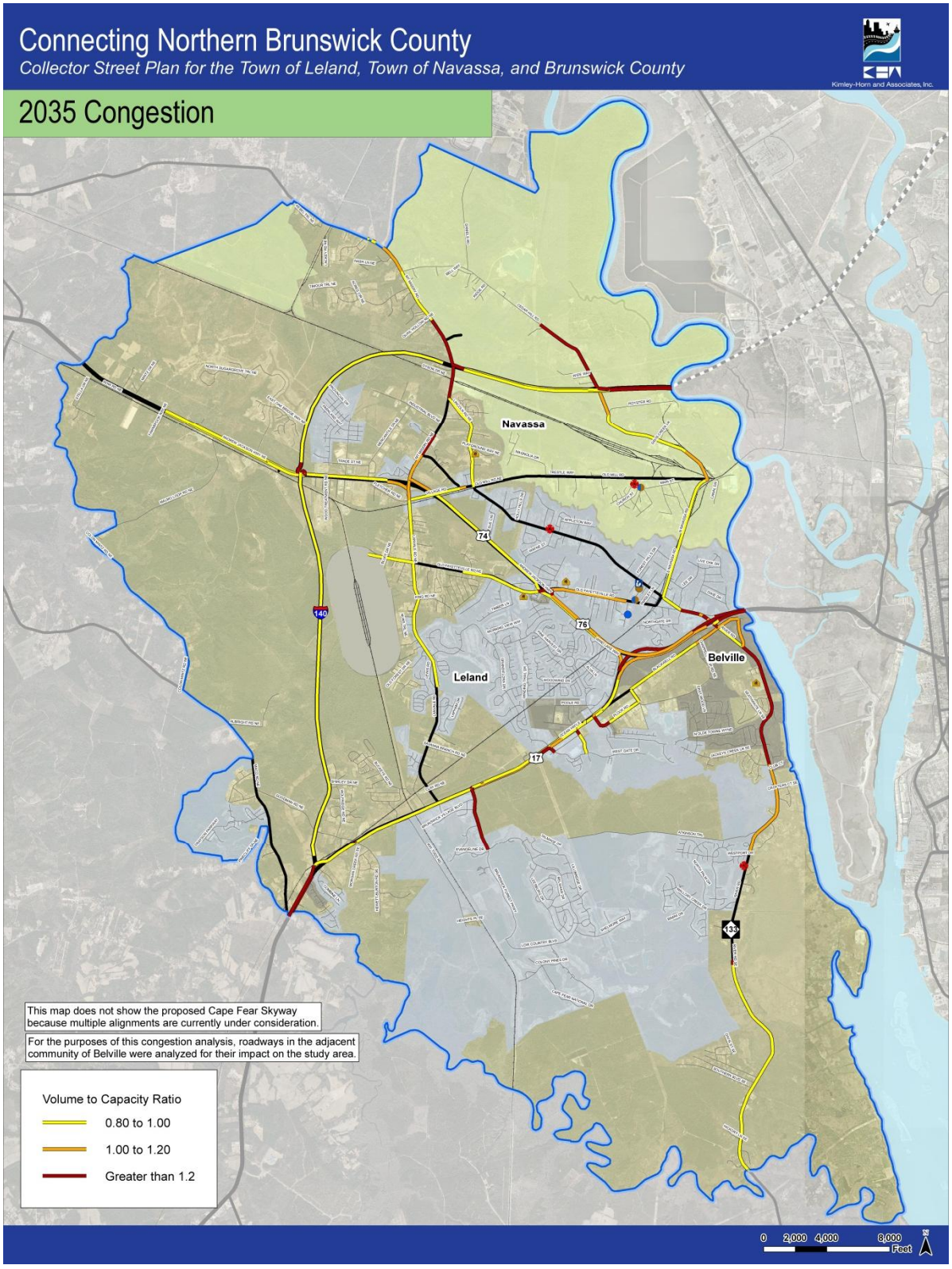


Figure 1.6: 2035 Congestion



Future Land Use Build-Out

Approved Developments Map

The Approved Developments Map (**Figure 1.7**) shows the location of planned and approved developments within the study area. This map shows where collector streets have already been planned and will allow the project team to coordinate recommendations with future land uses.

Collector Street Suitability Map

One of the reasons the Connecting Northern Brunswick County plan was initiated was to come up with a set of reasonable and implementable recommendations for collector streets within the study area. To help address this desire, the project team proposed the development of a Collector Street Suitability Map (**Figure 1.8**). This map was developed to highlight areas where collector streets are most suitable, somewhat suitable, or least suitable. Information obtained during the data gathering phase of the project was used to direct the content of this map. A variety of social and environmental factors, shown to the right in **Table 1.1**, were considered during the development of this map. 100 year floodplains, while noted in this figure, were not deemed to play an active role on the suitability for collector street construction. While this designation may inhibit development, it typically does not affect roadway construction.

Table 1.1: Collector Street Suitability Factors

Factor	Suitability
Civic Features	Least Suitable
Conservation Areas	Least Suitable
Railroad Corridors	Least Suitable
Military Areas	Least Suitable
Riparian Buffers	Least Suitable
Water Features	Least Suitable
Parcels from 0-2 acres	Least Suitable
Parcels from 2-5 acres	Somewhat Suitable
Wetlands	Somewhat Suitable
Parcels > 5 acres	Most Suitable

Figure 1.7: Approved Developments

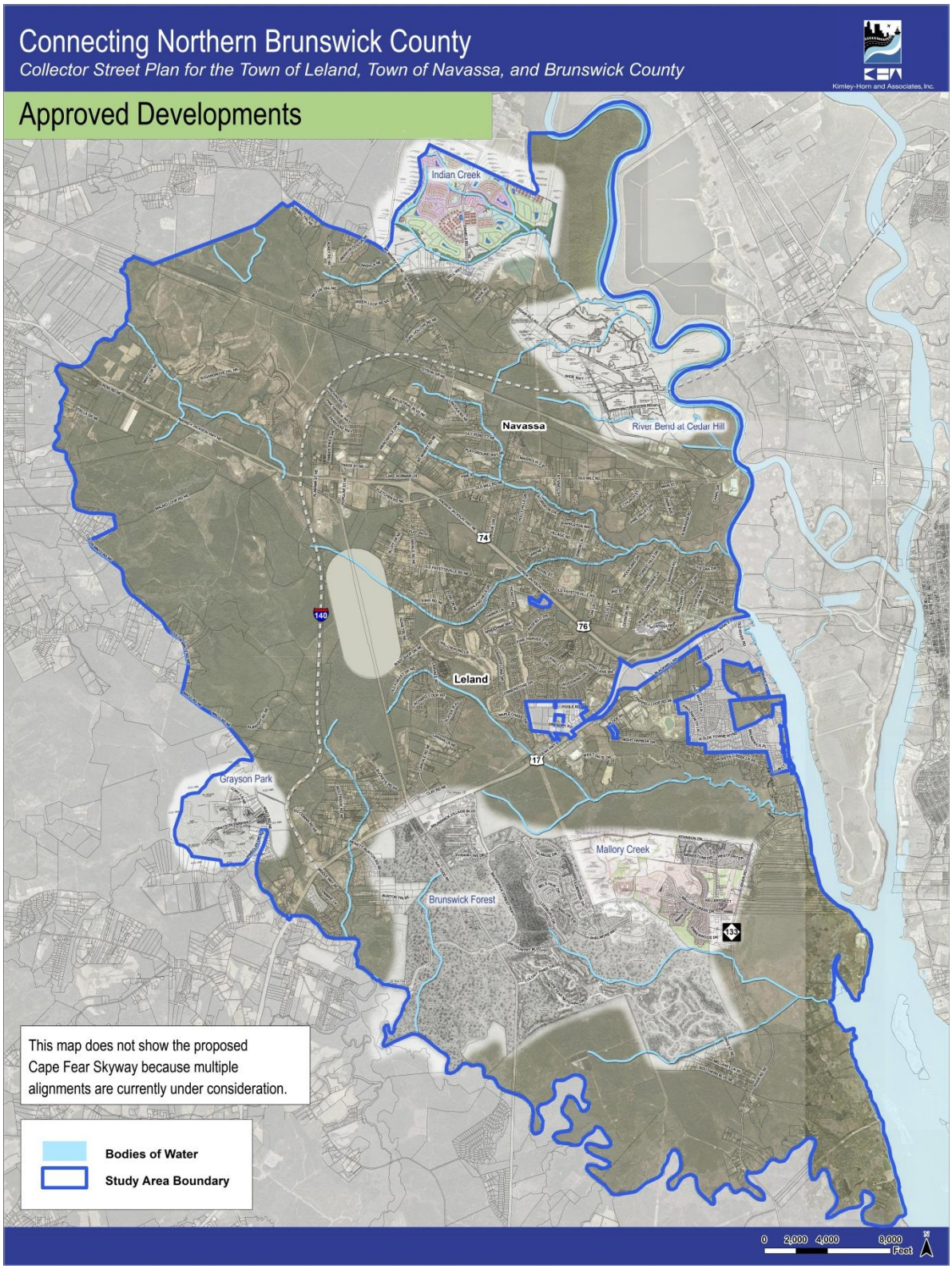
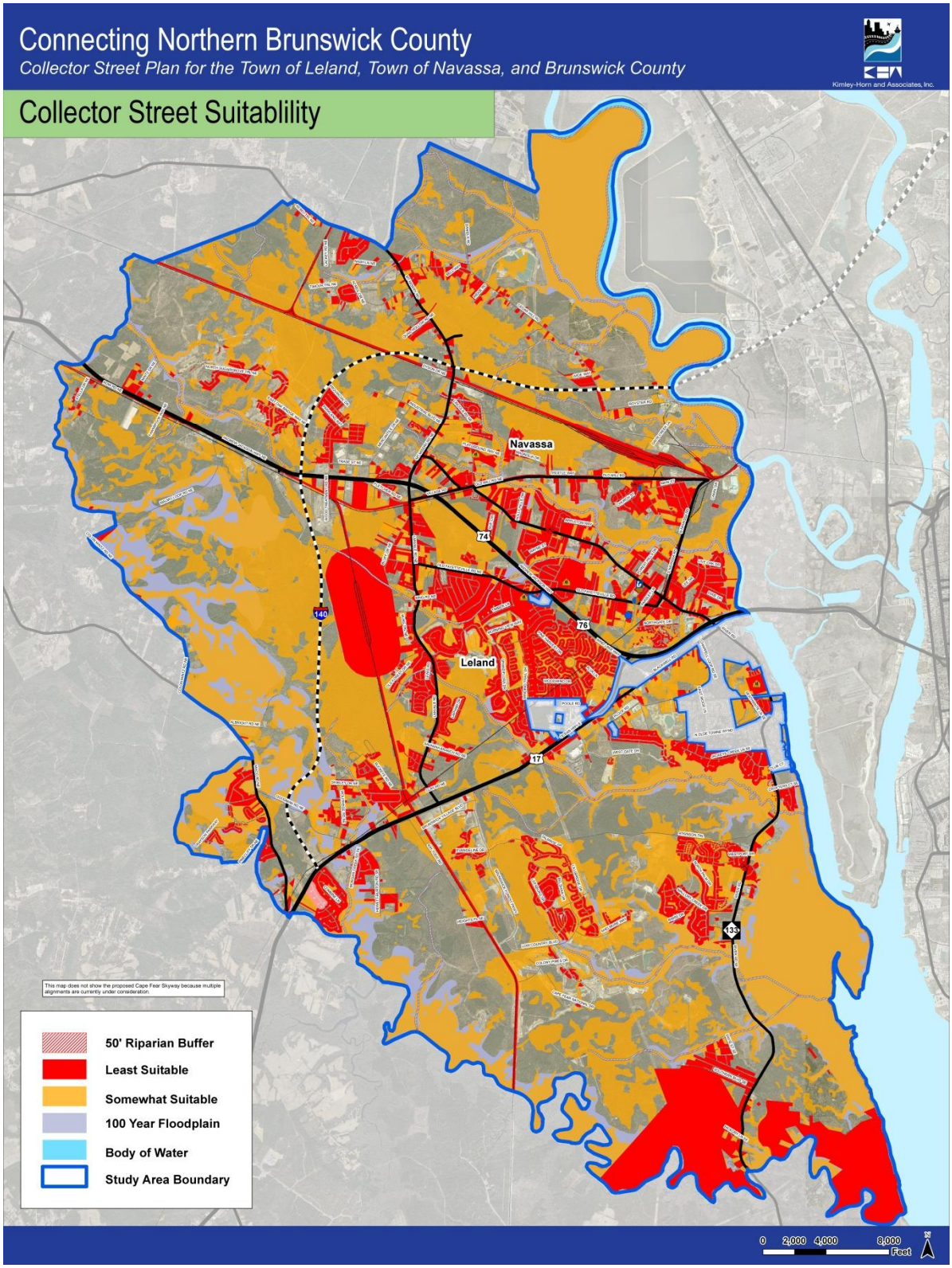


Figure 1.8: Collector Street Suitability



Steering Committee Work Sessions

Steering committee work sessions were held throughout the project. The first of these sessions served as the project kickoff. At this meeting the project team was introduced and an overview of the planning process, roles, and responsibilities was provided. Additionally, a mapping exercise to identify needs and issues was conducted.

Subsequent work sessions involved reviewing existing conditions within the study area and establishing vision and goals for the project. The steering committee also discussed logistics for outreach events, including the public questionnaire, stakeholder interviews, Public Workshop One, and council presentations.

The steering committee helped refine the collector street suitability map, discussed traffic calming measures, reviewed policy recommendations and helped confirm the collector street recommendations developed by the project team. Because the Town of Belville was originally included in the plan study area, staff from the Town were members of the steering committee.

Community Outreach

Project Questionnaire

A questionnaire distributed to members of the Steering Committee and the general public provided the project team with valuable information on a variety of transportation and land use topics and helped gauge the community's perception of the area's transportation network. The questionnaire included general questions as well as questions specific to collector streets. While the questionnaire was not intended to be a scientifically valid survey, the receipt of close to 250 responses proved helpful in assessing the transportation system and compiling recommendations. These responses also included residents of the Town of Belville due to their initial inclusion in the project study area.

Several items from the questionnaire are worth noting:

- 53% of the respondents have lived in the study area for more than 6 years
- 62% of respondents believe transportation has worsened while only 13% believe it has improved
- 56% of respondents rated the availability of alternate routes as poor
- 78% of respondents believe that relieving congestion on arterials should be considered when proposing new collector streets.
- 70% of respondents believe traffic calming is an important design feature for typical collector streets

Stakeholder Interviews

In an effort to reach as many stakeholders as possible, the stakeholder interviews were structured around focus group discussions. The project team facilitated three focus group discussions before and during Public Workshop One on September 17, 2012. Potential focus group participants were identified by the project Steering Committee, with the intention to gather feedback from elected and staff officials, emergency services, the development community, homeowner associations, and advocacy groups. The focus groups allowed people within the study area with commonalities to discuss their thoughts and questions about the project one on one with the project team members. Each focus group had the ability to view the existing conditions mapping and to make recommendations on another map.

Interactive Public Workshops

Interactive public workshops were held on Monday, September 17, 2012 and Thursday, March 14, 2013 at the Leland Town Hall.

At the first public workshop, members of the general public were invited to view the existing conditions mapping, fill out the project questionnaire, and offer suggestions for locations of new collector streets. Members of the public provided the project team with valuable local knowledge. Comments from the public included:

- Mobility across US 17 is a problem.
- There is a need to connect Brunswick Forest and Mallory Creek.
- Improving connectivity along and to NC 133 is a priority.
- Pedestrian connectivity needs to be improved.

At the second public workshop, the project team presented the purpose of the plan and collector streets in general. The presentation also included a description of the planning process. Participants viewed recommendations and provided feedback on implementation. Comments were received on the specific alignments and connections.

Knowledge from both workshops helped ensure that the recommendations are grounded in reality. Incorporating the public feedback also began to build consensus between the various constituents of the study area.

Appendix B – Community Outreach summarizes the public outreach efforts as a part of this plan. This includes more detail on questionnaire results and feedback from the Steering Committee meetings and Public Workshops.

Chapter 2
Facility Recommendations

Purpose: Chapter 2

This chapter details the facility recommendations developed through the planning process for *Connecting Northern Brunswick County*. Recommendations in this chapter represent the primary objective of this plan, which will be used to guide federal, state, and local investments in the study area's transportation infrastructure. The chapter is organized into the following sections:

- Project Categories
- Recommendations
- Next Steps

Improvement Types

A range of improvement types were developed to offer each community flexibility in responding to development constraints and changing circumstances. Proposed new collector streets were categorized into two tiers: Category A and Category B.

Category A

Category A projects are significant connections between existing developments or existing to future development. In this category, the roadway alignment is important, so more detail on each facility's attributes is being provided. **Table 2.1** provides the evaluation criteria for the Category A projects. Each of the Category A projects are included in this table. The projects are then evaluated on their ability to satisfy the following criteria: provision of alternative routes, safety, bicycle/pedestrian, transit, evacuation/security, emergency services, environmental impacts, and activity centers. The quantity of criteria addressed does not necessary correlate to a project's value. Rather, these criteria serve as a high-level purpose and needs assessment for each project that can be used as a starting point when seeking funds to implement the project.

Category B

Category B projects are important to facilitate the appropriate development of an area. For these projects, emphasis is focused on the connection rather than the specific alignment. This allows for flexibility in potential development plans.

Potential Facility Upgrades

In addition to new collector streets, potential facility upgrades were also identified. These facilities represent existing roadways that future collector streets will connect to. However, these facilities are currently inadequate to handle the additional demand of a collector street connection. In order for the proposed collector street to function effectively, the potential facility upgrades should be considered.

Bicycle and Pedestrian Improvements

Several recommendations were made pertaining to bicycle and pedestrian improvements. These recommendations were primarily focused on intersection level improvements to improve connectivity across US 17. An additional proposed improvement is the construction of a bicycle and pedestrian connection from the commercial and residential developments along US 17 to Brunswick Nature Park. It is the intent of these recommendations to complement the recommended collector street connections, resulting in an effective network for all modes.

