Bicycle Multi-Use Transportation Plan

Prepared for:

Town of Carolina Beach, North Carolina

Prepared by:

McKIM&CREED

243 NORTH FRONT STREET
WILMINGTON, NC 28401
PHONE: (910) 343-1048

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Division of Bicycle & Pedestrian Transportation

TOWN OF CAROLINA BEACH NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

McKIM&CREED ENGINEERS SURVEYORS PLANNERS

Bicycle Multi-Use Transportation Plan

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Town of Carolina Beach, North Carolina

Acknowledgements

Town of Carolina Beach

Joel Macon, Mayor
Pat Efird, Mayor Pro Tem
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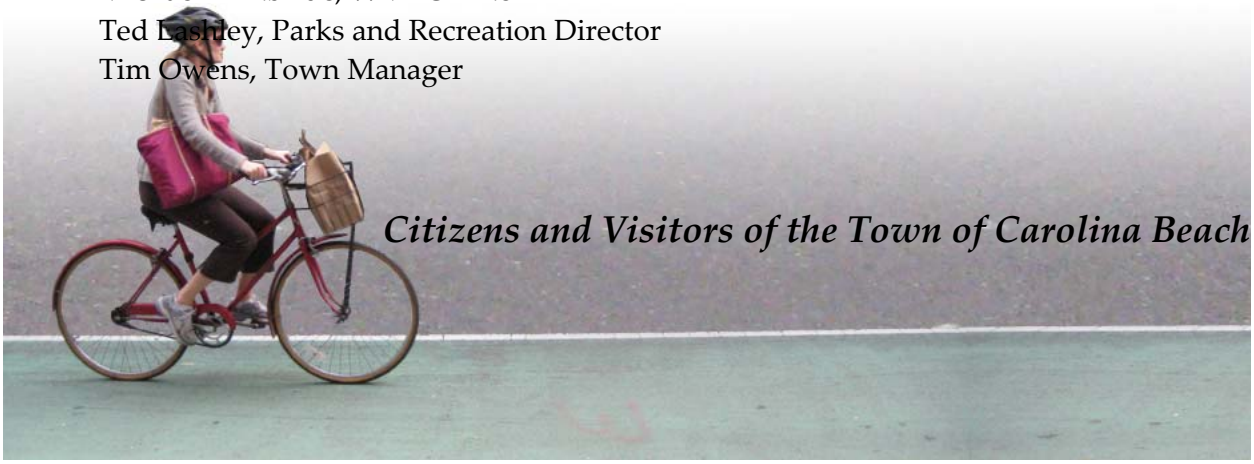
The Bicycle Multi-Use Transportation Plan Steering Committee

Alan Pacek, Pleasure Island Chamber of Commerce
Bill Pizarr, Seniors Center
Bob and Ann Pugh, Seniors Center
Brenda Butler, GIS Technician
Chris O'Keefe, Planning Director, New Hanover County
Ed Parvin, Senior Planner
Gail McCloskey, Pleasure Island Chamber of Commerce
Gary Ferguson, Director, Planning and Development Department
John Vine-Hodge, NCDOT Division of Bicycle and Pedestrian Transportation
Josh Mello, WMPO Bike
Kurt Bartley, Police Captain
Lonnie Lashley, Councilman
Michael Kirkbride, WMPO Bike
Ted Lashley, Parks and Recreation Director
Tim Owens, Town Manager

Citizens and Visitors of the Town of Carolina Beach



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EXECUTIVE SUMMARY

PROJECT OVERVIEW AND PURPOSE

BACKGROUND

In 2009, the Town of Carolina Beach was awarded a grant from the North Carolina Department of Transportation (NCDOT) Bicycle and Pedestrian Planning Grant Initiative. The town received a $20,000 grant and agreed to fund an additional $5,000 from Town resources for a total project fund of $25,000. The purpose of the grant initiative is to encourage towns to develop comprehensive bicycle multi-use transportation plans. This grant program is administered through NCDOT's Division of Bicycle and Pedestrian Transportation (DBPT).

VISION STATEMENT

Early in the design process, the Bicycle Multi-use Transportation Plan Steering committee developed a vision statement to help guide the objectives of the plan. That vision statement is as follows:

> *"Create a more bicycle multi-use path friendly environment and provide interconnectivity to the various town destinations."*

The community goals for the town's biking environment include:

- Improving safety on existing bike routes
- Increase citizen usage of bike routes
- Link existing bike routes
- Expand the greenway network
- Have the town become recognized as a resort area biking destination

PURPOSE OF PLAN

The purpose of the plan was to create a mechanism and instrument that supports the vision statement: "Create a more bicycle multi-use path friendly environment and provide interconnectivity to the various town destinations."

This required the need to evaluate current conditions, opportunities, and constraints. Opportunities included linkage nodes, existing bicycle multi-use plans and proposed bicycle multi-use plans, i.e. integrate the Dow Road Corridor Study and Island Greenway, respectively.

The needs of the users surfaced through the public open house meetings and the citizens / visitors survey. This feedback helped identify the potential corridor areas. In turn, these corridor areas would be further identified as short-term or long-term priorities.

The plan continued to drill-down to establish a five-year implementation plan for the top-ranked project corridors. These projects were further supported with facility design details, construction costs, funding opportunities, and supporting policies.

PLAN ORGANIZATION

This plan is designed to guide the Town of Carolina Beach with Implementation of the Vision Statement. This plan is organized into eight sections.

- Section 1 is an Introduction of the plan and the process,
- Section 2 assesses the current conditions of the town,
- Section 3 describes existing plans, programs, and policies,
- Section 4 identifies projects and project priorities,
- Section 5 provides details and references for specific bicycle facilities,
- Section 6 expands on ancillary facilities of bicycle multi-use paths,
- Section 7 identifies funding sources,
- Section 8 provides an action steps implementation plan, and
- Appendixes provide additional detailed information on the public survey, crash data, project priorities, and project costs.

THE PROCESS

DATA COLLECTION

Inventory assessment of existing bicycle multi-use facilities were conducted through a field reconnaissance. A base map was prepared utilizing GIS data which illustrated existing conditions. The existing conditions map can be found in Section 2. This map was critical in determining the opportunities and constraints for bicycle multi-use path development

PUBLIC INVOLVEMENT

Public involvement was solicited through two public open house meetings, and through public hearings at the town's Board and Council meetings. An on-line citizens / visitors survey was available locally (town's main website and Chamber of Commerce website) and regionally

(Island Greenway website). Surveys were also handed out at the town's parks and recreation center. The results of this survey can be found in the Appendix.

The first public open house meeting was held on May 19, 2010 at the Town Council chambers. During the first open house, citizens and visitors were made aware of the goals and objectives of the Bicycle Multi-use Transportation Plan. The second public open house meeting was held on August 11, 2010 at the Town Council chambers. During the second open house, highlights of the draft Bicycle Multi-use Transportation Plan were presented.

Draft Plan

The results of the public citizens / visitors' survey and the input received at the public open house meeting #1 contributed to preliminary design concepts. Balancing the current conditions with the plans vision statement enabled preparation of a draft plan. The draft plan was presented to the Steering Committee on August 18, 2010 and to NCDOT on September 9, 2010.

Portions of the draft plan were also presented at the public open house meeting #2.

Final Plan

Completion of the final plan and official adoption is expected to take place January 11, 2011.

Economic Benefits

Tourism is an important contributing financial factor to the town. And as with many resort destination towns, competition for tourist dollars is fierce.

There is a striking correlation of tourist dollars associated with bicycle / multi-use paths, based on a document titled "The Economic Impact of Investments in Bicycle Facilities" by NCDOT in 2003. The study was conducted in the Outer Banks, and quantifiable data was extrapolated:

- Estimated annual expenditures for bicycle tourists based on 10,200 cyclists x $175 / day x 8.3 days / trip = $14.8 million.

While the town will not see that number of annual cyclists, it is critical to note the correlation – cyclists can be a source of financial revenue if bicycle multi-use paths bring them to the area. In addition, the study determined that cyclists stay (in days) is longer if biking is involved, which further increases the tourist expenditure dollar amount.

Lastly, the study compared the one-time costs of bicycle multi-use path construction to economic dollars. The ratio was 1:8; for every one dollar spent on bicycle multi-use path construction, eight dollars was earned annually.

The town is a strategically located resort destination with close proximity to many popular Pleasure Island attractions, including Fort Fisher Historic Site, N.C. Aquarium and N.C. Ferry.

Building bicycle multi-use paths will be a good investment for the town that will have a positive annual economic impact.

RECOMMENDATIONS

A total of 19 miles of bicycle multi-use paths have been proposed for the town. Several types of on-road and off-road bicycle facility-types have been selected based on which facility-detail would best fit the right-of-way width and roadway characteristics. Below is a general overview of bicycle facility types. Comprehensive details can be found in Section 5.

Bicycle Lanes A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the exclusive use of bicyclists. Bicycle lanes are located on both sides of the road, and carry bicyclists in the same direction as adjacent motor vehicle traffic.

Bicycle Lanes with Parallel On-Street Parking Where on-street parking is permitted, and a bike lane is provided, the bike lane must be between parking and the travel lane. Appropriate space must be allocated to allow passing cyclists room to avoid open car doors. The distance between the curb face and the outer marking of the bicycle lane is typically 13 to 15 feet (parking stall of 8 to 10 feet and bike lane of 5 feet).

'Road Diets' for Bicycle Lanes Road diets typically involve reducing the number of travel lanes (from a four-lane road to a two-lane road with center turn lane, for example) allowing adequate space for bicycle lanes. These are generally recommended only in situations where the vehicular traffic count can be safely and efficiently accommodated with a reduced number of travel lanes. Study may be necessary for recommended road diets to ensure that capacity and level-of-service needs are balanced against bicycle level of service needs.

Wide Outside Lanes Even without a marked bicycle facility, the conditions for bicycling are improved when the outside travel lane in either direction is widened to provide enough roadway space so that bicyclists and motor vehicles can share the roadway without putting either in danger (e.g., higher volume roadways with wide (14') outside lanes). For outside lanes wider than 14', striping a bicycle lane should be considered.

Bicycle Boulevard Lower volume roadways may be modified to function as a through street for bicycles while maintaining access for automobiles. Traffic calming devices reduce traffic speeds and through trips while limiting conflicts between motorists and bicyclists, as well as give priority to through bicycle movement. Bicycle Boulevards allow you to pick and choose the appropriate mix of design elements needed for bicycle boulevard development along a particular corridor.

Shared Lane Marking A bicycle shared lane marking (or 'sharrow') can serve a number of purposes, such as making motorists aware of bicycles potentially traveling in their lane, showing bicyclists the appropriate direction of travel, and, with proper placement, reminding bicyclists to bike further from parked cars to prevent "door" collisions.

Sharrows with Back-in Angle Parking Back-in/head-out diagonal parking and conventional head-in/back-out diagonal parking have common dimensions, but the back-in / head-out is superior for safety reasons due to better visibility when leaving the parking stall. This is particularly important on busy streets or where drivers find their views blocked by large vehicles, tinted windows, etc. Furthermore, with back-in / head-out parking, drivers can see bicyclists as they prepare to pull out.

Contraflow Lanes A designated bicycle facility that allows cyclists to travel against the flow of traffic on a one-way street. Provides direct access and improves cyclist connectivity, reducing cyclist travel time by eliminating out-of-direction detours and unauthorized wrong-way riding. Installed on left side of the street facing one-way traffic, the contraflow lane is generally separated from the motor vehicle lane with a double-yellow line.

Multi-Use Paths Multi-use paths are paved surfaces a minimum of 10' in width to accommodate bicyclists, walkers, joggers, etc. The multi-use path is separated by a minimum of 5' from the adjacent motorized travel lane. If a 5' separation cannot be obtained due to limited right-of-way, a suitable barrier should be provided. A 10' width allows for two-directional travel.

Sidepaths Multi-use paths located within the roadway corridor right-of-way, or adjacent to roads, are called 'Sidepaths'. This configuration works best along roadways with limited driveway crossings.

- A minimum 10' width is necessary on sidepaths for bicyclists to pass one another safely (12' for areas expecting high use)
- A 6' or greater vegetated buffer between the sidepath and the roadway should be provided where possible.

The following recommended bicycle multi-use network plan proposes some, but not all, of these bicycle facility-types. As the town continues to grow there may be a need to implement additional bicycle facility types. This information is provided such that the town can grow into their plan.

PROJECT IDENTIFICATION

A total of 48 projects have been identified which will contribute to a more bicycle friendly environment and will provide interconnectivity to the various town destinations. Brief project discussions are provided below which reference the project purpose, the preferred project treatment, and the project constraints.

1. ### Clarendon Avenue

   Purpose: improve safety on school route and provide interconnectivity to park sites, school, and proposed Dow Road Greenway.
   Treatment: 90' right-of-way supports dual Multi-Use Paths providing 20' separation

from travel lane. Plan also includes the addition of high visibility crosswalks.
Constraints: dual multi-use paths may initially be cost prohibitive. On an interim basis a more feasible option could include dual bike lanes.

2. ### Harper Avenue
Purpose: provide interconnectivity to Central Business District and provide main street transition from residential to business.
Treatment: 90' right-of-way supports dual multi-use paths providing 20' of separation from travel lanes. Also add high visibility crosswalks and provide roundabout for traffic calming and transitioning.
Constraints: roundabout dramatically increases project costs. Dual multi-use paths may initially be cost prohibitive. On an interim basis a more feasible option could include dual bike lanes from Dow Road to Third Street.

3. ### Lake Park Boulevard (Winner to St. Joseph)
Purpose: improve pedestrian safety and provide main street transition.
Treatment: add bike lanes and sidewalks.
Constraints: will need to lose on-street parking to enable improvements.

4. ### Island Marina Drive
Purpose: improve safety and provide interconnectivity to existing multi-use path.
Treatment: add sharrows and signage to existing roadway.
Constraints: need to complete as part of overall phasing plan for improvements to have value.

5. ### St. Joseph Street
Purpose: improve safety and provide interconnectivity to commercial area and existing multi-use path.
Treatment: add sharrows, signage, and high visibility crosswalks to existing roadway.
Constraints: need to complete as part of overall phasing plan for improvements to have value.

6. ### Carolina Beach Avenue South
Purpose: provide a safer route from the southern end of town to the Central Business District and beach areas.
Treatment: since road is one-way plan will require a contraflow bike lane created with pavement markings and signage.
Constraints: area residents will not have parking within the public right-of-way.

7. ### Fourth Street
Purpose: provide interconnectivity to school and Lake Park.
Treatment: add sharrows, signage and high visibility crosswalks to existing roadway.
Constraints: route crosses three primary streets.

8. **Florida Avenue**
   Purpose: improve safety and provide interconnectivity to beach area.
   Treatment: add sharrows and signage to existing roadway.
   Constraints: need to complete as part of overall phasing plan for improvements to have value.

9. **Georgia Avenue**
   Purpose: improve safety and provide interconnectivity to beach area.
   Treatment: add sharrows and signage to existing roadway.
   Constraints: need to complete as part of overall phasing plan for improvements to have value.

10. **Island Greenway – Phase 1 (from Greenville Avenue to North Carolina Avenue)**
    Purpose: provide regional trail link outside the property limits of Carolina Sands.
    Treatment: 10′ paved asphalt multi-use path.
    Constraints: residential concerns relating to safety and proximity to home sites.

11. **Peninsula Drive**
    Purpose: improve safety and provide interconnectivity to multi-use path.
    Treatment: add sharrows, signage, and high visibility crosswalks to existing roadways.
    Constraints: need to complete as part of overall phasing plan for improvements to have value.

12. **Virginia Avenue**
    Purpose: improve safety and provide interconnectivity to multi-use path.
    Treatment: add sharrows, signage, and high visibility crosswalks to existing roadways.
    Constraints: need to complete as part of overall phasing plan for improvements to have value.

13. **Carolina Beach Avenue North**
    Purpose: improve safety and provide interconnectivity to beach area.
    Treatment: add sharrows, signage, and high visibility crosswalks to existing roadways.
    Constraints: the 30′ right-of-way limits the design treatment options.

14. **Otter Road**
    Purpose: improve safety and provide interconnectivity to existing multi-use path.
    Treatment: add sharrows and signage to existing roadway.
    Constraints: need to complete as part of overall phasing plan for improvements to have value.

15. **Teakwood Drive**
    Purpose: improve safety and provide interconnectivity to existing multi-use path.
    Treatment: add sharrows and signage to existing roadway.
    Constraints: need to complete as part of overall phasing plan for improvements to have value.

16. **Cape Fear Boulevard**
    Purpose: provide interconnectivity to Central Business District and provide main street transition from residential to business.
    Treatment: 90′ right-of-way supports dual multi-use paths providing 20′ of separation from travel lanes. Also add high visibility crosswalks and provide roundabout for traffic calming and transitioning.
    Constraints: roundabout dramatically increases project costs. Dual multi-use paths may initially be cost prohibitive. On an interim basis a more feasible option could include dual bike lanes from Dow Road to Third Street.

17. **Dow Road (Harper Avenue to Snows Cut Off-Road Trail)**
    Purpose: improve safety and provide interconnectivity to commercial area.
    Treatment: construct dual bike-lanes.
    Constraints: route intersects with high-volume traffic roadway – US Highway 421.

18. **Dow Road (Harper Avenue to Sumter Avenue)**
    Purpose: improve safety and provide interconnectivity to regional attractors and destinations.
    Treatment: construct dual bike lanes and single multi-use path along eastern right-of-way.
    Constraints: project is located within NCDOT right-of-way and subject to available funding and NCDOT authorization.

