

# River to the Sea Bikeway Master Plan 2013



## **PREFACE**

Formed in 1729, New Hanover County boasts extraordinary experiences from downtown Wilmington to the Atlantic Ocean. Bordered by the Cape Fear River to the west and the Atlantic Ocean to the east, New Hanover County is rich in scenic, cultural, recreational, historical and natural qualities.

New Hanover County, its beach communities and the City of Wilmington partner to create a dynamic place to live and work characterized by a strong sense of community. It is known for its stewardship of its bountiful assets including its

- Vibrant downtown riverfront
- Energetic beach communities
- Distinctive neighborhoods that include a range of quality housing
- Renowned historic character
- Ample greenspace and pristine and accessible waterways
- Emerging transportation options
- Exceptional education and health care institutions
- Effective regional partnerships
- Diverse employment opportunities

The goal of The River to the Sea Bikeway is to provide visitors and residents with a facility that creates opportunities for basic transportation, recreational use and physical activity while connecting downtown Wilmington to Wrightsville Beach. The bikeway traverses from the foot of Market Street fronting the Cape Fear River in downtown Wilmington, follows the historic path of the Historic Beach Car Line, enters Wrightsville Beach at the Heide-Trask draw bridge and ends at Johnnie Mercer's Pier at the Atlantic Ocean. The bikeway is collaboratively planned and managed by the City of Wilmington and the Town of Wrightsville Beach. New Hanover County and the Wilmington Metropolitan Planning Organization (WMPO) also participate in the planning of facilities and events to promote the bikeway. The purpose of this plan is to guide further development of the bikeway. The adoption of this plan will show citizen and political support for future development and will strengthen grant applications to assist with funding future sections of the bikeway.

Wilmington and New Hanover County serve their citizens and visitors with 3,578 acres of public parks and greenways and 364 miles of sidewalks. Current outdoor recreation opportunities include walking, cycling, hiking, skating and skateboarding, golfing, motorized and non-motorized boating, fishing, traditional and non-traditional sports, professional sports, dog parks, arts and cultural activities and nature interpretation. These amenities and programs are designed to provide physiological, sociological, cultural and economic benefits to residents, contributing to the quality of life for our community through health promotion, tourism promotion and environmental stewardship.



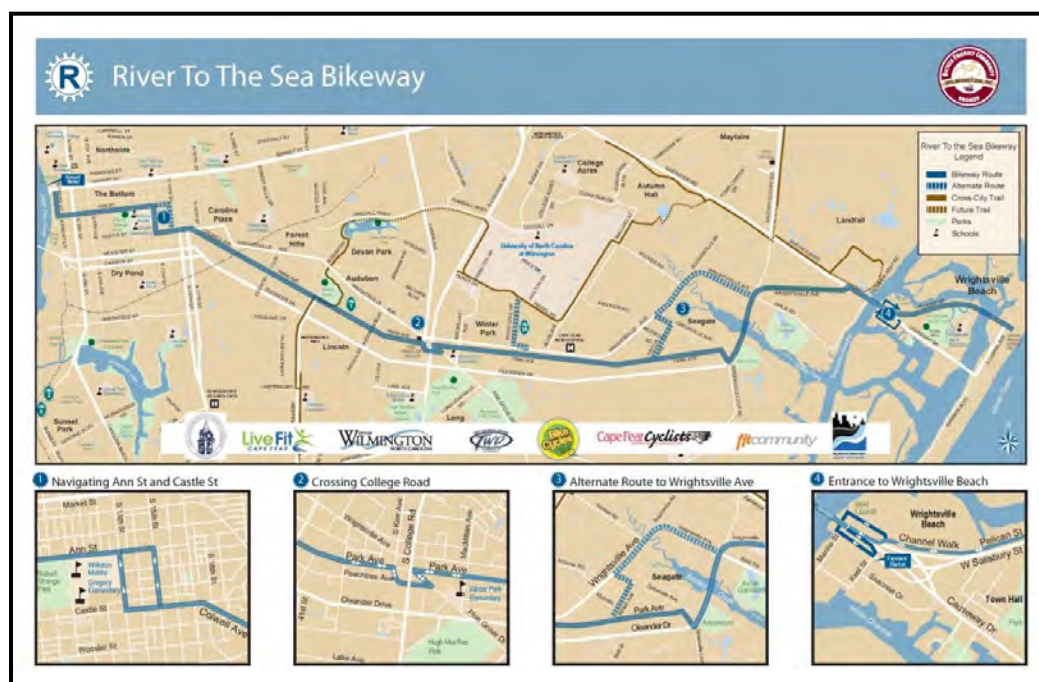
## Executive Summary

Throughout this document, River to the Sea Bikeway (RTSB), the bikeway, RTSB, and WMPO Bike Route 1 are used synonymously.

Upon completion, the River to the Sea Bikeway (also WMPO Bike Route 1) is an 11-mile on-and-off-road bicycle route that follows the Historic Beach Car Line, which carried vacationers from downtown Wilmington to Wrightsville Beach by trolley. The bikeway is comprised of neighborhood residential streets, off-road multi-use paths and a few arterial roadways. It provides bicycle and pedestrian access to numerous recreational, cultural, and educational destinations in Wilmington and Wrightsville Beach.

The facilities include the Ann Street Bicycle Boulevard, the Colwell Avenue Greenway, the Park Avenue Greenway, Wrightsville Avenue Bicycle Lanes, and Pelican Drive Sharrows. The Ann Street Bicycle Boulevard and the Colwell Avenue Greenway connect to create the downtown and western-most portion of the bikeway. The central portion includes Park Avenue along the Historic Beach Car Line. The eastern-most portion includes crossing Bradley Creek, following Wrightsville Avenue, crossing the Intracoastal Waterway and arriving at Jonnie Mercer's Pier on the Atlantic Ocean.

The River to the Sea Bikeway is a core bikeway in the developing region-wide bicycle and pedestrian network which will ultimately make basic transportation in the Wilmington area a safer and more convenient option for every citizen. The RTSB intersects most branded community bicycle and pedestrian routes. The RTSB connects to the Gary Shell Cross-City Trail, Wilmington's premier greenway facility, providing bicycle and pedestrian access to numerous recreational, cultural and educational destinations in Wilmington. The RTSB also intersects the East Coast Greenway, a partially constructed trail that spans from Maine to Florida and will function like an "urban Appalachian Trail".



River to the Sea Bikeway map, published April 2012

The goal of The River to the Sea Bikeway is to provide residents and visitors with a facility for basic transportation, recreational use, and physical activity while connecting The Cape Fear River and downtown Wilmington to Wrightsville Beach. Currently, the residents of Wilmington and surrounding areas are underserved by means that provide access to safe, convenient and attractive bicycle and pedestrian facilities. The bikeway provides access to established destinations located along the east-west corridor that connects downtown Wilmington to Wrightsville Beach. This connection between downtown and the beach creates new opportunities for commuting and access to employment, retail, cultural, educational and recreation sites in Wilmington, Wrightsville Beach and New Hanover County, improving safety, economic development, mobility, and the environment.

The bikeway begins at the foot of Market Street at the Riverwalk. The bikeway then traverses Old Wilmington, Bottom, and Forest Hills neighborhoods before crossing Independence Boulevard and passing Empie Park. From Empie Park to South Kerr Avenue, the bikeway follows Park Avenue, a quiet local street that passes the Audubon Trolley Station – the smallest structure on the National Register of Historic Places. After merging with Peachtree Avenue and crossing South College Road in the Winter Park neighborhood, the bikeway merges briefly onto Pine Grove Drive before joining up with Park Avenue again. Between Pine Grove Drive and Wallace Avenue cyclists enjoy the on-road environment of this low-volume and low-speed section of Park Avenue. Between Wallace Avenue and 52<sup>nd</sup> Street, the bikeway utilizes an off-road path, with a spur to the University of North Carolina Wilmington (WMPO Bicycle Route 1A) via Wood Dale Drive. Between 52nd Street and Greenville Avenue, cyclists again enjoy a low-volume, low-speed on-road environment where neighbors are accustomed to seeing cyclists on the street. From Greenville Avenue, the RTSB crosses Bradley Creek in an on-road section along Oleander Drive. Oleander Drive is a busy arterial roadway without dedicated bicycle facilities. An alternate route to crossing Bradley Creek on Oleander Drive is by taking Greenville Avenue northwest toward Wrightsville Avenue, then Wrightsville Avenue to the Oleander Drive/Military Cutoff intersection.

After crossing Bradley creek via Oleander Drive or Wrightsville Avenue, cyclists merge onto Wrightsville Avenue to ride in marked bicycle lanes towards Heide-Trask drawbridge. At the drawbridge cyclists must again ride with traffic on a busy bridge and along a rough surface; however, immediately after crossing the Heide-Trask drawbridge cyclists can merge onto bike lanes that will take them under the bridge to Pelican Drive. Pelican Drive is a low-speed, low-volume roadway that is marked with sharrows. At this point cyclists must merge onto the Salisbury Street Bridge to arrive at Johnnie Mercer's Pier.



River to the Sea Bikeway (Bike Route 1) alignment along Park Avenue near MacMillian Drive

The River to the Sea Bikeway provides access to many residential neighborhoods, five elementary schools, one middle school, five public parks, two community centers, two bike stations, a university, a hospital, a museum, the region's largest shopping mall, a local bike shop, Johnnie Mercer's Pier, Wrightsville Beach Visitor Center, the Wrightsville Beach Museum, and numerous commercial nodes.



River to the Sea Bikeway (WMPO Bike Route 1) along the Ann Street Bicycle Boulevard at Gregory Elementary School and Williston Middle School

## Planning Documents

Numerous planning documents recommend development and expansion of a city-wide and/or county-wide network of bicycle and pedestrian facilities in order to increase basic transportation and recreational opportunities. Adopted plans identifying the need for a pedestrian and bicycle network include:

- *Wilmington New Hanover County Greenway Plan (2013)*
- *2013-2018 Parks, Recreation, and Open Space Master Plan for the Town of Wrightsville Beach*
- *Wrightsville Beach Community Transportation Plan (2013)*
- *Wrightsville Avenue 2030: A Land Use & Transportation Plan for the Wrightsville Avenue Corridor (2012)*
- *Wrightsville Sound Small Area Plan (2011)*
- *Cape Fear Commutes 2035 (2010)*
- *Wilmington Park, Recreational and Open Space Master Plan Update 2010-2015*
- *Pelican Drive/Salisbury Street Bicycle Plan for the Town of Wrightsville Beach (2009)*
- *Walk Wilmington, A Pedestrian Plan (2009)*
- *US 17 Business Corridor Study: 3<sup>rd</sup> Street to Covil Avenue (2007)*
- *Seagate Neighborhood Plan (2007)*
- *New Hanover County Parks and Recreation Master Plan (2006-2011)*
- *Wilmington-New Hanover County Joint Coastal Area Management Plan (2006)*
- *City of Wilmington Future Land Use Plan (2004)*

The River to the Sea Bikeway is comprised of improved and unimproved segments. Prioritization is based upon a set of criteria including public input, accessibility, connectivity, the safety of road crossings, the physical conditions of the alignments, engineering, permitting, construction and operation costs, drainage management, and easement acquisitions.



River to Sea Bikeway along Park Avenue between Empie Park and Floral Avenue



The portion of the River to the Sea Bikeway located within Wilmington city limits is operated and maintained by the City of Wilmington through its ordinances and policies. Maintenance is overseen by the City's Community Services and Public Services Departments. The portion of the bikeway located in Wrightsville Beach town limits is maintained by the Wrightsville Beach Planning and Parks Department and the Public Works Department. Management of the trail is overseen by the WMPO.

Volunteers may also be a resource in the maintenance of the facility. City and County staff are currently in the process of developing an Adopt-A Trail Program that seeks to form a community partnership between area volunteers and the City of Wilmington. The program provides volunteers with the opportunity to conserve and maintain our natural environment, promote civic responsibility and community pride and serves to fulfill a gap in the demand for maintenance and existing operational funding.

Adopt-A-Trail sponsors will consist of groups and organizations throughout the community. Each sponsor is responsible for general trail maintenance and upkeep of their designated trail segment.

The River to the Sea Bikeway continues to require initial upfront costs consisting of land acquisition, design, permitting, construction costs, as well as ongoing costs such as of operations and maintenance.

In Wilmington and surrounding areas, bikeway development occurs in phases, as funding becomes available either through public funding allocation, grant awards or private donations and sponsorships. Opportunities for project coordination with external organizations such as private developers, sponsorships and external funding partners are important components in planning and funding.

The cost to develop each segment can vary widely based upon certain variables including land acquisition or easement costs; the geography the segment will traverse; drainage patterns; the number and type of permits required; the number and type of traffic devices required; signage; amenities; and landscaping requirements.