Recommendation Methodology

Figure 2.1 shows the proposed facility recommendations. These recommendations were developed through a comprehensive planning process that included various factors:

- Consideration of approved developments
- Development of a Collector Street Suitability Map (**Chapter 1**)
- Public input
- Steering Committee review and comment

This approach has been characterized as a practical approach to collector street planning. It is grounded in the reality that there are environmental constraints and market realities. The key to this approach is establishing a shared vision amongst the local jurisdictions and being targeted with the identification of recommended connector street projects. Furthermore, the two-category approach allows for an expression of detailed needs where the constraints are greatest (Category A) while offering flexibility of alignment that is responsive to future development through the Category B projects.

Table 2.1 – Category A Evaluation Criteria

	Mallory Creek to Brunswick Forest Connection	Night Harbor Drive Extension to Jackeys Creek Lane	Wide Way Extension to Mt. Misery Road	Magnolia Drive Extension to Mt. Misery Road	Lindenwood Drive Extension
Provision of Alternative Routes[1]	X	X	X	X	X
Safety[2]	X	X	X	X	-
Bicycle/ Pedestrian[3]	-	-	-	-	-
Transit[4]	-	-	-	X	-
Evacuation/ Security[5]	X	X	-	X	X
Emergency Services[6]	X	X	-	-	X
Environmental Impacts[7]	Low	Low	Low	Low	Low
Activity Centers[8]	X	X	-	-	-

1 - Connecting neighborhoods and/ or developments; reducing traffic on congested roadways

2 - Ability to avoid high crash corridors or intersections

3 - Priority connections identified in LRTP

4 - Provides connection to a transit route

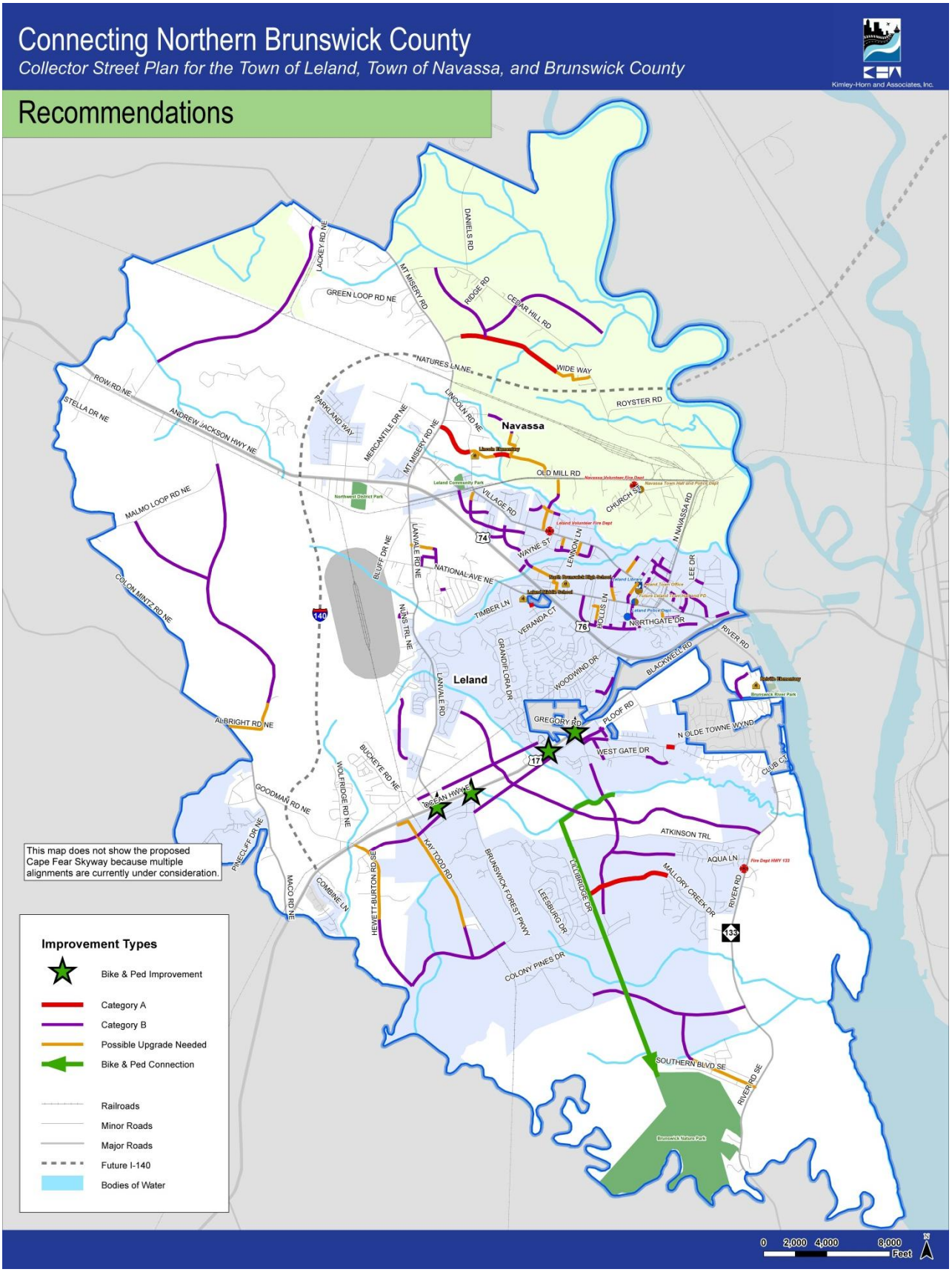
5 - Addresses flood-prone areas; provides additional route for evacuation

6 - Reduction in travel time for Fire, EMS, or Police

7 - Based on the Collector Street Suitability Map (high, medium, low) - See ***Chapter 1***

8 - Connection to commercial uses over 30,000 SF, civic uses, or recreational

Figure 2.1: Recommendations



Next Steps

Implementing the Strategic Connector Projects (Category A) and other recommendations described in **Chapter 2** is the most important step to achieving the vision of *Connecting Northern Brunswick County*—to create choice and foster connectivity through a recommended collector street network based on an inclusive and data-driven planning process. The next steps are simple but important. Local jurisdictions can use **Figure 2.1** to guide investments and streamline coordination with federal, state, and regional agencies. In addition, the supporting measures in **Chapter 3** work in conjunction with regional initiatives being led by the MPO and NCDOT. Implementation of the recommendations in this plan will give existing and future residents a transportation system that offers safe choices and enhanced mobility.

Chapter 3
Policies and Practices

Purpose: Chapter 3

This chapter details the policies and practices that can be considered and promoted as a part of the overall connectivity strategy for the study area. The result of this effort was a set of recommended performance measures that could be locally adapted and integrated into existing development procedures. This approach allows for a customized approach to local participation in a regional vision for connectivity. The chapter is organized into the following sections:

- Existing Standards
- Target Measures
- Conclusion

Existing Standards

Prior to the development of policy recommendations, the project Steering Committee reviewed a summary of existing practices that influence connectivity in the area. This largely consisted of a review of the existing development ordinances and subdivision design requirements. There was a wide spectrum of requirements representing both diversity of approaches (methods) and performance standards (requirements). Specifically, the following ordinances were reviewed: Brunswick County Unified Development Ordinance (UDO); Leland Subdivision Ordinance; Navassa Subdivision Ordinance & Zoning Code. The topic areas below were identified for specific focus within each community's ordinance:

Review of Existing Standards:

- Block Length – the permitted length of a given block
- Required Ratio – use of standards related to intersections and links as a means of promoting connectivity
- External Road Connections – requirements for number and placement of connections to existing roads
- Connections to Adjoining Property – requirements for the number of connections to adjoining properties
- Administrative Authority – staff level authority to require at their discretion waivers and/or required connections
- Private Streets – the allowance or prohibition of private rather than public streets for new subdivisions
- Gated Connections – the allowance or prohibition of new gated communities
- Sidewalk Requirements – requirements to incrementally construct new sidewalks along roadways
- Bike Lane Requirements – requirements associated with the inclusion of bike lanes on new streets
- Connections to Pedestrian Attractions – requirements associated with providing enhanced connectivity to pedestrian attractions such as schools, parks, and shopping.

Table 3.1 ***Existing Standards*** conveys how each of the study area jurisdictions approaches the implementation of connectivity. It also reveals a disconnect between the jurisdictions, most notably on the methods used as well as requirements related to the number and placement of required street connections and connections to adjoining property. If the vision for improved connectivity is to become a reality, a coordinated approach to local standards is needed. The remainder of this chapter is devoted to the identification of a common set of performance standards that have been developed in collaboration with the project steering committee.

Table 3.1 - Existing Standards

Topic Areas	Brunswick County UDO	Leland Subdivision Ordinance	Navassa Subdivision Ordinance & Zoning Code
Reference Locations	Section 8.9 Streets	Sec 22-144 - Subdivision Design	Subdivision Ordinance
Date of Update	2012 - monthly	2007	March 2009
Block Length Requirements	n/a	400'-1,800'	400'-800'
Required Ratio	1.3*	none	none
External Road Connections	Requirement based on number of units**	No	Required to connect to adjoining stub streets~
Connections to Adjoining Property	Rural Zoning: at least 1 per every 2,800' on any side; All other Zoning, 1 per every 1,400 on any side	Only when required by Planning Board	Required: unspecified number
Administrative Authority for Adjacent Connection	Yes (Planning Director)	No	Yes (Section 4.3.6)
Private Streets Allowed	Yes	No	Yes
Gated Connections Permitted	Yes	No	No
Sidewalk Requirements	Public Streets***	May be required by Planning Board	Yes (both sides In Major Subdivisions)
Bike Lane Requirements	Public Streets for Collectors and Arterials***	No	No (but greenways count towards open space calculation)
Connections to Pedestrian Attractions	n/a	Encourages "walkways" to attractions	n/a
Other Noteworthy Requirements	n/a	Discourage through traffic on residential local and collector streets	Explicitly requires conformance with official plans

*Allows 75 degree angles to be considered nodes; considers external connections "links"; in rural low density settings the minimum connection is 1.15; divided entrances can be considered separate "links"
** 90 or fewer requires at least one external connection; 91-120, 2 or more; greater than 120 requires 3 or more; hardship exemptions for wetlands, streams or other barriers
*** Requirements for sidewalks and bike lanes on public streets; however, according to county planners, the majority of new subdivisions are constructed with PRIVATE streets with no requirements
^ Construction of a connection may be required; ROW dedication with no construction may be considered where lots don't front the connection
~ Section 4.3.6 (B)

Target Measures

At the outset of this plan, previous planning efforts were reviewed to understand their recommendations and success following adoption. Discussions with the Steering Committee revealed that previous implementation efforts have sometimes been hampered by inconsistent policy measures across jurisdictional boundaries. The Connecting Northern Brunswick County plan brought together all the area jurisdictions, perhaps for the first time in this capacity. As a result, this plan endeavors to establish a set of goals for enhancing certain performance measures in the study area. The information that follows is not a requirement, but rather a non-prescriptive approach that can be implemented or adapted as appropriate by member jurisdictions.

The performance measures summarized on the following pages are the culmination of collaboration between local jurisdictions to establish a basis for updating ordinances and guidance documents that promotes implementation of an agreed upon vision for improved connectivity in the study area. These measures focus on five agreed upon elements: external road connections, connections to adjoining property, provisions for gated communities, street design, and traffic calming.

Tables 3.2 through **3.6** show the suggested performance measures for these five elements. Each table contains a description, purpose and intent, target performance measure, sample language/recommendation, comments, and notes. These categories are described below:

- Description – introduces and clarifies the topic being addressed
- Purpose and Intent – describes why addressing this topic is important to the collector street planning process
- Target Performance Measure – crystallizes the intent of the topic into a suggested policy measure that can be carried forward into the ordinances of member jurisdictions
- Sample Language/Recommendation – provides language that can be integrated into the existing ordinances for member jurisdictions. It is assumed that language may need minor modifications in order to be appropriate for a specific jurisdiction.
- Comments – explains the background behind formulating this measure, and how certain aspects of the measure advance best practices for collector street planning in the study area
- Notes – states additional caveats or reference details as needed

In its desire to seek connectivity each member jurisdiction should consider ways to create partnerships with the developmental community for transportation improvements in circumstances where the nature of the developer-constructed facilities are atypical in size, scope or complexity or are required to serve more than one project, or projects being constructed by other developers.

Significant time, effort, and collaboration were spent developing these measures in such a way as to serve as a guide for all member jurisdictions of the *Connecting Northern Brunswick County Collector Street Plan*. Updating the regulatory framework as appropriate for each member jurisdiction will help minimize confusion for future developers and will better serve to produce a cohesive collector street system. It is the recommendation of this plan that member jurisdictions strongly consider updating their ordinances to include these measures, or similar measures most appropriate for their areas, in the near future.

Table 3.2 – External Road Connections

Description	Refers to the method of vehicular access to proposed subdivisions from existing street network.
Purpose and Intent	Requiring multiple points of access to the EXISTING street network ensures a distribution of site trips across the transportation network and helps to manage traffic operations and safety. It also offers non-motorized trips a diversity of options to better align with trip destinations.
Target Performance Measure	At least (1) connection up to 90 dwelling units; Greater than 90 dwelling units a minimum of 2 connections.
Sample Language / Recommendation	Any proposed development with up to ninety (90) residential units shall be required to provide (a) a minimum of one (1) connection to the existing public network and (b) a minimum of one (1) connection (or stub-out if adjacent property has not been developed) to adjacent properties OR an additional connection to the public network. When the Planning Director/Planning Board deems a vehicular connection is impractical due to environmental constraints as indicated on the approved Collector Street Suitability Map, they may remove the requirement for an additional connection described in (b) and/or require non-motorized connections in lieu of the vehicular connection. Furthermore, any new development or additions to existing developments such that the total number of dwelling units exceeds ninety (90) shall be required to provide for vehicular access to at least two (2) public streets. *Efforts should be made to connect to existing street stubs and street rights-of-way where feasible unless hardships as defined by local government are identified and confirmed. When the Planning Director/Planning Board deems a vehicular connection is impractical due to environmental constraints as indicated on the approved Collector Street Suitability Map (**Chapter 1**), they may remove the requirement for an additional connection described in (b) and/or require non-motorized connections in lieu of the vehicular connection.*
Comments	This measure is loosely based on the Brunswick County requirements but falls shy of offering a third tier of requirements for 120 or more dwelling units. This will reinforce the value of the future connections required to adjoining properties. It also avoids the unintended frequency of street access points along existing collectors and arterials, thereby reducing the number of conflict points along busier streets. Furthermore, it is the intent of this measure to eliminate the potential of minor subdivision cul-de-sac developments that have no potential for future connectivity aside from the existing public street for which they take access. This language is also intended to allow for some hardship provisions that eliminate or modify the requirement if there are constructability constraints. Furthermore, it is the intent that this requirement promotes connections to existing streets and rights-of-way.
Notes	The information contained within this table is not a requirement, but rather a non-prescriptive approach that can be implemented or adapted as appropriate by member jurisdictions. This information is not intended to apply to existing development, but rather is intended for use solely in the consideration of new development.

Table 3.3 – Connecting with Adjoining Property

Description	Refers to requirements to provide street stub connections to adjoining undeveloped property and to connect with existing street stubs.
Purpose and Intent	Requiring connections to adjoining property allows for the orderly and efficient development of an integrated transportation system. It ensures future access to land locked parcels and offers residents transportation choices, improved traffic circulation, and enhanced accessibility to community features and attractions. The resulting connections between neighborhoods improves access for emergency responders, improves community connectivity, and enhances mobility for non-motorized trips and recreation.
Target Performance Measure	Provide a minimum of one (1) street stub-connection for every 500 linear feet of property on any side of a development parcel.
Sample Language / Recommendation	Roadway interconnections will be provided between the development site and its adjacent properties with one roadway interconnection every five hundred (500) linear feet for each direction (north, south, east, west) in which the development property abuts. If the common property boundary in any direction is less than 500 linear feet, the subject property will be required to provide an interconnection if it is determined by the Planning Director/Board that the interconnection in that direction can best be accomplished through the subject property. When the Planning Director/Planning Board deems a vehicular connection is impractical due to environmental constraints as indicated on the approved Collector Street Suitability Map, they may increase the length requirement and/or require non-motorized connections in lieu of the vehicular connection. The Planning Director/Planning Board may delay the interconnection if such interconnection requires state approval. *Efforts should be made to connect to existing street stubs and street rights-of-way where feasible unless hardships as defined by local government are identified and confirmed. When the Planning Director/Planning Board deems a vehicular connection is impractical due to environmental constraints as indicated on the approved Collector Street Suitability Map (**Chapter 1**), they may remove the requirement for an additional connection and/or require non-motorized connections in lieu of the vehicular connection.*
Comments	The local towns do not currently have this type of requirement; however, the insertion of this type of requirement fits within the framework of their current codes. The proposed requirement is greater than the Brunswick County UDO in that it doesn't make exceptions for Rural Zoning (which is currently one (1) connection per every 2,800 feet). The hardship provision that allows for administrative relief is something that may be considered optional but in response to the need for state permits does offer flexibility on the sequence of events that won't hinder initial phases of development. This performance measure falls within the range of a cross-section of communities across North Carolina. This language is also intended to allow for some hardship provisions that eliminate or modify the requirement if there are constructability constraints. Furthermore, it is the intent that this requirement would promote connections to existing streets and rights-of-way.
Notes	The information contained within this table is not a requirement, but rather a non-prescriptive approach that can be implemented or adapted as appropriate by member jurisdictions. This information is not intended to apply to existing development, but rather is intended for use solely in the consideration of new development. This requirement may not be necessary in places where a successful connectivity index requirement exists.

Table 3.4 – Gated Communities

Description	Communities constructed with gated entrances that prohibit access and circulation to non-residents.
Purpose and Intent	To ensure that gated neighborhoods do not result in fragmented transportation networks or limit community mobility.
Target Performance Measure	Support interconnectivity for emergency management, evacuation purposes, and bicycle & pedestrian connectivity.
Sample Language / Recommendation	Where gated developments have frontage on two public roadways they are required to make two unique connections to the public network (connections to two unique facilities). Gated communities shall be required to provide for bicycle and pedestrian connectivity along the public frontage.
Comments	Gated entrances should be prohibited in incorporated areas. Their use in unincorporated areas should be strongly discouraged/prohibited in locations adjacent to or within proximity of existing urbanized locations. Their use in more remote or isolated locations is not thought to significantly impact community mobility; however, their use in proximity to urbanized areas can have the net effect of reducing mobility by interrupting a coordinated strategy of interconnected streets.
Notes	The information contained within this table is not a requirement, but rather a non-prescriptive approach that can be implemented or adapted as appropriate by member jurisdictions. This information is not intended to apply to existing development, but rather is intended for use solely in the consideration of new development. Under no circumstances shall collector streets identified on the adopted collector street plan be interrupted by subdivision gates in new developments.