19. **Alabama Avenue**
    Purpose: improve safety and provide interconnectivity to Island Greenway and beach area.
    Treatment: construct single multi-use path along north side of roadway.
    Constraints: Town limits run down the centerline of Alabama Avenue.

20. **Lake Park Boulevard (Alabama to Lake Park)**
    Purpose: improve safety and provide interconnectivity from the southern portions of town to the beach and Central Business District areas.
    Treatment: construct single multi-use path along western side of roadway and install high visibility crosswalks.
    Constraints: will lose approximately eight on-street parking spaces to enable site improvements.

21. **Ocean Boulevard**
Purpose: improve safety and provide interconnectivity from Island Greenway to the beach area.
Treatment: construct dual multi-use path and high visibility crosswalks. Paved shoulders could be a short-term option. Later, a future resurfacing project could add a few more feet to the existing shoulder to create a bike lane.
Constraints: road is a high-volume traffic corridor located within a NCDOT right-of-way.

22. **Seventh Street (Harper Avenue to Recreation Center)**
Purpose: improve safety on roadway frequently traveled by children to the recreation center.
Treatment: construct a single asphalt multi-use path along the eastern side of the roadway and install high visibility crosswalks.
Constraints: improvements will affect some of the area residents landscaping.

23. **Snow's Cut Bridge – Phase 1 (bridge deck area)**
Purpose: improve safety and provide interconnectivity between the town and the City of Wilmington.
Treatment: construct dual bike lanes in place of existing sidewalks.
Constraints: space constraints would require center physical median to allow expanding sidewalks to bike lanes. Improvements would require substantial funding and NCDOT authorization.

24. **Eighth Street**
Purpose: improve safety and provide interconnectivity to park and Island Greenway.
Treatment: add sharrows, signage, and high visibility crosswalks to existing roadways.
Constraints: route crosses a couple high volume traffic roadways.

25. **Annie Drive**
Purpose: improve safety and provide interconnectivity to existing multi-use path.
Treatment: add sharrows and signage to existing roadway.
Constraints: need to complete as part of overall phasing plan for improvements to have value.

26. **Tennessee Avenue**
Purpose: improve safety and provide interconnectivity from southern portions of town to beach areas.
Treatment: 90' right-of-way supports dual multi-use paths providing 20' separation from travel lane. Plan also includes the addition of high visibility crosswalks.
Constraints: dual multi-use paths may initially be cost prohibitive. On an interim basis a more feasible option could include dual bike lanes.

27. **Snow's Cut Bike Path – Phase 2 (convert to asphalt surface)**
Purpose: provide interconnectivity to the Down Road Greenway and State Park.
Treatment: convert existing gravel trail to 10' paved asphalt multi-use path.
Constraints: safety concerns in heavily wooded remote area.

28. **Snow's Cut Bridge – Phase 2 (at-grade multi-use path)**
Purpose: improve safety by providing interconnectivity to commercial area, the Snows Cut trail, the Dow Road Greenway, and the State Park.
Treatment: construct a single 10' asphalt multi-use path beneath the bridge deck from Lewis Drive to the Snows Cut trail.
Constraints: would require NCDOT authorization for improvements.

29. **Island Greenway – Phase 2 (remaining portion)**
Purpose: provide regional trail link and interconnectivity to Kure Beach and southern Pleasure Island area attractors.
Treatment: construct a 10' paved asphalt multi-use path.
Constraints: funding limitations and Sunny Point buffer area approvals.

30. **Bonito Lane**
Purpose: improve safety and provide interconnectivity from southern portions of town to beach areas.
Treatment: 90' right-of-way supports dual multi-use paths providing 20' separation from travel lane. Plan also includes the addition of high visibility crosswalks.
Constraints: dual multi-use paths may initially be cost prohibitive. On an interim basis a more feasible option could include dual bike lanes.

31. **Lake Park Boulevard (Lake Park to Fayetteville Avenue) ***
Purpose: Reinvigorate the Central Business District and crate a successful downtown.
Treatment: Add dual bike lanes and sidewalks.
Constraints: Would require NCDOT authorization for improvements and an Encroachment Permit.

* All references to the design philosophy area based on the Carolina Beach, Central Business District, and streetscape design development study prepared by peter j. smith & company, inc. in October 2009.

32. **Cape Fear Boulevard (Third Street to Carolina Beach Avenue) ***
Purpose: Reinvigorate the Central Business District and crate a successful downtown.
Treatment: Add dual bike lanes and sidewalks.
Constraints: Existing residents which currently park within the public right-of-way would lose some parking spaces with revision from 90° parking to parallel parking.

* All references to the design philosophy area based on the Carolina Beach, Central

Business District, and streetscape design development study prepared by peter j. smith & company, inc. in October 2009.

33. **Harper Avenue (Third Street to Carolina Beach Avenue) ***
Purpose: Reinvigorate the Central Business District and crate a successful downtown.
Treatment: Add dual bike lanes and sidewalks.
Constraints: Existing residents which currently park within the public right-of-way would lose some parking spaces with revision from 90° parking to parallel parking.

* All references to the design philosophy area based on the Carolina Beach, Central Business District, and streetscape design development study prepared by peter j. smith & company, inc. in October 2009.

34. **Greenville Avenue (Fourth Street to Island Greenway)**
Purpose: provide interconnectivity to regional greenway.
Treatment: Add sharrows and signage to existing roadway.
Constraints: need to complete after Island Greenway to avoid a dead-end bicycle boulevard.

35. **King Avenue (North to Carolina Beach Avenue North)**
Purpose: provide interconnectivity to Central Business District and beach area.
Treatment: Add sharrows, signage, high-visibility crosswalk, and single shared use path.
Constraints: limited right-of-way within a highly urbanized area with heavy traffic.

36. **Hamlet Avenue (Lake Park Boulevard to Carolina Beach Avenue S)**
Purpose: provide interconnectivity to Lake Park and Central Business District.
Treatment: Add sharrows, signage, and high-visibility crosswalk.
Constraints: crosswalk location occurs at the terminus of an "S" curve.

37. **Intersection Upgrades**

    a. **Harper Avenue & Old Dow Road**
    Treatment: Install high-visibility crosswalk, pedestrian activated crosswalk signal, and pedestrian warning and crossing signs (advance motorist warning sign, pedestrian warning sign, and motorist specific instance sign).

    b. **Harper Avenue & Seventh Street**
    Treatment: Install high-visibility crosswalk

    c. **Harper Avenue & Carolina Beach Avenue North**
    Treatment: Install high-visibility crosswalk

d. **Cape Fear Boulevard & Old Dow Road**
Treatment: Install high-visibility crosswalk

e. **Clarenden Avenue & Old Dow Road**
Treatment: Install high-visibility crosswalk

f. **Alabama Avenue & Lake Park Boulevard South**
Treatment: Install high-visibility crosswalk

g. **Ocean Boulevard & Lake Park Boulevard South**
Treatment: Install high-visibility crosswalk

h. **Tennessee Avenue & Lake Park Boulevard South**
Treatment: Install high-visibility crosswalk

i. **Carolina Beach Avenue South & Lake Park Boulevard South**
Treatment: Install high-visibility crosswalk

j. **Driftwood Lane & Lake Park Boulevard South**
Treatment: Install high-visibility crosswalk

k. **King Avenue & Lake Park Boulevard North**
Treatment: Install high-visibility crosswalk

l. **Lake Park Boulevard North & St. Joseph Street**
Treatment: Install high-visibility crosswalk

Combining the information from the Existing Roadway Conditions Inventory with the Overall Projects Priority Table enabled preparation of the Bicycle Multi-Use Network Plan, which follows this page.

TOWN OF CAROLINA BEACH BICYCLE/MULTI-USE TRANSPORTATION PLAN

RECOMMENDED BICYCLE/MULTI-USE NETWORK PLAN

CAPE FEAR RIVER

CAROLINA BEACH RECREATION CENTER

PARK MARINA

PARK ENTRANCE

CAMPING LOOP

CAROLINA BEACH STATE PARK

CAROLINA BEACH GREENWAY SYSTEM

PROPOSED DOW ROAD BIKE LANES & MULTIUSE TRAIL

SUNNY POINT BUFFER AREA

ICWW

SNOWS CUT BRIDGE (TO WILMINGTON)

MIKE CHAPPEL PARK

CAROLINA BEACH ELEMENTARY SCHOOL

SNOWS CUT BIKE PATH

PROPOSED ISLAND GREENWAY

WILDLIFE BOAT RAMP

MARINA

FREEMAN PARK

LAKE PARK

CAROLINA BEACH SENIOR CENTER

CAROLINA BEACH LIBRARY

CAROLINA BEACH BOARDWALK & PAVILION

PROPOSED AQUARIUM PIER AT CAROLINA BEACH

ATLANTIC OCEAN

LEGEND

- TOTAL BICYCLE/MULTI-USE PATH DISTANCE: 19.0 MILES
- EXISTING PAVED SHOULDERS
- DUAL MULTI-USE PATH
- SINGLE MULTI-USE PATH:
  - EXISTING
  - PROPOSED
- DUAL BICYCLE LANES AND SIDEWALKS
- DUAL BICYCLE LANES & SINGLE MULTI-USE PATH (DOW ROAD)
- BICYCLE BOULEVARD (PAVEMENT MARKINGS W/ PRIORITIZED TRAVEL)
- CONTRAFLOW BICYCLE LANE W/ STANDARD BICYCLE LANE
- DUAL BICYCLE LANES:
  - EXISTING
  - PROPOSED
- PROPOSED ROUNDABOUT
- HIGH VISIBILITY CROSSWALK

McKIM&CREED
243 NORTH FRONT STREET
WILMINGTON, NORTH CAROLINA 28401
TELE: (910) 343-1048
FAX: (910) 251-8282
NC License # C-0342

PROJECT PRIORITIES

Projects had to be prioritized to better manage the 30 projects list and to maintain fiscal responsibility.

In order to identify project segments, a ranking system was used to evaluate the effectiveness of enhancing connectivity, improving safety, and the ease of implementation.

Project corridor rankings were further evaluated to create the High-Priority Short-Term Project Phases table to develop a manageable plan for implementation. Project phases were identified where implementation could occur within a 5-year time frame. High-Priority projects that exceeded 5-years were placed on the High-Priority Long-Term Project Phases. This phasing plan resulted in the following project phases.

HIGH-PRIORITY SHORT-TERM PROJECT PHASES

Phase	Roadway Segment	From	To	Approx. Length (ft)	Costs
1	Clarendon Avenue	Dow Road	Terminus	2,850	$218,000
				Subtotal	$218,000
2	Cape Fear Boulevard	Dow Road	Third Street	3,385	$245,000
2	Cape Fear Boulevard	Third Street	Carolina Beach Avenue N	1,042	$715,000
2	Harper Avenue	Dow Road	Third Street	3,465	$260,000
2	Harper Avenue	Third Street	Carolina Beach Avenue N	608	$635,000
				Subtotal	$1,855,000
3	Lake Park Boulevard N	Carl Winner Boulevard	St. Joseph Street	1,042	$415,000
3	Lake Park Boulevard S	Alabama Avenue	Lake Park shared-use path	5,430	$200,000
				Subtotal	$615,000
4	Carolina Beach Avenue N	Harper Avenue	Salt Marsh Lane	8,800	$7,500
4	Salt Marsh Lane	Carolina Beach Avenue N	Canal Drive	288	$850
4	Canal Drive	Salt Marsh Lane	Virginia Avenue	988	$2,500
4	Virginia Avenue	Canal Drive	Maryland Avenue	1,305	$1,500
4	Maryland Avenue	Virginia Avenue	Georgia Avenue	282	$800
4	Florida Avenue	Georgia Avenue	Canal Drive	2,218	$2,500

Phase	Roadway Segment	From	To	Approx. Length (ft)	Costs
4	Canal Drive	Florida Avenue	Periwinkle Lane	140	$1,500
4	Periwinkle Avenue	Canal Drive	Carolina Beach Avenue N	286	$1,000
				Subtotal	$18,150
5	St. Joseph Street	Lake Park Blvd N	Lewis Drive	4,682	$8,000
5	Lewis Drive	St. Joseph Street	Snows Cut Bridge	2,246	$1,500
5	Otter Road	Lewis Drive	Teakwood Drive	428	$1,000
5	Teakwood Drive	Otter Road	Peninsula Drive	798	$1,500
5	Peninsula Drive	Teakwood Drive	Island Marina Drive	916	$1,500
5	Island Marina Drive	Peninsula Drive	Annie Drive	894	$1,500
5	Annie Drive	Island Marina Drive	Snows Cut Bike Path	550	$21,000
				Subtotal	$36,000
6	Seventh Street	Harper Avenue	Rec. Center	2,184	$88,000
				Subtotal	$88,000
7	Dow Road	Harper Avenue	Sumter Avenue	4,678	$515,000
				Subtotal	$515,000
				TOTAL	**$6,690,300**

High-Priority Long-Term Project Phases

Phase	Corridor
1	Island Greenway – Phase 1 (from Greenville Avenue to North Carolina Avenue)
2	Dow Road (from Harper Avenue to Sumter Avenue)
3	Snow's Cut Bridge – Phase 1 (bridge deck area)
4	Snow's Cut Bridge – Phase 2 (at-grade multi-use path)
4	Snow's Cut Bike Path – Phase 2 (convert to asphalt surface)
5	Island Greenway – Phase 2 (remaining portion)

Bicycle Multi-Use Plan Enhancements

With the implementation of bicycle facilities, programs and policies will need to be adopted to support the plan objectives. Adoption of programs and policies will be dependent upon the critical mass of the bicycle facility improvements. The following have been identified:

EDUCATIONAL PROGRAMS

Specific educational programs available to the town include bike rodeos. The Division of Bicycle and Pedestrian Transportation also has educational safety resources as well as other Safety & Education resources and links.

In addition to bicycle rodeos, the town can conduct bicycle helmet use forums. The use of bicycle helmets is essential to reducing rider injuries and fatalities. The town can partner with NCDOT to undertake a helmet promotion. NCDOT has created brochures and materials to support helmet usage and these materials are predominately free of charges. The town can request helmets through DBPT's Bicycle Helmet Initiative if conducting safety events for underprivileged children.

To further support the town's safety educational initiatives the town has existing NCDOT resources which it can tap into. These include pamphlets, handouts, videos, posters, manuals, and guidebooks. These materials can be ordered online at www.ncdot.gov/bikeped/safetyeducation/materials, by phone (919) 807-0777 or by fax (919) 807-0768.

POLICE-ON-BICYCLES PROGRAM

A Police-on-Bicycles Program can be extremely valuable as an educational tool for both the motorist and bicyclist. When roadway travel patterns are changed to accommodate bicyclists, motorists can be unsure and / or unknowledgeable of the right-of-way hierarchy.

This program can be short term as resident and visitor understanding increases. And this program can move from area to area as bicycle / multi-use phases are developed. This program is predominately needed in areas where a form of bicycle boulevard is proposed. Bicycle boulevards blend bicycle movement with vehicular movement, providing prioritized travel to the bicyclist.

A Police-on-Bicycles program helps phase in the implementation of bicycle boulevards by having a presence, providing an example, enhancing knowledge, creating safety, and expanding the sense of community.

SAFE ROUTES TO SCHOOL PROGRAM (SRTS)

Established in May 2006, the National Center for Safe Routes to School assists communities in enabling and encouraging children to safely walk and bike to school. The center strives to equip Safe Routes to School programs with the knowledge and technical information to implement safe and successful strategies.

PUBLIC AWARENESS PROGRAM

Public awareness should continue as portions of the bicycle multi-use network are implemented. Both the motorists and the bicyclists need to be made aware of new roadway

conditions. New roadway conditions could include the additions of bike lanes, the establishment of bicycle boulevards, the additions of high visibility crosswalks, the addition of pedestrian signalization, and the establishment of contraflow bicycle lanes on one-way streets. This outreach can occur through the town's website, the local newspapers, and announcements at the regional cycling clubs and parks and recreation department.

BICYCLE FRIENDLY COMMUNITY PROGRAM

The League of American Bicyclists offers a Bicycle Friendly Community program, which provides incentives, hands-on assistance, and award recognition for communities that actively support bicycling. A Bicycle Friendly Community welcomes cyclists by providing safe accommodation for cycling and encouraging people to bike for transportation and recreation.

The town should apply for this designation as the Bicycle Multi-Use Network Plan implementation progresses.

SMART CYCLING PROGRAM

The Smart Cycling program is a set of curricula for adults and children and the certified instructors that teach it. Smart Cycling classes are taught across the United States by certified League Cycling Instructors (LCI) represented by the League of American Bicyclists. The town should enlist their services as an educational program.

NATIONAL BIKE MONTH PROGRAM

May is national bike month. Program events could be sponsored by the town, including bike week and bike-to-work day. Using the publicity that abounds with this national event, the town could promote local events as well.

BICYCLE PARKING PROGRAM

The citizens / visitors survey listed events and destinations that were most frequented. The town should implement assessment and installation of bicycle parking areas for these most-frequented areas. These areas include: beach access areas, Lake Park, and the boardwalk / pavilion area.

POLICIES

BICYCLE PARKING ORDINANCE

The town should consider adoption of a bicycle parking ordinance to create a more bicycle-friendly atmosphere. Fairly simple measures can be implemented to require bicycle parking. An example of a local ordinance is described below:

Bicycle parking – Each new multifamily, commercial, or office development or major redevelopment requiring twenty-five (25) or more automobile parking spaces shall make

provisions for parking a minimum of five (5) bicycles. Each additional one hundred (100) automobile parking spaces above the twenty-five (25) minimum shall require provisions for parking an additional five (5) bicycles up to a bicycle parking system that can accommodate a maximum of twenty (20) bicycles. The bicycle parking provisions shall allow for bicyclists to secure their vehicle against theft. Bicycle parking facilities shall be provided with twenty (20) feet of the primary entrance to the facility. In the event of multiple entrances, bicycle-parking facilities shall be dispersed for easy access to the multiple entrances.