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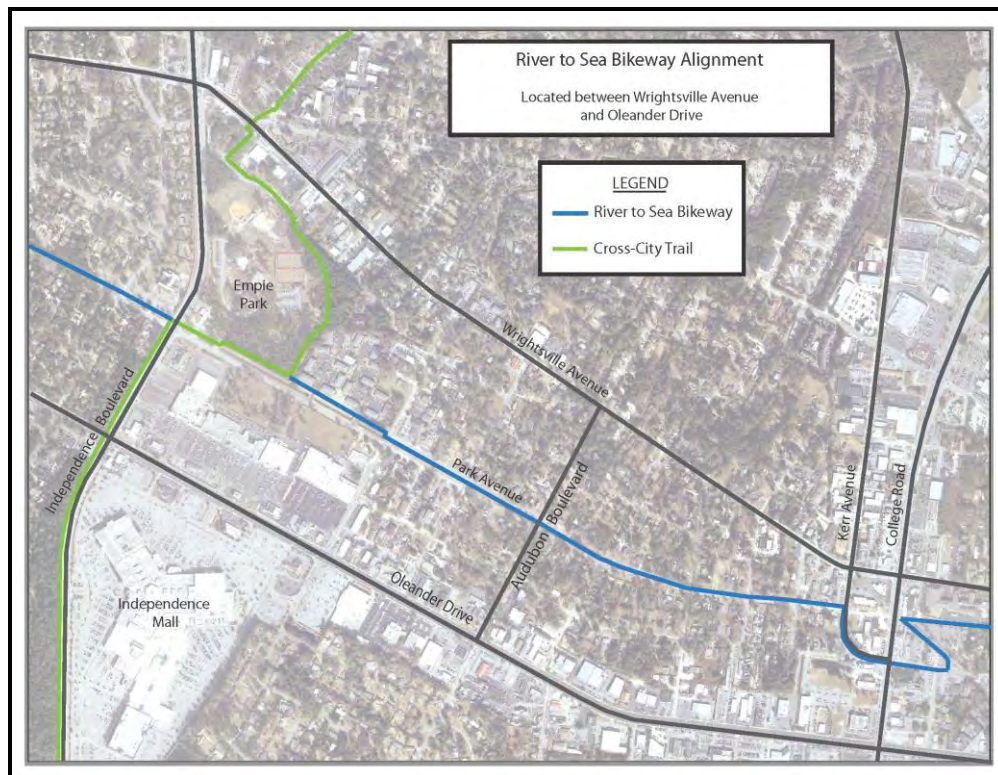
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## **Planning Framework**

The River to the Sea Bikeway, (WMPO Bike Route 1), is an 11-mile on-and off-road bicycle route that follows the Historic Beach Car Line. It is the west-east bicycle/pedestrian corridor in Wilmington and New Hanover County that connects downtown Wilmington to Wrightsville Beach on the Atlantic Ocean. The RTSB is a core west-east route which provides basic transportation in the Wilmington area a safer, more convenient and accessible option for every citizen. It intersects with the Gary Shell Cross-City Trail, which once completed will be a 15-mile multi-use trail providing bicycle and pedestrian access to numerous recreational, cultural and educational destinations in Wilmington and Wrightsville Beach. It also intersects with the East Coast Greenway, an off-road trail that will run all the way from Maine to Florida and will function like an “urban Appalachian Trail”.

Benefits of the RTSB include expanding commuting and recreational access to employment, retail, and recreational sites in Wilmington and Wrightsville Beach, thereby providing safety, mobility, environmental and economic benefits to the area. Additionally, the RTSB has the potential to reduce congestion, increase traffic efficiency, and improve health.



The River to the Sea Bikeway provides a safe cycling alternative to heavy vehicular traffic on Oleander Drive and Wrightsville Avenue

The City of Wilmington is nestled between the Cape Fear River and Atlantic Ocean. The historic district lies on the Cape Fear River and includes the Riverwalk and pocket parks as well as shops, restaurants and attractions. The City of Wilmington has 778 acres of public area maintained by the Community Services Department, including 532 acres of public parks, 116 acres of athletic facilities, 16 recreation facilities, 60 acres of greenways, 24 acres of landscaped areas and traffic calming devices, 38 play units, 202 miles of right-of-way, and five miles of medians. It is also home to the University of North Carolina Wilmington (UNCW).

The Town of Wrightsville Beach is located approximately 10 miles east of downtown Wilmington and covers an area of approximately 1.334 square miles. Its primary physical feature is a barrier island approximately 4.5 miles long with its beach strand maintained by the Town's Public Works Department. The Town's Planning and Parks Department maintains the public right-of-ways, 44 public beach accesses and numerous sound accesses, and approximately 23 acres of public park lands with athletic fields, playgrounds, tennis courts, amphitheatre, recreation center, and paddleboard/kayak launches. The Town also maintains a 2.45 mile community wide fitness trail known as "The Loop" which is used by many locals and visitors for running, walking, skating, or dog-walking.

The New Hanover County's Parks and Gardens division manages 2,800 acres of public lands. Of that total, 1,500 acres consists of parks, sporting areas, public spaces, and county owned properties including passive recreational lands. The remaining 1,300 acres consists of school campuses. Included in the New Hanover County system is Airlie Gardens, a historic landmark that encompasses 67 acres of quintessential Southern landscape. The Parks and Gardens Department provides quality programs in both indoor and outdoor spaces for County citizens and visitors through the operation of areas specifically designed for utilization by all age groups and user types. These departments work with other agencies and organizations to maximize the county resources throughout the New Hanover County area.

The Wilmington Metropolitan Planning Organization (WMPO) also provides guidance in the development of the River to the Sea Bikeway. The WMPO is the federally funded and federally mandated regional transportation planning agency for the lower Cape Fear region of southeastern North Carolina. The WMPO is composed of officials from New Hanover, Pender, and Brunswick County as well as many of the municipalities within including the City of Wilmington, the Town of Wrightsville Beach, Carolina Beach, Kure Beach, Belville, Leland, and Navassa as well as the Cape Fear Public Transportation Authority and the North Carolina Board of Transportation. The WMPO facilitates a cooperative, comprehensive and continuing transportation planning process that serves as the basis for the expenditure of all federal transportation funds in the region for streets, highways, bridges, public transit, intersections, and bicycle and pedestrian facilities. The WMPO relies on an appointed Bike and Pedestrian Advisory Committee for guidance on projects and policies related to bicycle and pedestrian activity. The WMPO commissioned a number of planning documents that have led to the support and advancement of the RTSB. The WMPO designated the bikeway as WMPO Bike Route 1 and the WMPO's Bicycle and Pedestrian Advisory Committee organizes the annual River to the Sea Bike Ride held on the first Saturday in May. The advisory committee also provides input on important issues such as design, safety and policy for bicycle facilities throughout the region.



## Guiding Principles

Although the majority of the River to the Sea Bikeway alignment has been determined by the historic beach car line, it is important to note that facility improvements will likely occur with existing infrastructure and future development, which at times, can make the alignment complex. The bikeway will become a significant part of Wilmington's culture and identity. In determining the best route for the bikeway, key principles should be established as guidance and evaluation tools. Given that the goal of the River to the Sea Bikeway is to provide residents and visitors with a facility for transportation, recreation/physical activity, and a downtown to the beach connection, the route should:

- Provide connectivity to established destinations;
- Provide a safe route with the least amount of conflicts;
- Minimize property impacts;
- Provide consistency with Wilmington, WMPO, Wrightsville Beach, and NCDOT planning practices and policies;
- ADA Accessible;
- In harmony with existing infrastructure;
- Represent good stewardship of the environment;
- Create a sense of place; and
- Meet all of the above criteria in a way that is politically acceptable.

During the design process, a number of factors are taken into consideration including:

- Topography;
- Right-of-way width;
- Drainage patterns;
- Utilities; and
- Intersection crossings.

In most cases, the bikeway will parallel the roadway off-set from the road or be located on road with bike lanes or sharrows. In locations where it is necessary because of limited right-of-way, utilities, environmental protection, or limitations due to private landownership, the greenway portion will be designed at back of curb. The path should have a maximum of five percent (5%) grade and a cross slope of two percent (2%) for drainage. The design will meet ADA standards.

## Relationship to Other Plans

The original concept for the River to the Sea Bikeway is explained in *The Trolley Trail: From the River to the Sea*, produced by the American Institute of Architects (AIA), Wilmington chapter. This document reflects the vision of a greenway connecting downtown Wilmington to Wrightsville Beach along the Historic Beach Line Trolley route. The document follows the simple premise: *wouldn't it be nice to ride a bike from downtown Wilmington to Wrightsville Beach?* The route has been greatly improved over the years through intermittent small projects to upgrade and improve small sections; but the route lacks a corridor-wide level of attention and consistency. As a result, the bikeway is a patchwork of streets, bike lanes, and paths that is not clearly organized. To complete the journey a cyclist must both enjoy a leisurely ride through separated paved trails and signalized crosswalks and navigate through intersections and over narrow bridges inches away from speeding cars.

The AIA document, *The Trolley Trail: From the River to the Sea*, divides the River to the Sea Bikeway into five zones and provides recommendations for improvements in each zone. These recommendations include a variety of bicycle and pedestrian facilities along the corridor including bike lanes, sidewalks, a greenway, bicycle and pedestrian bridges, intersection improvements and bike racks and benches at bus stops. It also includes a variety of facilities to enhance the bikeway including a sundial plaza at Colwell Avenue and Castle Street, a linear park along Park Avenue from College Road to Bradley Creek, an observation/fishing gazebo, kayak launch, kudzu exhibit, native plant beds, informational signage and public restrooms.

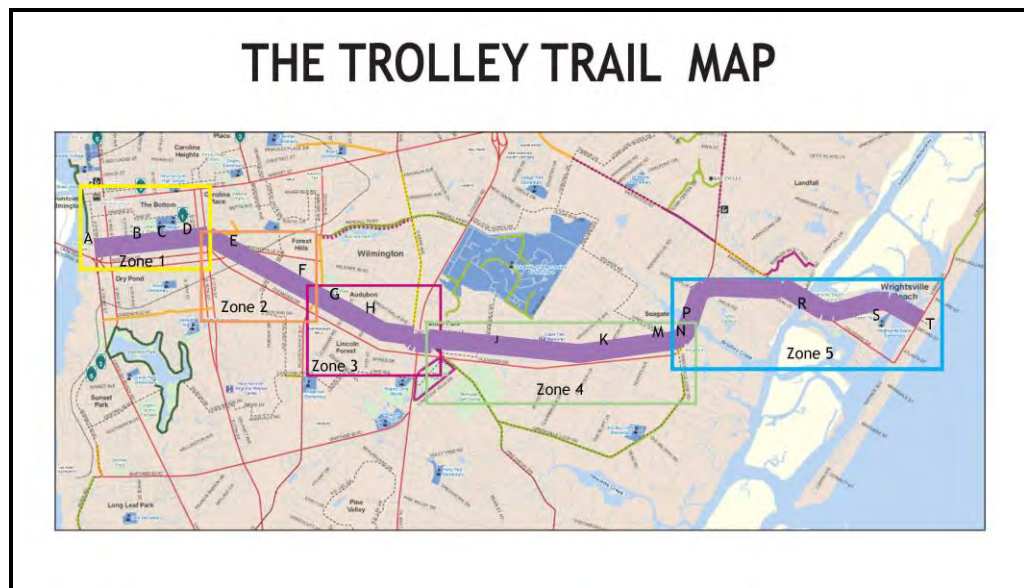


Image courtesy of American Institute of Architects Wilmington

*Cape Fear Commutes 2035 Transportation Plan* is the long range transportation plan for the urbanized area of Wilmington, North Carolina, prepared by the Wilmington Urban Area Metropolitan Planning Organization (WMPO). The plan establishes the goals and objectives for the improvement of travel conditions within the WMPO planning area and makes specific recommendations for transportation projects and funding sources. The *Cape Fear Commutes* Steering Committee received significant input from the cycling community, including detailed input from community surveys and open houses. The *Cape Fear Commutes* plan recommends increasing the security of the transportation system network for both motorized and non-motorized users and to construct several prioritized projects including the River to the Sea Bikeway. The RTS bikeway received prioritization because it is recognized as a regional trail and corridor. The following prioritized projects are located along the River to the Sea Bikeway:

- Priority #20 Park Avenue greenway-use path from Independence to Audubon Boulevard
- Priority #31 Pelican Drive greenway from Heidi Trask Bridge to N. Lumina Avenue
- Priority #34 Oleander Drive greenway from Greenville Avenue to Wrightsville Avenue
- Priority #39 Park Avenue greenway from Peachtree Avenue to Wallace Avenue
- Priority #41 NC Boat Ramp greenway from Old Causeway to Pelican Drive
- Priority #46 Park Avenue greenway from S. 52<sup>nd</sup> Street to Hinton Avenue
- Priority #59 Park Avenue greenway from Audubon Boulevard to S. Kerr Avenue

*Walk Wilmington: A Comprehensive Pedestrian Plan*, adopted by the Wilmington City Council in 2009, was developed to meet the demands for safer and more extensive pedestrian facilities, including greenways, sidewalks, and crosswalks. The comprehensive pedestrian plan is designed to guide local, regional, and state efforts to improve conditions for walking in the City of Wilmington. Walk Wilmington identifies and recommends the completion of the River to the Sea Bikeway. It specifically identifies the need for pedestrian signals to be added to the following existing signals along the bikeway:

- Castle Street and South 16<sup>th</sup> Street
- Castle Street and South 17<sup>th</sup> Street
- Oleander Drive and Airlie Road/Wrightsville Avenue
- Oleander Drive and Wrightsville Avenue
- Eastwood Road and Wrightsville Avenue

The WMPO, City of Wilmington and New Hanover County recently completed the *Wilmington/New Hanover County Greenway Plan*, a comprehensive plan which will serve as a blueprint for future greenway and blueway networks in New Hanover County. The River to the Sea Bikeway represents one of three primary bicycle/pedestrian corridors in the emerging greenway system. Planning for the undeveloped segments of the bikeway is included in the plan. The Greenway Plan recommends facility improvements along the RTSB route and prioritized the River to the Sea Bikeway second among the trails within Wilmington city limits and third among trails at Wrightsville Beach. The Greenway plan recommends seven intersection improvements along the bikeway:

- Park Avenue and Independence Boulevard
- Wrightsville Avenue and Wallace Avenue
- Greenville Loop Road and Oleander Drive
- Military Cutoff Road and Wrightsville Avenue
- Wrightsville Avenue and Eastwood Road
- Causeway Drive and Salisbury Street
- Salisbury Street and Lumina Avenue

Other plans discuss the need for the River to the Sea Bikeway and support the concept of the bikeway. Some of this information can be found in the public input section of this plan.