Table 3.5 – Multimodal Design Provisions

Description	Refers to the requirement to accommodate pedestrians and bicyclists along neighborhood collector streets and other similar facilities.
Purpose and Intent	An interconnected system of collector streets is intended to enhance transportation mobility which is inclusive of the connection of people with places (regardless of travel mode driving, walking and biking). Therefore, a Complete Streets approach to quality design should be promoted. It is the intent to require consistency with NCDOT design guidelines regarding Complete Streets.
Target Performance Measure	Provide pedestrian accommodations along both sides of all collector and neighborhood collector streets as well as all neighborhood streets that connect to adjoining property and ensure that the streets are designed as bicycle friendly streets.
Sample Language / Recommendation	Sidewalks (or similar walkways) will be required along both sides of all new neighborhood collector streets. This requirement should extend to all roads within a development that have external connection to streets (public or private) as well as adjoining property. The use of bicycle friendly design treatments (wide outside lanes, sharrows, dedicated routes, bike lanes, shared use paths or other similar facilities) is encouraged.
Comments	The inclusion of sidewalks/pedestrian paths on all collector streets should be viewed as a minimum standard. It will ensure that a continuous pedestrian network is created, thereby improving pedestrian safety, mobility and community health. It also will offer enhanced pedestrian accessibility to community attractions and features (parks, schools, shopping, recreation, etc.). Bicycles will be accommodated through bicycle friendly designs which may include wide outside lanes, sharrows, dedicated routes, bike lanes, shared use paths or other similar facilities. Signalized intersections will include provisions for safe pedestrian and bicycle crossing (crosswalks, pedestrian signals, ADA-compliant curb ramps, or other similar facilities). A comprehensive pedestrian and bicycle plan is recommended so that a coordinated approach to design and implementation occurs.
Notes	The information contained within this table is not a requirement, but rather a non-prescriptive approach that can be implemented or adapted as appropriate by member jurisdictions. This information is not intended to apply to existing development, but rather is intended for use solely in the consideration of new development.

Table 3.6 – Traffic Calming

Description	Typically refers to changes in road design intended to manage speed and reduce inappropriate through trips.
Purpose and Intent	Respond to concerns of excessive speed and cut-through traffic along neighborhood streets.
Target Performance Measure	Design collector streets so that travel speeds are appropriate for their context (25mph-30mph) within neighborhoods.
Sample Language / Recommendation	Collector Streets will be designed in a manner that promotes community connectivity while simultaneously promoting appropriate travel speeds within neighborhoods. NCDOT Complete Streets design standards should be applied for collector streets with the expressed intent of promoting community mobility. Furthermore, the use of approved traffic calming devices should be permitted along existing collector streets. Future collector streets should include a combination of design elements (i.e. active and passive traffic calming techniques) to ensure that new streets don't encourage excessive speeds.
Comments	It is important to note that most of the current codes include language suggesting that the design of neighborhood streets should discourage excessive speeding and cut-through traffic. In the absence of a connectivity requirement many developers will suggest that the best way to respond to this performance requirement is to limit or eliminate external connections (effectively severing external trips). This response is in conflict with the intent of an interconnected transportation system. Therefore, a combination of connectivity requirements and design/performance measures is important to successfully create a system of interconnected streets. When desired travel speeds are reinforced through active and passive traffic calming measures and supported by regulatory measures, inappropriate cut-through traffic is often limited.
Notes	The information contained within this table is not a requirement, but rather a non-prescriptive approach that can be implemented or adapted as appropriate by member jurisdictions. This information is not intended to apply to existing development, but rather is intended for use solely in the consideration of new development. A copy of recommended best practices is included in *Appendix A – Traffic Calming* of this report.

Conclusion

The performance measures presented in **Chapter 3** allow for a coordinated strategy for the implementation of connector streets incrementally as development occurs. Furthermore, they establish a performance-based approach with an emphasis on the outcomes rather than the specific language or regulatory method. This allows local communities the ability to integrate the agreed upon measures in a manner consistent with their local regulatory framework.

Chapter 2 compliments these standards by documenting high priority connector street projects within the study area. The result is a coordinated strategy that includes uniform performance standards and shared vision for strategic projects.

Appendix A – Traffic Calming includes a series of best practices regarding the design and placement of traffic calming devices. This toolbox is offered in response to concerns regarding cut-through traffic and excessive speed on neighborhood streets. While well-designed multi-modal streets should reduce unsafe driver behavior, traffic calming can be an effective tool to ensure appropriate driver behavior on community streets.

Appendix B – Community Outreach summarizes the public outreach efforts as a part of this plan. This includes more detail on questionnaire results and feedback from the Steering Committee meetings and Public Workshops.

Appendix A –

Traffic Calming

Unfortunately, there are instances when even the most well-designed collector streets experience unwanted cut-through traffic and/or have prevailing travel speeds in excess of posted speed limits. The inclusion of traffic calming measures in these areas can help mitigate these types of issues.

Overview

Traffic calming is quickly becoming a common term for addressing a wide range of citizen concerns, including slowing traffic speeds, reducing cut-through traffic, improving the aesthetics of a street, and increasing safety for pedestrians, bicyclists, and vehicles. The Institute of Transportation Engineers and other professional organizations publish 'best practices' for traffic calming. However, individual communities throughout the United States typically develop policies and protocols specific to their local traffic conditions and citizen expectations. Specific policies and protocols generally include definitive warrants and a toolbox of preferred traffic calming solutions to assist local officials with the design and implementation flexibility to best represent the values and vision of the community.

Measures

Common traffic calming measures are grouped into three types of categories: passive, vertical deflection, and horizontal deflection. These general categories are summarized below.

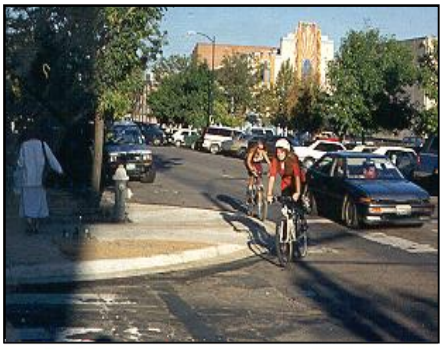
Passive traffic calming measures continuously alter a driver's perception of the travel corridor and include gateway treatments, street trees, sidewalks, bicycle lanes, pavement marking/textures, and signage. Together, these design elements signify to the driver that they have entered into a livable street in which all travel modes are afforded equal access to the travel corridor.

Vertical traffic calming measures represent features that drivers must navigate over to proceed on their desired travel path and may include treatments such as speed humps, speed tables, raised crosswalks, and raised intersections.

Horizontal traffic calming measures represent features that drivers must navigate around to proceed on their desired travel path and, in some cases, may divert drivers to other travel routes altogether. Typical treatments include chokers, bulb-outs, medians, traffic circles, roundabouts, realigned intersections, and chicanes.

***Passive**—Use of contrasting materials to clearly define crosswalks*

***Vertical**—Raised crosswalk using a contrasting paving pattern*



***Horizontal**—Bulb-out at an intersection*

Toolbox

Traffic calming measures described below are commonly found in the traffic calming 'toolboxes' of communities all across the country.

Speed Humps—Speed humps are commonly referred to as the 'sleeping policemen' in the roadway. These vertical devices typically measure between 3 and 4 inches in height at their center and extend the full width of the travel lanes before tapering at the outside lane line to allow unimpeded bicycle travel. Speed humps should not be confused with speed bumps typically found in shopping mall parking lots. Spacing of successive speed humps along a roadway determines the speed at which motorists travel between devices.

Installation of speed humps typically costs between $2,000 and $5,000, depending on materials incorporated into the design.

Speed Table/Raised Pedestrian Crosswalk—A speed table is a very long, broad speed hump that can be either parabolic or trapezoidal in design. Trapezoidal speed tables could accommodate raised pedestrian crosswalks on the flat portion of the device for mid-block crossings when designed to a sufficient width (typically ten feet or greater). These devices are also more appropriate for streets with larger vehicle traffic (e.g. buses and fire trucks).

Installation of a speed table is slightly more expensive than a speed hump with prices ranging between $2,000 and $15,000, depending on materials incorporated into the design.

Intersection Bulb-Out—Bulb-outs extend the sidewalk or curb line out into the parking lane of a street to effectively reduce the street width. These measures greatly improve pedestrian crossings by reducing the pedestrian crossing distance and improving the ability for pedestrians and motorists to see each other. Curb extensions also can also help reduce turning speeds at an intersection and provide additional space for curb ramps and/or level sidewalk landings where space is limited. Bulb-outs are only appropriate where on-street parking exists and curb extensions should never reach into travel lanes, bicycle lanes, or shoulders.

Installation of bulb-outs typically cost between $2,000 and $20,000 per corner; however, cost can greatly increase when drainage improvements and/or utility pole relocation is necessary.

Choker—A choker intentionally extends the curb line along a street into the travel lanes, usually designed with a wide sidewalk or landscape area, to create a 'pinch point' for vehicle movement. Chokers can be created by extending both curbs into the travel lane, or they can be done more dramatically by widening only one side at a mid-block location. They can also be used at intersections to create a gateway effect when entering a street. These devices have a dramatic effect on travel speed by requiring motorists to yield to each other or slow down. This treatment is usually only appropriate for low-volume, low-speed streets.

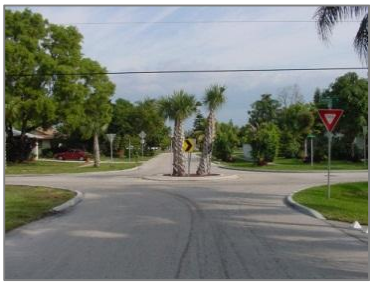
Installation of a choker typically costs between $5,000 and $20,000; although major drainage improvements associated with implementation can significantly raise project costs.

Raised Center Median—Raised center medians are islands along the centerline of a street that narrow the real and perceived travel lane width. Raised medians help achieve speed reduction by creating a horizontal shift and blocking a long view of the road ahead. A raised center median may be enhanced aesthetically and provide neighborhood identity by adding landscaping.

Installation of raised medians varies greatly among desired applications; however, short 'gateway' center medians typically cost between $10,000 and $20,000 depending on length, landscaping, and irrigation considerations.

Neighborhood Traffic Circle—A neighborhood traffic circle is a raised circular island constructed in the center of a local residential street intersection. These devices reduce vehicle speeds by forcing motorists to maneuver around them and are sometimes used instead of stop signs. Neighborhood traffic circles are commonly landscaped (i.e. bushes, flowers, or grass) to enhance aesthetics. Yield signs, not stops signs, should be used with neighborhood traffic circles.

The occasional larger vehicle passing through an intersection with a neighborhood traffic circle (i.e. fire truck or moving van) could be accommodated at the intersection by creating a mountable curb in the outer portion of the circle. Studies show no significant impact on left or right turns for these vehicles; left turns can be made across the front of the circle just as with standard intersections.



Installation of a neighborhood traffic circle typically costs between $15,000 and $20,000, including landscaping.

Raised Intersection—Raised intersections are flat, raised areas covering entire intersections with ramps on all approaches. These intersections may include brick or other textured materials on the flat sections to delineate pedestrian crosswalks. The longer flat fields plus ramps, which may be more gently sloped than speed humps, enable slightly higher design speeds that may be suitable for slowing speeds on higher volume streets. The brick or other textured materials improve the appearance of raised intersections, draw attention to these traffic calming devices, and may further enhance speed reduction.

Installation of a raised intersection typically costs between $50,000 and $150,000 with limited texture paving. This cost significantly increases for signalized intersections.

Chicane—Chicanes are curb extensions on otherwise straight streets that cause travel lanes to bend one way and then back the other way to the original alignment of travel. Chicanes achieve speed reductions by forcing a horizontal shift and blocking long views of the road ahead. Landscaping may be provided in the curbed island created by the chicane to enhance the aesthetics.

Installation of a chicane typically costs between $5,000 and $15,000, including landscaping.

Application

Traffic calming measures are an effective way to monitor the performance of collector streets, and as a result, traffic calming measures should be used in the design of new collector streets. A combination of passive, vertical and/or horizontal measures can be used to best fit the needs of the street, adjacent land uses, and multimodal travel.

Appendix B – Community Outreach

As mentioned in Chapter 1, the *Connecting Northern Brunswick County* Collector Street Plan included a variety of community outreach events designed to gather feedback on existing conditions, the community's vision, facility recommendations, and policy strategies. This appendix places a host of public outreach materials under one cover. These materials include a list of comments received through the public questionnaire and during the public workshops. These comments were evaluated and incorporated into the plan as appropriate.

Because the Town of Belville was originally included in the project study area, various references to the Town remain in the community outreach materials. The input of residents and Town staff members was retained even though no recommendations for the Town of Belville were developed as part of this plan.

Public Questionnaire

- Copy of Questionnaire
- Summary of Responses

Public Workshop #1 – September 17, 2012

- Press Release
- Flyer
- Website card
- Presentation Slides

Public Workshop #2 – March 14, 2013

- Presentation Slides
- Land Use Policy Boards
- List of Comments
- Maps with Comments

Public Questionnaire

The public questionnaire on the following pages is the actual questionnaire that was distributed to solicit feedback for this project. As a result of their inclusion in the original project study area, the Town of Belville is listed in the header of the questionnaire. Input received from residents and staff members of the Town was retained even though no recommendations were developed for the Town of Belville as part of this plan.

- Copy of Questionnaire
- Summary of Responses

CONNECTING NORTHERN BRUNSWICK COUNTY

Collector Street Plan for the Town of Leland, Town of Belville, Town of Navassa, and Brunswick County

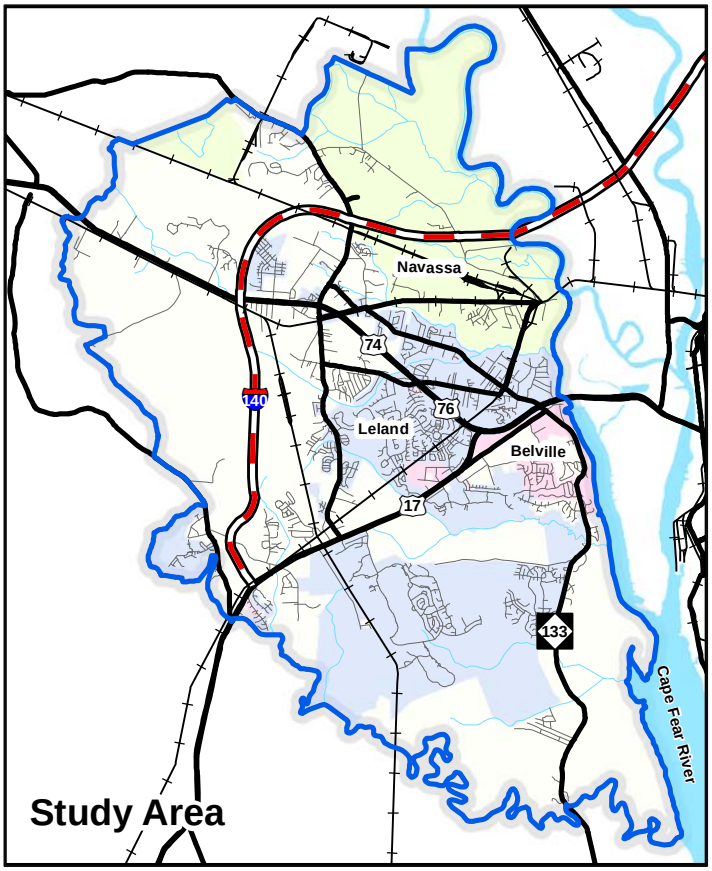
The Wilmington Urban Area Metropolitan Planning Organization has partnered with the Town of Leland, Town of Belville, Town of Navassa, and Brunswick County to study existing and future collector street needs in northern Brunswick County. See the study area map below.

Collector streets:

- are not major roads.
- have lower speeds and carry less traffic than major roads.
- typically have 2 or 3 lanes.
- link residential or local streets to major roads.
- provide a livable alternative to travelling on major roads.
- better suit bicycle and pedestrian traffic.

Collector streets help relieve congestion by providing alternatives for short trips connecting between neighborhoods and commercial areas.

The following 9 questions are intended to assess your travel patterns in the study area. Your input will provide valuable information that will help guide the collector street planning process. Thank you for your response.