Bicycle Multi-Use Network Funding

The town should consider allocating funding for bicycle multi-use phased improvements. This plan provides cost estimates for the 5-year high priority projects. The town should support these projects by providing funding in the Capital Improvements Plan, even if the phasing has to be further broken down into sections allocating funding initiates the primary implementation. Funding should be earmarked for new construction and ongoing maintenance.

Bicycle Multi-Use Network Maintenance

The town will need to include bicycle multi-use path maintenance with its street maintenance efforts. A vast majority of the network is within the town streets public right-of-ways, so this can be easily implemented. However, the network maintenance will need to occur on a more frequent interval, primarily as it pertains to debris removal. A comprehensive network maintenance schedule needs to be prepared.

Bicycle on Boardwalk Policy

The town should consider allowing bicycles on the boardwalk. The boardwalk area is listed as one of the favorite destinations for cyclists. A compromise policy to allow bicyclists on the boardwalk without affecting the safety of pedestrians could be developed.

Bicycle Contraflow Policy

The town should adopt a policy / ordinance to allow contraflow of bicycles on one-way streets where contraflow bike lanes are indicated with pavement markings.

Bicycle Multi-Use Transportation Plan Update Policy

The town should adopt a policy to update the Bicycle Multi-Use Transportation Plan every five years. For the document to continue to be effectively implemented, it will need to be updated. Similar to the CAMA Land Use Plan that is required to be updated every five years, this plan is a living document.

Town Code

Sec. 9-84. Riding on roadways and bicycle paths.

(a) Every person operating a bicycle upon a roadway shall ride as near to the right-hand side of the roadway as practicable, exercising due care when passing a standing vehicle or one proceeding in the same direction.

(b) Persons riding bicycles upon a roadway shall not ride more than two abreast, except on paths or parts of roadways set aside for the exclusive use of bicycles. ***The town should amend this section requiring that motorists respect a 3 foot passing distance when overtaking bicyclists.***

(c) Whenever a usable path for bicycles has been provided adjacent to a roadway, bicycle riders shall use the path and shall not use the roadway. ***The town should remove the requirement that cyclists use paths, when available, adjacent to roadway. In North Carolina, cyclists have as much right to a road as a vehicle.***

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

KEY PARTNERS

The town council will ultimately be responsible for formally adopting this plan. Through this adoption, the town's leadership is recognizing the value of the plan and their intent to pursue bicycle multi-use path improvements. In addition to improving the quality of life for the citizens of the town, this plan also provides economic benefit to the tourism industry, which is important to the town.

Adoption of this plan by town council provides support to town staff who helped prepare the plan, and to the town board which also advised on this plan prior to the town council hearing. Supporting roles for the continued implementation efforts will be required as action steps occur. The following Action Steps table will aide the town in on-going and successful plan implementation.

Bike Class by Mike Cynecki

ACTION STEPS TABLE

Task	Lead Agency	Support	Details	Phase	Page Reference
Adopt The Plan	Carolina Beach Parks And Recreation Department	Project Consultant	Council Meeting January 2011	Short-Term 2011	n/a
Adopt Bicycle Policies	Carolina Beach Planning Department	Carolina Beach Parks And Recreation Department	Adopt policies per plan recommendations	Continuous / Ongoing	Section 6 – Page 6
Create Bicycle Multi-Use Network Map In Town GIS Database	Carolina Beach GIS Department	Project Consultant	Prepare plan for project phases implementation	Continuous / Ongoing	Section 6 – Page 1
Adopt Bicycle Standards	Carolina Beach Parks And Recreation Department	Carolina Beach Planning Department	Adopt town wide bicycle signage and parking rack standard details.	Spring 2011	Section 5 – Page 22, 27, & 28
Enhance Bicycle Parking At Key Destinations	Carolina Beach Parks And Recreation Department	Island Women	Field assess existing bicycle parking areas at key destinations	Spring 2011	Section 2 - Page 14
Bicycle Parking Area Funding Campaign	Island Women	Carolina Beach Parks And Recreation Department	Obtain local and / or grant funding	Spring 2011	Section 7

Task	Lead Agency	Support	Details	Phase	Page Reference
Create High Priority Short Term Projects Implementation Schedule	Carolina Beach Parks And Recreation Department	Town Manager	Include in CIP	Short-Term Summer 2011 / Ongoing	Section 4 – Page 10
Seek Funding Opportunities Per Schedule Above	Carolina Beach Parks And Recreation Department	Island Women, Project Consultant	Submit funding applications	Short-Term Fall 2011 / On-Going	Section 7
Launch Programs As New Project Phases Are Built	Carolina Beach Parks And Recreation Department	Other Town Departments	Expand educational, safety, public awareness, and community programs	Short-Term Spring 2012 / On-Going	Section 6 – Page 2
Establish Bicycle Multi-Use Path Maintenance Schedule	Carolina Beach Parks And Recreation Department	Operations Department, Environmental Division	Debris removal and repair, acquire equipment as necessary	Continuous / On-Going	Section 6 – Page 6
Produce A Bicycle Map	Carolina Beach GIS Department	Carolina Beach Parks And Recreation Department	Prepare bicycle map that allows updates as project phases occur	Mid-Term (2013)	Section 6 – Page 1
Reassess Project Priorities	Carolina Beach Parks And Recreation Department	Town Manager	Reconfirm phasing plan meets town objectives	Long-Term (2014)	Section 4 – Page 3

Task	Lead Agency	Support	Details	Phase	Page Reference
Update Bicycle Multi-Use Transportation Plan	Carolina Beach Parks And Recreation Department	Town Manager, Other Town Departments, And Project Consultant	Prepare a new bicycle multi-use transportation plan every 5 years	Long-Term (2016) / On-Going	Section 6 – Page 7

SECTION 1 - INTRODUCTION

BICYCLE PLANNING INITIATIVE

The Town of Carolina Beach has actively pursued bicycle / multi-use path improvements. This is evidenced by the Snow's Cut Off-Road Bike Trail (2002), the Lake Park Multi-Use Trail (2004), and the Dow Road Greenway Trail (2007). As these bicycle / multi-use paths were developed, the town sensed the need for a Comprehensive Bicycle Multi-Use Transportation Plan.

In recognition of a need for this plan and financial assistance, the town submitted a North Carolina Department of Transportation (NCDOT) Application for Bicycle and Pedestrian Planning Grant Funds for 2007 and 2008. Unfortunately, these applications were denied.

The town continued to recognize the value of and need for a Comprehensive Bicycle Multi-Use Transportation Plan to enable implementation of an overall plan. Consequently, the town submitted a third application to NCDOT in 2009 and was awarded $20,000 of NCDOT Planning Funds to develop the plan. The town provided a $5,000 local match for a total project amount of $25,000.

With funding in place, the town hired McKim & Creed, P.A. to assist with the preparation of the 2010 Bicycle Multi-Use Transportation Plan. This plan will serve as a "road map" to expand and interconnect bicycle / multi-use paths. The plan will complement local and regional bicycle / multi-use path plans that have been completed or are underway.

This plan can further be used to apply for grant funding from state, federal, and regional funding resources. With the current competition for funding dollars, the adoption of a Bicycle Multi-Use Transportation Plan signals the serious intentions of the town's pursuit to expand its bicycle / multi-use path network. The plan itself is a living document, which will need to be updated as the town's growth changes.

PUBLIC INVOLVEMENT

It is imperative to have public involvement in order to develop a responsive plan. A responsive plan evolves over time as consensus of the plan goals is developed; thus, the need for many public input opportunities and venues.

Public input was solicited through two public open houses, and through public hearings at the town's Board and Council meetings. An on-line citizens / visitors survey was available locally (town's main website and Chamber of Commerce website) and regionally (Island Greenway website).

The first public open house meeting was held on May 19, 2010 at the Town Council Chambers. During the first open house, citizens and visitors were made aware of the goals and objectives of the Bicycle Multi-Use Transportation Plan. The second public open house meeting was held on August 11, 2010 at the Town Council Chambers. During the second open house, highlights

of the Draft Bicycle Multi-Use Transportation Plan were presented, with further input from the citizens and visitors.

Media outreach was provided with press releases, public notices, announcements at Chamber of Commerce and Island Greenway events, and postings at the Parks and Recreation Center and Carolina Beach State Park.

A Steering Committee was formed that was composed of diverse interests, including representation from town staff, the town council, the Manager's Office, the Parks and Recreation Department, the Planning Department, the GIS Department, the Police Department, the Chamber of Commerce, the Seniors Center, the New Hanover County Planning Department, the Wilmington Metropolitan Planning Organization, Bicycle and Pedestrian Transportation, and the NCDOT Division of Bicycle and Pedestrian Transportation.

This committee met four times throughout the planning process and a majority of the committee members attended the public open house meetings as well. This committee provided input on existing plans and policies, bicycle facilities, standards, guidelines, project corridors, project priorities, and project implementation.

VISION STATEMENT

During the initial project kick-off meeting, members discussed the town's unique characteristics and traits. Undoubtedly, one of the unique characteristics of the town was the opportunity for interconnectivity. Although the town is only 2.5 square miles, it provides a multitude of local, state, and federal linkage nodes. As such, the vision for the plan was to "create a more bicycle / multi-use path friendly environment and provide interconnectivity to the various town destinations."

The community goals for the town's biking environment include:

- Improving safety on existing bike routes
- Increase citizen usage of bike routes
- Link existing bike routes
- Expand the greenway network
- Have the town become recognized as a resort area biking destination

PLAN DEVELOPMENT PROCESS

Purpose:

Create a more bicycle / multi-use path friendly environment and provide interconnectivity to the various town destinations.

How:

- Build on the linkage nodes you already have
- Generate public support and endorsement
- Create policies to support goals

TASK 1: CONFIRM PROJECT ORGANIZATION AND GOALS

Purpose: Gain understanding of staff and committee visions, goals and objectives for plan; learn about target areas in Town of Carolina Beach.

- Four (4) Steering Committee meetings
- Monthly e-mail summaries to Steering Committee
- Monthly and quarterly report for NCDOT and Carolina Beach

TASK 2: PROJECT INVENTORY

Purpose: Provide tools to define opportunities and constraints for bicycle improvements.

- Preliminary assessment of specified bike corridors
- Inventory map of facilities, greenways, trails, roadways, etc., within study area
- Inventory of linkage nodes
- Assessment of current projects and policies

End Product: Comprehensive composite map of existing conditions

TASK 3: PUBLIC INVOLVEMENT

Purpose: Gain public's understanding and endorsement for community-wide bicycle system.

- Two public open house meetings
  - *Open House #1:* Review current status of bicycle system, gain understanding of citizens' goals and visions, and distribute citizens survey (May 12, 2010)
  - *Open House #2:* Present preliminary maps, discuss prioritization plan, gain feedback (July 19, 2010)
- Citizens survey (May 12th – June 30th)

End Product: Tabulated responses to citizens survey

TASK 4: PRELIMINARY COMPREHENSIVE BICYCLE MULTI-USE PLAN

Purpose: Identify means to create more bicycle-friendly environment.

- Goals and objectives
- Current conditions evaluation and existing conditions map
- Bicycle network plan and map
- Bicycle facility guidelines
- Program and policy recommendations
- Implementation strategy

End Product: Preliminary Comprehensive Bicycle Multi-Use Plan with supporting design details and policies.

TASK 5: CLIENT REVIEW

Purpose: Ensure plan addresses staff, committee and NCDOT comments, issues, suggestions and concerns.

- Meet with staff and Steering Committee before second public open house
- 90 days to review plan and submit comments

TASK 6: FINAL PLAN

Purpose: Create a more bicycle / multi-use path friendly environment and provide interconnectivity to the various town destinations.

- Incorporate comments from staff, Steering Committee, NCDOT and general public.
- Produce final Comprehensive Bicycle Multi-Use Plan.
- Present plan to Town of Carolina Beach Board for adoption.
- Planning and Zoning review and recommendation.

End Product: Final Comprehensive Bicycle Multi-Use Transportation Plan with prioritized bicycle network areas, 5 year priority cost estimates, facilities guidelines, policies, funding options, and implementation strategy.

BENEFITS OF BICYCLING

Webster's Dictionary defines benefit as "something that promotes well-being." Bicycling supports the well-being of many things.

- Health
- Attitude
- Environment
- Economic

HEALTH

One of the common health hazards today is a sedentary lifestyle which contributes to chronic health issues such as heart disease, obesity, diabetes, and high blood pressure. Most Americans don't get any real exercise. This percentage continues to increase as society moves toward technological conveniences with little patience for time-driven activities such as exercise.

Bicycling as a form of exercise or simply for pleasure can help improve your health. Cardiovascular exercise, such as bicycling, helps your heart and your blood circulation, and it helps burn carbohydrates and fat. Another motivating factor is, its fun!

ATTITUDE

Bicycling is therapeutic for the mind and spirit, and it reduces stress. Since you have to be outdoors for cycling, it allows the rider to enjoy more of the natural environment. The mind has an opportunity to be redirected to some of nature's wonders. This in itself fosters appreciation and well-being.

The fundamentals of cycling generally involve some planning, preparation, and a destination. These fundamentals require you to become organized (planning / preparation) and set a goal (destination). Simple steps are completed. You have accomplished a goal you set, and you feel good about yourself. It does not matter whether it is a timed relay, training, or a family outing; it makes you feel good about yourself and improves your attitude.

ENVIRONMENT

Bicycling helps improve the environment in a number of ways. First, if you are on a bike, that means you are not driving a motor vehicle. Motor vehicles cause noise pollution and air pollution. Traffic congestion also affects the mental environment with increased stress.

Motor vehicles require paved surfaces and roadway extensions. This results in additional stormwater run-off and potential community divisions with roadway extensions.

Bicycling can provide a safe alternative to motor vehicle use, which effectively reduces the environmental consequences of motor vehicles.

ECONOMIC

Tourism is an important contributing financial factor to the town. And as with many resort destination towns, competition for tourist dollars is fierce.

There is a striking correlation of tourist dollars associated with bicycle / multi-use paths, based on a document titled "The Economic Impact of Investments in Bicycle Facilities" by NCDOT in 2003. http://www.ncdot.gov/bikeped/researchreports/ The study was conducted in the Outer Banks, and quantifiable data was extrapolated:

- Estimated annual expenditures for bicycle tourists based on 10,200 cyclists x $175 / day x 8.3 days / trip = $14.8 million.

While the town will not see that number of annual cyclists, it is critical to note the correlation – cyclists can be a source of financial revenue if bicycle multi-use paths bring them to the area. In addition, the study determined that cyclists stay (in days) is longer if biking is involved, which further increases the tourist expenditure dollar amount.

Lastly, the study compared the one-time costs of bicycle multi-use path construction to economic dollars. The ratio was 1:8; for every one dollar spent on bicycle multi-use path construction, eight dollars was earned annually.

The town is a strategically located resort destination with close proximity to many popular Pleasure Island attractions, including Fort Fisher Historic Site, N.C. Aquarium and N.C. Ferry. Building bicycle multi-use paths will be a good investment for the town that will have a positive annual economic impact.

View of Woods at Fort Fisher

SECTION 2 - CURRENT CONDITIONS

OVERVIEW

Carolina Beach and the surrounding area, known as the lower Cape Fear region, abound with historic and romantic lore. Settled long before the Revolutionary War, some of the famous plantations that graced the banks of the Cape Fear River still remain, and are famous for their gardens.

Pirates made the nearby shores and inlets bases for their operations for decades, and history records the efforts of the authorities to rid the section of these interesting but troublesome outlaws. The Revolutionary War saw much activity, with Lord Cornwallis making nearby Wilmington his headquarters. The War Between the States saw the famed blockade runners based in the Cape Fear River. The Battle of Fort Fisher was the greatest naval engagement in history up to that time, and many wrecks of vessels sunk during that bitter fight still lay off the shores of Carolina Beach, and can be plainly seen at low tide, resting on the sandy bottom. Some of these wrecks now provide fisherman with grand sport, as they are favorite feeding places for sheepshead and other kinds of fish.

Carolina Beach is located on the Atlantic Coast of Southeastern North Carolina, 15 miles from the historic city of Wilmington. The town is uniquely situated between the Cape Fear River and the Atlantic Ocean. This proximity affords the residents and visitors with many opportunities to enjoy the scenic beauty that makes the town a unique place to live. A more detailed study area map follows this page.