### **Interaction with Existing Bicycle and Pedestrian Networks**

An important consideration in the planning of the River to the Sea Bikeway is to identify opportunities for connectivity to existing and future trails. Portions of the River to the Sea Bikeway overlap with the Gary Shell Cross-City Trail and the East Coast Greenway. The Cross-City Trail is primarily an off-road multi-use trail which provides bicycle and pedestrian access to numerous attractions in and around Wilmington. It is an ideal facility for local casual recreationalists and families who enjoy walking, biking, jogging, skateboarding and rollerblading.



Cross-City Trail map, published Spring 2012

The East Coast Greenway is another primary bicycle corridor that traverses Wilmington and New Hanover County. It is a developing trail system, spanning nearly 3,000 miles between Canada and Key West, linking major cities of the eastern seaboard. Currently the spinal route enters Wilmington from the west coming over the Cape Fear River. The coastal route enters Wilmington from the east along Military Cutoff Drive. The two routes converge along the Cross-City Trail and the alignment goes through the southern portion of New Hanover County, taking the ferry from Fort Fisher to Southport and going towards South Carolina.



East Coast Greenway alignment showing spinal route through Wilmington



## **External Agency Coordination**

Portions of the RTSB were funded through various sources to include City of Wilmington Capital Improvement Program and State Transportation Improvement Program as well as maintenance and operations budgets. Several improvements were funded by external agencies in the form of grants.

Along the Ann Street portion of the RTSB, improvements funded by the North Carolina Health and Wellness Trust Fund through a “Fit Community” Grant were branded “the Ann Street Bicycle Boulevard”. The goal of the Fit Community grant is to provide opportunities for physical activity while improving access to healthy foods. A Fit Community Task Force was established to implement the goals and objectives of the project. The task force included City of Wilmington Transportation Planning, City of Wilmington Engineering, City of Wilmington Police Department, the Obesity Prevention Initiative, New Hanover County Planning and Inspections Department, New Hanover County Health Department, Safe Kids Cape Fear, Cape Fear Cyclists, the Residents of Old Wilmington and the Bottom Neighborhood Association. In 2009, the \$60,000 grant funded the construction of the bicycle boulevard from Riverfront Park to the Colwell Avenue Greenway; design work for intersection improvements at Ann Street and South 5<sup>th</sup> Avenue; multiple bike racks; two information kiosks with literature boxes; supplies and materials for ten community events to promote the bicycle boulevard; and wayfinding signage.

A separate project branded “the Colwell Avenue Greenway” completes the next portion of the RTSB. The Colwell Avenue Greenway was funded by an “Eat Smart Move More” grant in 2010 through the North Carolina Department of Public Health and the City of Wilmington. The goal of “Eat Smart Move More” is to improve communities by providing opportunities to eat smart and move more. An Eat Smart Move More Task Force was established to implement the goals and objectives of the project. The task force includes the New Hanover County Health Department, City of Wilmington Transportation Planning, City of Wilmington Engineering, the Obesity Prevention Initiative, Safe Kids Cape Fear, and Cape Fear Cyclists. The \$25,000 grant funded the construction of a greenway along Colwell Avenue to connect from the Ann Street Bicycle Boulevard to the existing greenway on the River to the Sea Bikeway. It also funded two community events to promote the new path. These events included bicycle safety training, helmet fittings, and a healthy cooking demonstration.

## **Benefits of Bikeways and Greenways**

Bikeways and greenways provide “green” (non-polluting) infrastructure that links people to places while preserving open space. As recreational areas, they provide opportunities for exercise, wellness and physical recreation such as walking and biking. As transportation networks, bikeways and greenways provide safe convenient alternatives to motorized travel and have the potential to reduce traffic congestion. Additionally, positive impacts to the environment can be significant – as multi-modal transportation increases, air quality improves. Socially, greenways provide opportunities to connect people and neighborhoods.

Bicycling is economically advantageous to individuals in regards to cost savings associated with bicycle travel and potential health care costs. It is also advantageous to communities as bicycle infrastructure projects are generally far less expensive than automobile-related infrastructure. For approximately \$50 million, the price of a single mile of four-lane urban highway, hundreds of miles of

bicycle and pedestrian infrastructure can be built<sup>1</sup>. Also, shifting daily trips by vehicle to trips by bicycle reduces the impact on the region's transportation network, reducing the need for maintenance, improvement and expansion projects.

The City of Wilmington and New Hanover County recognize the importance of bikeways and greenways and the positive impacts these facilities have on economic development. Bikeways and greenways have many effects on the local economy including positive impacts on tourism, special events, urban redevelopment, community improvement, health care savings, economic investment, and general consumer spending. There is an increasing body of studies showing that greenways improve local economies. In many communities, greenways and other bicycle and pedestrian improvements have proven to raise property values and increase tourism and recreation-related revenues. In a 2002 survey of recent home buyers sponsored by the National Association of Home Builders, trails ranked as the second most important community amenity out of a list of 18 choices. The City of Boulder, Colorado purchased a greenbelt for approximately \$1.5 million. The overall value of the Greenbelt was \$5.4 million which contributed potentially \$500,000 annually to overall property tax revenue for the neighborhood where the greenbelt was located, allowing a return on the investment for the project costs in three years<sup>2</sup>

Portland, Oregon, the first major city to achieve Platinum Bicycle Friendly Community Status, was estimated to have a \$90 million bicycle-related economy in 2008. This represents a 38% increase since 2006.<sup>3</sup> A 2006 study conducted by the Wisconsin Department of Transportation and the Bicycle Federation of Wisconsin estimates that the bicycle-related sector contributes \$556 million to the Wisconsin economy annually. This estimate does not include the economic benefits derived from bicycle tourism, which is reported to constitute a significant portion of the state's \$11.7 billion in the tourism sector.<sup>4</sup>

Greenville, South Carolina reports that trail-based tourism is providing a variety of economic advantages to their community in their report *Greenville Health System, Swamp Rabbit Trail: Year 2 Findings*. In Year 1 a total of nine managers/owners of retail businesses directly abutting and/or within close proximity to the Greenville Health System Swamp Rabbit Trail (GHS SRT) were interviewed. Most businesses reported increases in sales/revenue ranging from 30% to as high as 85%. Twenty managers/owners were interviewed in Year 2, including five retail bicycle shops. The majority of the businesses surveyed in Year 2 reported increases in sales/revenue ranging from 5% to as high as 100% (avg.=47%). Five new businesses decided to open as a result of the trail being built and/or changing

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<sup>1</sup> Gotschi T, Mills K. Active transportation for America. 2008; *Rail Trail Conservancy: 1-44*.

<sup>2</sup> Geoghegan J, Lynch L, Bucholtz S. Capitalization of open spaces into housing values and the residential property tax revenue impacts of agricultural easement programs. *Agricultural and Resource Economics Review*. 2003; 23(1): 33-45.

<sup>3</sup> "The Value of the Bicycle-Related Industry in Portland." Alta Planning + Design. 2008.

<sup>4</sup> "The Economic Impact of Bicycling in Wisconsin." Bicycle Federation of Wisconsin and WI DOT, 2006. <http://www.dot.wisconsin.gov/business/econdev/docs/impact-bicycling.pdf>

location(s) because of their desire to be closer to the trail. Businesses that relocated observed a 30% to 90% increase in sales in Year 2.<sup>5</sup>

A recent study entitled *Using Pedestrian and Bicycle Infrastructure: A National Study of Employment Impacts* examined data from departments of transportation and public works departments from eleven cities in the United States. After evaluating 58 separate projects, the report shows that bicycling infrastructure, such as bike lanes, creates the most jobs for a given level of spending – for each \$1 million spent, the bicycle projects create 11.4 jobs within the state where the project is located. Pedestrian-only projects, such as sidewalks, create an average of about ten jobs per \$1 million invested. Multi-use trails create 9.6 jobs per \$1 million invested. Infrastructure that combines road construction with pedestrian and bicycle facilities create fewer jobs than pedestrian and bicycle projects. Automobile-only road projects create the least number of jobs per \$1 million spent -7.8 jobs.<sup>6</sup>

### **History of the Bikeway Corridor**

At the turn of the 20<sup>th</sup> century, Wilmington was the largest city in North Carolina. Like many other sizable cities of the time, Wilmington had an electric trolley system that replaced the horse-drawn railways of the previous century. The city trolleys serviced the downtown area. In 1902, Hugh McRae purchased the trolley system, adding a very popular electric trolley to Wrightsville Beach along the tracks of an earlier railway. However, by 1940 the automobile had taken over as the predominant transportation option and the entire trolley system was closed. The wide right-of-way of the trolley that ran from downtown Wilmington to Wrightsville Beach remained and was converted to park blocks, roadways and drainage ditches. The River to the Sea Bikeway alignment follows this historic beach car line.

The River to the Sea Bikeway functions as Wilmington/New Hanover County's main west-east bicycle corridor. It performs a recreation-transportation function, allowing for bicycle-based access to parks, educational, commercial and cultural destinations. By paralleling Oleander Drive, the RTSB is uniquely situated to bicycling activity. As one of New Hanover County's major commercial corridors, Oleander Drive is both attractive to cyclists as a major trip-generator (Oleander Drive has many necessary and/or attractive destinations) and a repellent as a fast-moving 45 mph facility that sees approximately 30 thousand vehicles per day. By paralleling a major facility like Oleander Drive, the RTSB is able to provide bicycle-based access to destinations along Oleander Drive ("through the back door") while enabling cyclists to remain on a facility that is more geared towards safe and easy bicycling.

### **Geographic Description**

New Hanover County is located in the southeastern portion of North Carolina. Wilmington and New Hanover County are bound by the Cape Fear River on the west and the Intracoastal Waterway and/or the Atlantic Ocean to the east. Wilmington covers approximately 54.3 square miles or 27.4 % of the land in New Hanover County.

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<sup>5</sup> Reed, Julian A. "Greenville Health System Swamp Rabbit Trail: Year 2 Findings." 2013.

<sup>6</sup> Garrett-Peltier H. Pedestrian and bicycle infrastructure: A national study of employment impacts. Political Economy Research Institute. 2011.

The topography of the area is relatively flat with elevations typically around 38-40 feet above sea level or less. The low-lying, flat terrain is characterized by sandy soils covered with loblolly and long leaf pines and various species of hardwood trees. There are numerous creeks, rivers, and lakes in and around the Wilmington area supporting large expanses of freshwater and coastal wetlands and bottomland swamps.

The River to the Sea Bikeway's alignment varies from the densely populated Central Business District of downtown Wilmington, through the urban core, through traditional suburban areas, and automobile-oriented suburban areas. The alignment traverses primarily through commercial areas, interspersed with residential neighborhoods and municipal parks on its way to Wrightsville Beach and the Atlantic Ocean. The River to the Sea Bikeway begins at the foot of Market Street at the Cape Fear River where the Wilmington Riverwalk winds along the eastern bank of the River. From west to east the bikeway can be broken into the following sections. The following provides a description, proposed facilities and existing facilities:

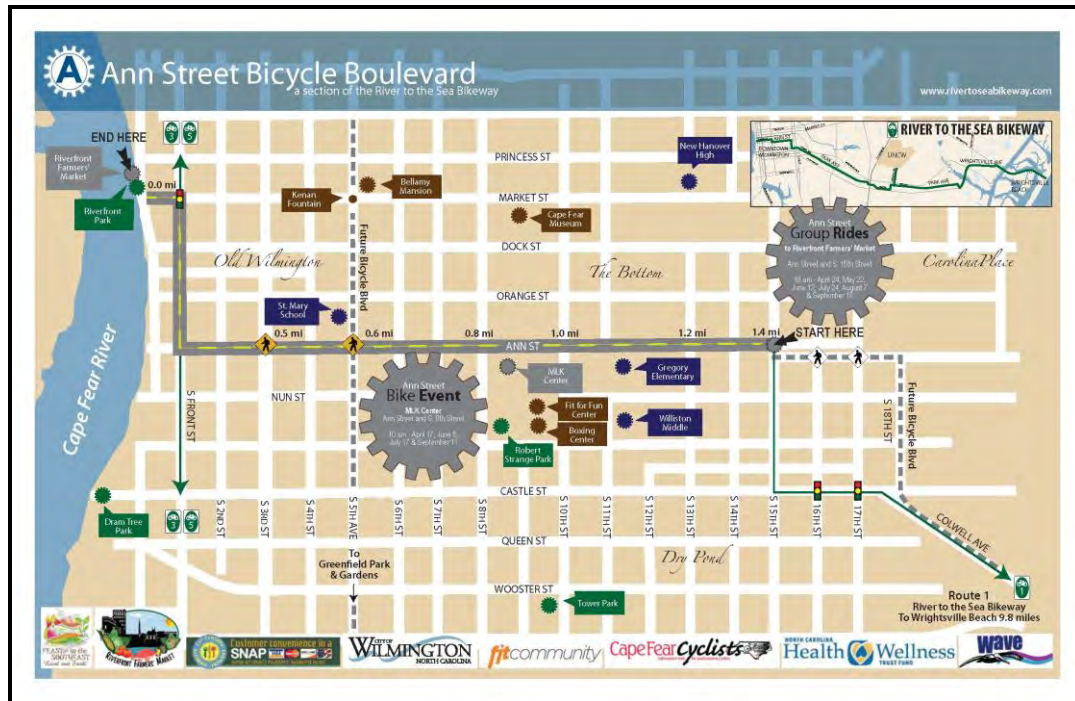
#### Ann Street Bicycle Boulevard

The Ann Street Bicycle Boulevard joins the River to the Sea Bikeway one block east of the Cape Fear River. Completed in 2010, it is the first bicycle boulevard in North Carolina. It is located in downtown Wilmington, beginning at Riverfront Park on the Cape Fear River. The bicycle boulevard concept, which originated in Berkeley, California, is a strategy whereby bicycles are given priority over motor vehicles on an existing roadway corridor. The creation of the bicycle boulevard involved both policy changes and infrastructure improvements including curb extensions, alley resurfacing, high-visibility crosswalks, pavement markings, and signage. Although the bicycle boulevard is complete, its functionality could be improved by closing the intersection at Ann Street and South 5<sup>th</sup> Avenue.