1. Which of the following best describes where you live? *(check one)*
   - ☐ Leland
   - ☐ Belville
   - ☐ Navassa
   - ☐ Unincorporated Brunswick County
   - ☐ New Hanover County
   - ☐ Other: _____

2. How long have you lived in the study area? *(check one)*
   - ☐ Less than one year
   - ☐ 1 to 5 years
   - ☐ 6 to 10 years
   - ☐ More than 10 years
   - ☐ I don't live in the study area

3. Over the last five years, has transportation improved, stayed the same, or worsened? *(check one)*
   - ☐ Improved
   - ☐ Stayed the same
   - ☐ Worsened

4. Overall, how do you rate the following in the study area?

	Excellent	Good	Fair	Poor
Traffic flow	☐	☐	☐	☐
Attractiveness of roads	☐	☐	☐	☐
Availability of alternate routes (to grocery store or other local destination)	☐	☐	☐	☐
Traffic safety	☐	☐	☐	☐
Sidewalks	☐	☐	☐	☐
Crosswalks	☐	☐	☐	☐
On-street bicycle facilities	☐	☐	☐	☐
Greenways/multi-use paths	☐	☐	☐	☐
Intersections	☐	☐	☐	☐

5. What factors should be considered when proposing new collector streets? *(check all that apply)*

- ☐ Connecting to existing development/ neighborhoods
- ☐ Avoiding existing development/neighborhoods
- ☐ Avoiding natural resources
- ☐ Shortening travel times
- ☐ Providing efficient emergency vehicle response
- ☐ Connecting to activity centers
- ☐ Expanding bicycle and pedestrian network
- ☐ Relieving congestion on arterials

6. How important are the following design features for typical collector streets?

	Top Priority	Somewhat Important	Not Important
Plant trees along streets	☐	☐	☐
Preserve neighborhood character	☐	☐	☐
Traffic calming	☐	☐	☐
On-street parking	☐	☐	☐
Sidewalks	☐	☐	☐
Crosswalks	☐	☐	☐
Bike lanes or wide outside lanes	☐	☐	☐
Greenways or off-street paths	☐	☐	☐
Pedestrian-level lighting	☐	☐	☐

7. How far from home are the typical activities you participate in for the following categories:

	0 to 2 miles	3 to 5 miles	6 to 10 miles	Within study area	Outside study area	Not Applicable
Work/School	☐	☐	☐	☐	☐	☐
Shopping	☐	☐	☐	☐	☐	☐
Dining	☐	☐	☐	☐	☐	☐
Medical/Dental	☐	☐	☐	☐	☐	☐
Library/Civic	☐	☐	☐	☐	☐	☐
Recreation	☐	☐	☐	☐	☐	☐
Grocery Store	☐	☐	☐	☐	☐	☐

8. When traveling to the following, what types of transportation *do you currently use:*

	Personal Vehicle	Bicycle	Walk	Transit	Not Applicable
Work/School	☐	☐	☐	☐	☐
Shopping	☐	☐	☐	☐	☐
Dining	☐	☐	☐	☐	☐
Medical/Dental	☐	☐	☐	☐	☐
Library/Civic	☐	☐	☐	☐	☐
Recreation	☐	☐	☐	☐	☐
Grocery Store	☐	☐	☐	☐	☐

9. When traveling to the following, what types of transportation *would you prefer to use if available:*

	Personal Vehicle	Bicycle	Walk	Transit	Not Applicable
Work/School	☐	☐	☐	☐	☐
Shopping	☐	☐	☐	☐	☐
Dining	☐	☐	☐	☐	☐
Medical/Dental	☐	☐	☐	☐	☐
Library/Civic	☐	☐	☐	☐	☐
Recreation	☐	☐	☐	☐	☐
Grocery Store	☐	☐	☐	☐	☐

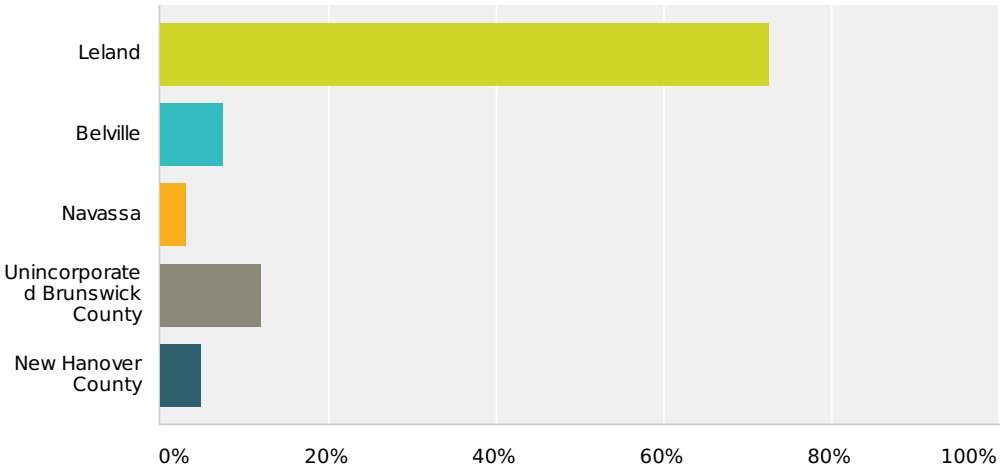
Please use the space below to provide additional comments.

To be informed about the Collector Street Plan, please provide your email or mailing address.

_____

Q1 Which of the following best describes where you live? (check one)

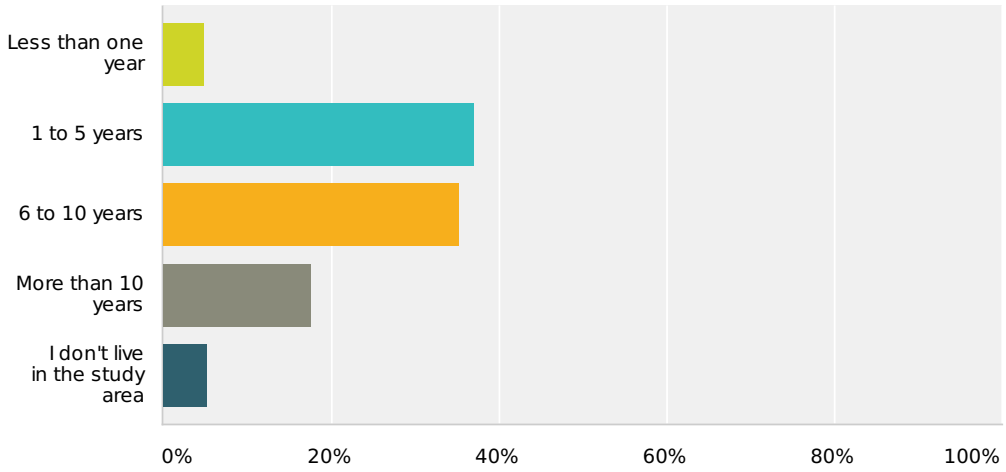
Answered: 267 Skipped: 4



Answer Choices	Responses	
Leland	**72.66%**	194
Belville	**7.49%**	20
Navassa	**3.00%**	8
Unincorporated Brunswick County	**11.99%**	32
New Hanover County	**4.87%**	13
Total		267
Other (please specify) (40)		

Q2 How long have you lived in the study area? (check one)

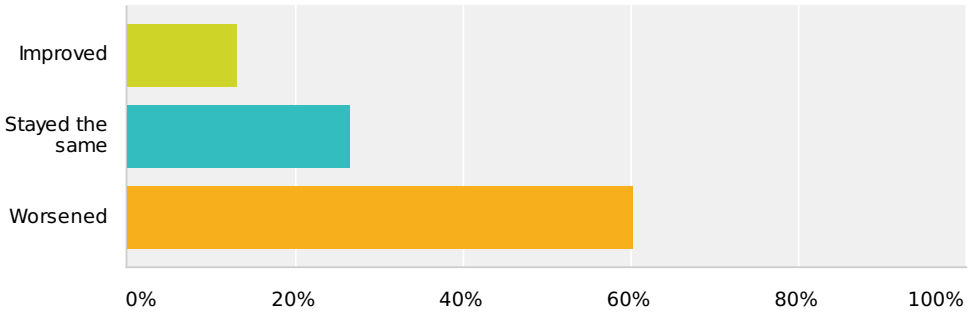
Answered: 267 Skipped: 4



Answer Choices	Responses	
Less than one year	**4.87%**	13
1 to 5 years	**37.08%**	99
6 to 10 years	**35.21%**	94
More than 10 years	**17.60%**	47
I don't live in the study area	**5.24%**	14
Total		267

Q3 Over the last five years, has the transportation improved, stayed the same, or worsened? (check one)

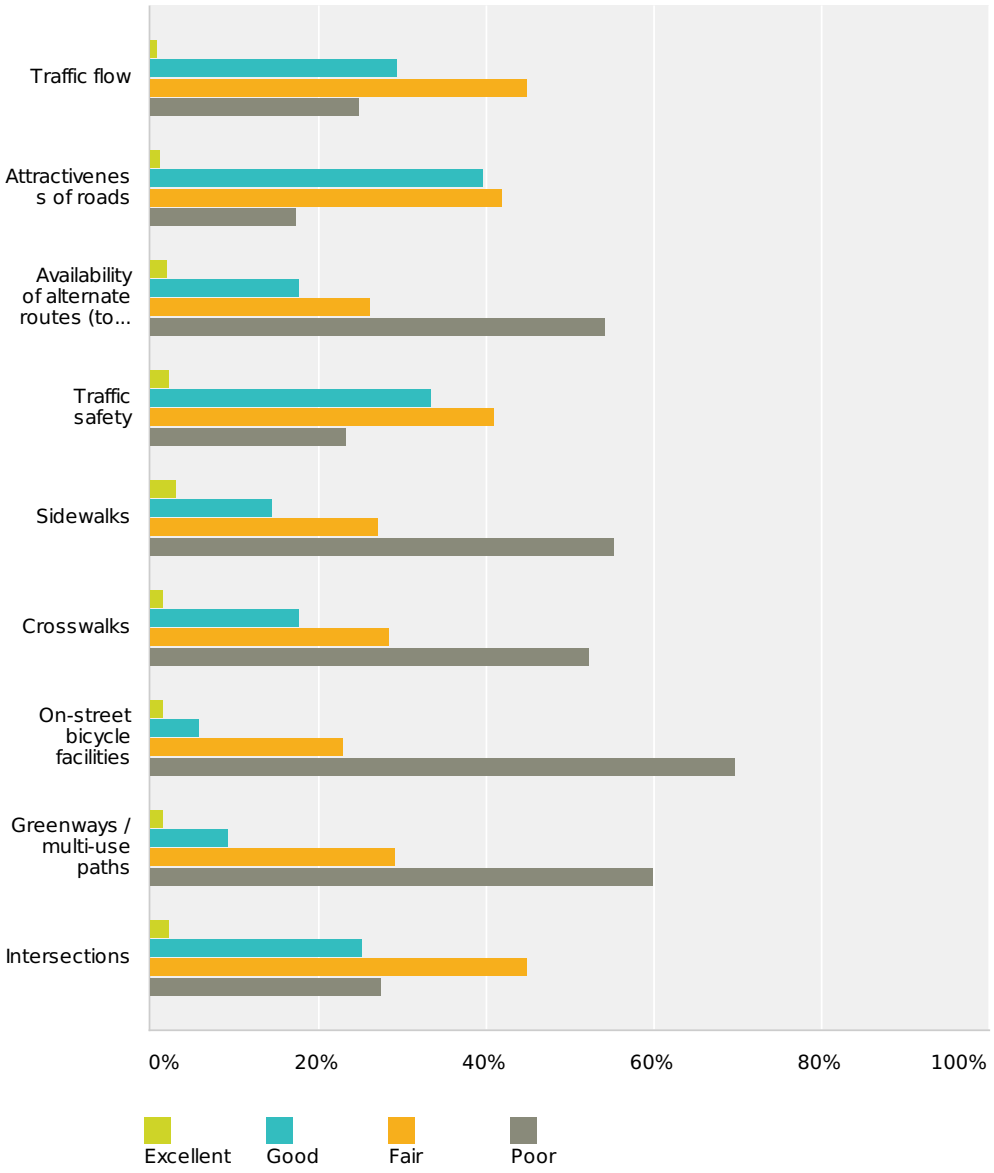
Answered: 267 Skipped: 4



Answer Choices	Responses	
Improved	**13.11%**	35
Stayed the same	**26.59%**	71
Worsened	**60.30%**	161
Total		267

Q4 Overall, how do you rate the following in the study area?

Answered: 266 Skipped: 5

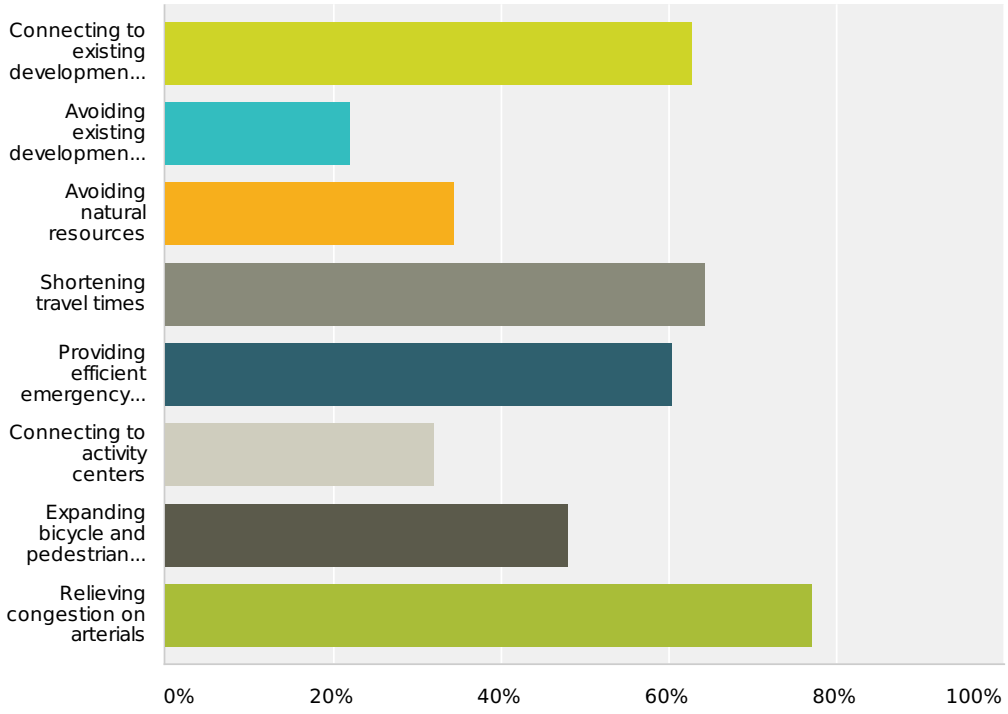


	Excellent	Good	Fair	Poor	Total
Traffic flow	**0.75%** 2	**29.43%** 78	**44.91%** 119	**24.91%** 66	265
Attractiveness of roads	**1.13%** 3	**39.62%** 105	**41.89%** 111	**17.36%** 46	265
Availability of alternate routes (to grocery store or other local destination)	**1.92%** 5	**17.69%** 46	**26.15%** 68	**54.23%** 141	260
Traffic safety	**2.26%** 6	**33.46%** 89	**40.98%** 109	**23.31%** 62	266
Sidewalks	**3.05%** 8	**14.50%** 38	**27.10%** 71	**55.34%** 145	262

Crosswalks	**1.54%** 4	**17.69%** 46	**28.46%** 74	**52.31%** 136	260
On-street bicycle facilities	**1.53%** 4	**5.75%** 15	**22.99%** 60	**69.73%** 182	261
Greenways / multi-use paths	**1.54%** 4	**9.23%** 24	**29.23%** 76	**60%** 156	260
Intersections	**2.26%** 6	**25.28%** 67	**44.91%** 119	**27.55%** 73	265

Q5 What factors should be considered when proposing new collector streets? (check all that apply)

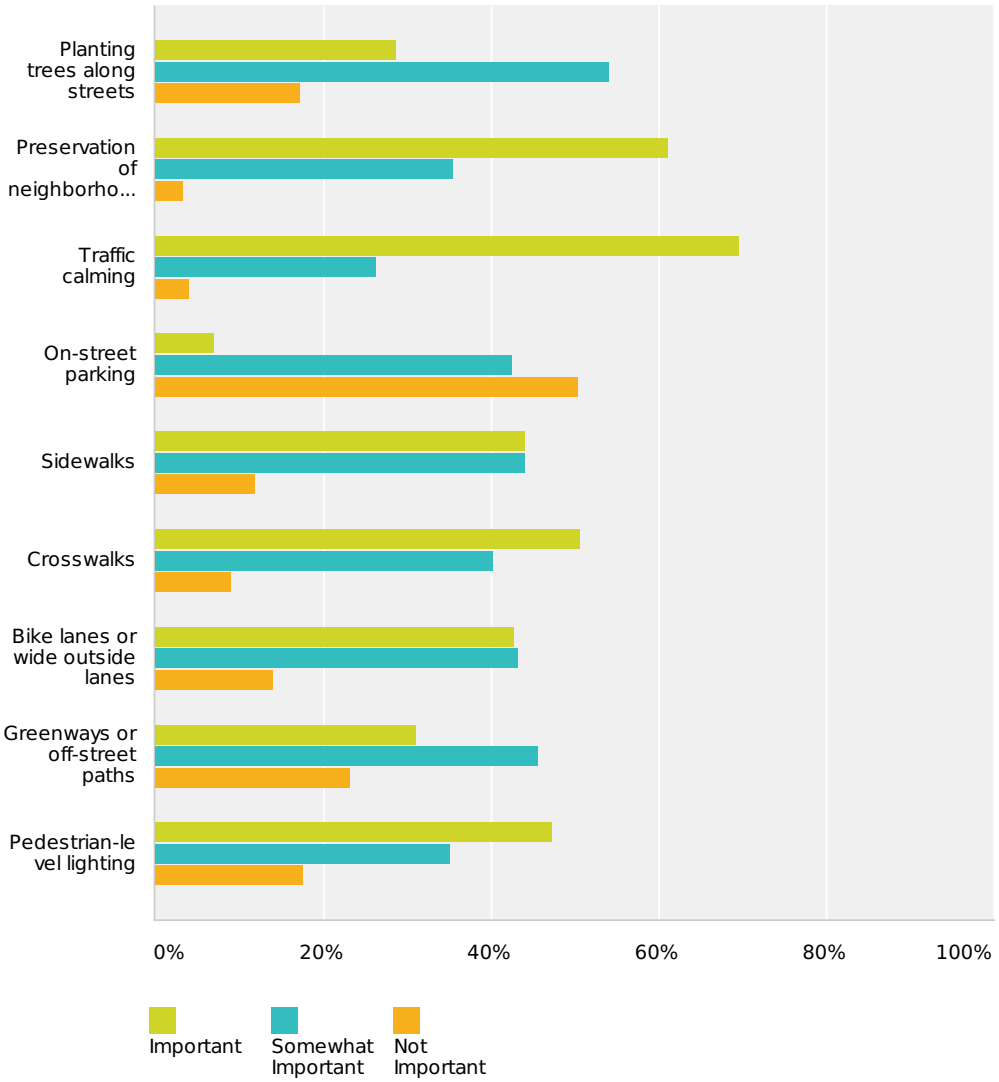
Answered: 250 Skipped: 21



Answer Choices	Responses	
Connecting to existing development / neighborhoods	**62.80%**	157
Avoiding existing development / neighborhoods	**22%**	55
Avoiding natural resources	**34.40%**	86
Shortening travel times	**64.40%**	161
Providing efficient emergency vehicle response	**60.40%**	151
Connecting to activity centers	**32%**	80
Expanding bicycle and pedestrian network	**48%**	120
Relieving congestion on arterials	**77.20%**	193
Total Respondents: 250		

Q6 How important are the following design features for typical collector streets?