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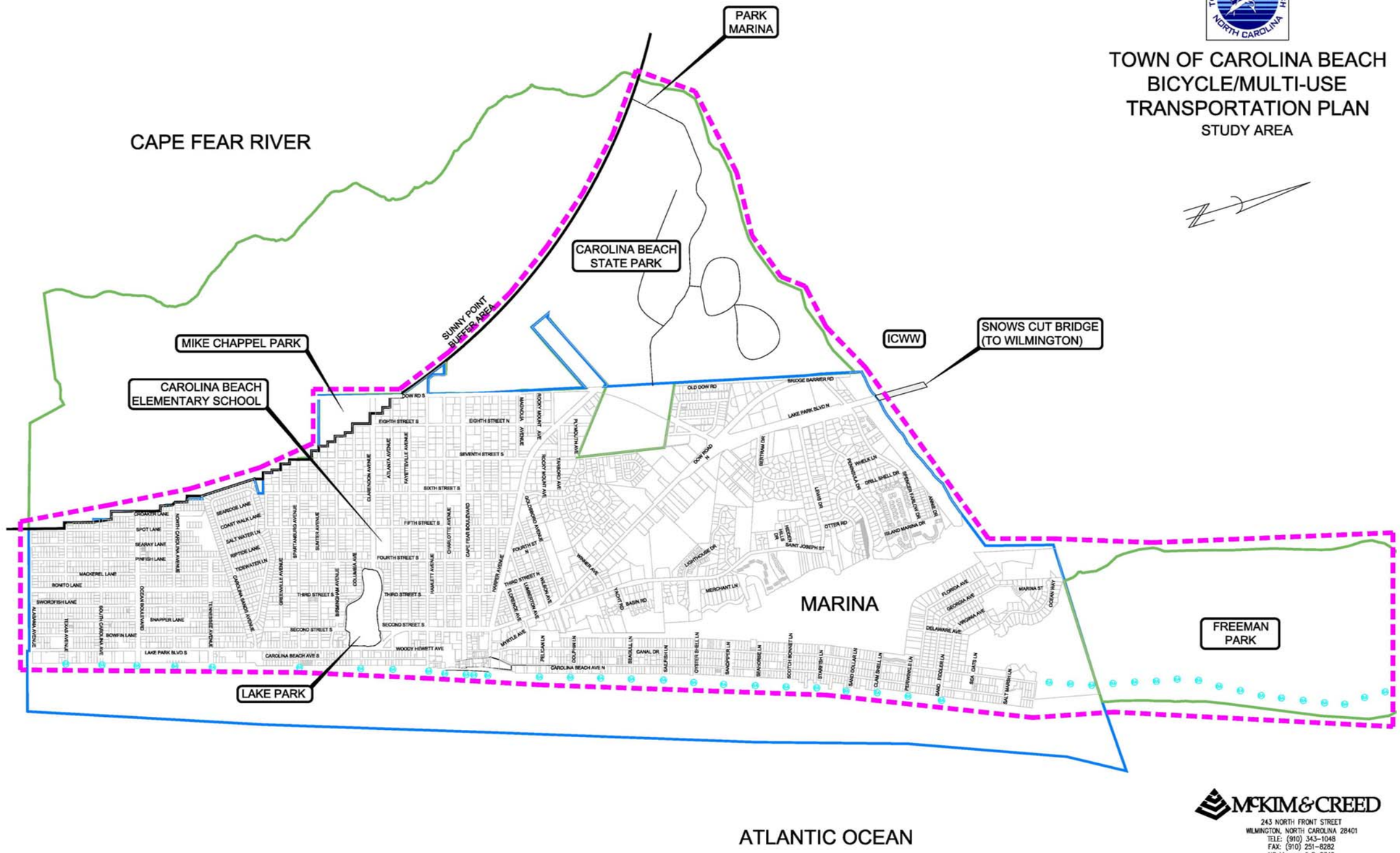
STUDY AREA MAP



TOWN OF CAROLINA BEACH
BICYCLE/MULTI-USE
TRANSPORTATION PLAN
STUDY AREA

McKIM&CREED
243 NORTH FRONT STREET
WILMINGTON, NORTH CAROLINA 28401
TELE: (910) 343-1046
FAX: (910) 251-8282
NC License # C-0342

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Hospitality has long been a trademark of Carolina Beach. It is a unique resort community and makes a pleasant vacation stop any time, year round. Located 30 miles from the Gulf Stream, the mild temperatures and warm waters offer endless hours of fun; from relaxing and sunning on the white beaches, to fishing, boating, surfing or wave riding in the blue-green ocean.

Conditions on Carolina Beach are perfect to enjoy water sports, surf fishing, pier fishing, deep-sea fishing, skiing, knee boarding, and body surfing. Residents pride themselves in keeping the beaches clean and safe with yearly cleanups and efficient public services. Carolina Beach is home to a boardwalk fully equipped with arcades, food establishments, and a gazebo where there is live music on the weekends. Its active charter boat basin at the Municipal Marina offers offshore fishing excursions.

BICYCLE CRASH DATA (SOURCE NCDOT)

Bicycle crash data was obtained from NCDOT for New Hanover County. The most pertinent tables pertaining to crash statistics are included within this section with all data located in Appendix A.

Crash Type

Crash Type	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
Bicyclist Left Turn - same direction	-	-	-	-	-	-	-	-	1	-	-	1
Bicyclist Ride-Out - sign control	-	-	-	-	-	-	-	-	1	-	-	1
Bicyclist Ride-Through - sign control	-	-	-	-	-	-	-	-	1	-	-	1
Motorist Drive-Out - sign control	1	1	-	-	2	-	-	-	-	-	-	4
Motorist Left Turn - opposite direction	-	1	-	-	-	-	-	-	-	-	-	1
Motorist Right Turn - same direction	-	-	-	-	-	-	-	-	-	-	1	1
Unknown/Insufficient Information	-	-	-	1	1	-	-	-	-	-	-	2
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Crash Location

Crash Location	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
Intersection	1	1	-	-	3	-	-	-	2	-	1	8
Intersection Related	-	1	-	-	-	-	-	-	-	-	-	1
Non-intersection	-	-	-	1	-	-	-	-	1	-	-	2

Crash Location	97	98	99	00	01	02	03	04	05	06	07	Totals
Non-roadway	-	-	-	-	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Road Type (Classification)

Road Type (Classification)	97	98	99	00	01	02	03	04	05	06	07	Totals
Interstate Route	-	-	-	-	-	-	-	-	-	-	-	-
United States Route	-	1	-	-	1	-	-	-	1	-	-	3
North Carolina Route	-	-	-	-	-	-	-	-	-	-	-	-
State Secondary Route	-	-	-	-	-	-	-	-	-	-	-	-
Local City Street	1	1	-	1	2	-	-	-	2	-	1	8
Public Vehicular Area (ex. Parking lot)	-	-	-	-	-	-	-	-	-	-	-	-
Private Property	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

The crash data revealed that the majority of accidents occurred at four-way intersections on local streets. Accidents were caused by motorist drive-out on bicycle-shared travel lanes. Weather was not a contributing factor as the accidents occurred during daylight hours on clear days. There was a 50/50 split on the faulty party; bicyclist and motorists.

CURRENT USAGE / USER DEMOGRAPHICS

In planning a bicycle network, the demographic makeup of the community is important to know in determining the preferences and travel behaviors of the town's residents. Information regarding the current usage and user demographics was obtained from the US Census Bureau, the NCDOT Bicycle and Pedestrian Division, and from a public bicycling survey.

Geography

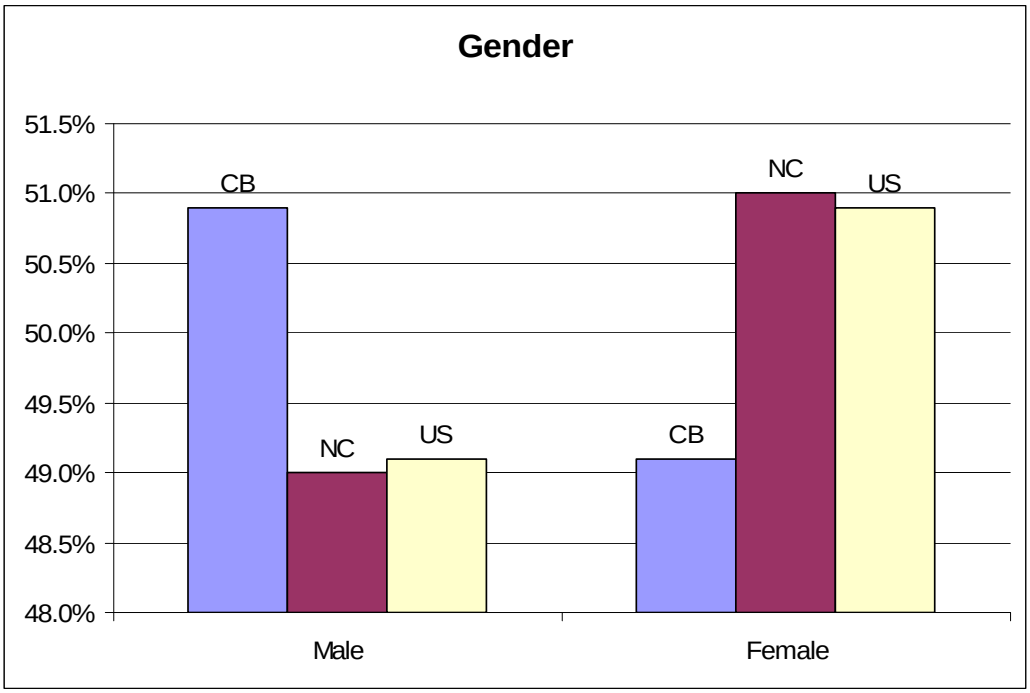
According to the US Census Bureau, the town has a total area of 2.5 square miles; 2.2 square miles of it is land and 0.2 square miles of it is water.

Demographics

The demographics indicate that the majority (65.5%) of the town's population is age group 25-64. Most (52.7%) of this group was employed in professional and service professions and had a 31.8 minute commute to work. In the summer, the population of Carolina Beach swells three-to-five times its size with visitors; however, 68% of the homes are owner-occupied. Of this amount 88% commute to work.

The target population based on the census date, the crash data, and the citizen's survey is age groups 30-60.

- A demographic analysis was completed based on available data obtained from the US Census Bureau. As of the year 2000, the total population for the Town of Carolina Beach was 4,701, of which 2,392 were males and 2,309 were females with a median age of 42 years. In the same census year, the estimated North Carolina population was 8,046,500 and the US population was 281,424,602. The median age was 35.3 years for both North Carolina and the United States. For every 100 females there were 103.6 males. For every 100 females age 18 and over, there were 104.0 males.

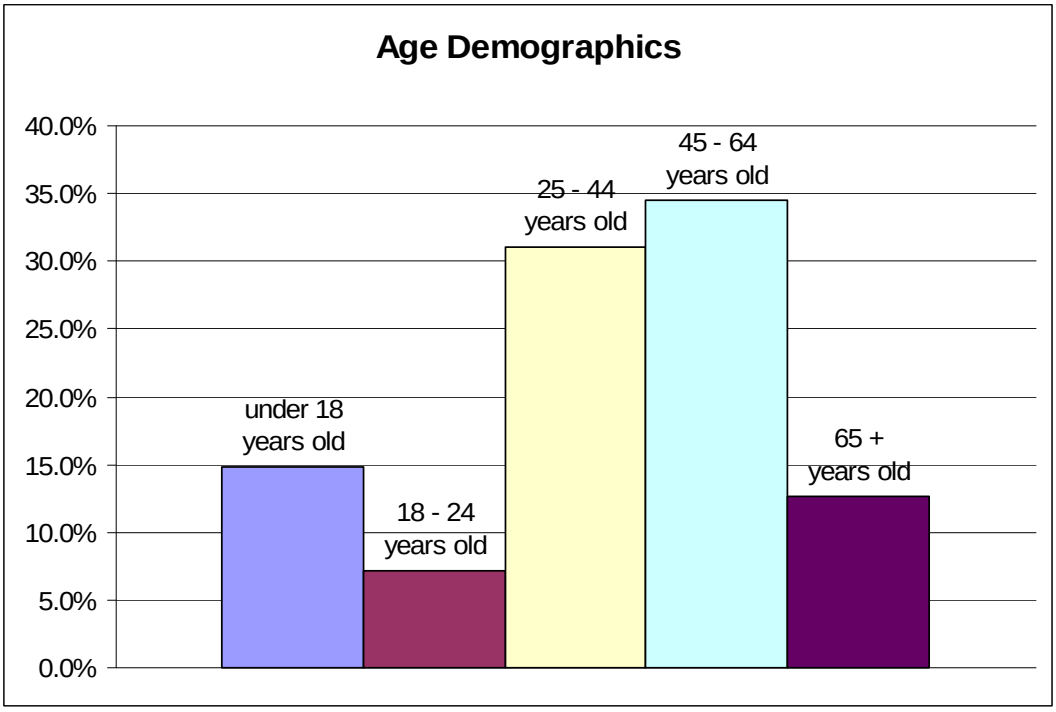


- As of the census of 2000, there were 4,701 people, 2,296 households, and 1,253 families residing in the town. The population density was 2,086.4 people per square mile. There were 4,086 housing units at an average density of 1,813.5/sq mi.

- In the year 2000, there were 2,296 households, of which 18.3% had children under the age of 18 living with them, 43.5% were married couples living together, 7.7% had a female householder with no husband present, and 45.4% were non-families. 35.1% of all

households were made up of individuals and 7.6% had someone living alone who was 65 years of age or older. The average household size was 2.03 and the average family size was 2.59.

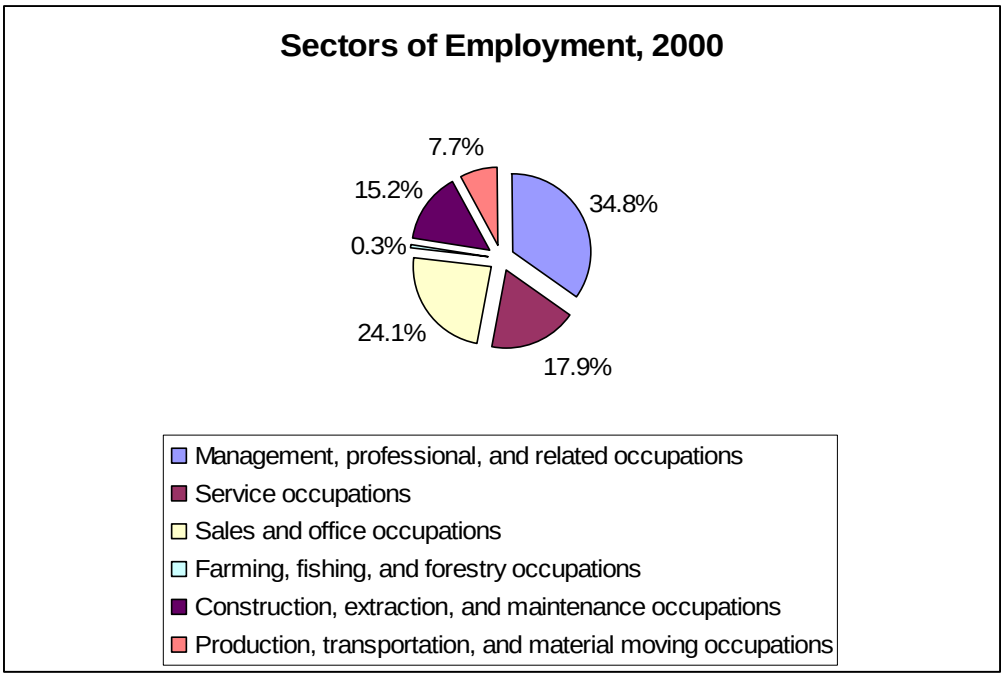
- In 2000, the percent of persons under the age of 18 in North Carolina was 27.2%. In the US it was 28.6%. The population 65 years of age or older in North Carolina was 12%, and in the US it was 12.4%. In comparison, Carolina Beach's population was spread out with 14.8% under the age of 18, 7.1% from 18 to 24, 31.0% from 25 to 44, 34.5% from 45 to 64, and 12.7% who are 65 years of age or older. The median age is 44 years.



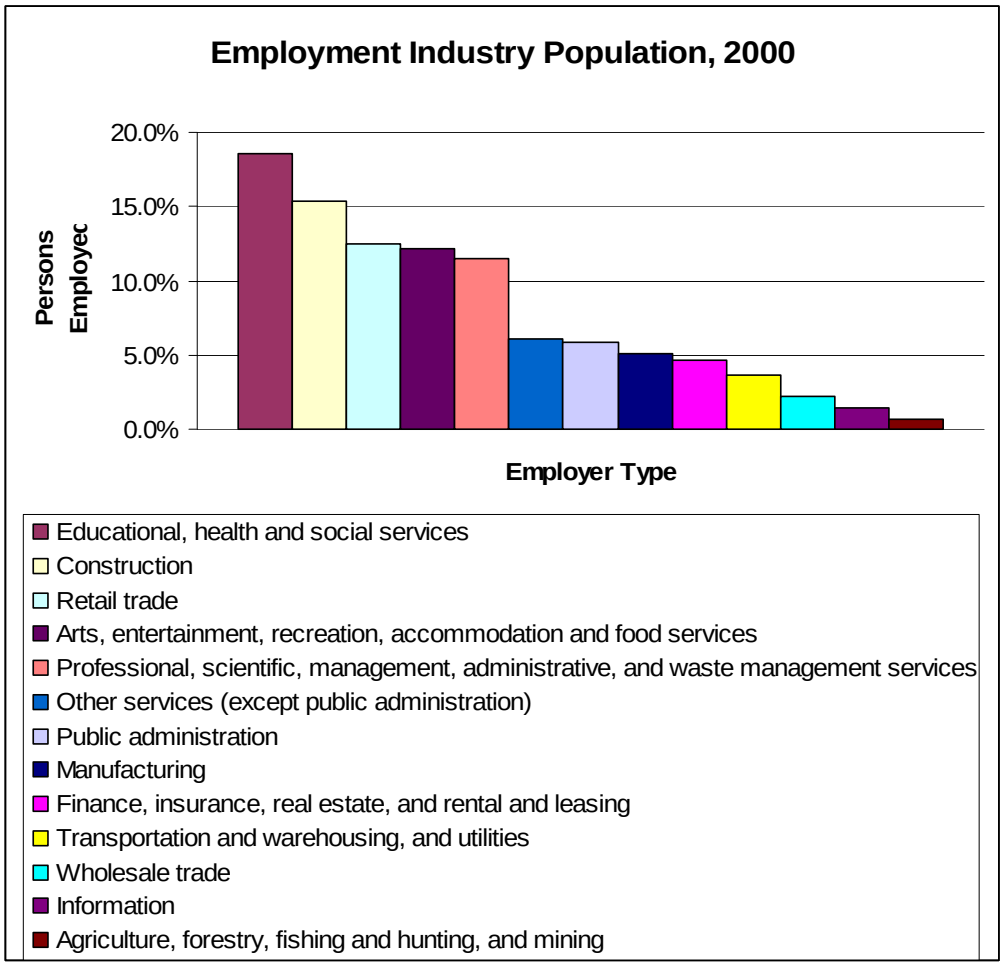
Employment

- Carolina Beach's labor force (population 16 years and over) in 2000 was 2,799 people or 68% of the working population. The civilian labor force included 2,799 people, of which 87 people were unemployed and 2,026 were employed females 16 years and over, and 686 males 16 years and over. Of those in the labor force, there was no one who was part of the armed forces. The mean travel time to work was 31.8 minutes.