The bicycle boulevard connects the historic neighborhoods of Ardmore, the Bottom, Brookwood, Carolina Place, Forest Hills and Old Wilmington to Williston Middle School, Gregory Elementary School, Fit for Fun Center, Sherridale Morgan Physical Fitness and Boxing Center, Robert Strange Park, Martin Luther King, Jr. Recreation Center, downtown Wilmington and the Riverfront Farmers' Market.

Specifically, the bicycle boulevard follows South Front Street from Market Street to Ann Street then turns east on Ann Street. It follows along Market Street, South Front Street, Ann Street, South 15<sup>th</sup> Street and South 13<sup>th</sup> Street and Castle Street ending at Colwell Avenue. At Ann Street and South 3<sup>rd</sup> Street, a rectangular rapid flash beacon has been located to assist pedestrians and cyclists crossing this busy intersection. When traveling east, there is an alternative option of taking South 13<sup>th</sup> Street to Castle rather than South 15<sup>th</sup> Street to Castle Street. This allows cyclists to use the traffic signal at South 13<sup>th</sup> and Castle Street to make a left onto Castle Street when traveling east on the bicycle boulevard. Intersection improvements are recommended at South 13<sup>th</sup> Street and Castle Street to facilitate this movement. When traveling west on the bicycle boulevard, cyclists can easily turn right on South 15<sup>th</sup> Street or South 13<sup>th</sup> Street to connect to Ann Street.

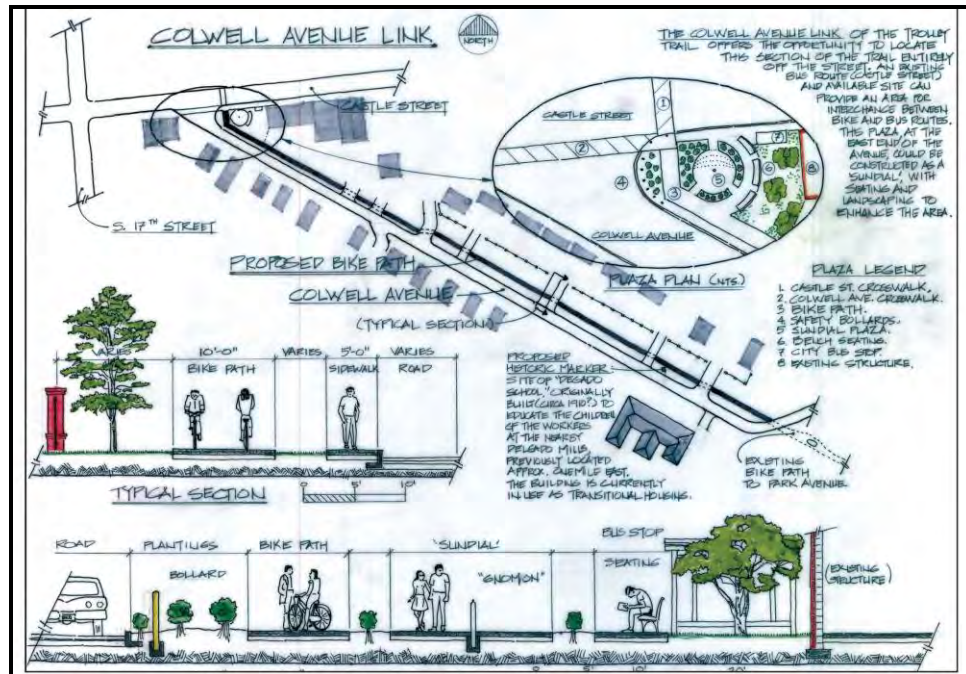




Ann Street Bicycle Boulevard maps, published Summer 2010 for bike events and group rides  
 Note: The Ann Street Bicycle Boulevard has since expanded to include S. 13<sup>th</sup> Street and Castle Street to Colwell Avenue

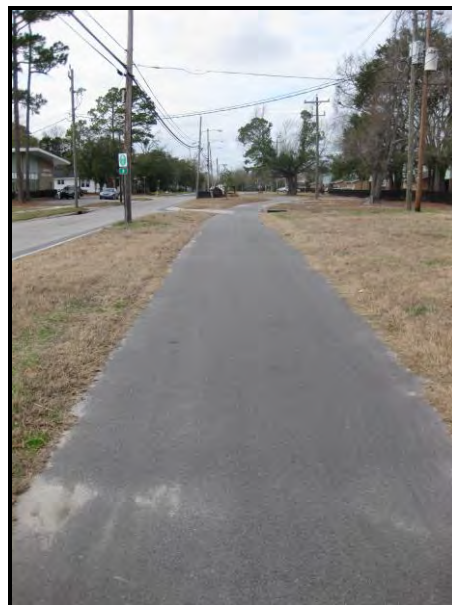
### Colwell Avenue Greenway

Traveling east from the Ann Street Bicycle Boulevard, sharrows are recommended along Castle Street from S. 15<sup>th</sup> Street to Colwell Avenue. Intersection improvements are recommended at Castle Street and S. 16<sup>th</sup> Street and Castle Street and S. 17<sup>th</sup> Street. There is a missing connection from Castle Street to S. 19<sup>th</sup> Street of approximately 924 feet. The intersection of Castle Street and Colwell Avenue is currently angled. It is recommended that a sundial plaza be constructed at the corner of Castle Street and Colwell Avenue in the existing right-of-way. This will allow for a perpendicular intersection alignment. A greenway is recommended to extend from the intersection to the existing greenway on Colwell Avenue at South 19<sup>th</sup> Street.



Design courtesy of American Institute of Architects Wilmington

The existing Colwell Avenue Greenway extends from South 19<sup>th</sup> Street along a wide right-of-way in front of the Vesta Village neighborhood to Kent Street. It continues as a greenway, as it is located behind and between commercial and residential areas. It crosses Dawson Street with an existing marked crosswalk and pedestrian refuge island and the path ends at Camellia Drive.



Colwell Avenue Greenway in front of Vesta Village

### Park Avenue to Independence Boulevard

The Colwell Avenue Greenway terminates at Camellia Drive and Park Avenue, at this point the bikeway uses on-road facilities for a short segment. Sharrows are needed to designate the on-road portions of the RTSB along Park Avenue in the Forest Hills neighborhood. A crosswalk is needed at the intersection of Park Avenue and Country Club Road. Park Avenue is split into two streets at Country Club Road by a very wide median which is heavily landscaped with trees and shrubs. This wide median is actually the original historic beach car line corridor. Sharrows on the northernmost Park Avenue are needed from Country Club Road to Forest Hills Drive.

Park Avenue remains split into two roadways until its intersection with Hawthorne Road/Forest Hills Drive. Crossing improvements are needed at this intersection. Following eastward, there is an existing greenway from Hawthorne Road to Independence Boulevard, providing a connection from the RTSB to the Cross-City Trail at Independence Boulevard. Intersection improvements serving the RTSB corridor have been made to accommodate the Cross-City Trail through the intersection of Park Avenue and Independence Boulevard.

### Independence to South Kerr Avenue

Traveling eastward from Independence Boulevard, the River to the Sea Bikeway follows the existing greenway from Independence Boulevard to the southeast corner of Empie Park. While current bikeway users make-do with riding on-road alongside motorized vehicles on the bumpy pavement of Park Avenue, a future greenway facility is needed to extend from the Cross-City Trail paralleling the length of Park Avenue to Kerr Avenue. From the edge of Empie Park to Floral Parkway a wide right-of-way has been retained by the City from the historic beach line corridor and is used for drainage. At Floral Parkway, Park Avenue splits again creating a wide median. The proposed greenway will meander through this right-of-way to include winding by the Audubon Trolley Stop at the intersection of Audubon Boulevard and Park Avenue. The Audubon Trolley Stop is the only surviving structure along the Trolley line and is listed on the National Register of Historic Places. It is of major historical and symbolic importance to the River to the Sea Bikeway.



Historic Beach Car Line circa 1911 - 1940

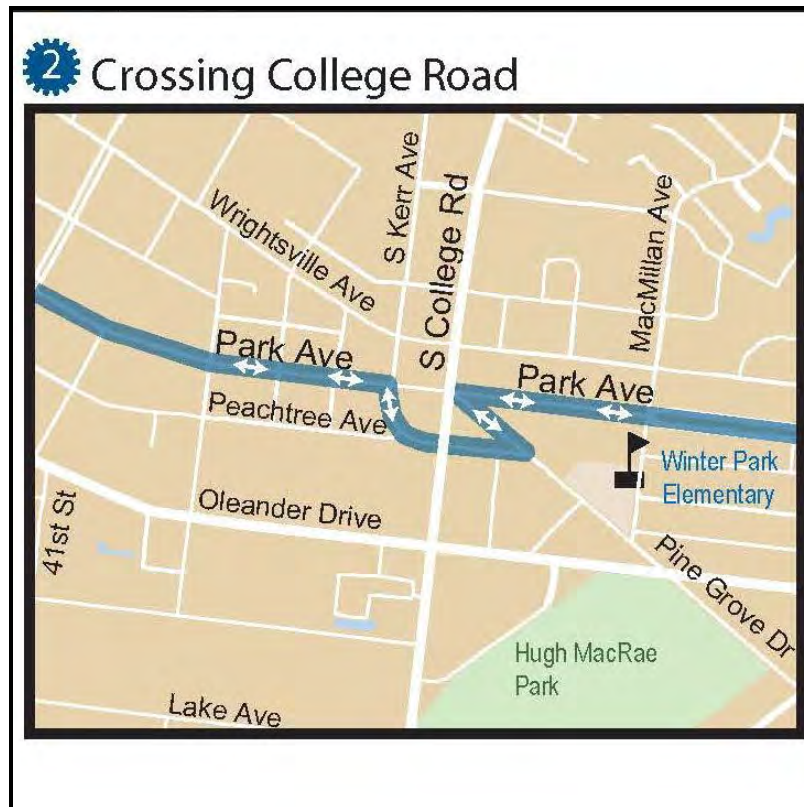


East of Audubon Boulevard, Park Avenue comes together as one street rather than two with a wide median. The proposed path will continue along the wide right-of-way on the north side of Park Avenue until South Kerr Avenue.

#### South Kerr Avenue to MacMillan

Historically, the River to the Sea Bikeway route crosses at the busy intersection of South College Road and Park Avenue. It is not recommended for the bikeway to cross S. College at Park Avenue because this intersection is not signalized. However, one block south of Park Avenue is a signal with a signalized push-button pedestrian crosswalk at Peachtree Avenue and S. College Road.

The proposed greenway along Park Avenue will terminate at South Kerr Avenue. Bicycle lanes are recommended along South Kerr Avenue from the terminus of the greenway on Park Avenue to Peachtree Avenue. Bicycle lanes are recommended along Peachtree Avenue to South College Road. Existing push-button pedestrian signals at the intersection of Peachtree Avenue and South College Road allow bicyclists and pedestrians to cross South College Road safely. Bike lanes are recommended on the east of S. College Road along Peachtree Avenue, ending at Pine Grove Drive. Sharrows are recommended along Pine Grove Drive from Peachtree Avenue to Park Avenue, continuing on Park Avenue from Pine Grove Drive to MacMillan Avenue.



Recommendation for crossing South College Road

### MacMillian to Greenville Avenue

Continuing east along the River to the Sea Bikeway, Park Avenue, again, splits into two streets with a wide median again beginning at MacMillian Avenue continuing to Wallace Avenue. Similar to the western portion of Park Avenue, this creates a very wide median heavily landscaped with trees and shrubs where the historic beach car line previously existed. A crosswalk is recommended at the intersection of MacMillian Avenue and Park Avenue. Sharrows are recommended along the southern Park Avenue from MacMillian to Wallace Avenue.

Wallace Avenue provides a connection to UNCW by crossing Wrightsville Avenue, and following Barefoot Drive to connect to the existing bike lanes on Wood Dale Drive. Sharrows are recommended on Wallace Avenue from Park Avenue to Barefoot Drive and Barefoot Drive to Wood Dale Drive. Intersection improvements are recommended at Wallace Avenue and Wrightsville Avenue.

Continuing east along the River to the Sea Bikeway, the two streets of Park Avenue converge to become one road again at Wallace Avenue. A crosswalk is needed at this intersection. A greenway exists on the north side of Park Avenue from Wallace Avenue to Pine Street. Park Avenue terminates at Pine Street and continues again at South 52<sup>nd</sup> Street. An existing greenway connects the two roads.