Answered: 250 Skipped: 21

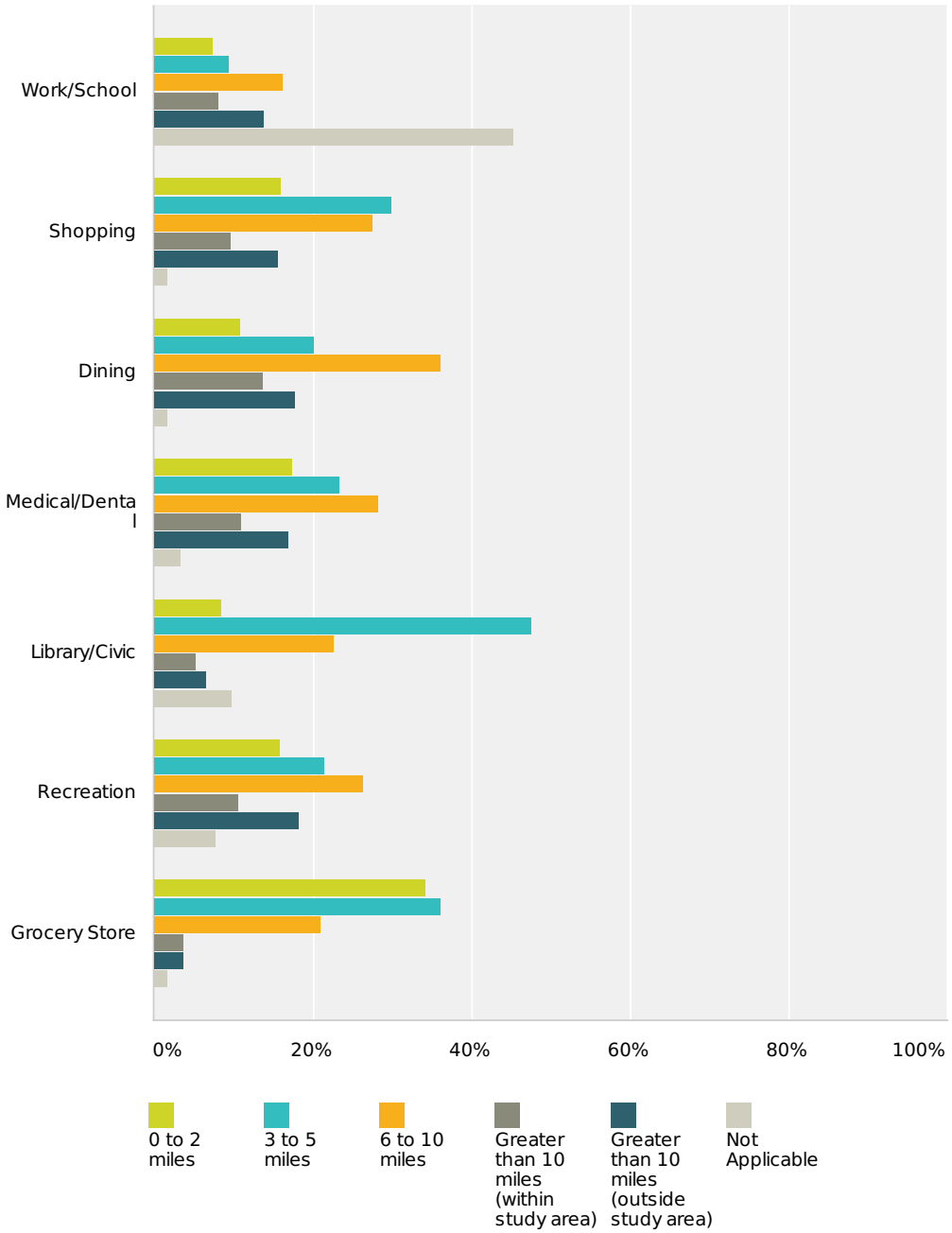


	Important	Somewhat Important	Not Important	Total
Planting trees along streets	**28.69%** 70	**54.10%** 132	**17.21%** 42	244
Preservation of neighborhood character	**61.16%** 148	**35.54%** 86	**3.31%** 8	242
Traffic calming	**69.64%** 172	**26.32%** 65	**4.05%** 10	247
On-street parking	**7.02%** 17	**42.56%** 103	**50.41%** 122	242
Sidewalks	**44.08%** 108	**44.08%** 108	**11.84%** 29	245
Crosswalks	**50.62%** 123	**40.33%** 98	**9.05%** 22	243

Bike lanes or wide outside lanes	**42.80%** 104	**43.21%** 105	**13.99%** 34	243
Greenways or off-street paths	**31.12%** 75	**45.64%** 110	**23.24%** 56	241
Pedestrian-level lighting	**47.28%** 113	**35.15%** 84	**17.57%** 42	239

Q7 How far from home are the typical activities you participate in for the following categories:

Answered: 251 Skipped: 20

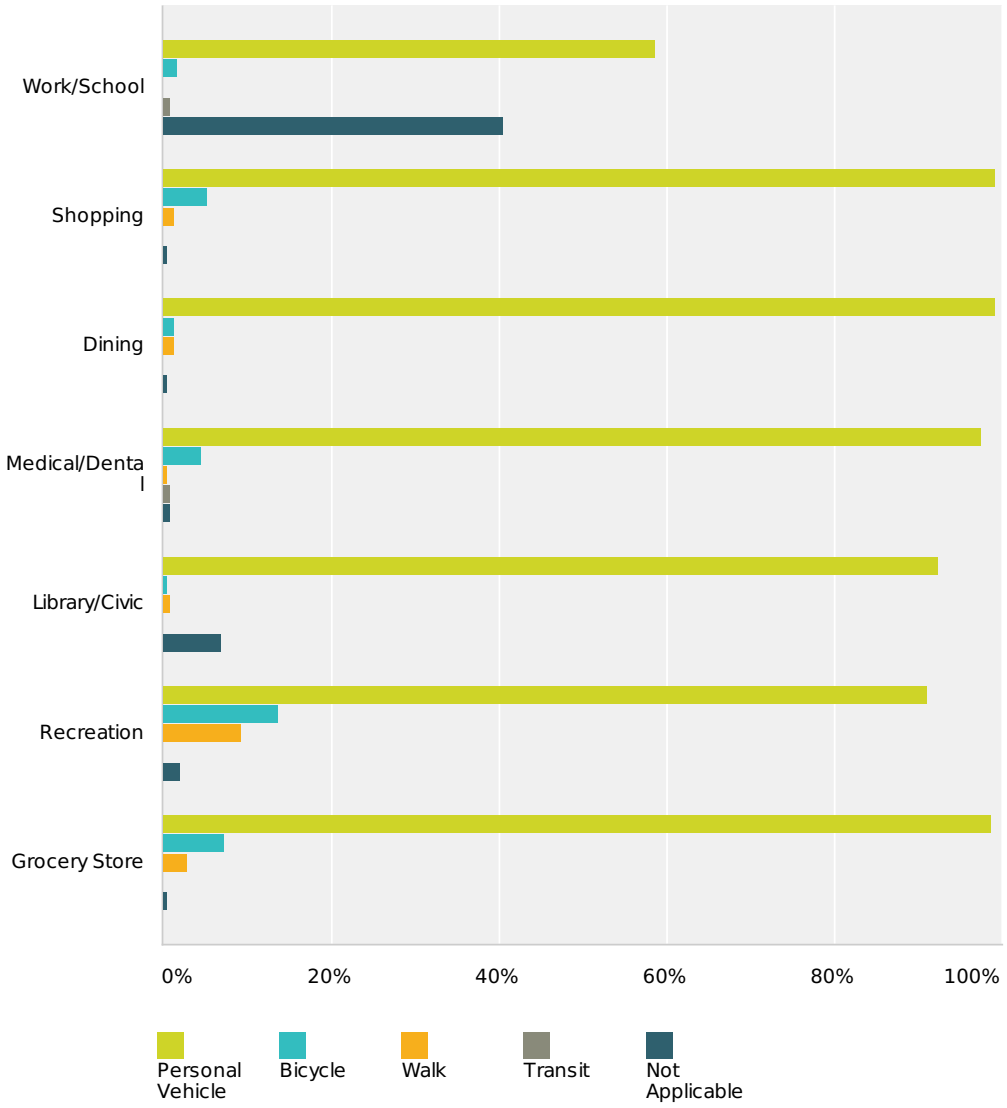


	0 to 2 miles	3 to 5 miles	6 to 10 miles	Greater than 10 miles (within study area)	Greater than 10 miles (outside study area)	Not Applicable	Total
Work/School	**7.29%** 18	**9.31%** 23	**16.19%** 40	**8.10%** 20	**13.77%** 34	**45.34%** 112	247
Shopping	**15.94%** 40	**29.88%** 75	**27.49%** 69	**9.56%** 24	**15.54%** 39	**1.59%** 4	251

Dining	**10.84%** 27	**20.08%** 50	**36.14%** 90	**13.65%** 34	**17.67%** 44	**1.61%** 4	249
Medical/Dental	**17.34%** 43	**23.39%** 58	**28.23%** 70	**10.89%** 27	**16.94%** 42	**3.23%** 8	248
Library/Civic	**8.47%** 21	**47.58%** 118	**22.58%** 56	**5.24%** 13	**6.45%** 16	**9.68%** 24	248
Recreation	**15.79%** 39	**21.46%** 53	**26.32%** 65	**10.53%** 26	**18.22%** 45	**7.69%** 19	247
Grocery Store	**34.14%** 85	**36.14%** 90	**20.88%** 52	**3.61%** 9	**3.61%** 9	**1.61%** 4	249

Q8 When traveling to the following, what types of transportation do you currently use? (check all that apply)

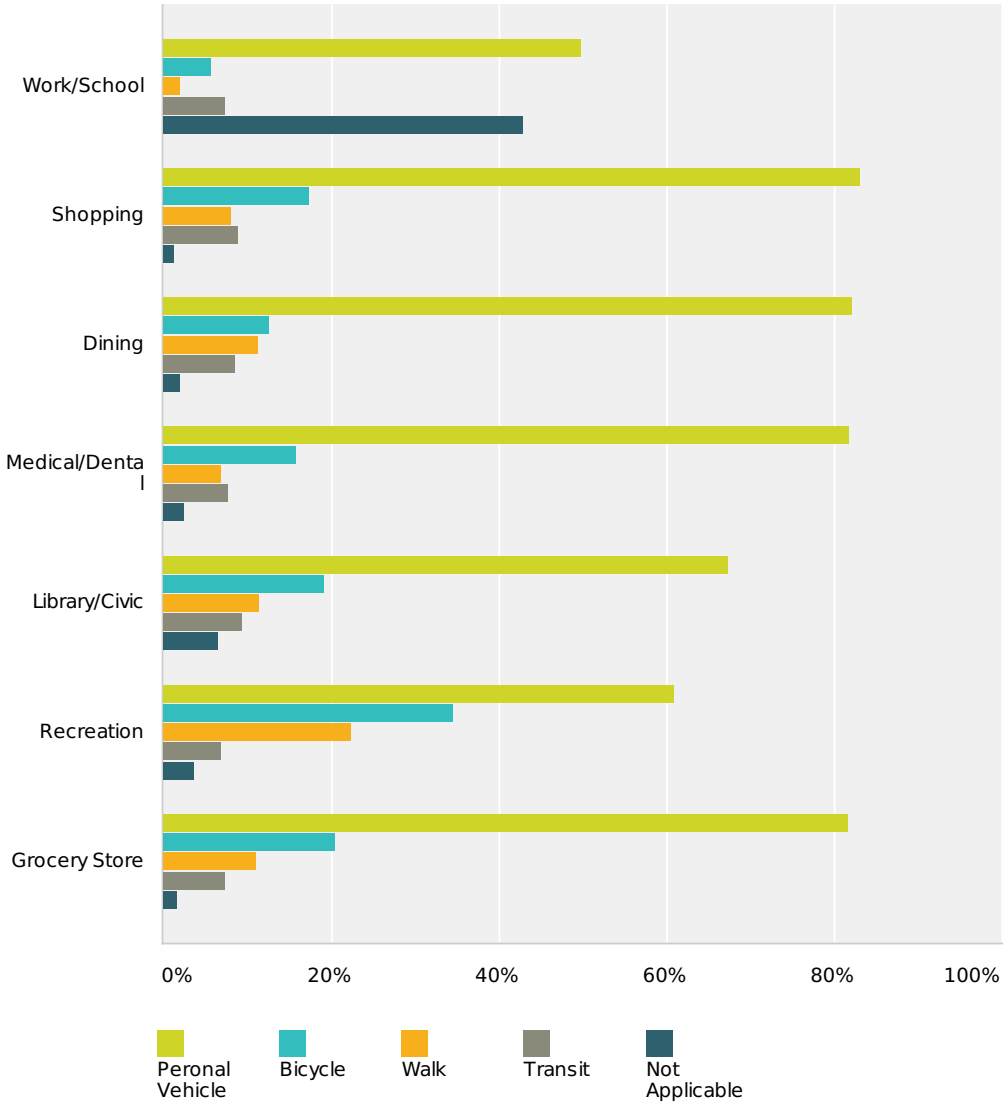
Answered: 250 Skipped: 21



	Personal Vehicle	Bicycle	Walk	Transit	Not Applicable	Total Respondents
Work/School	**58.70%** 145	**1.62%** 4	**0%** 0	**0.81%** 2	**40.49%** 100	247
Shopping	**99.20%** 248	**5.20%** 13	**1.20%** 3	**0%** 0	**0.40%** 1	250
Dining	**99.20%** 248	**1.20%** 3	**1.20%** 3	**0%** 0	**0.40%** 1	250
Medical/Dental	**97.59%** 243	**4.42%** 11	**0.40%** 1	**0.80%** 2	**0.80%** 2	249
Library/Civic	**92.37%** 230	**0.40%** 1	**0.80%** 2	**0%** 0	**6.83%** 17	249
Recreation	**91.13%** 226	**13.71%** 34	**9.27%** 23	**0%** 0	**2.02%** 5	248
Grocery Store	**98.80%** 246	**7.23%** 18	**2.81%** 7	**0%** 0	**0.40%** 1	249

Q9 When traveling to the following, what types of transportation would you prefer to use if available? (check all that apply)

Answered: 250 Skipped: 21



	Peronal Vehicle	Bicycle	Walk	Transit	Not Applicable	Total Respondents
Work/School	**49.80%** 123	**5.67%** 14	**2.02%** 5	**7.29%** 18	**42.91%** 106	247
Shopping	**83.06%** 206	**17.34%** 43	**8.06%** 20	**8.87%** 22	**1.21%** 3	248
Dining	**82.19%** 203	**12.55%** 31	**11.34%** 28	**8.50%** 21	**2.02%** 5	247
Medical/Dental	**81.78%** 202	**15.79%** 39	**6.88%** 17	**7.69%** 19	**2.43%** 6	247
Library/Civic	**67.35%** 165	**19.18%** 47	**11.43%** 28	**9.39%** 23	**6.53%** 16	245
Recreation	**60.98%** 150	**34.55%** 85	**22.36%** 55	**6.91%** 17	**3.66%** 9	246

Grocery Store	**81.63%** 200	**20.41%** 50	**11.02%** 27	**7.35%** 18	**1.63%** 4	245

Q10 Please use the space below to provide any additional comments:

Answered: 83 Skipped: 188

Q11 To be informed about the Connecting Northern Brunswick County Plan, please provide your email address or mailing address.

Answered: 129 Skipped: 142

Answer Choices	Responses	
Name:	**0%**	0
Company:	**0%**	0
Address:	**0%**	0
Address 2:	**0%**	0
City/Town:	**0%**	0
State:	**0%**	0
ZIP:	**0%**	0
Country:	**0%**	0
Email Address:	**100%**	129
Phone Number:	**0%**	0
Total Respondents: 129		

Q12 _

Answered: 82 Skipped: 189

Answer Choices	Responses	
Name:	**91.46%**	75
Company:	**0%**	0
Address:	**96.34%**	79
Address 2:	**0%**	0
City/Town:	**97.56%**	80
State:	**97.56%**	80
ZIP:	**95.12%**	78
Country:	**0%**	0
Email Address:	**0%**	0
Phone Number:	**0%**	0
Total Respondents: 82		

Public Workshop #1 – September 17, 2012

- Press Release
- Flyer
- Website card
- Presentation Slides

September 7, 2012

FOR IMMEDIATE RELEASE

Contact:
Wilmington Urban Area Metropolitan Planning Organization
305 Chestnut Street, Floor 4
PO Box 1810
Wilmington, NC 28401
Contact: Suraiya Rashid at (910) 341-3258 / Suraiya.Rashid@wilmingtonnc.gov

Public Workshop Set to Discuss Connectivity in northern Brunswick County

Brunswick County, NC – When the 2010 census showed Brunswick County was the second fastest growing county in North Carolina and Leland was the state's fast growing municipality, local officials were not surprised or unprepared. A series of plans for Leland, Navassa, and the US 17/NC 133 area as far back as 2005 estimated up to 100,000 people could move to the area. The area is still riding the early wave of development.

With growth not expected to slow, local officials continue to focus on distributing traffic through an appropriately spaced and carefully designed hierarchy of roads. The expectation is that this network of roads will support mobility, encourage multimodal travel, and protect the environment. The Wilmington Urban Area Metropolitan Planning Organization (WMPO) is partnering with the Towns of Leland, Belville, and Navassa and Brunswick County to study existing and future collector street needs in northern Brunswick County. Collector streets are mid-level streets that link residential or local streets to major arterials. These agencies are asking citizens to help with the new plan, which is called Connecting Northern Brunswick County.

A series of maps and exhibits showing existing conditions will be presented at an interactive public workshop on Monday, September 17, 2012 from 5:30-7:30 p.m. at the Leland Town Council Chambers (102 Town Hall Drive, Leland, NC). Citizens—particularly those interested in the mobility of all residents—can learn more about the plan by joining staff and the consultant team at the workshop. Attendees can view maps and exhibits that depict existing transportation features, congestion, crashes, environmental features, and approved developments. A scrolling presentation will provide an overview and key concepts of the plan. During the meeting, attendees can discuss issues and opportunities related to existing and future collector streets and view a preliminary map that shows areas suitable for future collector streets.