- The following figure illustrates Carolina Beach's general sectors of employment. Employment is further broken down into sectors of employment, based on the 2,799 employed civilian population 16 years and over.



- According to the 2000 Census, employment industry for the population of Carolina Beach was focused around education, health, and social services. The majority of employment opportunities were in education and 18.6% of the employed population worked in this industry. The following figure illustrates Carolina Beach's employment industry by population.



Income

- According to the 2000 Census, the median income for a household in the town was $37,662, and the median income for a family was $44,882. North Carolina's median household income was $39,184 and the median family income was $46,335. During the same year, the US median household income was $41,994 and the median family income was $50,046.

- The per capita income for the town was $24,128. About 4.4% of families and 9.4% of the population were below the poverty line, including 8.9% with related children under age 18. None of those ages 65 or over were below the poverty line. The population below the poverty line of the state and nation is similar to that of Carolina Beach with 9.0% in North Carolina and 9.0% in the United States.

- Carolina Beach's full-time, year-round workers earned the following median incomes: Males had a median income of $31,013 versus $21,241 for females. The per capita income for North Carolina was $20,307 and the US was $20,307.

Vehicle

Carolina Beach – (Year – 2000)

Source: NC State Data Center

- Occupied Housing Units with No Vehicles Available – 133 (6%)
- Occupied Housing Units with One Vehicle Available – 823 (36%)
- Occupied Housing Units with Two or More Vehicles Available – 1346 (58%)

Six percent of Carolina Beach's households / units do not own a vehicle, so biking may be able to serve as a primary transportation mode.

WALK SCORE

www.walkscore.com

Also a form of demographics exists in the way of a walk score. Since this plan proposes multi-use paths which accommodate walking, this information is germane. Walk Score is the first large-scale, public access walkability index. According to the Washington Post, "Walkscore.com ranks communities nationwide (and soon, globally) based on how many businesses, parks, theaters, schools, and other common destinations are within walking distance of any given starting point."

How It Works

Walk Score is a number between 0 and 100 that measures the walkability of any address.

Walk Score	**Description**
90–100	Walker's Paradise — Daily errands do not require a car.
70–89	Very Walkable — Most errands can be accomplished on foot.
50–69	Somewhat Walkable — Some amenities within walking distance.
25–49	Car-Dependent — A few amenities within walking distance.
0–24	Car-Dependent — Almost all errands require a car.

Carolina Beach scored high with a total score of 78. It is a town that is deemed very walkable. Providing multi-use paths in conjunction with the bicycle transportation plan will further enhance this town attribute.

Inventory and Assessment of Existing Bicycle and Multi-Use Facilities

Inventory and assessment of existing bicycle multi-use facilities were conducted through a public survey and field reconnaissance. A base map was prepared utilizing GIS data that illustrated existing conditions, which follow this page. Immediately after the Existing Conditions Map, follows a more detailed analysis of the Existing Roadway Conditions.

TOWN OF CAROLINA BEACH BICYCLE/MULTI-USE TRANSPORTATION PLAN

EXISTING CONDITIONS

TOWN OF CAROLINA BEACH NORTH CAROLINA

CAPE FEAR RIVER

CAROLINA BEACH RECREATION CENTER

CAROLINA BEACH STATE PARK

PARK MARINA

PARK ENTRANCE

CAMPING LOOP

CAROLINA BEACH GREENWAY SYSTEM

SUNNY POINT BUFFER AREA

ICWW

SNOWS CUT BRIDGE (TO WILMINGTON)

MIKE CHAPPEL PARK

CAROLINA BEACH ELEMENTARY SCHOOL

SNOWS CUT BIKE PATH

WILDLIFE BOAT RAMP

MARINA

FREEMAN PARK

LAKE PARK

CAROLINA BEACH SENIOR CENTER

CAROLINA BEACH LIBRARY

CAROLINA BEACH BOARDWALK & PAVILION

ATLANTIC OCEAN

LEGEND

EXISTING BIKE FACILITIES

- OFF-ROAD TRAIL
- BICYCLE LANES
- MULTIUSE TRAIL
- PAVED SHOULDER
- NC STATE BIKE ROUTE #3 (PORTS OF CALL)

EXISTING OTHER

- UNPAVED ROAD
- STREET R/W > 90 FT
- BEACH ACCESS

McKIM & CREED
243 NORTH FRONT STREET
WILMINGTON, NORTH CAROLINA 28401
TELE: (910) 343-1048
FAX: (910) 251-8282
NC License # C-0342

Existing Roadway Conditions

Roadway Segment	From	To	2008 AADT's NCDOT & WMPO	Speed Limit	Ownership	R/W Width	Pavement Width	No./ Width of Lanes	Wide Paved Shoulders (WPS), Wide Curb Lane (WCL) or Bike Lane (BL)	On Street Parking (Y or N), Parallel, Perpendicular, or Diagonal	Notes
Alabama Avenue	Spot Lane	Lake Park Blvd S	No Count	25	Town	90	18′	2	N/A	N	Drainage ditch both sides intermittent
Annie Drive	Risso Lane	Snows Cut Trail	No Count	25	Town	30	20′	2	N/A	N	Wildlife boat ramp parking on both sides of road (dirt)
Atlanta Avenue	Second Street	Carolina Beach Avenue S	No Count	25	Town	50	19′	2	N/A	N	Moderate traffic, residential / hotel electric on Northside
Bonito Lane	Tennessee Avenue	Alabama Avenue	No Count	25	Town	90	18′	2	N/A	N	Drainage ditch east side
Canal Drive	Cape Fear Boulevard	Terminus	No Count	25	Town	40	26′	2	BL(W)	N	Heavy traffic, slow moving; electric on east and west; heavy pedestrian and bike traffic
Cape Fear Boulevard	Dow Road	Carolina Beach Avenue S	No Count	35	Town	90	34′	3	N/A	Y; Portion Diagonal	Moderate traffic, center turn lane; parking on grass median; electric on north and south
Carl Winner	Canal Drive	Lake Park Blvd N	No Count	25	Town	25	46′	3	N/A	N	Loading zone north side; electric on south side
Carolina Beach Avenue N	Harper Avenue	Salt Marsh Lane	1,256	25	Town	30	28′	2	BL(E)	N	Moderate traffic, pedestrian and bike traffic; electric on west side
Carolina Beach Avenue S	Lake Park Blvd S	Hamlet Avenue	No Count	25	Town	30	21′	1	N/A	N	Electric on east side
Clarendon Avenue	Dow Road	Terminus	No Count	25	Town	90	19′	2	N/A	N	Electric on south; Drainage on north; light traffic, cars parked in grassed shoulder
Eighth Street	Harper Avenue	Sumter Avenue	No Count	25	Town	50	19′	2	N/A	N	Light traffic; residential
Florida Avenue	Canal Drive	Georgia Avenue	No Count	25	Town	40	19′	2	N/A	N	Light traffic; residential; SD grates on south side; electric on south side

Roadway Segment	From	To	2008 AADT's NCDOT & WMPO	Speed Limit	Ownership	R/W Width	Pavement Width	No./ Width of Lanes	Wide Paved Shoulders (WPS), Wide Curb Lane (WCL) or Bike Lane (BL)	On Street Parking (Y or N), Parallel, Perpendicular, or Diagonal	Notes
Fourth Street	Harper Avenue	Greenville Avenue	No Count	25	Town	50	18′	2	N/A	N	Light traffic; residential; Drainage on west side; electric on west side
Georgia Avenue	Oceana Way	Marina Street	No Count	25	Town	40	19′	2	N/A	N	Light traffic; residential; electric on east side
Greenville Avenue	Fourth Street	Terminus	No Count	25	Town	50	22′	2	N/A	N	Light traffic; residential; some parking in grassed median; Drainage on south
Harper Avenue	Dow Road	Canal Drive	No Count	35	Town	100	14′E 14′W	2	WCL	Y; Portion Non-Designated Diagonal	Grassed center median; moderate traffic
Island Marina Drive	Peninsula Drive	Spencer Farlow Drive	No Count	25	Town	25	22′	2	N/A	N	Neighborhood road; 12″ ribbon curb; moderate traffic; Storm Drain grates in center
Lake Park Boulevard	Harper Avenue	St. Joseph Street	17,403	25	NCDOT	60	45′	3	WCL	Y; Portion Parallel and Diagonal	Heavy traffic; slow moving; heavy pedestrian and bike traffic
Lake Park Boulevard	Alabama Avenue	Carolina Sands	6,934	35	NCDOT	60	29′	2	WPS(5′)	Y; Portion Parallel and Diagonal	Heavy traffic; slow moving; heavy pedestrian and bike traffic
Lewis Drive	Otter Road	Lake Park Blvd N	No Count	25	Town	60	27′	2	N/A	N	Moderate traffic
Ocean Boulevard	Dow Road	Lake Park Blvd S	1,900	35	NCDOT	90	23′	2	N/A	N	Moderate fast moving traffic; water / electric on south (large offset); Drainage on north
Oceana Way	Virginia Avenue	Georgia Avenue	No Count	25	Town	40					Private road; locked gate
Otter Road	Lewis Drive	Teakwood Drive	No Count	25	Town	60	20′	2	N/A	N	Light traffic; residential
Peninsula Drive	Teakwood Drive	Island Marina R/W	No Count	25	Town	50	30′	2	WCL	Y; parallel	Light traffic; residential; asphalt curb
Risso Lane	Spencer Farlow	Annie Drive R/W	No Count	25	Town	30	N/A	2	N/A	N	Dirt road

Roadway Segment	From	To	2008 AADT's NCDOT & WMPO	Speed Limit	Ownership	R/W Width	Pavement Width	No./ Width of Lanes	Wide Paved Shoulders (WPS), Wide Curb Lane (WCL) or Bike Lane (BL)	On Street Parking (Y or N), Parallel, Perpendicular, or Diagonal	Notes
Seventh Street	Harper Avenue	Rec. Center	No Count	25	Town	50	27′	2	WPS(E)	N	Moderate traffic; bike traffic; electric on west side
St. Joseph Street	Lake Park Blvd N	Otter Road	No Count	25	Town	60	27′	2	WPS	N	Moderate traffic; fast moving; electric on east side
Teakwood Drive	Otter Road	Peninsula Drive	No Count	25	Town	50	28′	2	WCL	N	Light traffic; residential; asphalt curb
Tennessee Avenue	Lake Park Blvd S	Bonita Lane	No Count	25	Town	90	18′	2	N/A	N	Lots of mailboxes on north; electric on north
Virginia Avenue	Canal Drive	Oceana Way	No Count	25	Town	50	27′	2	N/A	N	Light traffic; residential

NOTE: 25 mph is the city-wide speed limit except for select roads that are posted at 35 mph and NCDOT roadways.

As evidenced on the previous pages, roadways were identified for potential bicycle / multi-use paths and were further inventoried. Field data included roadway width, right-of-way width, speed limit, ownership, average daily trips (ADTs), and general observations.

The town currently has an off-road bike trail at Snow's Cut and the Dow Road greenway trail that links Snow's Cut to the State Park. There also is a multi-use trail at Lake Park. Most recently, bike lanes were added along a portion of Lake Park Boulevard between Harper Avenue and Atlanta Avenue.

The off-road bike trail at Snow's Cut is well used but the off-road users say the trail is too short and some users are concerned about safety. The on-road bicyclists would like to see the trail paved as the trail provides a local biking link from west to east while avoiding the heavily traveled Lake Park Boulevard North.

The Dow Road Greenway is heavily used as the greenway participants feel safe since the 10' multi-use path is separate from the street travel way. The greenway provides interconnection to the Carolina Beach State Park, which is a favored destination of bicyclists. One problem area the greenway has experienced is vehicular parking on the greenway while vehicles wait for the park to open. Bollards have been installed to address this problem. Another problem area includes the greenway crossing area at Harper Avenue and Dow Road. Harper Avenue is widely used by area residents to access the greenway system. However, the busy roadway corridor of Dow Road poses safety concerns since it is un-signalized.

The recently installed bike lanes on a portion of South Lake Park Boulevard, in conjunction with diagonal parking have received mixed-reviews. Most residents complain of safety issues as the bike lanes at the rear of front-in parking creates a visual challenge to those backing out across the bike lane. The bike lane design here does not meet national standards and should therefore be restriped at some point in the future.

As was observed from the citizens input survey, the biggest deterrent for bike users was the lack of continuous routes. Ironically, the multitude of the town's linkage nodes can contribute to a solution for this. Continuous routes are in demand to the boardwalk / pavilion area, beach and beach access areas, Carolina Beach State Park, the central business district, Freeman Park, Mike Chappell Park, Lake Park, Recreation Center, and the local elementary school. Along with these destinations, there are several town events which could be biked to. These include the Farmer's Market, summer concerts, boardwalk events, and the free movie series.

The majority of the roadways that lead to these destinations and events are not biker-friendly. Only a few roads have dedicated bike lanes. In addition, at most of these locations and events areas bicycle racks are minimal.

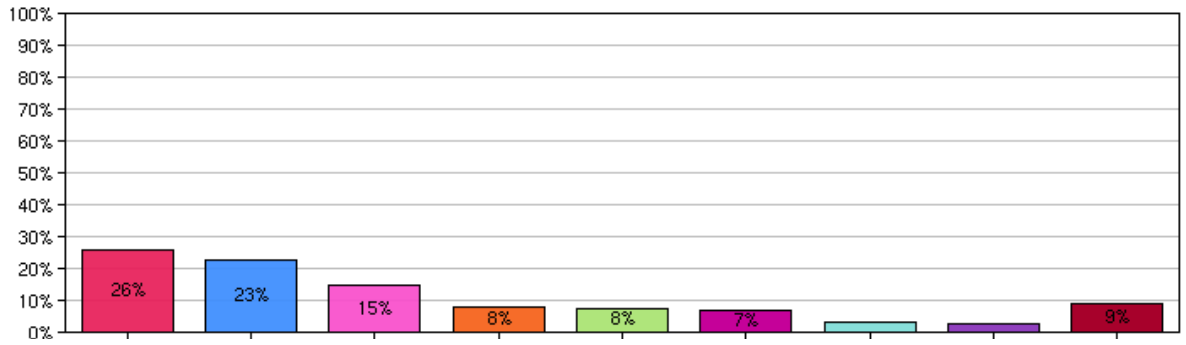
NCDOT has a bike route that crosses the Snows Cut Bridge and follows Lake Park Boulevard. This bike route is known as NC State Bike Route 3, the Ports of Call Bike Route. This route will be changed in the future to align with Harper Avenue and connect to Dow Road, which also has future bike lanes proposed.

Carolina Sands creates a connectivity barrier to the southern portion of the town. The residents oppose an internal bike route. The town proposes bypassing this community with the establishment of the Island Greenway within the Sunny Point Buffer Area. Bikeway linkages to the north and south of Carolina Sounds will support a bikeway route around Carolina Sands.

Input was obtained from citizens and visitors through a public survey and public open house meetings. The survey was on the Town's website and was also handed out at the recreation center. This feedback was important in the assessment of the existing bicycle multi-use facilities.

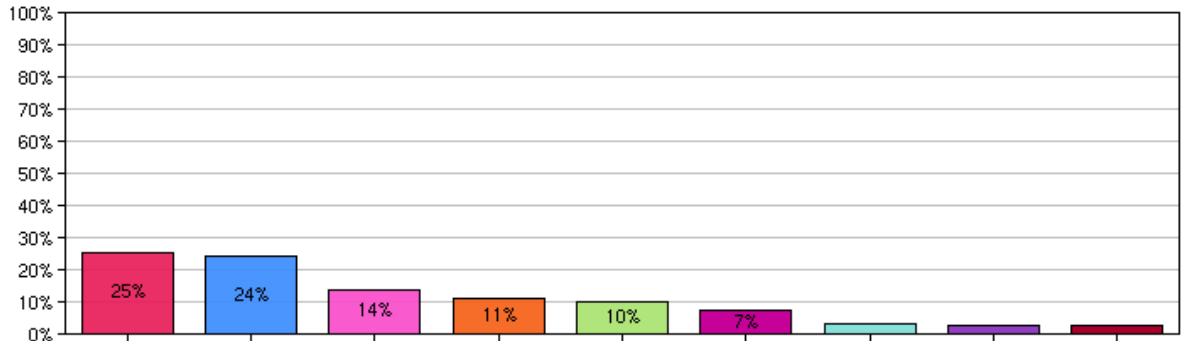
The more informative sections of the survey and a brief synopsis follow this page. The entire citizen's survey can be found in the Appendix.

What has prevented you from biking to areas of interest?