A connection from the River to the Sea Bikeway to University of North Carolina Wilmington (UNCW) is made by way of Donna Avenue at Park Avenue. There is an existing greenway along Donna Avenue to Wrightsville Avenue, and bike lanes for a short distance on Wrightsville Avenue connecting to bike lanes on Wood Dale Drive. Wood Dale Drive provides a direct connection to UNCW.



Greenway connecting Pine Street to Hinton Drive

At South 52<sup>nd</sup> Street, Park Avenue continues eastward. A greenway is recommended on the south side of Park Avenue from South 52<sup>nd</sup> Street to Hinton Avenue. Crosswalks are recommended at the intersection of Park Avenue and Hawthorne Drive, Park Avenue and French Road, and Park Avenue and Hinton Avenue.

A new City park will be located along Hinton Avenue about 650 feet away from the River to the Sea Bikeway. As a spur to the bikeway, bike lanes and sidewalks are recommended to connect the park to the bikeway, along Hinton Avenue from Park Avenue to Mariner Lane.

From Hinton Avenue to Myrtle Avenue a greenway is recommended on the south side of Park Avenue. From Myrtle Avenue to Greenville Avenue a greenway is recommended on the north side of Park Avenue. Crosswalks are recommended at the Myrtle Avenue intersection to accommodate these facilities.

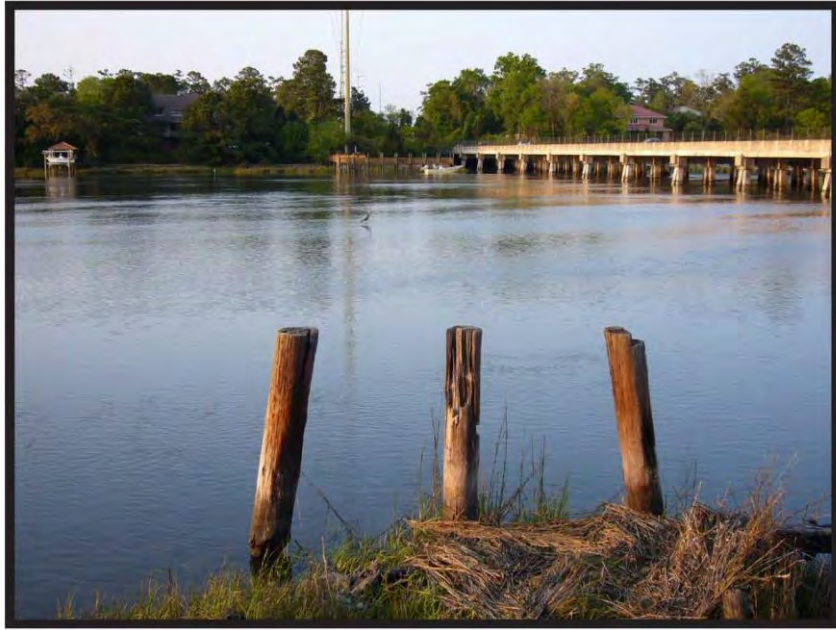
#### Greenville Avenue to Wrightsville Avenue

Currently, the designated River to the Sea Bikeway alignment follows Greenville Avenue from Park Avenue to Oleander Drive. At this intersection, bicyclists turn north onto Oleander Drive. Intersection improvements are recommended at Oleander Drive and Greenville Avenue. Oleander Drive has a wide outside shoulder, however it is recommended that cyclists ride with caution as this is a high volume, high speed roadway. This route also crosses the Bradley Creek Bridge. The existing designated route continues along Oleander Drive to Wrightsville Avenue using the wide outside shoulders.

An alternative to Oleander Drive is for bicyclists to turn northwest on Greenville Avenue then turn northeast on Wrightsville Avenue to the Oleander Drive/Military Cutoff/Airlie Road intersection. Bike lanes are recommended along Greenville Avenue from Oleander Drive to Wrightsville Avenue and along Wrightsville Avenue from Greenville Avenue to Oleander Drive/Military Cutoff Road. Intersection improvements are recommended at Greenville Avenue and Wrightsville Avenue to create this alternate route. Bicyclists would cross that intersection at the proposed crosswalk, then continue east along Wrightsville Avenue.

To better accommodate bicycle and pedestrian traffic a pedestrian bridge is recommended to cross Bradley Creek. This realignment would begin with a crosswalk at the intersection of Park Avenue and Circular Drive, where Park Avenue currently terminates. Circular Drive terminates at Bradley Creek east of the existing Bradley Creek Bridge/Oleander Drive. A non-motorized bicycle and pedestrian bridge is recommended from Circular Drive to the opposite side of Bradley Creek. This path is also the path of the historic beach car line where the pilings from the historic beach car bridge can still be seen.





Terminus of Circular Drive at Bradley Creek

On the north side of Bradley Creek, a greenway is recommended to the west of Oleander Drive until the Wrightsville Avenue/Airlie Road and Oleander Drive intersection. Crosswalks with pedestrian signals are recommended at this intersection. The proposed bikeway alignment will cross from the west side of Oleander Drive to the east side using this intersection improvement. A greenway is recommended along the east side of Oleander Drive that will veer east with Wrightsville Avenue.

#### Wrightsville Avenue

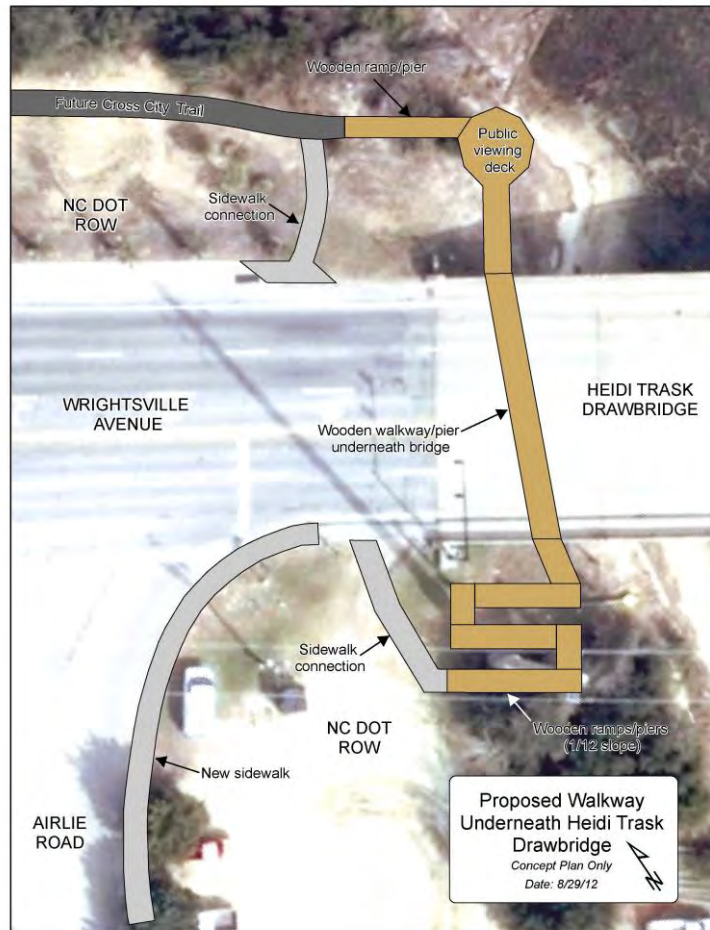
A greenway is recommended along the south side of Wrightsville Avenue to Airlie Forest Court. A Crosswalk is recommended at Wrightsville Avenue and Airlie Forest Court. This will accommodate the proposed greenway converging into the existing bike lanes that continue along Wrightsville Avenue.



Existing bicycle lanes on both sides of Wrightsville Avenue

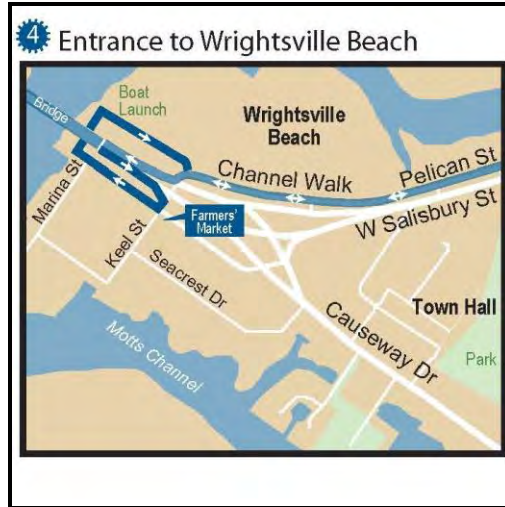
### Eastwood Road to Heide- Trask Bridge and the Wrightsville Beach Boat Launch

From Wrightsville Avenue, the designated bikeway turns east onto Wrightsville Avenue where Eastwood Drive terminates. This intersection will have crosswalks with pedestrian signals. The Cross-City Trail will be constructed on the north side of Wrightsville Avenue to the Heide-Trask Bridge, terminating at Airlie Road. For the safety of bicyclists traveling east on the north side of Wrightsville Avenue, a path will be constructed that will go under the Heide-Trask Bridge to the other side of Wrightsville Avenue. This will allow bicyclists to travel in the correct direction while crossing the Heide-Trask Bridge. Sharrows are recommended on the Heide-Trask Bridge extending to Keel Street to accommodate bicyclists.



Conceptual design of walkway under Heide Trask Bridge

Once the Heide-Trask Bridge is crossed, bicyclists and pedestrians turn south on Keel Street and west on Old Causeway Drive to follow the road under the Heide-Trask Bridge. Sharrows are recommended on Marina Street under the Heide-Trask Bridge. The designated bikeway turns east through the boat launch.



#### Navigating the East Side of the Heide Trask Drawbridge

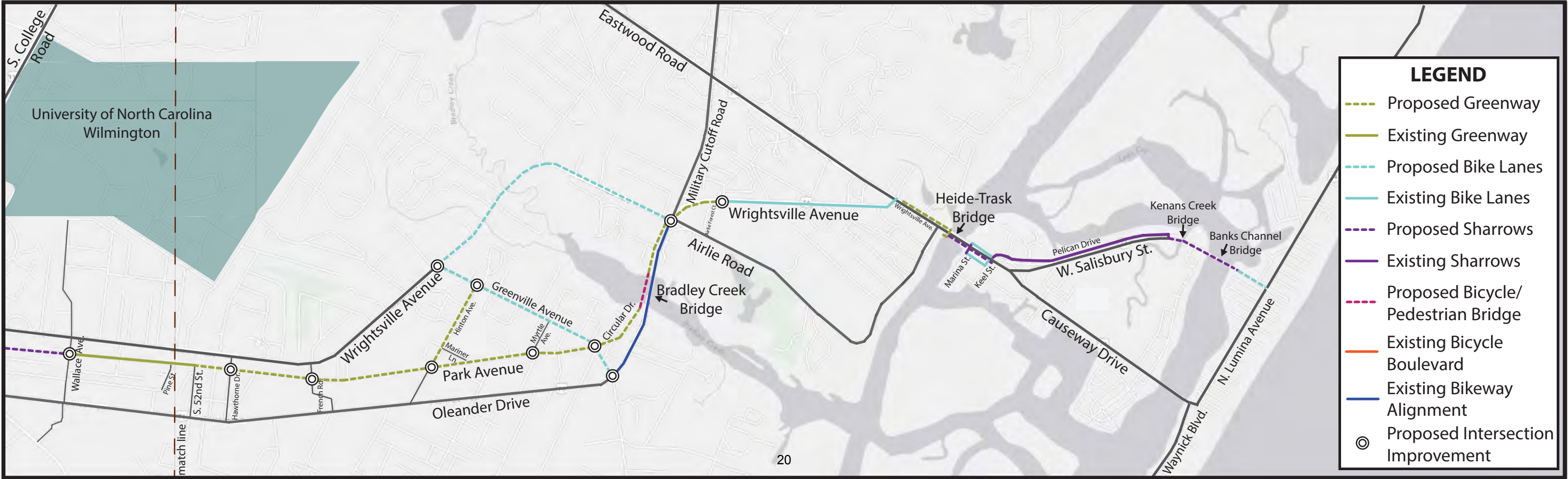
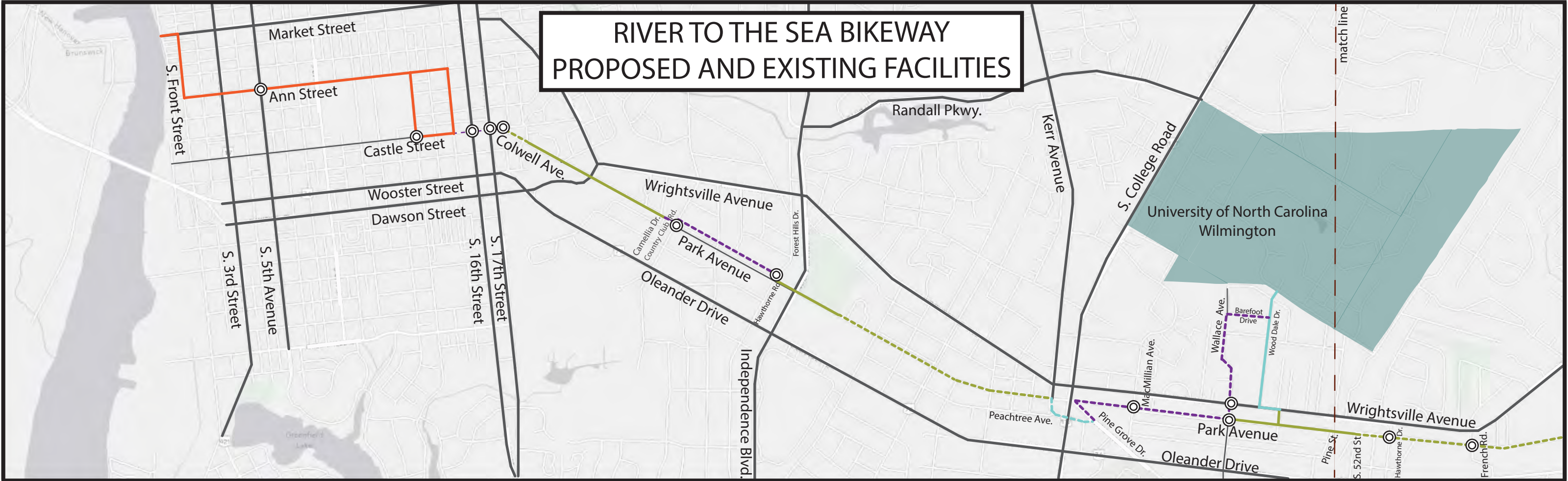
##### Pelican Drive to Salisbury Street ending at Johnnie Mercer's Pier