The WMPO and its member jurisdictions recognize the challenges and opportunities that arise with growth in northern Brunswick County. Connecting Northern Brunswick County will result in an official plan for increasing connectivity in northern Brunswick County through improving the collector street network.

More information about the Connecting Northern Brunswick County plan can be found on www.connectingnbc.com. This website is a one-stop place for up-to-date information on the plan, including the latest news, mapping, documents, and upcoming meetings. Anyone interested in providing feedback to the planning process also is invited to complete a project questionnaire, available online at www.surveymonkey.com/s/ConnectingNBC.

###

If you'd like more information about this topic, or to schedule an interview with Suraiya Rashid, please contact her at (910) 341-3258 or email her at Suraiya.Rashid@wilmingtonnc.gov.

Public Workshop

Connecting Northern Brunswick County:

Collector Street Plan for the Town of Leland, Town of Belville, Town of Navassa, and Brunswick County

Why

The Wilmington Metropolitan Planning Organization has partnered with the Town of Leland, Town of Belville, Town of Navassa, and Brunswick County to conduct a study of the existing and future collector street needs in the area.

Collector streets are mid-level streets that link residential or local streets to major arterials. The plan will result in recommendations for where new streets will connect.

When

Monday - September 17, 2012

Public Workshop: Drop-in between 5:30pm and 7:30pm

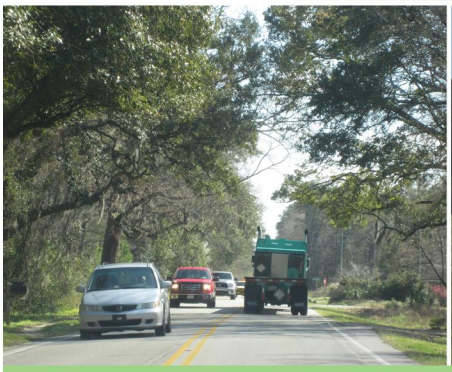
Where

Leland Town Council Chambers
102 Town Hall Drive, Leland

What

Public Workshop Details:

- **Open House - View maps and exhibits**
- **Presentation - Learn about the planning process and key concepts**
- **Feedback - Discuss issues and opportunities**



questions?

WMPO www.wmpo.org

Suraiya Rashid suraiya.rashid@wilmingtonnc.org (910) 341-3258

Connecting Northern Brunswick County

Collector Street Plan for the Town of Leland, Town of Belville, Town of Navassa, and Brunswick County

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http://www.connectingnbc.com

Kimley-Horn and Associates, Inc.

CONNECTING NORTHERN BRUNSWICK COUNTY

Collector Streets at a Glance

- Collector streets…
  - link residential or local streets to major roads.
  - are NOT major roads.
  - have lower speeds and carry less traffic than major roads.
  - typically have 2 or 3 lanes.
  - provide a livable alternative to traveling on major roads.
  - better suit bicycle and pedestrian traffic.

CONNECTING NORTHERN BRUNSWICK COUNTY

Typical Collector Street

CONNECTING NORTHERN BRUNSWICK COUNTY

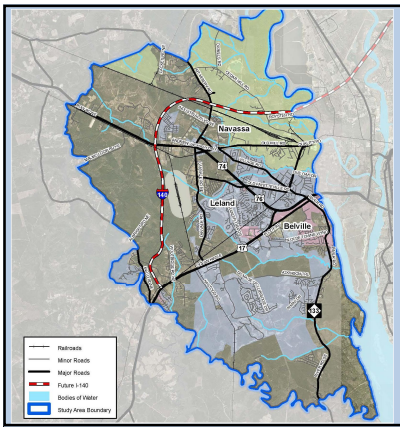
What is a Collector Street Plan?

- Street Plan to guide future development and investments
- Data-Driven
  - Characteristics of Growth
  - Existing Plans
  - **Community Input**
  - Existing Constraints
- Ensure recommendations are realistic
- Support existing economic development and livable community objectives

CONNECTING NORTHERN BRUNSWICK COUNTY

Collector Streets and Traffic Calming

- Safety:
  - Make streets safe for everyone
  - Discourage speeding and shortcutting
  - Reduce conflicts and crashes
- Livability:
  - Preserve and enhance community livability
  - Reduce noise, pollution and visual intrusion



Planning Area

CONNECTING NORTHERN BRUNSWICK COUNTY

Vision Statement

The Vision of *Connecting Northern Brunswick County* is to create choice and foster connectivity through a recommended collector street network based on an inclusive and data-driven planning process.

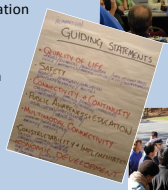


CONNECTING NORTHERN BRUNSWICK COUNTY

Guiding Statements

Guiding Statements

- Connectivity & Continuity
- Constructability & Implementation
- Economic Development
- Multimodal Connectivity
- Public Awareness & Education
- Quality of Life
- Safety

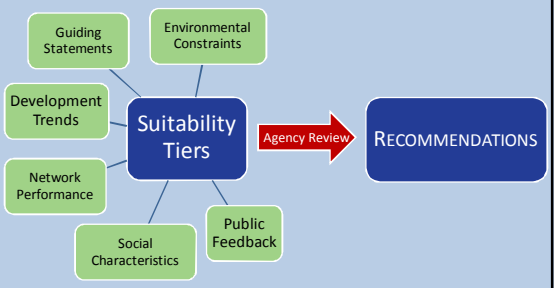
CONNECTING NORTHERN BRUNSWICK COUNTY

Plan Schedule

- Project Initiation | June 2012
- Public Workshop #1 | September 2012
- Tech Memos #1 and #2 | November 2012
- Tech Memo #3 | December 2012
- Public Workshop #2 | January 2012
- Presentation of Final Plan | February 2013
- Final Deliverables | March 2013

CONNECTING NORTHERN BRUNSWICK COUNTY

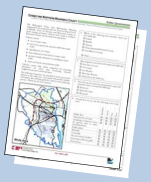
Development of Recommendations



CONNECTING NORTHERN BRUNSWICK COUNTY

Community Engagement

- Project website
- Stakeholder interviews
- Questionnaire (online & print)
- Public workshops
- Steering Committee
- Council presentations



CONNECTING NORTHERN BRUNSWICK COUNTY

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CONNECTING NORTHERN BRUNSWICK COUNTY

Collector Streets and Traffic Calming

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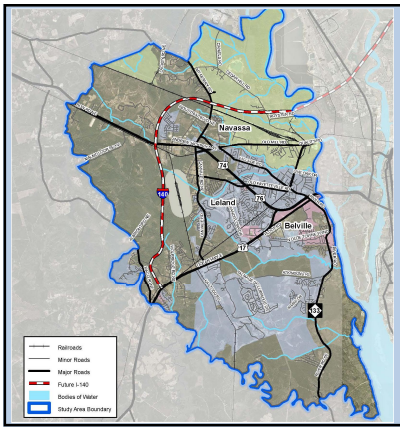

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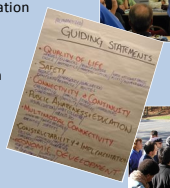

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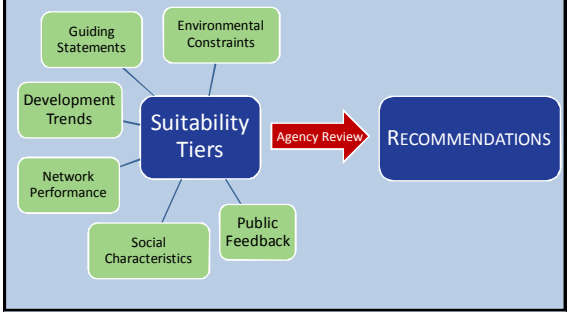

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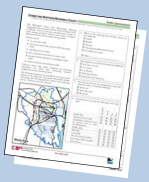

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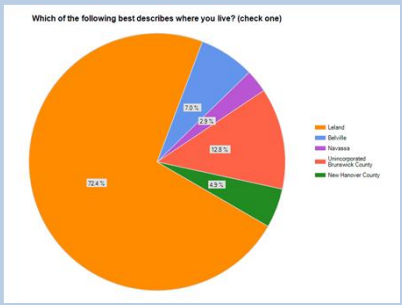

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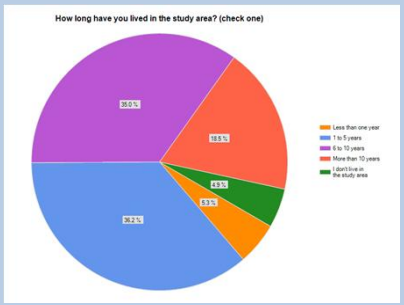

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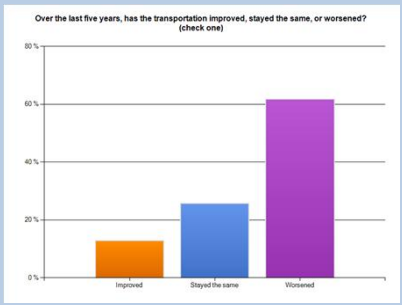

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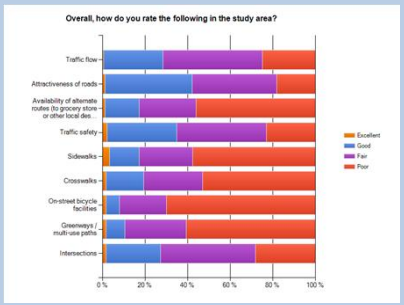

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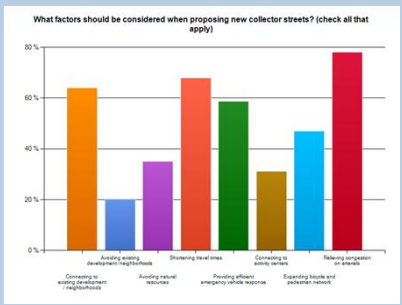

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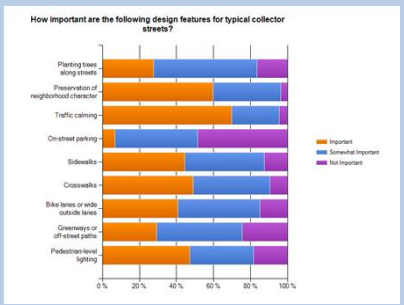

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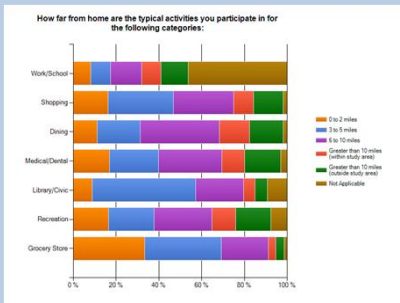

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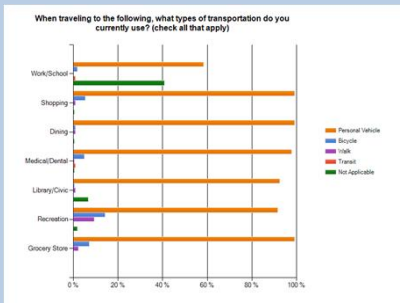

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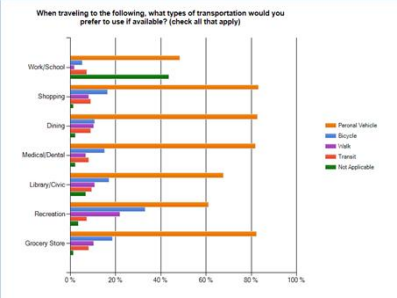

CONNECTING NORTHERN BRUNSWICK COUNTY

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Public Workshop #2 – March 14, 2013

- Presentation Slides
- Land Use Policy Boards
- List of Comments
- Maps with Comments

CONNECTING NORTHERN BRUNSWICK COUNTY

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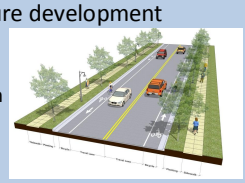
CONNECTING NORTHERN BRUNSWICK COUNTY

What is a Collector Street Plan?



- Street Plan to guide future development and investments
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CONNECTING NORTHERN BRUNSWICK COUNTY

Progress So Far

- Vision and Guiding Statements
- Public Outreach
- Establish recommendation methodology
- Develop and refine recommendations
  - Facilities (map)
  - Policies and guidelines

CONNECTING NORTHERN BRUNSWICK COUNTY

Vision and Guiding Statements

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Guiding Statements

- Connectivity & Continuity
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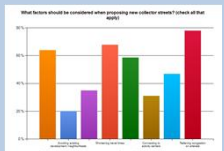
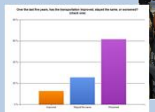
CONNECTING NORTHERN BRUNSWICK COUNTY

Public Outreach

- Project website
- Stakeholder interviews
- Questionnaire (online & print)
- Community events
- Public workshops
- Steering Committee
- Council presentations

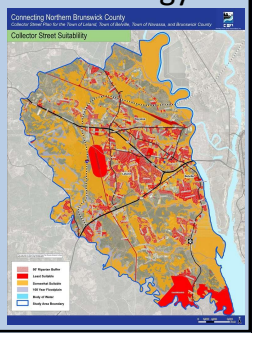




CONNECTING NORTHERN BRUNSWICK COUNTY

Recommendation Methodology

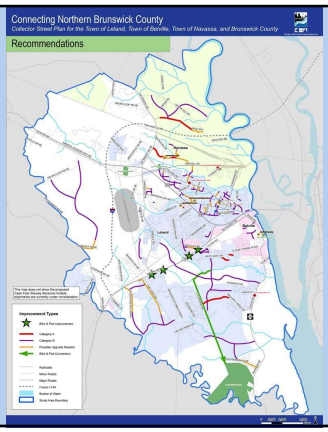
- Consideration of approved developments
- Development of collector street suitability map
  - Environmental, social, and land use constraints
- Public input
- Targeted Steering Committee meetings to review findings



CONNECTING NORTHERN BRUNSWICK COUNTY

Project Categories

- Projects have been categorized to offer each community flexibility in responding to development constraints and changing circumstances
- **Category A Projects** – High priority connections, between existing developments or existing to future development. Alignment is important, so more detail on each facility's attributes is being provided.
- **Category B Projects** – Secondary connections, still very important to appropriate development of area. Emphasis is focused on the connection rather than the specific alignment, allowing for flexibility in potential development plans.



CONNECTING NORTHERN BRUNSWICK COUNTY

Policy Suggestions

- Policy suggestions are centered around the following topics:
  - External road connections
  - Connections with adjoining property
  - Gated communities
  - Multimodal design provisions
  - Traffic calming
- Suggested policy language has undergone extensive review and modification by member jurisdictions

CONNECTING NORTHERN BRUNSWICK COUNTY

External Road Connections

- **Description:** Refers to the method of vehicular access to proposed subdivisions from existing street network.
- **Target Performance Measure:** *At least (1) connection up to 90 dwelling units; Greater than 90 dwelling units a minimum of 2 unique connections.*

CONNECTING NORTHERN BRUNSWICK COUNTY

Connecting with Adjoining Property

- **Description:** Refers to requirements to provide street stub connections to adjoining undeveloped property and to connect with existing street stubs.
- **Target Performance Measure:** *Provide a minimum of one (1) street stub-connection for every 1000 linear feet of property on any side of a development parcel.*

CONNECTING NORTHERN BRUNSWICK COUNTY

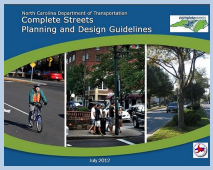
Gated Communities

- **Description:** Ensuring that gated neighborhoods do not result in fragmented transportation networks or limit community mobility.
- **Target Performance Measure:** *Where gated developments have frontage on two public roadways they are required to make two unique connections to the public network. Gated communities shall be required to provide for bicycle and pedestrian connectivity along the public frontage.*

CONNECTING NORTHERN BRUNSWICK COUNTY

Multimodal Design Provisions

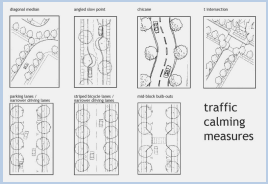
- **Description:** Refers to the requirement to accommodate pedestrians and bicyclists along neighborhood collector streets and other similar facilities.
- **Target Performance Measure:** *Provide pedestrian accommodations along both sides of all collector and neighborhood collector streets as well as all neighborhood streets that connect to adjoining property and ensure that the streets are designed as bicycle friendly streets.*



CONNECTING NORTHERN BRUNSWICK COUNTY

Traffic Calming

- **Description:** Typically refers to changes in road design intended to manage speed and reduce inappropriate through trips.
- **Target Performance Measure:** *Design collector streets so that travel speeds are appropriate for their context (25mph-30mph) within neighborhoods.*



traffic calming measures

CONNECTING NORTHERN BRUNSWICK COUNTY

Next Steps

- Public Workshop #2 | March 2012
- Revise Draft Plan | March 2012
- Presentation of Final Plan | April 2013
- Final Deliverables | April 2013

CONNECTING NORTHERN BRUNSWICK COUNTY

Website:
www.connectingnbc.com

Category A Evaluation Criteria

	Mallory Creek to Brunswick Forest Connection	Westgate Drive Extension to Coral Stone Court	Night Harbor Drive Extension to Jackeys Creek Lane	Wide Way Extension to Mt. Misery Road	Magnolia Drive Extension to Mt. Misery Road	Glendale Drive Extension to Lindenwood Drive
Provision of Alternative Routes[1]	X	X	X	X	X	X
Safety[2]	X	X	X	X	X	-
Bicycle / Pedestrian[3]	-	-	-	-	-	-
Transit[4]	-	-	-	-	X	-
Evacuation / Security[5]	X	-	X	-	X	X
Emergency Services[6]	X	-	X	-	-	X
Environmental Impacts[7]	Low	Low	Low	Low	Low	Low
Activity Centers[8]	X	X	X	-	-	-

1 - Connecting neighborhoods and / or developments; reducing traffic on congested roadways