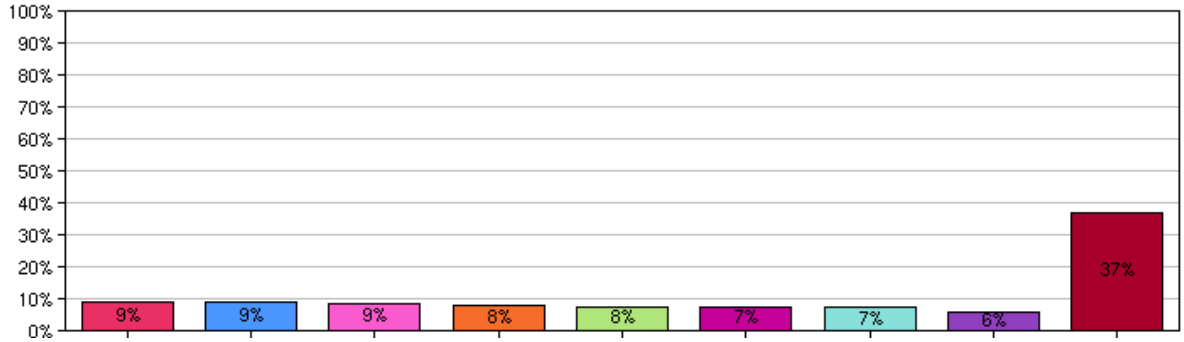
Value	*Count*	*Percent*
No continuous bikeway routes	119	25.9%
Heavy or fast traffic	104	22.6%
Bikeways are too narrow	67	14.6%
Bikeways are poorly marked	36	7.8%
No crosswalks / signalization at intersections	35	7.6%
Bikeways are poorly maintained	32	7.0%
It is easier to drive	15	3.3%
Weather (too hot, cold, rainy, etc.)	11	2.4%
All Other Categories:	41	9.0%
Other	10	2.2%
Destination is too far away to bike	10	2.2%
Too busy, no time	9	2.0%
I have too much stuff to carry	4	0.9%
Do not own a bike	3	0.7%
I need to keep a clean appearance	2	0.4%
Concern of crime	1	0.2%
Lack of interest	1	0.2%
My health does not permit me to bike	1	0.2%

What do you ride your bike for?



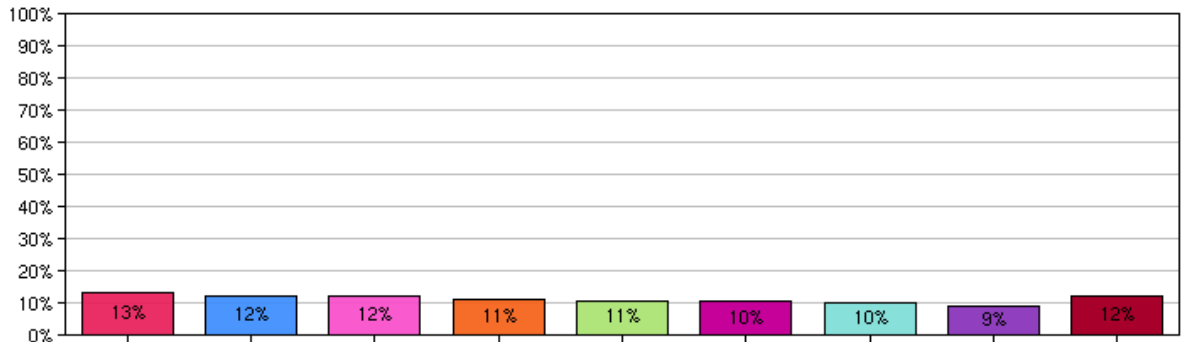
Value	*Count*	*Percent*
Recreation	141	25.3%
Exercise	134	24.0%
Errands	77	13.8%
Visit family / friends	63	11.3%
Shopping	57	10.2%
Family event	40	7.2%
School	18	3.2%
Other	14	2.5%
Work	14	2.5%

What areas would you enjoy biking to if access was easier?



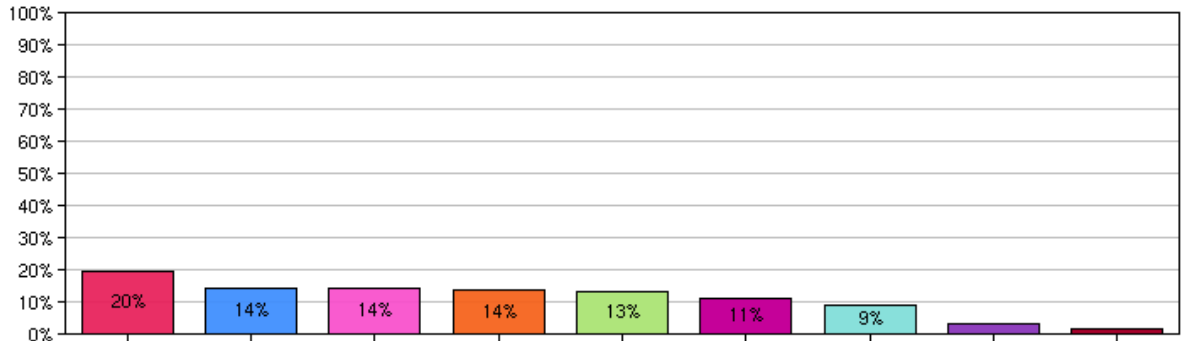
Value	*Count*	*Percent*
Boardwalk / Pavilion Area	111	9.0%
Beach and Beach Access Areas	108	8.8%
Carolina Beach State Park	105	8.6%
Proposed Ocean Pier and Park	100	8.1%
Snows Cut Bike Path	93	7.6%
Central Business District	91	7.4%
Lake Park	90	7.3%
Store	74	6.0%
All Other Categories:		37.0%
Recreation Center	65	5.3%
In neighborhood	62	5.0%
Freeman Park	55	4.5%
Wildlife Boat Ramp	52	4.2%
Town Marina	49	4.0%
Library	47	3.8%
Mike Chappell Park	45	3.7%
School	27	2.2%
Other	21	1.7%
Senior Center	17	1.4%
Work	16	1.3%

What events would you bike to?



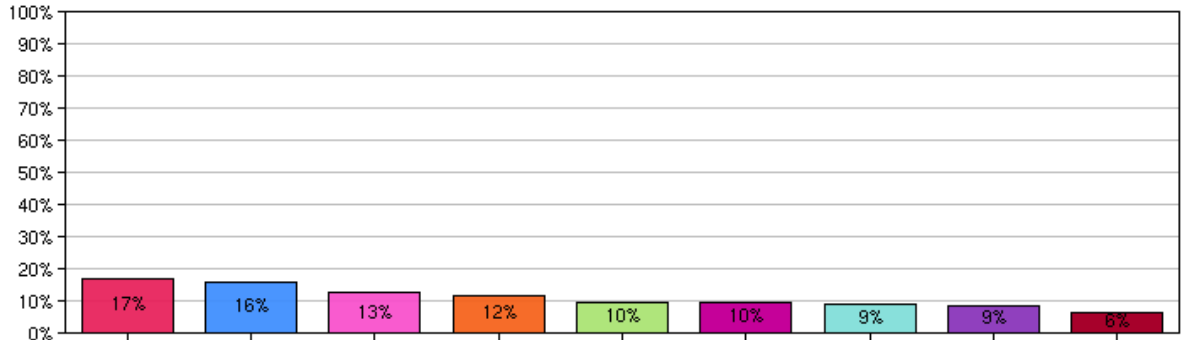
Value	*Count*	*Percent*
Farmers Market at the Lake	122	13.0%
Free Summer Concerts	114	12.2%
Boardwalk Events	112	12.0%
Fireworks on the Beach	104	11.1%
Free Movies at Lake Park	100	10.7%
Annual Chowder Cook-off	96	10.3%
Independence Day Fireworks	92	9.8%
Annual Beach Music Festival	82	8.8%
All Other Categories:	114	12.0%
Island of Lights Light Up Celebration at Lake Park	71	7.6%
Annual Salty Paws Festival	43	4.6%

Would you ride your bike more if:



Value	*Count*	*Percent*
There were more clearly marked trails	119	19.5%
You felt safer	87	14.3%
There were wider roads to ride on	87	14.3%
You felt motorists respected cyclists and better understood cyclists' rights and responsibilities	83	13.6%
There were better roadway conditions, such as smoother pavement, less debris	81	13.3%
You had better places to ride to	69	11.3%
Drivers drove slower	53	8.7%
Other	21	3.4%
All Other Categories:	9	1.5%
You felt more confident on your bike	5	0.8%
You owned a bike	4	0.7%

What are some improvements you think Carolina Beach should do to make it better for bicycling in the Town?



Value	*Count*	*Percent*
More bike lanes	130	16.9%
More off-road paths, like greenways	122	15.9%
More bike racks at destinations	97	12.6%
Bike boulevards, shared roadways, with bike speed limits	90	11.7%
More "Share the Road" signs	73	9.5%
Allow bikes on the Boardwalk, walk them when busy	73	9.5%
Police enforcement of a new Bike and Pedestrian friendly policy	69	9%
More crosswalks	65	8.5%
All Other Categories:	49	6.4%
Accommodations for bikes on buses	29	3.8%
Other	18	2.3%
None	2	0.3%

The Citizens Input Survey revealed that most riders chose to ride for recreational purposes and the biggest deterrent was the lack of continuous bike routes. Cyclists would ride more if there were better places to ride town trails that were wider and clearly marked. The primary problem areas include the Snows Cut Bridge, Dow Road, Spencer Farlow Drive, and the lack of crosswalks.

SECTION 3 - EXISTING PLANS, PROGRAMS, & POLICIES

RELEVANT PLANS

In order to assure complementary aspects of current local, regional, state, and federal plans relative to the Bicycle Multi-Use Transportation Plan, several plans were reviewed. The objective was to confirm the plans were compatible or consider plans and / or policy revisions. This section addresses the plan and policy reviews. If needed, plan or policy revisions are proposed in Section 6.

LOCAL PLANS

TOWN OF CAROLINA BEACH BIKEWAY ROUTING PLAN

In 2001, the town prepared a town-wide conceptual bikeway plan. The plan was based upon an earlier citizen's survey and input from town staff. This plan was prepared primarily for use in funding application submittals. It is interesting to note that many of the proposed project corridors in this plan coincide with the 2001 concept plan. This indicates stability in the proposed designated project corridors.

Currently, the town has several designated bicycle multi-use paths. These areas include:

- The Lake Park Multi-Use Trail (0.67 miles) – the Lake Park Multi-Use is a perimeter walkway around a popular park. The trail is colored-concrete and is used by a variety of residents including walkers, joggers, bikers, and strollers.
- The Dow Road Greenway (0.83 miles) – the Dow Road greenway is a 10' paved asphalt surface that provides linkage to the Carolina Beach State Park and to the Snow's Cut off-road trail. It is widely used by cyclists providing access to the favored state park destination.
- The Snow's Cut Off-Road Trail (0.42 miles) – the Snow's Cut off-road trail is an 8' graveled surface trail. It is one of the Town's few off-road trails. This segment of trail provides linkage to the wildlife boat ramp.
- The Lake Park Boulevard (portion) main street core with on-street parking and bike lanes (0.32 miles) – this dual bike lane system is a fairly recent addition to the town. Bike lanes are located behind front-end diagonal parking in the Central Business District. These bike lane additions were part of the NCDOT road diet design for Lake Park Boulevard.

All of these bicycle multi-use paths were developed independent of one another over an eight-year time period. Interconnectivity is provided between the Snow's Cut Off-Road Trail and the

Dow Road Greenway. The Dow Road Greenway provides connectivity to the Carolina Beach State Park.

2008 – 2013 Parks, Recreation, and Open Space Master Plan

This Master Plan document inventoried existing parks that would provide obvious interconnectivity opportunities for the bicycle multi-use path.

These included:

- Carolina Beach Lake Park
- Freeman Park
- McDonald Park
- Mike Chappell park
- Carolina Beach Recreation Center
- Snow's Cut Bike Path
- Dow Road Greenway
- Carolina Beach State Park
- Fort Fisher Recreation Area
- Fort Fisher Historic Site
- NC Aquarium at Fort Fisher
- Public boat ramps
- 16 neighborhood beach access sites
- 2 regional beach access sites
- 14 public estuary access sites

Repeatedly through the course of the development of the Recreation Open Space Master Plan, the need for "bike paths, sidewalks, pedestrian corridors, trails, paths to provide access and connectors between public facilities" resonated. Not surprisingly the most recent North Carolina Outdoor Recreation Survey listed "walking for pleasure" as the most popular activity.

2007 Town of Carolina Beach CAMA Land Use Plan

Coastal communities are required to update their CAMA Land Use Plan every five years. In reviewing this plan, there were several references pertaining to transportation systems and public access which are germane to a bicycle multi-use transportation plan.

Specific plan references are noted below:

Transportation Systems

According to the 2007 Carolina Beach Land Use Plan, the towns of Kure Beach and Carolina Beach had originally adopted a thoroughfare plan in 1973, which was later updated in 1982. Carolina Beach and Kure Beach, with assistance from the NCDOT, updated their thoroughfare plan again in 1992 to identify transportation needs, describe existing transportation conditions, and prioritize future projects. Three of the 1992 thoroughfare plan's most significant recommendations included:

- Dow Road should be emphasized as a by-pass to avoid through-traffic congestion of the already congested Lake Park Boulevard
- Harper and Carl Winner Avenues should be converted into a one-way pair system to alleviate congestion of traffic leaving and entering the northern end beach area
- Alternative transportation systems, such as a trolley and increased bike lanes, should be created

The 2007 Land Use Plan also mentioned that, by 1995, the thoroughfare plan had been shelved due to lack of consensus by the business community on implementing significant portions of the plan, such as the comprehensive street system and traffic management initiatives. Today, traffic and transportation issues remain among the top community concerns. Enhancement of street paving and of curbs and gutters, improvement of public parking and exploring possibilities for a public parking deck, and improvement of pedestrian and bicycle mobility options are all current issues. In addition, there remains a community desire for the town to proactively address traffic congestion and transportation management issues.

To that end, in April 2004 the town approved traffic improvement strategies recommended in a transportation study conducted by Wilbur Smith Associates and funded through the Wilmington Metropolitan Transportation Planning Organization (WMPO). The purpose of the study was to improve traffic conditions in the CBD and North End Peninsula, improve pedestrian and bicycle circulation, improve streetscapes, address one-way or two-way traffic on Carolina Beach Avenue North, and to recommend parking enhancements.

In spring 2004, the town adopted the Carolina Beach North End Traffic and Circulation Study and selected a set of improvements from the study's recommended traffic scenario alternatives. The traffic improvements included:

- Establishing Carolina Beach Avenue North to Sandpiper as a one-way traffic pattern.
- Implementing two right-turn lanes on Carl Winner Avenue outbound to US 421 northbound with expanded storage bays.
- Introducing sidewalks, bicycle lanes and traffic-calming devices on Carolina Beach Avenue North and Canal Drive.
- Adding a landscaped median, bicycle lanes, expanded sidewalks on US 421 between Harper Avenue and Charlotte. Relocating parking to the adjacent blocks on Harper Avenue and Cape Fear Boulevard.
- Establishing bicycle lanes on US 421 south from Charlotte to Carolina Sands.

In the 2004-2010 DOT Division 3 Transportation Improvement Program, Carolina Beach has the following projects scheduled:

- Dow Road (SR 1573) (Not currently funded) - Widen 3.9 miles to multi-lanes from US 421 (Lake Park Boulevard) to US 421 (Fort Fisher Boulevard) in Kure Beach.
- Construction of an off-road bike/multi-use path connecting Carolina Beach's inner city bikeway path (Boardwalk/CBD to Carolina Beach Lake bike loop) west to Dow Road.

As of the 2000 Census, the expansion of the Wilmington Urbanized Area resulted in Carolina Beach's inclusion as part of the Wilmington Urban Area WMPO. As part of the membership, the town will be included in the MPO's Thoroughfare Plan update. According to the Wilmington Urban Area MPO, "the MPO provides the regional, cooperative planning process that serves as the basis for the expenditure of all Federal transportation funds in the area for streets, highways, bridges, public transit, bicycle and pedestrian paths." The MPO is also assisting the town in seeking funding sources for some of the traffic enhancement projects mentioned in the town's traffic and circulation study. In addition, the MPO can assist in integrating NCDOT traffic engineering and other transportation planning expertise to aid in the town's development review process, particularly in developments that will generate large amounts of traffic.

MANAGEMENT TOPIC: PUBLIC ACCESS

Goal: Maximize public access to the beaches and the public trust waters of the jurisdiction.

Objectives and Background Discussion

- Although most public street ends on the ocean side in Carolina Beach are used and dedicated as public access points, the town would like to establish a Shoreline Access Plan to address public access needs along Myrtle Grove Sound and to increase parking and accessibility at existing access facilities. The town has 16 neighborhood access sites along 3.5 miles of beach (Avg. 2.3 per half mile), 2 regional access sites roughly in the

center of the beach strand, and several local access points (public street ends). Continued improved and managed access with CAMA-approved parking and restroom facilities for the Freeman Park (North End) beach strand area will be established in 2005.

- The town would like to increase public access by exploring the feasibility of converting public or private lands that are threatened by erosion or other severe and continuous natural hazards to dedicated public access sites.
- Due to the limited surface area of public trust waters for use and enjoyment by the public, the town wishes to discourage certain activities and facilities such as private mooring fields. However, the town wishes to explore the feasibility of public mooring fields, to attract transient and recreation boaters to the town and boost the local economy.

PUBLIC ACCESS SIGNAGE

A uniform system of signs that clearly identify all public access ways, access boundaries, vista points, bicycle paths, specific shoreline destinations and areas where access is hazardous and/or restricted shall be provided by the appropriate managing agency or the town.

Opportunity for pedestrian or bike path interconnectivity should also be a consideration in planning for public parking areas.