From the boat launch, the River to the Sea Bikeway follows the existing sharrows along Pelican Drive. Pelican Drive parallels West Salisbury Street before it crosses Kenan's Creek Bridge. At the last connection to West Salisbury Street before the Kenan's Creek Bridge, the bikeway turns right to access West Salisbury Street. Sharrows are recommended from Pelican Drive to Kenans Creek Bridge. From Kenans Creek Bridge to the east side of Banks Channel Bridge, restriping for wide-outside lanes and sharrows are recommended. With future bridge replacement projects, a five-foot sidewalk and six-foot bicycle lanes are recommended on both bridges, with bike lanes connecting the bridges. Bike lanes are recommended from the east side of Banks Channel Bridge to N. Lumina Avenue. The designated bikeway continues along West Salisbury Street through the intersection of North Lumina Avenue where the River to the Sea Bikeway terminates at Johnnie Mercer's Pier.



Existing sidewalk along Banks Channel Bridge





## Land Acquisition

As a general guideline, the River to the Sea Bikeway is located primarily within existing right-of-way along the historic beach car line. When it is necessary to acquire easements, the City of Wilmington's philosophy is to work with land owners from a "willing seller" approach. Instances in which it may be necessary to acquire easements from private property owners may include insufficient right-of-way, conflicts with existing roadway curb limits, or environmental impacts.

An inventory of required bikeway parcels is recommended and should be maintained so that the City and Town can maintain a good relationship with the land owners and maintain communication. The "willing seller" approach means that the City and Town engage the property owner in discussions and negotiations that allow for maximum flexibility. Terms of the easement may vary depending upon the goal of the landowner and the characteristics of the specific property. Negotiations may include the following alternatives:

- Aligning the bikeway to utilize portions of the property that have marginal development potential such as road frontage or land adjacent to wetlands or floodplains;
- Acquiring the easement through developer negotiations that may include redevelopment incentives;
- Negotiate with the landowner/developer to secure easement dedications in advance of development;
- Other mitigation alternatives;
- Negotiating a donated easement which normally qualifies as a charitable contribution, entitling the donor to a charitable income tax deduction for the easement's value; and
- Other nonfinancial benefits include a landowner being able to leave land that's going to be open into perpetuity while still remaining in a family's ownership.

## **Public Involvement**

The importance of seeking public input on the bikeway from a variety of sources and methods cannot be understated. Information sought from the public includes:

- How well the community needs for open space are being met;
- How well the community needs for connectivity and mobility are being met;
- How well the community needs for the number and type of bicycle and pedestrian facilities are being met;
- What priorities the community values in the alignment of the trail; and
- What amenities the community values in the alignment of the trail.

A multi-tiered approach to obtaining public input is necessary in an attempt to ensure the process is comprehensive, inclusive and transparent. Public input on bicycle and pedestrian facilities along the River to the Sea Bikeway has been obtained through public surveys, meetings with stakeholder groups, and public workshops for the *Wilmington New Hanover County Greenway Plan*, the *City of Wilmington 2010-2015 Parks, Recreation and Open Space Master Plan*, the *2013-2018 Parks, Recreation and Open Space Master Plan for the Town of Wrightsville Beach*, the *2006 New Hanover County Master Plan for Parks, Recreation and Open Space*, the *2012 Wilmington Community Survey Report*, the *Cape Fear Commutes 2035 Long Range Transportation Plan*, and the *Walk Wilmington: A Comprehensive Pedestrian Plan*.

### **Public Surveys**

#### **Wilmington New Hanover County Comprehensive Greenway Plan Survey**

As part of the Wilmington New Hanover County Greenway Plan, over 3,600 people provided comments to determine the importance of these facilities, if and how they use them, and where they would like to see more facilities. The survey results show:

- When asked to rank choices for destinations the respondents would most like to get to, beaches ranked #1, parks ranked #2 and other greenways ranked #3;
- 96% of respondents feel that it is very important or important to create more greenways in Wilmington and New Hanover County;
- 95% of respondents would use greenways more often if they were closer to them or there were more of them;
- The top three factors that discourage greenway use are lack of safe connections (52.2%), lack of information about existing greenways (35.5%), and motor vehicles (33.5%); and
- The top three choices for how respondents would (or do) use greenways, 60.4% would use it for fitness or recreation, 30.4% would use it to get outside/enjoy nature, and 29.4% would use it for transportation to a destination.

#### **City of Wilmington 2010-2015 Parks, Recreation and Open Space Master Plan Survey**

The *City of Wilmington 2010-2015 Parks, Recreation, and Open Space Master Plan* includes a public survey to gather community and citizens input on parks, recreation and open space needs and priorities. The results of this survey indicate the following:



- Walking/jogging (83.5% of respondents) and bicycling (24.1% of respondents) were among the top ten activities that brought respondents and/or members of their household to visit the City of Wilmington areas/facilities during the past 12 months.
- When asked what parks and recreation programs and services not currently provided by the City of Wilmington that respondents and/or members of their household would like to participate in during the next twelve months, the respondents included four (of 37) bicycle services: more bike trails, safe bicycle trails away from traffic and exhaust fumes, bicycle trails, and more bike paths.
- When asked what parks and recreation areas/facilities/programs not adequately provided by the City of Wilmington that respondents and/or the members of their household would like to have the City of Wilmington provide within the next 5 years, 45.6% of respondents indicated pedestrian/non-motorized vehicular paths (priority #3). Other responses include bicycle/greenways, family bike trails, and bike paths.
- When asked to identify the three most important issues or needs regarding the City of Wilmington parks and recreation programs, services, areas and facilities, nineteen respondents indicated bike, walking and hiking paths/trails (#1 response).

#### 2013-2018 Parks, Recreation, and Open Space Master Plan for the Town of Wrightsville Beach Survey

The 2013-2018 Parks, Recreation, and Open Space Master Plan for the Town of Wrightsville Beach includes a needs assessment survey. The results of this survey indicated the following:

- Walking (57% of respondents) and bicycling (48% of the respondents) were among the top two activities that residents of Wrightsville Beach preferred to participate and
- Walking and bicycling facilities were also among the top two responses to the questions regarding new facilities needed and new health and wellness programs needed.

#### 2006 New Hanover County Master Plan for Parks, Recreation and Open Space Survey

The 2006 New Hanover County Master Plan for Parks, Recreation and Opens Space includes a needs assessment survey. The results of the survey indicated the following:

- 62% of New Hanover County residents surveyed indicate that they currently use public parks most often for walking or jogging (#2 response).
- When measuring current and future interest levels of specific activities, more than 90% of respondents indicated interest in the top three activities, including walking or jogging.

#### 2012 Wilmington Community Survey Report

A community survey was administered for the City of Wilmington with the purpose of assessing resident satisfaction with the delivery of major city services and to help set priorities for the community. The results of the survey indicated the following:

- 39% of respondents with an opinion (excludes 'don't knows) are satisfied with biking trails in the City. 12% are very satisfied, and 21% are dissatisfied.
- Satisfaction with biking trails in the City has increased from 29% in 2007, to 33% in 2010, to 51% in 2012.

- 18% of respondents felt that walking trails in the City were the most important service for the City to provide (#2 response), and 17% of respondents felt that biking trails in the City were the most important service (#3 response).

#### Cape Fear Commutes 2035 Transportation Plan Survey

The *Cape Fear Commutes 2035* Committee developed a survey for area residents. This survey had several underlying purposes, including: ascertain the community's transportation needs and values, solicit new ideas for transportation projects, and gauge public opinion regarding alternative funding sources for transportation projects. The results of the survey indicated the following:

- When respondents were asked what percentage of their trips are currently made by bicycle, 80.7% of respondents said less than 10% of their trips are currently made on bicycle for commuting purposes and 8.9% of respondents said between 10-25% of their trips are currently made on bicycle for commuting purposes. However, when asked what percentage of trips would respondents *like to* make by bicycle, only 37.7% wanted to make less than 10% of their trips by bicycle and 24.4% of respondents wanted to make 10-25% of their trips by bicycle for commuting purposes. Overall, over 40% of people who currently make less than 10% of their trips by bicycle would like to make more.
- When respondents were asked how we can encourage people to bicycle more often, 71.9% said construct more off-road multi-use paths (#1 response), 68.6% said construct more on-road bike lanes (#2 response), and 46.1% said provide better information about safe and comfortable bicycle routes (#3 response).
- When respondents were asked how we can encourage people to walk more often, 81.3% said construct more sidewalks and multi-use paths (#1 response), 62.5% said improve safety of roadway crossings (#2 response), and 58% said improve connections between nearby homes, stores and offices (#3 response).
- When respondents were given the scenario of being provided with \$100 to spend on transportation improvement projects to divide among eight projects, respondents allocated the most (\$28.94) towards improving bicycle and pedestrian facilities.

#### Walk Wilmington: A Comprehensive Pedestrian Plan Survey

While sidewalks are not considered a bicycle facility, a greenway can be used by both bicyclists and pedestrians. Greenways and intersection improvements are included in the existing and proposed River to the Sea Bikeway facilities, and therefore the demand for pedestrian infrastructure is applicable to the Bikeway. A survey was developed to gather information about citizen habits, preferences and priorities related to walking. The results of this survey indicated the following:

- 53.6% of respondents indicated the lack of sidewalks and/or gaps in the sidewalk make walking difficult or unpleasant in the city.
- 33.6% of respondents indicated heavy traffic makes walking difficult or unpleasant in the city.
- 30% of respondents indicated intersection and road crossings are the most important areas for the city to focus on improving pedestrian facilities.
- When asked what the city's top priority should be for improving the walking network, 29% indicated making intersections and roads more comfortable to cross (#1 response), and 21% indicated building more sidewalks in residential neighborhoods (#2 response).

- When asked what the most critical issue that people face while walking in the City of Wilmington, 66.9% said unsafe street crossings or intersections, and 22.8% said missing or poorly maintained sidewalks

### **Additional Public Input**

To better understand residents' issues, concerns and ideas for the River to the Sea Bikeway, ongoing input is obtained from various groups. In addition to discussing the future alignment and construction of the trail, feedback is sought on policies and programs related to the bikeway. The WMPO Bicycle and Pedestrian Committee, the WMPO Citizens Advisory Committee, the Wilmington Parks and Recreation Advisory Board, the Obesity Prevention Initiative, New Hanover County Health Department, Cape Fear Cyclists, and Cape Fear Future participate in providing feedback regarding alignment, construction, policies and programs. Also, the draft River to the Sea Bikeway Master Plan was released to the public for comments from September 11, 2013 to November 1, 2013. Their comments can be found in Appendix B.

### **Public Events**

May 2013 marked the 24<sup>th</sup> annual River to the Sea Bike Ride along WMPO Bike Route 1. The WMPO Bike/Ped Committee plans and organizes the event. This event takes place the first Saturday in May, also designated as National Bike Month. Ridership for these events continues to increase. In 2010 there were approximately 220 participants; in 2011 approximately 230 participants; and in 2012 approximately 250 participants. The ride begins in downtown Wilmington. The group rides the bikeway to Wrightsville Beach where refreshments are provided and prizes are given away. T-shirts are also sold with logos of sponsors on the back. WAVE Transit provides bus service from Wrightsville Beach to downtown Wilmington for those who only want to ride one-way rather than both ways. Ridership tends to increase every year, with over 250 people of all ages participating in 2012. This event highlights and promotes the River to the Sea Bikeway and allows participants to ride in a group with police assistance at intersections.



The Ann Street Bicycle Boulevard funded by the Fit Community grant also held a variety of community events. Between April and September 2010 there were four community events and six group rides along the Ann Street Bicycle Boulevard. The community events included bicycle safety training, healthy cooking demonstrations, a scavenger hunt along the bicycle boulevard, trick-your-bike competitions, face paintings, live music and lots of giveaways. The group rides began at the eastern most point of the bicycle boulevard. Participants would ride along the bicycle boulevard to the Riverfront Farmers' Market where prizes were given away including gift cards to the farmers' market.

## **Demand Forecast**

The River to the Sea Bikeway is intended to provide New Hanover County's residents and visitors with facilities that provide safe, convenient multi-modal transportation and recreation opportunities in an area where bicycle and pedestrian facilities are not adequate.