2 - Ability to avoid high crash corridors or intersections

3 - Priority connections identified in LRTP

4 - Provides connection to a transit route

5 - Addresses flood-prone areas; provides additional route for evacuation

6 - Reduction in travel time for Fire, EMS, or Police

7 - Based on the Collector Street Suitability Map (high, medium, low)

8 - Connection to commercial uses over 30,000 SF, civic uses, or recreational

Performance Measures:
External Road Connections

Description	Refers to the method of vehicular access to proposed subdivisions from existing street network.
Purpose and Intent	Requiring multiple points of access to the EXISTING street network ensures a distribution of site trips across the transportation network and helps to manage traffic operations and safety. It also offers non-motorized trips a diversity of options to better align with trip destinations.
Target Performance Measure	At least (1) connection up to 90 dwelling units; Greater than 90 dwelling units a minimum of 2 connections.
Sample Language / Recommendation	Any proposed development with up to ninety (90) residential units shall be required to provide (a) a minimum of one (1) connection to the existing public network and (b) a minimum of one (1) connection (or stub-out if adjacent property has not been developed) to adjacent properties OR an additional connection to the public network. When the Planning Director/Planning Board deems a vehicular connection is impractical due to environmental constraints as indicated on the approved Collector Street Suitability Map, they may remove the requirement for an additional connection described in (b) and/or require non-motorized connections in lieu of the vehicular connection. Furthermore, any new development or additions to existing developments such that the total number of dwelling units exceeds ninety (90) shall be required to provide for vehicular access to at least two (2) public streets. *Efforts should be made to connect to existing street stubs and street rights-of-way where feasible unless hardships as defined by local government are identified and confirmed. When the Planning Director/Planning Board deems a vehicular connection is impractical due to environmental constraints as indicated on the approved Collector Street Suitability Map (Chapter 1), they may remove the requirement for an additional connection described in (b) and/or require non-motorized connections in lieu of the vehicular connection.*
Comments	This measure is loosely based on the Brunswick County requirements but falls shy of offering a third tier of requirements for 120 or more dwelling units. This will reinforce the value of the future connections required to adjoining properties. It also avoids the unintended frequency of street access points along existing collectors and arterials, thereby reducing the number of conflict points along busier streets. Furthermore, it is the intent of this measure to eliminate the potential of minor subdivision cul-de-sac developments that have no potential for future connectivity aside from the existing public street for which they take access. This language is also intended to allow for some hardship provisions that eliminate or modify the requirement if there are constructability constraints. Furthermore, it is the intent that this requirement promotes connections to existing streets and rights-of-way.
Notes	None

Performance Measures:
Connecting with Adjoining Property

Description	Refers to requirements to provide street stub connections to adjoining undeveloped property and to connect with existing street stubs.
Purpose and Intent	Requiring connections to adjoining property allows for the orderly and efficient development of an integrated transportation system. It ensures future access to land locked parcels and offers residents transportation choices, improved traffic circulation, and enhanced accessibility to community features and attractions. The resulting connections between neighborhoods improves access for emergency responders, improves community connectivity, and enhances mobility for non-motorized trips and recreation.
Target Performance Measure	Provide a minimum of one (1) street stub-connection for every 1000 linear feet of property on any side of a development parcel.
Sample Language / Recommendation	Roadway interconnections will be provided between the development site and its adjacent properties with one roadway interconnection every one thousand (1000) linear feet for each direction (north, south, east, west) in which the development property abuts. If the common property boundary in any direction is less than 1000 linear feet, the subject property will be required to provide an interconnection if it is determined by the Planning Director/Board that the interconnection in that direction can best be accomplished through the subject property. When the Planning Director/Planning Board deems a vehicular connection is impractical due to environmental constraints as indicated on the approved Collector Street Suitability Map, they may increase the length requirement and/or require non-motorized connections in lieu of the vehicular connection. The Planning Director/Planning Board may delay the interconnection if such interconnection requires state approval. *Efforts should be made to connect to existing street stubs and street rights-of-way where feasible unless hardships as defined by local government are identified and confirmed. When the Planning Director/Planning Board deems a vehicular connection is impractical due to environmental constraints as indicated on the approved Collector Street Suitability Map (Chapter 1), they may remove the requirement for an additional connection and/or require non-motorized connections in lieu of the vehicular connection.*
Comments	The local towns do not currently have this type of requirement; however, the insertion of this type of requirement fits within the framework of their current codes. The proposed requirement is greater than the Brunswick County UDO in that it doesn't make exceptions for Rural Zoning (which is currently one (1) connection per every 2,800 feet). The hardship provision that allows for administrative relief is something that may be considered optional but in response to the need for state permits does offer flexibility on the sequence of events that won't hinder initial phases of development. This performance measure falls within the range of a cross-section of communities across North Carolina. This language is also intended to allow for some hardship provisions that eliminate or modify the requirement if there are constructability constraints. Furthermore, it is the intent that this requirement would promote connections to existing streets and rights-of-way.
Notes	This requirement may not be necessary in places where a successful connectivity index requirement exists.

Performance Measures:
Gated Communities

Description	Communities constructed with gated entrances that prohibit access and circulation to non-residents.
Purpose and Intent	To ensure that gated neighborhoods do not result in fragmented transportation networks or limit community mobility.
Target Performance Measure	Support interconnectivity for emergency management, evacuation purposes, and bicycle & pedestrian connectivity.
Sample Language / Recommendation	Where gated developments have frontage on two public roadways they are required to make two unique connections to the public network (connections to two unique facilities). Gated communities shall be required to provide for bicycle and pedestrian connectivity along the public frontage.
Comments	Gated entrances should be prohibited in incorporated areas. Their use in unincorporated areas should be strongly discouraged/prohibited in locations adjacent to or within proximity of existing urbanized locations. Their use in more remote or isolated locations is not thought to significantly impact community mobility; however, their use in proximity to urbanized areas can have the net effect of reducing mobility by interrupting a coordinated strategy of interconnected streets.
Notes	Under no circumstances shall collector streets identified on the adopted collector street plan be interrupted by subdivision gates.

Performance Measures:
Multimodal Design Provisions

Description	Refers to the requirement to accommodate pedestrians and bicyclists along neighborhood collector streets and other similar facilities.
Purpose and Intent	An interconnected system of collector streets is intended to enhance transportation mobility which is inclusive of the connection of people with places (regardless of travel mode driving, walking and biking). Therefore, a Complete Streets approach to quality design should be promoted. It is the intent to require consistency with NCDOT design guidelines regarding Complete Streets.
Target Performance Measure	Provide pedestrian accommodations along both sides of all collector and neighborhood collector streets as well as all neighborhood streets that connect to adjoining property and ensure that the streets are designed as bicycle friendly streets.
Sample Language / Recommendation	Sidewalks (or similar walkways) will be required along both sides of all new neighborhood collector streets. This requirement should extend to all roads within a development that have external connection to streets (public or private) as well as adjoining property. The use of bicycle friendly design treatments (wide outside lanes, sharrows, dedicated routes, bike lanes, shared use paths or other similar facilities) is encouraged.
Comments	The inclusion of sidewalks/pedestrian paths on all collector streets should be viewed as a minimum standard. It will ensure that a continuous pedestrian network is created, thereby improving pedestrian safety, mobility and community health. It also will offer enhanced pedestrian accessibility to community attractions and features (parks, schools, shopping, recreation, etc.). Bicycles will be accommodated through bicycle friendly designs which may include wide outside lanes, sharrows, dedicated routes, bike lanes, shared use paths or other similar facilities. Signalized intersections will include provisions for safe pedestrian and bicycle crossing (crosswalks, pedestrian signals, ADA-compliant curb ramps, or other similar facilities). A comprehensive pedestrian and bicycle plan is recommended so that a coordinated approach to design and implementation occurs.
Notes	None

Existing Standards

Topic Areas	Brunswick County UDO	Leland Subdivision Ordinance	Belville Subdivision Ordinance	Navassa Subdivision Ordinance & Zoning Code
Reference Locations	Section 8.9 Streets	Sec 22-144 – Subdivision Design	Section 404 Subdivision Design	Subdivision Ordinance
Date of Update	2012 - monthly	2007	2012 - Annually	March 2009
Block Length Requirements	n/a	400'-1,800'	400'-1,800'	400'-800'
Required Ratio	1.3*	none	none	none
External Road Connections	Requirement based on number of units**	No		Required to connect to adjoining stub streets~
Connections to Adjoining Property	Rural Zoning: at least 1 per every 2,800' on any side; All other Zoning, 1 per every 1,400 on any side	Only when required by Planning Board	Only when required by Planning Board^	Required: unspecified number
Administrative Authority for Adjacent Connection	Yes (Planning Director)	No	No	Yes (Section 4.3.6)
Private Streets Allowed	Yes	No	Yes	Yes
Gated Connections Permitted	Yes	No	No	No
Sidewalk Requirements	Public Streets***	May be required by Planning Board	May be required by Planning Board near pedestrian attractors	Yes (both sides In Major Subdivisions)
Bike Lane Requirements	Public Streets for Collectors and Arterials***	No	No	No (but greenways count towards open space calculation)
Connections to Pedestrian Attractions	n/a	Encourages "walkways" to attractions	Encourages "walkways" to attractions	n/a
Other Noteworthy Requirements	n/a	Discourage through traffic on residential local and collector streets	Discourage through traffic on residential local and collector streets	Explicitly requires conformance with official plans

Performance Measures:
Traffic Calming

Description	Typically refers to changes in road design intended to manage speed and reduce inappropriate through trips.
Purpose and Intent	Respond to concerns of excessive speed and cut-through traffic along neighborhood streets.
Target Performance Measure	Design collector streets so that travel speeds are appropriate for their context (25mph-30mph) within neighborhoods.
Sample Language / Recommendation	Collector Streets will be designed in a manner that promotes community connectivity while simultaneously promoting appropriate travel speeds within neighborhoods. NCDOT Complete Streets design standards should be applied for collector streets with the expressed intent of promoting community mobility. Furthermore, the use of approved traffic calming devices should be permitted along existing collector streets. Future collector streets should include a combination of design elements (i.e. active and passive traffic calming techniques) to ensure that new streets don't encourage excessive speeds.
Comments	It is important to note that most of the current codes include language suggesting that the design of neighborhood streets should discourage excessive speeding and cut-through traffic. In the absence of a connectivity requirement many developers will suggest that the best way to respond to this performance requirement is to limit or eliminate external connections (effectively severing external trips). This response is in conflict with the intent of an interconnected transportation system. Therefore, a combination of connectivity requirements and design/performance measures is important to successfully create a system of interconnected streets. When desired travel speeds are reinforced through active and passive traffic calming measures and supported by regulatory measures, inappropriate cut-through traffic is often limited.
Notes	A copy of recommended best practices is included in *Appendix A – Traffic Calming* of this report.

Comments

- I agree with the plan to add collector streets. Nobody likes to have more streets added to their communities, but these streets are necessities. Thank you!
- I live on Remount Ct. in Waterberry Plantation. I do not want a connector street to go through Jackey's Creek and through my neighborhood. We moved into our gated community to have a quiet lifestyle. We pay homeowner's fees to maintain our neighborhood and a throughway street with lots of traffic will tear up our streets and will make it unsafe for small children and adults. I am against the collector street through Jackey's Creek.
- I live on Jackey's Lane on private roads in a gated community, use Olde Town Road, not Jackey's Creek Drive.
- Widen 133 first!
- When is the next meeting and how will we know?
- Do not even consider Jackey's Creek Lane as a collector street. This is a residential street and not a commercial area. People are not in favor of such a proposal. Why does any proposal consider an established neighborhood? This is not a viable proposal and must not be pursued. Part of Jackey's Creek Lane is considered to be a privately owned road.
- Waterbury Plantation is gated, the streets are maintained by residents!
- Don't use Jackey's Creek.
- I am not for connector roads. Bought off 133 to be away from stores.
- Jackey's Creek Waterberry Plantation - we were told when we bought our property that we were going to be in a gate community. Were we duped? We do not want to open the gates to traffic.
- Not in favor of road from Malloy Creek connecting to Brunswick Forest property.
- Ok with the idea of connector streets only if they are used for emergency vehicles, bikes and walking paths. I am not in favor of allowing additional traffic through individual neighborhoods.
- Rice Creek Road - Brunswick Forest from Mallory Creek - traffic, speed (no matter what you do). Those of us living there will have trouble getting out onto low country - more crime! How sad, did not know this when bough in Forest.
- Too idealistic!
- Mallory Creek to Brunswick Forest: 1. Needs to connect to Hwy 17 via Wire Road; connection between the two needs to be roundabout; bike/walking pathways along the side of the road/not stripped edge of pavement. 2. Look at City of Tallahassee, FLA Blueprint 2000" plans. Very good connector streets in midtown. 3. Connector for 133 Bypass to Hwy 17 south of Mallory Creek to Walmart area.
- It is my sincere hope that the commission will listen to the voice of the people tonight. This is an extremely problematic issue for us as homeowners in this community of W.P. that we bought with the understanding that it would be traveled through only by residents and friends.
- The gates are beneficial to everyone on Jackey's Creek Lane in order to keep drivers from racing through to reach the 17, Walmart, etc. I don't think they will care to observe the 25 mph speed limit that is supposed to be enforced here.
- This is an extremely problematic issue for us as homeowners in this community of Waterberry Plantation where we bought understanding that there would be only residents and friends. The gates benefit everyone on Jackey's Lane….
- My wife and I are adamantly opposed to this plan. Our home is on the corner of Jackey's Quail Lane and Stoney Brook Court. In rezone the traffic (and you will) will greatly increase the noise, remove my privacy, greatly decrease the value of our home and generally decrease the quality of our life. This is not why we bought in Jackey Creek.
- The bike path proposed between Lillibridge has property currently for sale right on the proposed bike path. We paid a premium for out lot on 1277 Lillibridge, I do not want to look at a bike path

behind my house. Please reconsider not making this a bike path. There is already 40 miles of bike paths in Brunswick forest. This path would disrupt private premium lots and decrease property value.

- We, the residents, bought into a gated community for the privacy and do not want traffic through our development. Please respect our privacy or we will seek legal counsel.
- Widen 133 first and connect 133 to 17 then connect streets second.
- Please do not extend Jackey's Creek Road. Can negatively impact quiet gated community. A cut through already exists in Old Towne via Eastwood Road.
- Please consider alternatives to the Mallory Creek - B. Forest connector - you will decrease property values and reduce desire for people to move to Brunswick Forest. Jerry Helms, the manager of Brunswick Forest gave me a letter saying that this road would never be paved, but now you have a proposal to pave our road for pedestrians but there is property there for sale.
- We believe that the collector street (Rice Gate) should not go thru Brunswick Forest because of the domino effect. Rice Gate leads to Low Country, which is the primary way out of B.F. It connects to B.F. Parkway which is poorly designed. Multiple arrows and stop signs (this road houses all the amenities of B.F .before you get to the supermarket). Why not connect to Wire Road which exits on Rt. 17 and already has a light. Cars then can go either way to shopping and Lanvale Road which leads to 74. You seem to be concerned about the communities on 133 and not the chaos you will be causing B.F.
- To call Jackey's Creek a "collector" is dishonest. It is a perfect example of a "cut through." Thousands of cars every day will cut through as a shortcut to US 17. I've lived in NC long enough to know that a substantial percentage of the population considers speed limit signs, stop signs, etc. as a "suggestion" only. Many will consider your lame speed limiting devices a challenge. Waterberry Plantation <u>WILL NOT COOPERATE</u>**.**
- 1) I live in Waterberry Plantation, a private street, gated community. Have environmental concerns if Jackey's Creek Lane is connected/extended to the neighborhood behind ours. We have a privately owned/maintained streets in Waterberry Plantation. To allow the public to traverse our streets will become and liability issue for us as owners of these streets. Increased traffic will create further deterioration of our streets, increase roads surface runoff by that use. We would be asked financially to maintain additional funds as our roads deteriorate. 2) As it stands now, emergency vehicles have gate access codes and the legal right to access any property in an emergency. We paid a premium to live in a gated community. Who is to compensate homeowners should we be forced to discontinue use of security gates, for the decrease in value of homes as traffic is increased on formerly sparsely used roads? 3) Quality of life issues: A.) Presently, children and disabled adults living in Waterberry Plantation can safely walk and play on our streets. With increased traffic, would safety be guaranteed to those living there; B.) Crime/vandalism will increase with increased access to our community. 3) Lack of planning by Leland: How will regional expansion of feeder streets be helpful to air pollution in an already polluted air region. Taking longer to get from home to a main street through feeder roads just increase pollution. In the past, developers were given little to no guidance as to street design. What has Leland done to change input on design. 4) There is not street tree ordinance in Leland that would require future developers to maintain what they plant.
- What is the primary goal of a collector street in a residential neighborhood? Your presentation indicates it is to serve residential land uses and ASSOCIATED traffic. What do you mean by associated traffic? Would the cars using this residential street as a cut-through to a commercial area be considered collateral damage for the people who live in the neighborhoods? The presentation said that roadway capacity is not the primary focus of a residential collector street. It will be the primary result though. No traffic calming device or intersection treatment will prevent people who have to go to WALMART. That's what major roads are for. I'm not sure who decided that increasing residential traffic is a good thing. The

children of these neighborhoods would strongly disagree with that idea.