Suffice it to say that many of the 2007 Town of Carolina Beach CAMA Land Use Plan goals and policies can be complemented in the Bicycle Multi-Use Transportation Plan.

CENTRAL BUSINESS DISTRICT STREETSCAPE DESIGN DEVELOPMENT STUDY

The following provides a brief introduction of this study:

> *In October of 2008, the Town of Carolina Beach retained peter j. smith and company inc. to undertake a design development study of the primary roads in the Central Business District.*
>
> *The fundamental intent of redeveloping these streets is to reinvigorate the CBD and create a successful downtown. Lake Park Boulevard has evolved into a vehicle-dominated thoroughfare that dramatically compromises the pedestrian environment and the experience of being in Carolina Beach. As a result, the downtown struggles to support the activities and uses necessary to create a thriving core area. The transformation of Lake Park Boulevard into "Main Street", with major enhancements to Cape Fear Boulevard and Harper Avenue, is a cornerstone of stimulating private sector investment to revitalize the town.*
>
> *This study is an integral component of a broad-based strategy to revitalize the town as articulated in "Recapturing the Spirit – Carolina Beach Master Development Plan",*

> *prepared by peter j. smith & company inc. and adopted by town council in May 2008. The Master Development Plan put forward a multi-faceted strategy that identified several key initiatives that, when implemented over time, would make the town a preferred destination for tourists and create a desirable built form in the CBD.*

The establishment of a new street classification system was one of seven key components of the strategy. With the primary goal being to stimulate investment and economic development, the classification system created a hierarchy of "Complete Streets" with well-defined circulation functions and design attributes. A series of core principles were established to define the system, and guide decision-making and future design work. The principles include:

- Create a walkable community with strong pedestrian connections to key attractions and destinations throughout the CBD.
- Improve vehicular circulation and flow in the CBD by strengthening the urban grid, alleviating congestion along Lake Park Boulevard and introducing traffic calming measures.
- Enhance the pedestrian friendliness of the Carolina Beach through creating usable, attractive, and safe streets.
- Enhance the aesthetic quality of the public realm by establishing a high standard of streetscape design quality emphasizing the unique character of Carolina Beach.
- "Green" the community through the integration of street tree plantings native to the Coastal Plain.
- Integrate and better organize on-street parking in the CBD.
- Promote public / private partnerships and shared facilities to meet parking demands in the CBD.
- Develop an integrated multi-use path and bicycle lane system through the town to strengthen linkages and provide a recreational feature.

This study further developed design details for three street types:

1. Main Street Core
2. Main Street Transition
3. Transit Streets

All of these street design details included bike lanes on both sides of the street. The only notable deviation from the design details was the Main Street Core. Originally, that street design detail included the replacement of angled parking with parallel parking. Due to the loss of parking spaces and opposition by local businesses, the angled parking remained.

As is the case of the town's CAMA Land Use Plan, many of the goals and design details within this plan can contribute to the Bicycle Multi-Use Transportation Plan.

CAROLINA BEACH MASTER DEVELOPMENT PLAN (MAY 2008)

In response to new development pressures, the Town of Carolina Beach retained peter j. smith & company inc. to prepare a Master Development Plan for the central business district (CBD).

The goals and objectives area is described below:

The goals and objectives further the vision of the community, they serve as a guide for the Master Development Plan and articulate what the community ultimately intends to achieve over the coming years. The goals and objectives are the standard against which the accomplishments of the plan are measured. They are realistic and attainable and are flexible enough to accommodate changes in the forces that might influence how the vision is achieved and how the plan is implemented.

Specifically, the goals describe the key accomplishments Carolina Beach will strive to attain by implementing the Master Development Plan, while the objectives are results oriented and outline the specific actions to be undertaken to attain each goal.

The Master Development Plan details goals and objectives for five elements of development. These elements include:

1. Land Use
2. Economic Development
3. Urban Form
4. Natural Resources
5. Circulation

Since bicycle multi-use paths are an integral component of circulation, that element has been included below:

Circulation

Develop a comprehensive circulation network that integrates vehicular, pedestrian, and bicycle systems as a key organizing element of the town.

Objectives:

- To create a connected pedestrian system that promotes walking by developing high-quality, pedestrian-oriented streetscapes, parks, plazas, and trails that provide easy access to all key destinations in the town.
- To improve the visual quality of primary streets and implement traffic-calming measures and techniques at busy roads and intersections to improve traffic flow and pedestrian safety.

- To provide attractive, organized, and well-designed on- and off-street parking areas that provides convenient access to town attractions.
- To create a hierarchy of gateways that announces arrival to the town, the CBD, and the beach.
- To implement a way-finding system that clearly identifies destinations and helps visitors navigate their way through town.

Retain Visitors Longer

In Section 1 of this plan, references were made pertaining to the economic benefit of bicycle multi-use paths capturing tourist dollars.

The CBD Master Development Plan also speaks to the need to retain visitors longer. Since bicycle multi-use paths contribute to additional vacation days spent, that information is worth repeating again.

A tourist who visits a community for the day or for the afternoon spends a limited amount of money. Lunch, gas, and entry costs to tourist attractions are typical expenditures. However, capturing the visitor for an overnight or extended visit will capture more significant rewards. On an overnight visit, the costs of accommodation, additional meals, and entertainment are greater and circulate more dollars throughout the regional economy.

According to the North Carolina Division of Tourism, overnight travelers expenditures in 2006 were:

2006 Average Trip Spending for Overnight Visitors

United States Average Visitor Party Spending $758
North Carolina Average Visitor Party Spending $549
North Carolina Out-Of-State Visitor Party Spending $636
North Carolina Resident Visitor Party Spending $369

2006 Average Trip Spending for Overnight Visitors by Primary Purpose of Trip

Average Overnight Business Travel Party Spending $616
    Out-of-State Travel Party Spending $763
    NC Resident Travel Party Spending $305
Average Overnight Leisure Travel Party Spending $555
    Out-of-State Travel Party Spending $634
    NC Resident Travel Party Spending $390

The Master Development Plan for the Town of Carolina Beach is intended to provide a diversity of activity and accommodation for the visitor. Offering more and higher-quality activities can encourage longer visits and stimulate the regional economy more significantly.

In addition, the CBD Master Development Plan speaks to the urban framework of the town.

Reaching out from the CBD, an integrated system of pedestrian-oriented streets, multi-use paths, and bicycle lanes knits the community together. A trio of new public park spaces is connected to the system and provides a greater diversity of recreational opportunities for residents and visitors.

The Bicycle Multi-Use Transportation Plan can and should dovetail with the CBD Master Development Plan.

REGIONAL PLANS

ISLAND GREENWAY

The following information was taken directly from the Island Greenway website (http://www.islandgreenway.org/):

As Pleasure Island continues to grow, we need to maintain opportunities for the safe enjoyment of our island and its resources that both residents and visitors treasure. Pleasure Island thrives as a small island with tourism as its largest industry. A user friendly environment for walking and biking is an essential amenity for growing tourist destinations. However our infrastructure reality reflects an entirely different picture. Our roads sidewalks and shoulder paths that we rely on have become overcrowded and compromised when our tourist season hits full stride. Our discontinuous sections of sidewalk and shoulder paths become dangerous for our children, citizens and visitors alike. The implementation of the Pleasure Island Bike and Pedestrian Greenway (referred on this site as simply the Island Greenway) will begin our island's trek towards becoming bike and pedestrian friendly while linking all of our parks and tourist destinations with a path way system.

The proposed Pleasure Island Greenway will be a pedestrian bike path that will extend from the Northern Tip of our island (at the Snow's Cut Boat Access area) to the Southern Tip of our Island at Federal Point (Approximately 9.5 Miles)

The Island Greenway will provide a haven for people to quietly and safely enjoy our island while offering healthier choices in the future for all of our citizens and visitors. Our children could once again enjoy safe routes to schools, parks, beaches and play grounds. Families could once again have an alternative to the car to run errands, or go to events and they will be able to enjoy safe family fun while biking or simply just taking a stroll with one another.

The Island Greenway is an idea developed by citizens of Pleasure Island and supported by Carolina Beach, Kure Beach, New Hanover County and the Wilmington Metropolitan Planning Organization (WMPO).

It should be noted that the Island Greenway pedestrian bike path has been incorporated into the town's Bicycle Multi-Use Network Plan and provides important linkage nodes to proposed Multi-Use Paths. Portions of the greenway have been built by the Town and the NC Aquarium. Additional portions will be added as approved by respective jurisdictions.

DOW ROAD CORRIDOR STUDY

In 2009, the WMPO retained Wilbur Smith Associates (WSA) to perform a corridor study for Dow Road from its northern terminus at Lake Park Boulevard to K Avenue in Kure Beach.

Excerpts from the study are noted below:

WSA began the process by performing a preliminary environmental screening, and developing several concepts for the extension of Dow Road. WSA met with representatives from Marine Ocean Terminal Sunny Point (MOTSU), the United States Air Force, and the North Carolina State Parks, the towns of Carolina Beach and Kure Beach, and the North Carolina Department of Transportation (NCDOT), and members of the public.

Through this analysis and meetings it became readily apparent that the proposed extension of Dow Road faced many issues with gaining access to right-of-way from Sunny Point and the US Air Force, and would be unlikely to receive the necessary permits due to significant environmental impacts to both wetlands and endangered species and some impacts to archeological sites. In addition, the Kure Beach's town council felt that the Dow Road Extension would divert traffic around their community and could potentially lead to a decline in visitor traffic.

Due to the Dow Road extension falling within an environmentally sensitive area and the lack of support from multiple stakeholders, the WMPO passed a resolution on August 27, 2008 eliminating the extension of Dow Road from K Avenue to US 421 from further study. Based on this resolution, the scope of this project was amended to focus solely on the forecasts of future volumes along Dow Road from US 421 to K Avenue, and along K Avenue from Dow Road to US 421 and the multi-modal transportation facilities needed to support these project future volumes and to improve safety along the corridor.

CONCLUSIONS

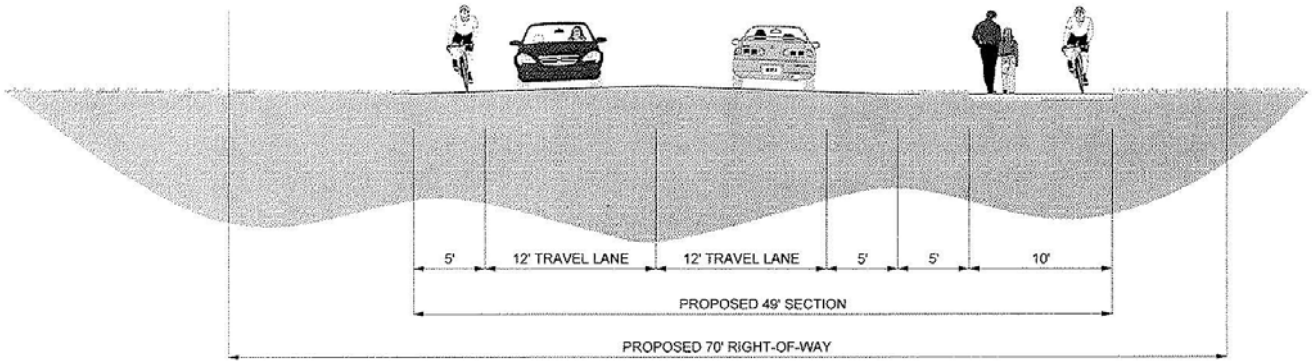
Based on the potential for significant environmental impacts and the lack of public support for a new facility, WSA recommends that Dow Road not be extended from K Avenue to US 421. Due to the lack of significant growth projected on the island, the traffic analysis indicates that the Dow Road will function with a reasonable level of service as a two lane facility in 2030. Improvements should be made to better accommodate cyclists and a multi-use path should be added to better facilitate cyclists and pedestrians along this corridor. Finally, the Dow Road / K Avenue curve should be constructed to allow for safer travel through this intersection. As a result of this study, WSA proposes left turn lanes on Dow Road at Cape Fear Boulevard and Ocean Boulevard. This design concept prepared by WSA follows this page.

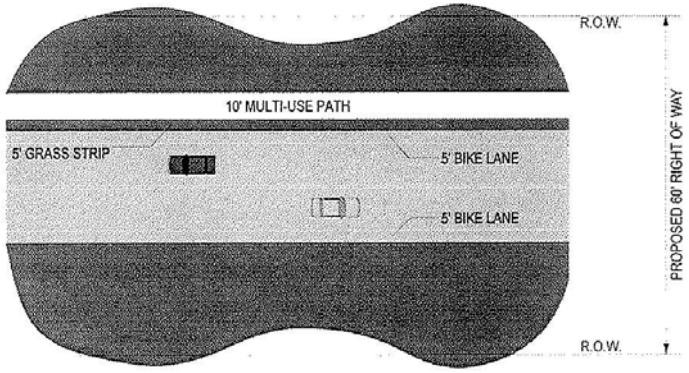
DESIGN CONCEPT PREPARED BY WSA

DOW ROAD

TYPICAL SECTION – TWO-LANE ROADWAY WITH BIKE LANES AND MULTI-USE PATH

NOT TO SCALE





PLAN – TWO-LANE ROADWAY

NOT TO SCALE

PREPARED FOR:

WILMINGTON METROPOLITAN PLANNING ORGANIZATION

PREPARED BY:

WilburSmith ASSOCIATES
ENGINEERS PLANNERS ECONOMISTS
421 Fayetteville Street, Suite 1303
Raleigh, North Carolina 27601
Tele:919.755.0583
Fax: 919.832.8798

FIGURE 12

State Plans

Bicycling and Walking in North Carolina: A Long-Range Transportation Plan

This plan identifies five goals and corresponding focus areas, which represent strategies for achieving each goal, relating to facilities, safety education and enforcement, institutionalization, research, needs assessment, and encouragement. The overall intent of the plan is to reduce the number of pedestrian and bicycle crashes, injuries, and fatalities.

2009-2015 State Transportation Improvements Program (STIP) and NCDOT Transportation Improvement Program (TIP)

This program funds transportation projects including new construction, maintenance of existing infrastructure. Each transportation project within the state is described and its status is listed.

Programs and Initiatives

There are several programs and initiatives available to support bicycle multi-use paths:

- Safe Routes to Schools
- Bicycle Helmet Initiatives
- Bicycle and Pedestrian Grant Planning Initiatives
- Share the Road Initiatives
- Bikes on Public Transportation

The town applied for a Safe Routes to School Grant in 2009 to provide improvements to pedestrian and biking routes adjacent to Carolina Beach Elementary School, but was not selected as a grant recipient. There are no additional programs in Carolina Beach.

Due to the budget shortfalls in recent years, NCDOT has re-prioritized its TIP projects. Portions of Lake Park Boulevard were recently improved and included bike lanes. No additional projects are proposed within the 2009-2015 TIP.

Wilmington Metropolitan Planning Organization (WMPO)

The Wilmington Urban Area Metropolitan Planning Organization (WMPO) is the regional transportation planning agency for the Lower Cape Fear region of southeastern North Carolina. The WMPO is composed of officials from each of the Wilmington area governments 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 area for streets, highways, bridges, public transit, and bicycle and pedestrian facilities.

WMPO BikePed Committee

Created in April 2007, the WMPO BikePed Committee advises the Transportation Advisory Committee on issues regarding bicycle and pedestrian programs, projects, policies and safety. The committee assumes the following duties: 1) develop and support bicycle and pedestrian education programs for youth and adults, 2) support the enforcement of traffic laws for all roadway users, 3) promote the use of bicycling and walking for transportation, fitness, and recreation, 4) develop safe bicycle and pedestrian facilities, 5) facilitate projects, plans, programs, and ideas that will promote a safer environment for bicycling and walking in the WMPO planning area. The current members of the WMPO BikePed Committee are:

Representing	TAC Member	BikePed Member
Town of Carolina Beach	Bob Lewis	Michael Kirkbride

Policies and Institutional Framework

The most restrictive overlay zone within the town is the Sunny Point Buffer.

This buffer area is a large piece of open space located on the west side of the town along the Cape Fear River within the town's Extra Territorial Jurisdiction (ETJ). Most of the property is undeveloped. The reason that the property is largely undeveloped is that it is in the buffer zone of the Sunny Point Military Ocean Terminal – the largest ammunition port in the nation and the Army's primary East Coast deep-water port. The port has 16,000 acres of property and is surrounded by a large undeveloped buffer zone for safety. Lands around the port are managed as forest and fish & wildlife areas. According to planners at Sunny Point, the military's focus for the conservation lands is primarily on maintaining safety for the public.

The Sunny Point Buffer area has strict land development guidelines that are restricted based on the following Department of Defense documents:

- DOD Ammunition and Explosives Safety Standards (July 1999); DOD 6055.9-Std
- Department of Army Ammunition and Explosives Safety Standards; Pamphlet 385-64

The town has actively pursued an off-road bike trail within this buffer area. Some strides were made with the allowance of the Island Greenway within the buffer areas.

Relevant Bicycle Statutes, Laws, and Ordinances

State and federal laws, regulations, and acts have all been implemented for the bicyclist and pedestrian. Local town ordinances are also in place. Whichever regulation is the strictest shall be adhered to.

FEDERAL

US Department of Transportation (DOT)

The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into its transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.

The design guidelines incorporate three key principles:

- A policy statement that bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist;
- An approach to achieving this policy that has already worked in state and local agencies; and
- A series of action items that a public agency, professional association, or advocacy group can take to achieve the overriding goal of improving conditions for bicycling and walking.

STATE

Laws

http://www.ncdot.gov/bikeped/lawspolicies/laws/

In North Carolina, the bicycle has the legal status of a vehicle. This means that bicyclists have full rights and responsibilities on the roadway and are subject to the regulations governing the operation of a motor vehicle.