Since passage of the federal Land and Water Conservation Fund (LWCF) Act of 1965, preparation of a Statewide Comprehensive Outdoor Recreation Plan (SCORP) has been required in order for states to be eligible for LWCF acquisition and development assistance. Past and current SCORPs including the North Carolina Statewide Outdoor Comprehensive Plan 2009-2013 (NCSCORP) prepared by the N.C. Division of Parks and Recreation, have provided a coordinated framework addressing the problems, needs, and opportunities related to the need for improved public outdoor recreation. The plan contents and format are shaped by the planning guidelines of the LWCF Act. NCSCORP identifies trends affecting outdoor recreation and the concomitant changes they will bring.

A component of the plan is the 2002-2007 National Survey on Recreation and the Environment (NSRE), coordinated by the USDA Forest Service. The primary purpose of the NSRE is to learn about approximately 85 specific outdoor recreation activities of people aged 16 and over in the United States. Questions from the NSRE broadly address areas such as outdoor recreation participation, demographics, household structure, lifestyles, environmental attitudes, natural resource values, constraints to participation, and attitudes toward management policies. The results of the survey are used to identify standards for outdoor public recreation facilities.

In 2010, Wilmington had 7.26 miles of multi-purpose trail per 100,000 population. Utilizing NCSCORP standards applied to Wilmington, Wilmington has a current need for 17.74 miles of multi-purpose trail. Projecting to 2015, Wilmington will have a demand for 28.75 miles of multi-purpose trail. When ranking all North Carolina Counties based on the number of trails available (all types) per capita, New Hanover County ranks #24.

## **Demographics**

In 2000, New Hanover County's population was 160,307. By 2010 the population had grown to 202,667 at a rate of 26.4%. The median age is 35.3 years with the following age distribution:

- Under 10: 11.3%
- 10-19: 12%
- 20-29: 17%
- 30-39: 13.5%
- 40-49: 13.3%
- 50-59: 13.2%
- 60-69: 10.5%
- Over 69: 9.3%

## Outdoor Recreation Trends

According to residents participating in NCSCORP, walking for pleasure is rated as the number one recreational activity, selected by 85% of the respondents. Of individual sports activities, respondents listed running or jogging (first) and inline skating (fourth) as the most popular activities, both of which are applicable to all or portions of the River to the Sea Bikeway. Walking for pleasure was the number one activity listed by North Carolina residents participating in outdoor recreation activities. The primary activity of the bikeway, bicycling, was the 18<sup>th</sup> most popular activity with 31% of respondents participating.



## Special Considerations

The City of Wilmington and the Town of Wrightsville Beach are committed to providing access and recreational opportunities to all persons, including people with disabilities. The River to the Sea Bikeway will be developed in accordance with ADA standards and guidelines.

The bikeway is designed according to the City of Wilmington, North Carolina Department of Transportation and federal standards. This includes the following guidelines:

- Complete Streets Policy (Wilmington, State and Federal);
- Best Practices Design Guide (FHWA);
- Design Guidelines: Accommodating Bicycle and Pedestrian Travel; A Coordinated Approach (FHWA);
- National Association of City Transportation Officials' (NACTO) 2012 Urban Bikeway Design Guide;
- ADA Accessibility Guidelines for Outdoor Developed Areas (United States Access Board);
- ADA and ABA Accessibility Guidelines for Buildings and Facilities (United States Access Board);
- Guide for the Development of Bicycle Facilities, American Association of State Highway and Transportation Officials (ASSHTO); and
- Manual on Uniform Traffic Control Devices (MUTCD).



Associated site amenities such as parking and restrooms, primarily located in parks along the bikeway, are all designed to accommodate persons with disabilities. In all possible circumstances, the greenways along the bikeway will be designed to be a 10' wide multi-purpose path which safely and comfortably accommodates two-way directional, multi-modal traffic. In all possible circumstances, bike lanes will be designed to be a 4' or 5' wide bike lane on both sides of the street.

The River to the Sea Bikeway crosses several major roadways. All such roadways will be designed to accommodate all users to facilitate the safe passage of the roadway. At each intersection, traffic signals are reviewed to determine modifications to the signal timing. All intersections will include push-button pedestrian heads and high visibility crosswalks and will be designed and constructed to ADA standards.



## **Management Plan**

### **Etiquette**

The River to the Sea Bikeway is open to the general public. Its intended use is bicycling. Certain sections, such as greenway facilities, may include walking, jogging, strollers, skating and other uses provided by state law and local ordinances. The bikeway is enjoyed by many different types of users and provides a variety of facilities. Whether users are bicycling along bike lanes or walking, biking, jogging, skating, walking a dog or pushing a stroller along a greenway, all users are advised to follow the same set of rules on their experience on the bikeway in order to make the experience a safer and more enjoyable one. Etiquette recommendations include:

#### **Bike lanes and Sharrows – Appropriate for Bicyclists**

Cyclists should:

- In urban areas where bike lanes are bordering parallel parked cars, cycle towards the left to position yourself out of the door zone while being aware of a cyclists potentially passing on the left;
- In suburban or rural areas without parallel parked cars, cycle towards the right to provide more distance between yourself and passing vehicles;
- Pass other cyclists on the left;
- Yield to pedestrians when going through a crosswalk; stop before the crosswalk as opposed to blocking the crosswalk;
- Use turning signals and merge into the turning lane early on rather than the last moment
- Travel in the same direction as vehicles – cyclists should always be to the right of a moving vehicle; and
- Slow down when executing maneuvers in traffic. If you are a fast cyclists, understand that sometimes you have to go with the flow of traffic, even if you are capable of going faster.

#### **Greenways – Appropriate for Bicyclists, Pedestrians and Other Active Recreationalists**

- Always stay to the right side of the trail except when passing others. Always allow other trail users room to pass on the left;
- Pass others traveling in the same direction on the left. Yield to slower and on coming trail users and remember that children and pets can be unpredictable;
- Politely warn trail users as you approach from behind. Give a clear audible signal when passing like “Passing on your left”. Give the person you are passing time to respond. Don’t wear headphones on the trail so you can hear others passing you;
- All trail users, including bicyclists, joggers, walkers, wheelchairs, strollers, rollerbladers and skaters, should be respectful of other users regardless of their mode, speed or level of skill.
- Be predictable. Travel in a consistent and predictable manner. Always look behind when changing position on the trail;

- Do not block the trail. When in a group or with your pets, use no more than half the trail so you don't block the flow of other users;
- Do not litter. Do your part to keep the park clean. Please pick up after yourself and pets; and
- Move off of or to the side of the trail when you stop. Beware of others behind you and make sure they know you are stopping.

It has been clearly demonstrated that community bikeways and trails enhance quality of life, improve the environment, ease traffic congestion, promote wellness, and provide unique recreational opportunities for citizens, close to home where they can easily be accessed. The River to the Sea Bikeway should serve as a valued asset to the residents of Wilmington and New Hanover County and future policy development should consider the rights of Wilmington's residents to access the bikeway freely and without undue interruption.

## **Maintenance**

The River to the Sea Bikeway is located within two municipalities and therefore maintained by two separate entities. The City of Wilmington's Community Services and Public Services Departments maintain the portion of the bikeway located in the Wilmington city limits. The Town of Wrightsville Beach maintains the portion of the bikeway located on Wrightsville Beach.

Maintenance activities include:

- Mowing;
- Blowing natural debris such as leaves, acorns and twigs;
- Trash pickup;
- Weed control as needed by mechanical or chemical removal;
- Edge/Trail shoulder vegetative maintenance;
- Erosion repair;
- Bridge and boardwalk repair;
- Bituminous patching and striping replacement as needed;
- Sign inventory and replacement;
- Periodic trail sweeping and vacuuming; and
- Pet waste stations.

As an extension and enhancement of the City's maintenance program, Wilmington and New Hanover County are in the process of developing an Adopt-A-Trail program. The program is designed as a community partnership between area volunteers and the City of Wilmington. The program gives volunteers the opportunity to conserve and maintain our natural environment, promoting civic responsibility and community pride and also serves to fulfill a gap in the demand for maintenance and existing operational funding.

Adopt-A-Trail sponsors are made up of groups and organizations throughout the community. Each sponsor is responsible for general trail maintenance and the upkeep of their designated portion of the trail.

## Signage

The need for quality wayfinding, trail marker, and directional signage is an important component of the bikeway. As each segment is designed, the type and quantity of each type of signage is analyzed and incorporated into the project. Coherent, consistent wayfinding signs are used throughout Wilmington to guide residents and visitors to significant attractions and destinations, including the bikeway. The need for quality, consistent bikeway markers that identify the bikeway are used in both assisting the user and in marketing of the trail. Finally, signage that advises both pedestrian and vehicles that may interact with trail users of traffic laws are utilized to encourage safe use of the bikeway.



Wayfinding signage and information kiosks are critical components of the Ann Street Bicycle Boulevard. Wayfinding signage is currently located along the bicycle boulevard with information regarding the distance and direction to several community points of interest such as UNCW, Wrightsville Beach, Riverfront Park, Independence Mall, schools, parks, and museums. It is recommended that similar signage is used along the River to the Sea Bikeway at locations near points of interest. There are currently two information kiosks along the bikeway. One is located at Robert Strange Park on Ann Street, the other at Empie Park at the intersection of the River to the Sea Bikeway and the Cross-City Trail. Additional information kiosks should be installed in popular public spaces, such as Johnnie Mercer's Pier and the Wrightsville Beach Park.



## **Outreach and Education**

Education, programming and awareness are critical to connect community members with the bikeway. In order to achieve this, the City of Wilmington, Town of Wrightsville Beach and New Hanover County capitalize on its diverse, existing community partner network to promote the bikeway. Wilmington and New Hanover County collaborate with the Obesity Prevention Initiative at UNCW, the New Hanover County Health Department, New Hanover County Schools, Safe Kids Cape Fear, Cape Fear Cyclists, Cape Fear Healthy Carolinians, the Wilmington Police Department, and Live Fit Cape Fear to develop awareness and educational initiatives related to the bikeway.

River to the Sea Bikeway maps are printed and distributed on a regular basis. Bicycle safety information is included on the maps. When facilities are installed along the bikeway, those changes are made to the map and they are mass produced. Maps are distributed around the WMPO jurisdictions in March and early August every year.

As an effort to educate the public on creating a safe traveling environment, it is recommended that the local safety campaign be promoted while collaborating with local partners and organizing River to the Sea Bikeway public events. See Share Be Aware is a multi-organizational effort towards creating a safer roadway environment in the Lower Cape Fear for motorists, cyclists, and pedestrians. [www.seesharebeaware.com](http://www.seesharebeaware.com) provides safety materials to assist with creating a safer experience while walking, biking and driving in the area.

Additional outreach and awareness efforts are and conducted by the City through the City's website, [wilmingtonnc.gov](http://wilmingtonnc.gov), the bikeway website, [rivertoseabikeway.com](http://rivertoseabikeway.com) and through the City's facebook page.

## **Implementation**

The River to the Sea Bikeway is being developed in phases. Construction of the various phases are driven by a number of factors including available funding, public support, acquisition of land, and the timing of other infrastructure improvements. A prioritization process has been developed to prioritize the recommended projects based on their connection to existing facilities; the location of the project; the cost or ease of construction; and if it improves circulation around schools, parks, employments centers and/or major corridors. Please see Appendix A for the project scoring sheet.

### **High Priority Recommendations:**

- Close the intersection at S. 5th Avenue and Ann Street
- Intersection improvements at Castle Street and S. 13th Street
- Sharrows on Castle Street from S. 15th Street to Colwell Avenue
- Intersection improvements at Castle Street and S. 16th Street
- Intersection improvements at Castle Street and S. 17th Street
- Greenway along Colwell Avenue from Castle Street to S. 19th Street
- Intersection improvements at Park Avenue and Wallace
- Sharrows along Wallace Avenue from Park Avenue to Barefoot Drive, and along Barefoot Drive from Wallace Avenue to Wood Dale Drive
- Intersection improvements at Oleander Drive/Military Cutoff Road and Wrightsville Avenue/Airlie Road
- Greenway along Wrightsville Avenue from Oleander Drive/Military Cutoff to Airlie Forest Court
- Intersection improvements at Wrightsville Avenue and Airlie Forest Court
- Greenway along Wrightsville Avenue from Wrightsville Avenue/Eastwood Road to Heide-Trask Bridge
- Sharrows on Heide-Trask Bridge from terminus of recommended Wrightsville Avenue greenway to Keel Street
- Sharrows under Heide-Trask Bridge on east side along Marina Street from Old Causeway Drive to marina
- Sharrows along W. Salisbury Street from eastern-most terminus of Pelican Drive, crossing Kenans Creek Bridge and Banks Channel Bridge
- Bike lanes along W. Salisbury Street from Banks Channel Bridge to terminus at N. Lumina Avenue