- This plan will turn a residential neighborhood street to a primary cut-through to access a major business area being the Walmart Shopping Center. Everyone goes to Walmart or the related businesses. This street is not capable of handling cut-through traffic. It is naïve to believe that only residents of the affected neighborhoods will use this cut through to get to the commercial areas surrounding Walmart. Jackeys Creek Lane and Night Harbor Drive are not parkways and were never designed to be such. They are two lane undivided roads with houses fronting the majority of each roadway.
- In response to the notion that emergency vehicles will get stuck in traffic and will be unable to get where they need to go. Again the threat of public safety is often thrown around as a scare tactic to cloud the best judgment of citizens and decision makers. I know from experience as being a Wilmington Police Officer who always deals with heavy traffic. Public safety officers have lights and sirens for this purpose.
- In response to a comprehensive pedestrian and bicycle plan. These words sound good and are often used when discussing changing unique residential neighborhoods to an unpopular cut-through. But the idea of biking and walking to destinations sounds good until it comes time to actually do the biking and walking. It is often decided that those modes of transportation are not useful when carrying twelve bags of groceries or walking two miles in the hot summer to sit down at a restaurant looking like a sweaty mess. People enjoy walking and biking casually in a neighborhood like they currently do on these streets.
- This increase in non- residential traffic will result in increased amounts of litter, noise and potentially crime. Those who use the streets will have no ties to the community. Rarely do people litter in their own street. They save their trash to roads that they don't care about. Also, crime has the potential to increase with such a cut-through. Typically criminal activity in neighborhoods is solved with the help of those that are familiar with their neighbors...knowing who owns what car and seeing cars that have never been in the neighborhood before. The traffic plan would eliminate people from being good neighbors. They will lose their sense of community. With the drastic increase in vehicles cutting through it will be impossible to know who belongs and who doesn't.
- The best roads to solve traffic problems won't travel through residential neighborhoods. They should be designed to move cars around neighborhoods. These roads should be designed with that purpose in the planning phases. For example, Cardinal Drive in Wilmington has become a cut through residential road. It is a real mess regarding traffic that wants to get from point A to Point B and doesn't care how they get there. I used to patrol that area as a police officer in Wilmington. Complaints of speeding were non-stop but there are never enough police officers or "traffic calming devices" that will prevent this from being a problem. It shows that connecting streets together just because they are some-what close together on a map is not a solution to any problem. Roads that solve problems often must be built with that specific purpose.
- Flawed concept – Idea is to lessen the burden of major roads but also discourage cut-through traffic. It's either one or the other.
- Plan was scrapped in Wilmington. Westgate Waterpark.

- I propose NO collector street connection at the end of Jackey's Creek Lane due to my attached reason but also NO because we bought into a gated community for privacy and quiet conditions. Per David Hollis, he agrees with this recommendation per our conversation. In addition, due to the GPC connection in the area, he has agreed to address my request for a NO OUTLET sign at the entrance to Jackey's Creek Plantation to stop dead end in-out traffic to the communities.
- I am concerned about the intent/end result of the BF/MC connector is in essence to provide a primary route (minor arterial) from 133 through MC & BF to 17. I would be completely opposed to this happening in effect. From what I have read, an appropriate connector should

draw traffic from residential streets to arterials and back into rather than through. On the other hand, if the Category B connector from Ploof Rd - Shellmore was developed before or concurrently as a minor arterial, this would encourage potential 133-17 cut-through traffic to use it rather than more residential streets of BF. I believe I could support that contingent on answers to next question. Would you support requiring construction of such a minor arterial before or concurrently with the BF/MC connector?

- Having the Ploof Rd – Shellmore connector as routed with the BF/MC connector would unfortunately seem to create even more traffic potential through Mallory Creek. I would like to know why the Ploof Rd – Shellmore connector isn't a Ploof Rd – Central Blvd SE minor arterial. This could be the desired route parallel to 133 I see referenced in earlier WMPO planning documents. This would then service the "back sides" of all the developments in this area without encouraging cut-through traffic in any as long as the Southern terminus connects into 133 without bisecting a neighborhood community. This would also improve traffic flow until or if the Bypass is not completed. Can you explain why this is not part of the recommendations?
- The proposed connector between 133 (vicinity of Liberty Landing Rd) and 17 (vicinity of Wire Rd) seems like it might be a better route for the 140 Bypass instead of a connector. In addition, if the above minor arterial (item #2) is constructed as suggested, such a Bypass routing would eliminate the need for this connector as it would become redundant or it would serve in lieu of the Bypass if it is not constructed or significantly delayed. Can you let me know if this was considered and why the current Bypass routing is recommended?
- Out of curiosity, why isn't at least some (North of Rice Gate) of the Wire Rd used as a connector? It already comes to 17 at an intersection and is a gravel road. Is it somehow incompatible with dual use along with Bike & Ped Connection? This could serve as a poor alternative to #2 above but better than not and perhaps better in addition.
- Any idea when Kay Todd Rd – Brunswick Forest Pkwy connector would be developed?
- Any idea when Hewett-Burton Rd – Brunswick Forest Pkwy connector would be developed?
- Any idea when Cape Fear National Blvd – 133 connector would be developed? In the worst case scenario, if the BF/MC connector was developed before #2 above, this connector could be an additional parallel cut-through BF that could at least use the 4 lane Brunswick Parkway and distribute the load.
- When the BF/MC connector is developed, would there be measures taken to discourage cut-through traffic such as making the intersection of Rice Gate & Lillibridge a 4-way stop and/or other calming features?
- Will the final product be some kind of master plan and/or zoning that will force coordination between developers and local governments by reserving in some fashion right-of-ways for these connectors/arterials?
- What are the true expectations that the developers will either construct or contribute to this plan? What leverage does the town/county/WMPO/?? have to get any of this done? How else?
- My husband and I are the owners of Lot 20 in Waterberry Plantation, the property at the end of Jackey's Crek Lane. As our plot plan states, the easement on the south end of our lot is designated as UTILITY and DRAINAGE easement. We will NOT deed over or sell this easement for any reason. I've done some measuring on my own based on the boundaries of our property and a road connector through our property would place our house 10 1/2 feet from the road edge. That doesn't allow for a safety shoulder from accidents that will most likely occur and put my home in harm's way.
- Eminent Domain. The laws that govern "eminent domain" fall under the Fifth Amendment. In order to acquire possession of this portion of our property, there must be NECESSITY. Providing the impatient public an alternate route around 133 traffic or a shortcut to Walmart is not a necessity. Extending Jackey's Creek Lane so that it connects outside residents access to 17 is not a life or death necessity! As a matter of fact, it will cause a dangerous situation for established residents in both Jackey's Creek Plantation and Waterberry.

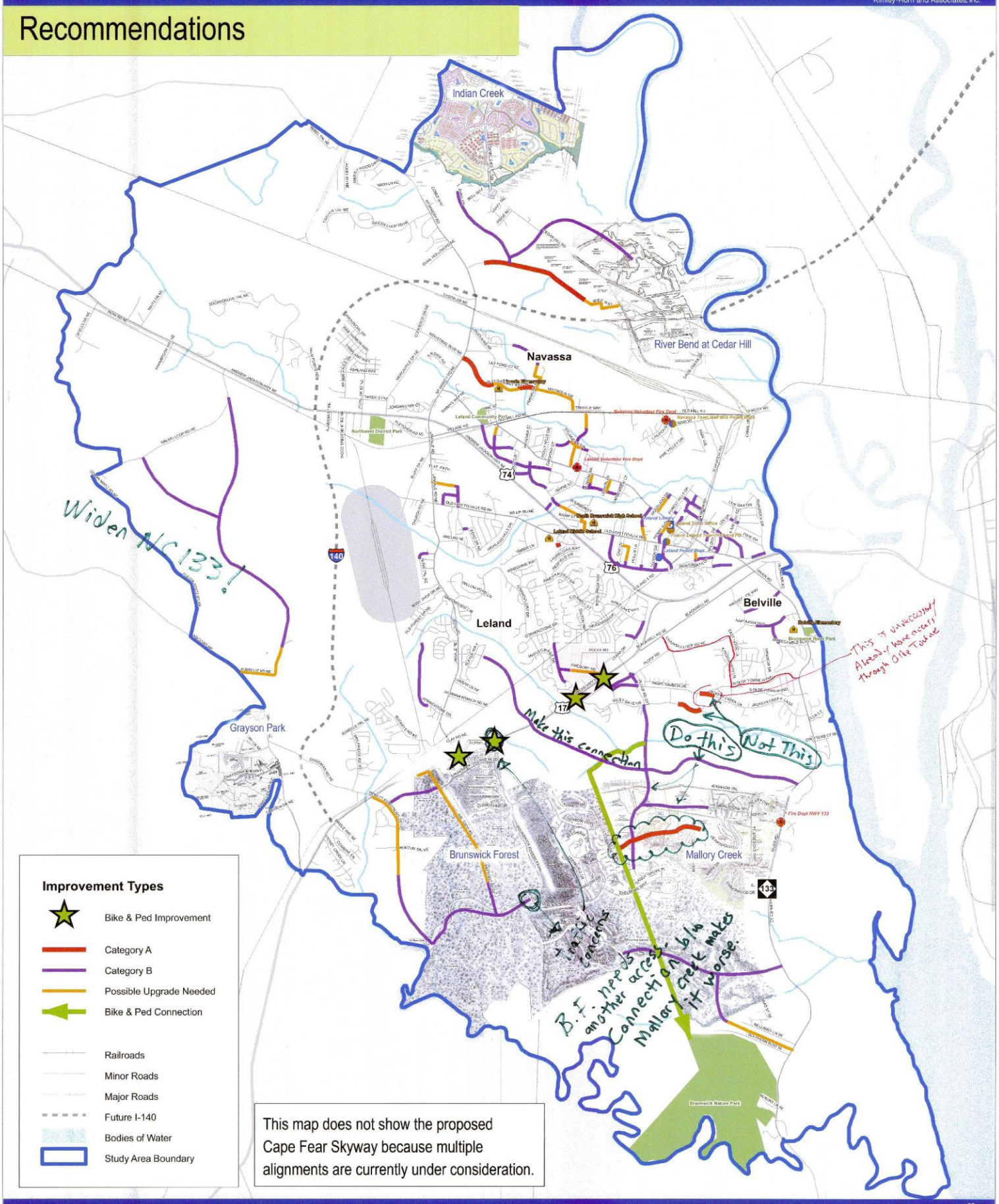
    - If the county planned to access Jackey's Creek Lane as a future collector road, why did they grand approval for a PRIVATE GATED COMMUNITY with private roads, namely Waterberry Plantation, right in its path? Now the county wants to change their mind? No Jackey's Creek Lane collector street! I bought into a gated private community to avoid this!
- I live on Low Country in Brunswick Forest and I will be affected by the Rice Gate connection. I think you should work with the utilities to be able to use Wire Road. People have just as much to say about this as the power company.
- Did not know of the traffic pattern on Rice Gate Way when I purchased home in Brunswick Forest. This traffic will be one block from my home and behind my home on Low Country.
- As a resident of Waterberry Plantation, I am strongly opposed to any cut-through access through our private, gated roads. Once the town gave approval for private roads, that should have removed us from the plan. There is a purple "category B" road drawn south of our community connecting 133 all the way to 17. That road would solve most of the problems. No impact on existing communities. No need to remove residences. The ability to build a 4-lane road that can handle much more traffic. Sounds like a winner on all fronts, when do we start?
- Ultimately, an arterial must be built to connect River Road near Town Creek to US 17 west of Brunswick Forest. A large number of homes will be built in Brunswick forest. This is a problem more than a collector, but still needs to be a central feature of any sound long-term plan.

Connecting Northern Brunswick County

Collector Street Plan for the Town of Leland, Town of Belville, Town of Navassa, and Brunswick County

Kimley-Horn and Associates, Inc.

Recommendations



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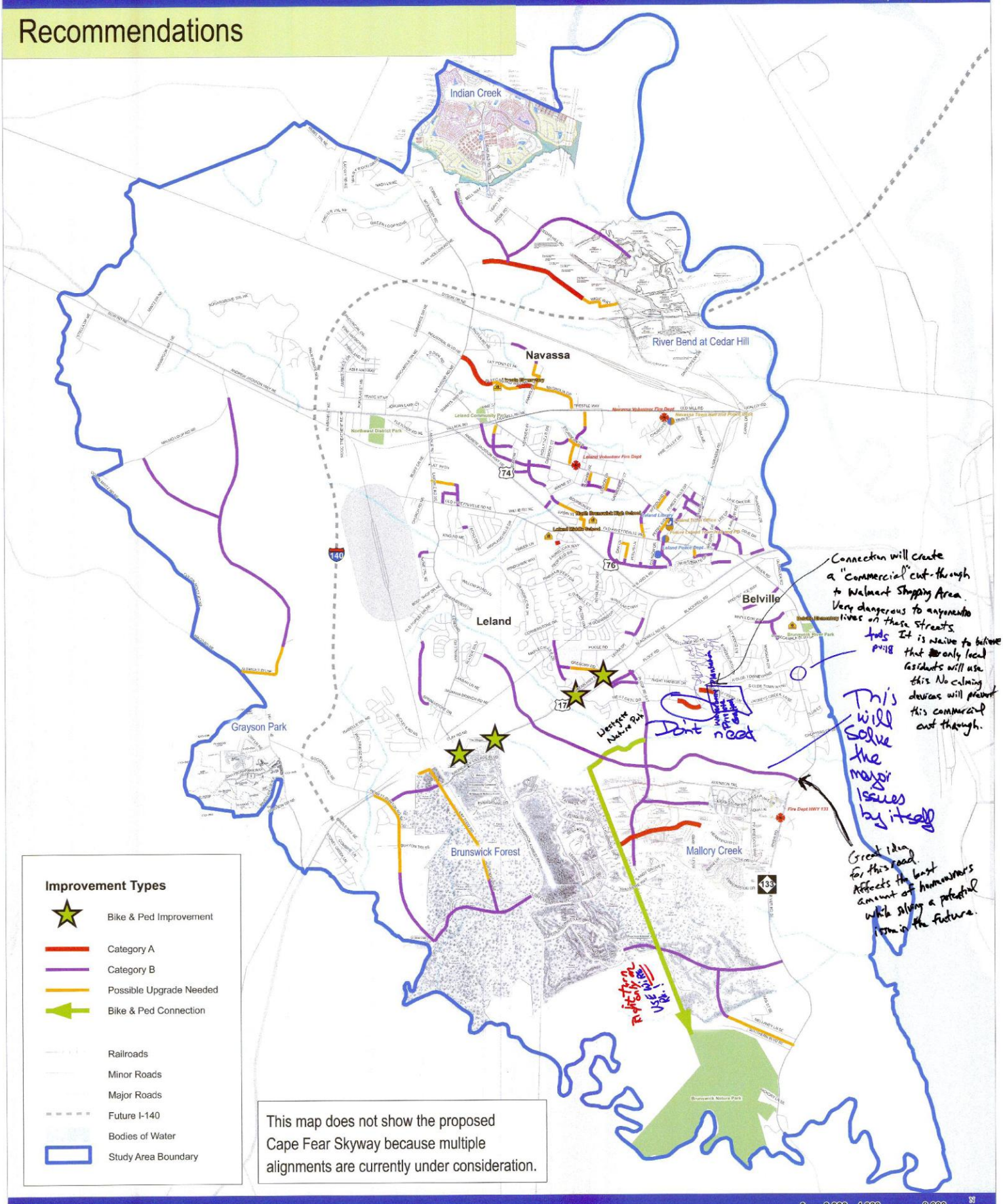

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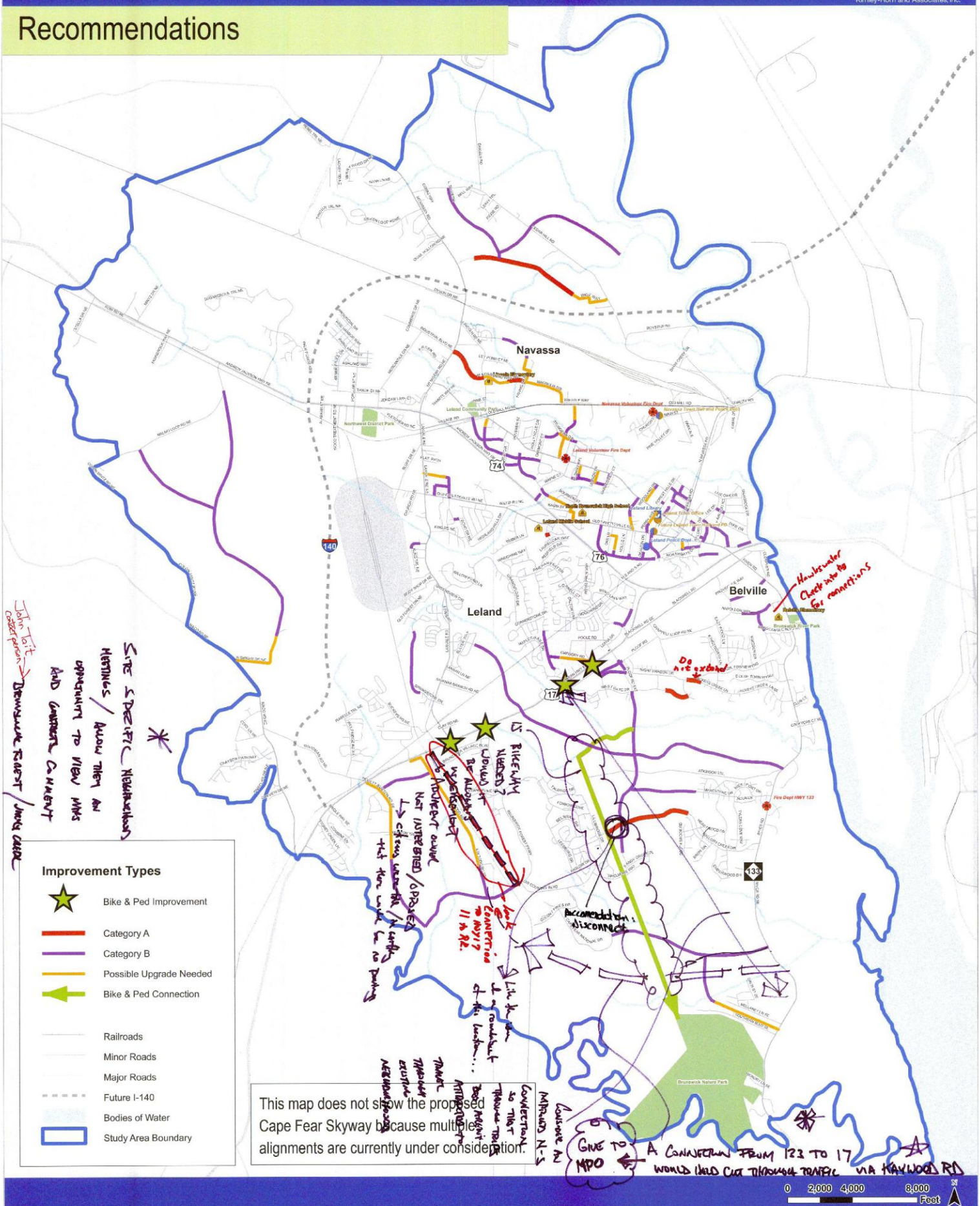

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