### **Medium-Priority Recommendations:**

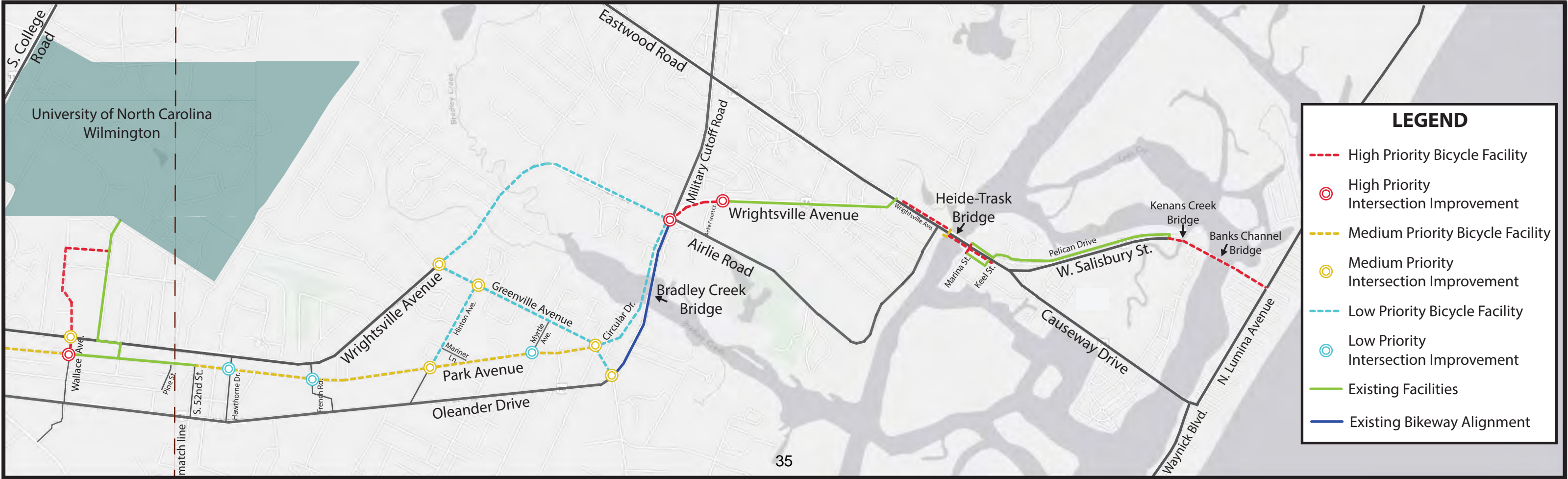
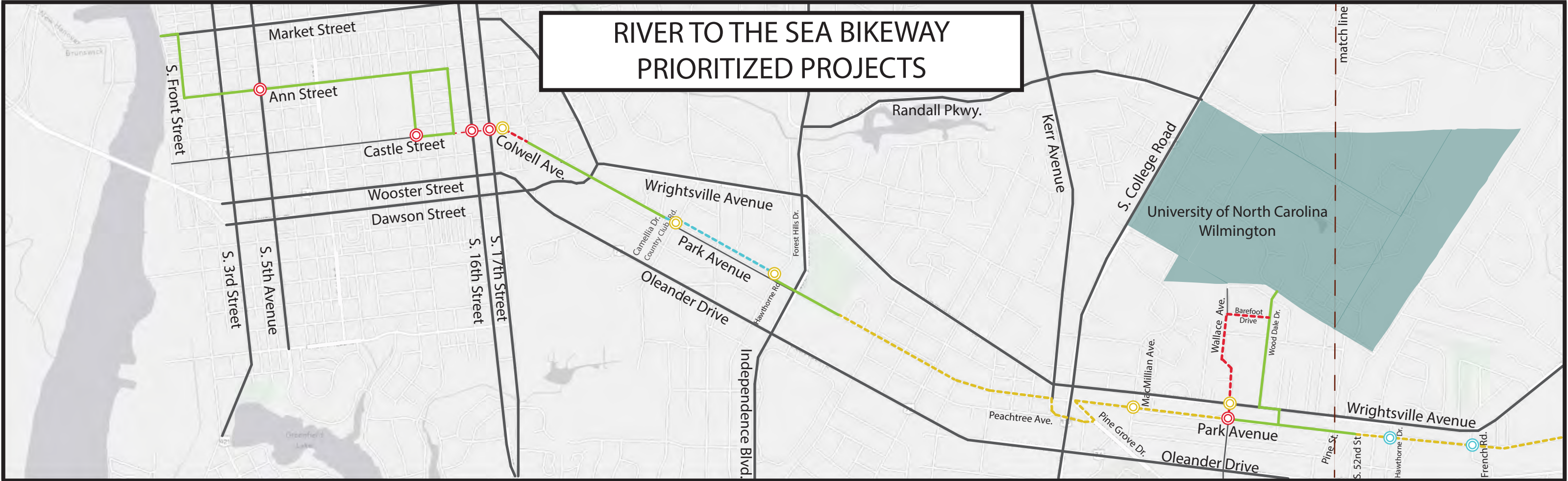
- Sundial plaza at the intersection of Castle Street and Colwell Avenue
- Intersection improvements at Park Avenue and Country Club Road
- Intersection improvements at Park Avenue and Hawthorne Road
- Greenway along Park Avenue from the southeast corner of Empie Park to Kerr Avenue
- Bike lanes along Kerr Avenue from Park Avenue to Peachtree Avenue, and along Peachtree Avenue to Pine Grove Drive

- Sharrows along Pine Grove Drive from Peachtree Avenue to Park Avenue, and along Park Avenue from Pine Grove Drive to Wallace Avenue
- Intersection improvements at Park Avenue and MacMillian Avenue
- Intersection improvements at Wrightsville Avenue and Wallace Avenue
- Greenway along Park Avenue from S. 52nd Street to Greenville Avenue
- Intersection improvements at Park Avenue and Hinton Avenue
- Intersection improvements at Hinton Avenue and Greenville Avenue
- Intersection improvements at Greenville Avenue and Wrightsville Avenue
- Intersection improvements at Greenville Avenue and Oleander Drive
- Intersection improvements at Park Avenue/Circular Avenue and Greenville Avenue
- Bicycle/pedestrian multi-use walkway under west side of Heide-Trask Bridge

**Low-Priority Recommendations:**

- Sharrows on Park Avenue from Country Club Road to Hawthorne Road
- Intersection improvements at Park Avenue and Hawthorne Drive
- Intersection improvements at Park Avenue and French Road
- Greenway along Hinton Avenue from Park Avenue to Greenville Avenue
- Bike lanes along Greenville Avenue from Oleander Drive to Wrightsville Avenue
- Bike lanes along Wrightsville Avenue from Greenville Avenue to Oleander Drive/Military Cutoff Road
- Intersection improvements at Park Avenue and Myrtle Avenue
- Greenway along Circular Avenue from Greenville Avenue to terminus
- Bicycle/pedestrian multi-use bridge over Bradley Creek parallel to Oleander Drive
- Greenway along Oleander Drive from end of proposed Bradley Creek bridge to Wrightsville Avenue





## Appendix A

### High Priority Recommendations - Projects that answer 'yes' to 3 or 4 of the priority considerations

Proposed Project	Existing Facilities on one or both sides	Located in CBD, Urban Core or High Tourist Population Area	Low-Cost/Ease of Construction	Improves Circulation around Schools, Parks, Employment Centers or Major Corridors	
Close the intersection at S. 5 <sup>th</sup> Avenue and Ann Street	Yes	Yes	Yes	Yes	4
Intersection improvements at Castle Street and S. 13 <sup>th</sup> Street	Yes	Yes	Yes	Yes	4
Sharrows on Castle Street from S. 15th Street to Colwell Avenue	Yes	Yes	Yes	Yes	4
Intersection improvements at Castle Street and S. 16 <sup>th</sup> Street	No	Yes	Yes	Yes	3
Intersection improvements at Castle Street and S. 17 <sup>th</sup> Street	No	Yes	Yes	Yes	3
Greenway along Colwell Avenue from Castle Street to S. 19 <sup>th</sup> Street	Yes	Yes	Yes	No	3
Intersection improvements at Park Avenue and Wallace	Yes	No	Yes	Yes	3
Sharrows along Wallace Avenue from Park Avenue to Barefoot Drive, and along Barefoot Drive from Wallace Avenue to	Yes	No	Yes	Yes	3
Intersection improvements at Oleander Drive/Military Cutoff Road and Wrightsville Avenue/Airlie Road	No	Yes	Yes	Yes	3
Greenway along Wrightsville Avenue from Oleander Drive/Military Cutoff to Airlie Forest Court	Yes	Yes	Yes	Yes	4
Intersection improvements at Wrightsville Avenue and Airlie Forest Court	Yes	Yes	Yes	Yes	4

Greenway along Wrightsville Avenue from Wrightsville Avenue/Eastwood Road to Heide-Trask Bridge	Yes	Yes	Yes	Yes	4
Sharrows on Heide-Trask Bridge from terminus of recommended Wrightsville Avenue greenway to Keel Street	No	Yes	Yes	Yes	3
Sharrows under Heide-Trask Bridge on east side along Marina Street from Old Causeway Drive to marina	Yes	Yes	Yes	Yes	4
Sharrows along W. Salisbury Street from eastern-most terminus of Pelican Drive, crossing Kenans Creek Bridge and Banks Channel Bridge	Yes	Yes	Yes	Yes	4
Bike lanes along W. Salisbury Street from Banks Channel Bridge to terminus at N. Lumina Avenue	No	Yes	Yes	Yes	3

## Medium Priority Recommendations - Projects that answer 'yes' to 2 of the priority considerations

Proposed Project	Connects to Existing Facilities on one or both sides	Located in CBD, Urban Core or High Tourist Population Area	Low-Cost/Ease of Construction	Improves Circulation around Schools, Parks, Employment Centers or Major Corridors	
Sundial plaza at the intersection of Castle Street and Colwell Avenue	No	Yes	Yes	No	2
Intersection improvements at Park Avenue and Country Club Road	Yes	No	Yes	No	2
Intersection improvements at Park Avenue and Hawthorne Road	Yes	No	Yes	No	2
Greenway along Park Avenue from the southeast corner of Empie Park to Kerr Avenue	Yes	No	No	Yes	2
Bike lanes along Kerr Avenue from Park Avenue to Peachtree Avenue, and along Peachtree Avenue to Pine Grove Drive	No	No	Yes	Yes	2
Sharrows along Pine Grove Drive from Peachtree Avenue to Park Avenue, and along Park Avenue from Pine Grove Drive to Wallace Avenue	No	No	Yes	Yes	2
Intersection improvements at Park Avenue and MacMillian Avenue	No	No	Yes	Yes	2
Intersection improvements at Wrightsville Avenue and Wallace Avenue	No	No	Yes	Yes	2
Greenway along Park Avenue from S. 52 <sup>nd</sup> Street to Greenville Avenue	Yes	No	No	Yes	2
Intersection improvements at Park Avenue and Hinton Avenue	No	No	Yes	Yes	2
Intersection improvements at Hinton Avenue and Greenville Avenue	No	No	Yes	Yes	2
Intersection improvements at Greenville Avenue and Wrightsville Avenue	No	No	Yes	Yes	2
Intersection improvements at Greenville Avenue and Oleander Drive	No	No	Yes	Yes	2
Intersection improvements at Park Avenue/Circular Avenue and Greenville Avenue	No	No	Yes	Yes	2
Bicycle/pedestrian multi-use walkway under west side of Heide-Trask Bridge	No	Yes	No	Yes	2

**Low Priority Recommendations - Projects that answer 'yes' to 1 of the priority considerations**

<b>Proposed Project</b>	<b>Connects to Existing Facilities on one or both sides</b>	<b>Located in CBD, Urban Core or High Tourist Population Area</b>	<b>Low-Cost/Ease of Construction</b>	<b>Improves Circulation around Schools, Parks, Employment Centers or Major Corridors</b>	
Sharrows on Park Avenue from Country Club Road to Hawthorne Road	Yes	No	Yes	No	1
Intersection improvements at Park Avenue and Hawthorne Drive	No	No	Yes	No	1
Intersection improvements at Park Avenue and French Road	No	No	Yes	No	1
Greenway along Hinton Avenue from Park Avenue to Greenville Avenue	No	No	No	Yes	1
Bike lanes along Greenville Avenue from Oleander Drive to Wrightsville Avenue	No	No	No	Yes	1
Bike lanes along Wrightsville Avenue from Greenville Avenue to Oleander Drive/Military Cutoff Road	No	No	No	Yes	1
Intersection improvements at Park Avenue and Myrtle Avenue	No	No	Yes	No	1
Greenway along Circular Avenue from Greenville Avenue to terminus	No	No	No	Yes	1
Bicycle/pedestrian multi-use bridge over Bradley Creek parallel to Oleander Drive	No	No	No	Yes	1
Greenway along Oleander Drive from end of proposed Bradley Creek bridge to Wrightsville Avenue	No	No	No	Yes	1

## **Appendix B**

The public was invited to comment on the draft River to the Sea Bikeway Plan from September 11, 2013 – November 1, 2013. Their comments are listed below.

- “I think this looks pretty great. If I am still living in Wilmington in the future I would love to utilize this path and amenities proposed.”
- “I would suggest that the alternative route across Bradley Creek on Wrightsville Road be the primary route instead of using Oleander Drive. There is room to add a designated bike lane, so that biking on it would be safer.”
- “I am still very concerned about the difficulty riding a bike across the Wrightsville Beach Bridge. I hope there is still a plan to build a walkway or rideway under or next to that bridge. You can not safely ride on the new grating.”
- “Overall this is an excellent document. I only have one suggestion. The first diagram in the section “Eastwood Road to Heide-Trask Bridge and the Wrightsville Beach Boat Launch” (page 18) is hard to read and understand. It also should make clear that this is the West side of the bridge. If possible, replace with a better diagram.”
- “To reduce bike travel time on Oleander, please consider incorporating West Airlie Road as part of the River to Sea Trail. Immediately after crossing Bradley Creek from the Arboretum, one could exit right off Oleander onto W. Airlie, which connects to Airlie Gardens/Airlie Road. It appears this linkage can be made using DOT right-of-way and only a wooden fence and a few shrubs stand in the way. Thanks for your consideration. This is a great and essential bike corridor initiative. Keep up the great work!