North Carolina traffic laws require bicyclists to:

- Ride on the right in the same direction as other traffic.
- Obey all traffic signs and signals.
- Use hand signals to communicate intended movements.
- Equip their bicycles with a front lamp visible from 300 feet and a rear reflector that is visible from a distance of 200 feet when riding at night.
- Wear a bicycle helmet on public roads, public paths and public rights-of-way if the bicyclists are under 16 years old.

- Secure child passengers in a child seat or bicycle trailer if under 40 pounds or 40 inches.

LOCAL

Article III of the Code of Ordinances (February 2, 2010) for the town outlined the following regulations. All bicycles meeting the definition below must comply.

Bicycle: any vehicle propelled by human power and having two (2) tandem wheels twenty (20) inches in diameter or greater. This definition shall also include single, three (3) or four (4) wheeled vehicles and motorized bicycles which are not required to be licensed as motor vehicles.

ARTICLE III. BICYCLE REGULATIONS*

*State law references: Operation of bicycles, G.S. §§ 20-171.1, 20-171.2.

Sec. 9-80. Effect of regulations.

(a) The parent of any child and the guardian of any ward shall not authorize or knowingly permit any child or ward to violate any of the provisions of this chapter.

(b) These regulations shall apply whenever a bicycle is operated upon any street or upon any public path set aside for the exclusive use of bicycles, subject to those exceptions stated herein.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-81. Traffic laws apply to persons riding bicycles.

Every person riding a bicycle upon a roadway shall be granted all of the rights, and shall be subject, to all of the duties applicable to the driver of a vehicle by the laws of this state declaring rules of the road applicable to vehicles or by this title applicable to the driver of a vehicle, except as to special regulations in this chapter and except as to those provisions of laws and ordinances which by their nature can have no application.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-82. Obedience to traffic control devices.

(a) Any person operating a bicycle shall obey the instructions of official traffic control signals, signs, and other control devices applicable to vehicles, unless otherwise directed by a police officer.

(b) Whenever authorized signs are erected indicating that no right, left or U-turn is permitted, no person operating a bicycle shall disobey the direction of any sign, except where the person dismounts from the bicycle to make any turn, in which event the person shall then obey the regulations applicable to pedestrians.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-83. Riding on bicycles.

(a) A person propelling a bicycle shall not ride other than astride a permanent and regular seat attached thereto.

(b) No bicycle shall be used to carry more persons at one time than the number for which it is designed and equipped.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-84. Riding on roadways and bicycle paths.

(a) Every person operating a bicycle upon a roadway shall ride as near to the right-hand side of the roadway as practicable, exercising due care when passing a standing vehicle or one proceeding in the same direction.

(b) Persons riding bicycles upon a roadway shall not ride more than two abreast, except on paths or parts of roadways set aside for the exclusive use of bicycles.

(c) Whenever a usable path for bicycles has been provided adjacent to a roadway, bicycle riders shall use the path and shall not use the roadway.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-85. Speed.

No person shall operate a bicycle at a speed greater than is reasonable and prudent under the conditions then existing.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-86. Carrying articles.

No person operating a bicycle shall carry any package, bundle, or article which prevents the rider from keeping at least one hand upon the handlebars.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-87. Riding on sidewalks; prohibited.

No person shall ride a bicycle upon any sidewalk or walkway within the town.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-88. Lamps required at night.

No person shall ride a bicycle on any street or highway between sunset on any day and sunrise on the following day, unless it is equipped with an operating and lighted lantern or lamp.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-89. Clinging to motor vehicles.

No person riding upon any bicycle, motorcycle, coaster, sled, roller skates, or toy vehicle shall attach the same or himself to any public conveyance or moving vehicle upon any roadway.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-90. Riding on handlebars; prohibited.

No operator of a motorcycle, or bicycle, when upon a street, shall carry any person upon the handlebar, frame, or tank of any such vehicle, nor shall any person so ride upon any such vehicle.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-91. Bicycle helmets.

All persons twelve (12) years of age or younger who operate a bicycle within the public rights-of-way of the town shall be required to wear protective headgear with a chinstrap fastened under the chin. Such headgear (helmet) shall meet or exceed the standards of the American National Standards Institute (ANSI) or the Snell Memorial Foundation's 1984 standard for protective headgear.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Sec. 9-92. Reserved.

Sec. 9-93. Children's safety seats.

Any persons operating a bicycle within the public rights-of-way of the town who allows anyone four (4) years of age or younger to ride as a passenger on a bicycle shall be required to provide a child safety seat for such passenger which adequately retains the child in place and protects the child from the bicycle's moving parts.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

Secs. 9-94--9-99. Reserved.

A schedule of violations and penalties for infractions is as follows:

Section	**Violation**	**Penalty**
9-80 – 9-90	Operating bicycle in violation of regulations	$10.00
9-92	Operating bicycle without proper headgear (age 12 or under)	$10.00
9-93	Bicycle passenger (age 4 or younger) without proper child safety seat	$10.00

Traffic patterns on specified streets pertaining to bicycling are also defined:

Carolina Beach Avenue North is designated as a two-way street with nine and one-half-foot drive lanes and a pedestrian/bike lane provided along the east side of the street (widths will vary), and including three-way stops at appropriate intersections.

Canal Drive is designated as a two-way street with nine and one-half-foot drive lanes and a pedestrian/bike lane provided on the west side of the street (widths will vary).

SECTION 4 - STRATEGIC BICYCLE PLAN

SYSTEM OVERVIEW

To best describe the town's bicycle multi-use transportation network, you must first reflect on the town's initial vision statement: "Create a more bicycle / multi-use path friendly environment and provide interconnectivity to the various town destinations."

To address this, the Steering Committee developed an Existing Conditions map. The town's destination attractors were illustrated on the map. The town's existing bicycle multi-use paths were also added. In reviewing this map, it became apparent that the town had a lot of destination attractors but lacked interconnectivity.

Further assessment of the existing system surfaced as a result of the citizens / visitors survey. Specific questions were asked that pertained to the following:

- What has prevented you from biking to areas of interest?
- What are some improvements you think Carolina Beach should do to make it better for bicycling in town?

The results of these questions reflected on the current bicycle multi-use network system. The top responses included:

- No continuous biking routes
- Heavy traffic
- Bikeways too narrow and poorly marked
- No crosswalks or pedestrian signalization at intersections

These responses and the Existing Conditions Map set the cornerstone for the next effort – Corridor Identification.

CORRIDOR IDENTIFICATION

The town's destination attractors (schools, parks, beach, downtown, boardwalk) were linked together on selected roads with a total bicycle multi-use project corridor of 19 miles. This linkage plan strived to minimize routes on high-volume and / or high-speed roads, although this was not always possible. As referenced in the previous section, our immediate goal was to provide interconnectivity and enhance safety.

With the bicycle multi-use corridors identified, it was time to make field assessments of the existing roadway conditions.

The purpose of the inventory was to help determine which project corridors would be suited to the following bicycle facilities:

- Multi-Use Pathways
- Wide Paved Shoulders
- Wide Curb Lanes
- Bicycle Lanes
- Bicycle Boulevards
- Improved Bicycle Crossing
- Grade-Separated Crossings
- Signed Bicycle Routes

Based on the existing project corridor roadway conditions, one bicycle facility may be easier to implement than another.

OPPORTUNITIES / POTENTIAL PROJECTS

A corridor ranking system was used for the entire 19-mile bicycle multi-use network to help prioritize the project corridors. The rankings were based on a sliding point system for the following criteria:

- Enhances Connectivity
- Improves Safety
- Ease of Implementation

The first two criteria were selected because they had a direct correlation to the input received from the citizens / visitors survey. The third criterion was selected to help sequence the Priority Table on the basis of project obstacles, i.e., sufficient right-of-way, town ownership, feasibility (project costs), utility conflicts, open-ditch conflicts, signalization upgrade requirements, and lastly potential loss of parking.

Based on the rankings we established an Overall Projects Priority Table which follows this page.

Town of Carolina Beach Bicycle / Multi-use Trail

Overall Projects Priority Table

Priority	*Corridor*
1	Clarendon Avenue
2	Harper Avenue
3	Lake Park Boulevard (Carl Winner Boulevard to St. Joseph Street)
4	Island Marina Drive
5	St. Joseph Street
6	Carolina Beach Avenue South
7	Fourth Street
8	Florida Avenue
9	Georgia Avenue
10	Island Greenway – Phase 1 (from Greenville Avenue to North Carolina Avenue)
11	Peninsula Drive
12	Virginia Avenue
13	Carolina Beach Avenue North
14	Otter Road
15	Teakwood Drive
16	Cape Fear Boulevard
17	Dow Road
18	Dow Road (from Harper Avenue to Sumter Avenue)
19	Alabama Avenue
20	Lake Park Boulevard (Alabama to Lake Park)
21	Ocean Boulevard
22	Seventh Street (Harper Avenue to Recreation Center)
23	Snow's Cut Bridge – Phase 1 (bridge deck area)
24	Eighth Street
25	Annie Drive
26	Tennessee Avenue
27	Snow's Cut Bike Path – Phase 2 (convert to asphalt surface)
28	Snow's Cut Bridge – Phase 2 (at-grade Multi-Use Path)
29	Island Greenway – Phase 2 (remaining portion)
30	Bonito Lane
31	Lake Park Boulevard (Lake Park to Fayetteville Avenue)
32	Cape Fear Boulevard (Third Street to Carolina Beach Avenue)
33	Harper Avenue (Third Street to Carolina Beach Avenue)
34	Greenville Avenue (Fourth Street to Island Greenway)

Priority	*Corridor*
35	King Avenue (Lake Park Boulevard North to Carolina Beach Avenue North)
36	Hamlet Avenue (Lake Park Boulevard to Carolina Beach Avenue South)
37	Intersection Upgrade
a.	Harper Avenue & Old Dow Road
b.	Harper Avenue & Seventh Street
c.	Harper Avenue & Carolina Beach Avenue North
d.	Cape Fear Boulevard & Old Dow Road
e.	Clarenden Avenue & Old Dow Road
f.	Alabama Avenue & Lake Park Boulevard South
g.	Ocean Boulevard & Lake Park Boulevard South
h.	Tennessee Avenue & Lake Park Boulevard South
i.	Carolina Beach Avenue South & Lake Park Boulevard South
j.	Driftwood Lane & Lake Park Boulevard South
k.	King Avenue & Lake Park Boulevard North
l.	Lake Park Boulevard North & St. Joseph Street

PROJECT IDENTIFICATION

A total of 48 projects have been identified which will contribute to a more bicycle friendly environment and will provide interconnectivity to the various town destinations. Brief project discussions are provided below which reference the project purpose, the preferred project treatment, and the project constraints.

1. ### Clarendon Avenue
   Purpose: improve safety on school route and provide interconnectivity to park sites, school, and proposed Dow Road Greenway.
   Treatment: 90′ right-of-way supports dual Multi-Use Paths providing 20′ separation from travel lane. Plan also includes the addition of high visibility crosswalks.
   Constraints: dual multi-use paths may initially be cost prohibitive. On an interim basis a more feasible option could include dual bike lanes.

2. ### Harper Avenue
   Purpose: provide interconnectivity to Central Business District and provide main street transition from residential to business.
   Treatment: 90′ right-of-way supports dual multi-use paths providing 20′ of separation from travel lanes. Also add high visibility crosswalks and provide roundabout for traffic calming and transitioning.
   Constraints: roundabout dramatically increases project costs. Dual multi-use paths may initially be cost prohibitive. On an interim basis a more feasible option could include dual bike lanes from Dow Road to Third Street.

3. ### Lake Park Boulevard (Carl Winner Boulevard to St. Joseph Street)
   Purpose: improve pedestrian safety and provide main street transition.
   Treatment: add bike lanes and sidewalks.
   Constraints: will need to lose on-street parking to enable improvements.

4. ### Island Marina Drive
   Purpose: improve safety and provide interconnectivity to existing multi-use path.
   Treatment: add sharrows and signage to existing roadway.
   Constraints: need to complete as part of overall phasing plan for improvements to have value.

5. ### St. Joseph Street
   Purpose: improve safety and provide interconnectivity to commercial area and existing multi-use path.
   Treatment: add sharrows, signage, and high visibility crosswalks to existing roadway.
   Constraints: need to complete as part of overall phasing plan for improvements to have value.

6. **Carolina Beach Avenue South**
   Purpose: provide a safer route from the southern end of town to the Central Business District and beach areas.
   Treatment: since road is one-way plan will require a contraflow bike lane created with pavement markings and signage.
   Constraints: area residents will not have parking within the public right-of-way.

7. **Fourth Street**
   Purpose: provide interconnectivity to school and Lake Park.
   Treatment: add sharrows, signage and high visibility crosswalks to existing roadway.
   Constraints: route crosses three primary streets.

8. **Florida Avenue**
   Purpose: improve safety and provide interconnectivity to beach area.
   Treatment: add sharrows and signage to existing roadway.
   Constraints: need to complete as part of overall phasing plan for improvements to have value.

9. **Georgia Avenue**
   Purpose: improve safety and provide interconnectivity to beach area.
   Treatment: add sharrows and signage to existing roadway.
   Constraints: need to complete as part of overall phasing plan for improvements to have value.

10. **Island Greenway – Phase 1 (from Greenville Avenue to North Carolina Avenue)**
    Purpose: provide regional trail link outside the property limits of Carolina Sands.
    Treatment: 10′ paved asphalt multi-use path.
    Constraints: residential concerns relating to safety and proximity to home sites.

11. **Peninsula Drive**
    Purpose: improve safety and provide interconnectivity to multi-use path.
    Treatment: add sharrows, signage, and high visibility crosswalks to existing roadways.
    Constraints: need to complete as part of overall phasing plan for improvements to have value.

12. **Virginia Avenue**
    Purpose: improve safety and provide interconnectivity to multi-use path.
    Treatment: add sharrows, signage, and high visibility crosswalks to existing roadways.
    Constraints: need to complete as part of overall phasing plan for improvements to have value.

13. ### Carolina Beach Avenue North
Purpose: improve safety and provide interconnectivity to beach area.
Treatment: add sharrows, signage, and high visibility crosswalks to existing roadways.
Constraints: the 30′ right-of-way limits the design treatment options.

14. ### Otter Road
Purpose: improve safety and provide interconnectivity to existing multi-use path.
Treatment: add sharrows and signage to existing roadway.
Constraints: need to complete as part of overall phasing plan for improvements to have value.

15. ### Teakwood Drive
Purpose: improve safety and provide interconnectivity to existing multi-use path.
Treatment: add sharrows and signage to existing roadway.
Constraints: need to complete as part of overall phasing plan for improvements to have value.

16. ### Cape Fear Boulevard
Purpose: provide interconnectivity to Central Business District and provide main street transition from residential to business.
Treatment: 90′ right-of-way supports dual multi-use paths providing 20′ of separation from travel lanes. Also add high visibility crosswalks and provide roundabout for traffic calming and transitioning.
Constraints: roundabout dramatically increases project costs. Dual multi-use paths may initially be cost prohibitive. On an interim basis a more feasible option could include dual bike lanes from Dow Road to Third Street.

17. ### Dow Road (Harper Avenue to Snows Cut Off-Road Trail)
Purpose: improve safety and provide interconnectivity to commercial area.
Treatment: construct dual bike-lanes.
Constraints: route intersects with high-volume traffic roadway – US Highway 421.

18. ### Dow Road (Harper Avenue to Sumter Avenue)
Purpose: improve safety and provide interconnectivity to regional attractors and destinations.
Treatment: construct dual bike lanes and single multi-use path along eastern right-of-way.
Constraints: project is located within NCDOT right-of-way and subject to available funding and NCDOT authorization.
NCDOT Division 3 Concerns: Dow Road would need to be widened prior to any consideration of a bike facility. The plan does not specifically identify if the proposal will be separate or connected to Dow Road.

19. **Alabama Avenue**
    Purpose: improve safety and provide interconnectivity to Island Greenway and beach area.
    Treatment: construct single multi-use path along north side of roadway.
    Constraints: Town limits run down the centerline of Alabama Avenue.

20. **Lake Park Boulevard (Alabama to Lake Park)**
    Purpose: improve safety and provide interconnectivity from the southern portions of town to the beach and Central Business District areas.
    Treatment: construct single multi-use path along western side of roadway and install high visibility crosswalks.
    Constraints: will lose approximately eight on-street parking spaces to enable site improvements.

21. **Ocean Boulevard**
    Purpose: improve safety and provide interconnectivity from Island Greenway to the beach area.
    Treatment: construct dual multi-use path and high visibility crosswalks. Paved shoulders could be a short-term option. Later, a future resurfacing project could add a few more feet to the existing shoulder to create a bike facility.
    Constraints: road is a high-volume traffic corridor located within a NCDOT right-of-way.

22. **Seventh Street (Harper Avenue to Recreation Center)**
    Purpose: improve safety on roadway frequently traveled by children to the recreation center.
    Treatment: construct a single asphalt multi-use path along the eastern side of the roadway and install high visibility crosswalks.
    Constraints: improvements will affect some of the area residents landscaping.

23. **Snow's Cut Bridge – Phase 1 (bridge deck area)**
    Purpose: improve safety and provide interconnectivity between the town and the City of Wilmington.
    Treatment: construct dual bike lanes in place of existing sidewalks.
    Constraints: space constraints would require center physical median to allow expanding sidewalks to bike lanes. Improvements would require substantial funding and NCDOT authorization. NCDOT is not in favor of the proposed bike facility at the snows cut bridge (US-421) due to there being no existing facility to accommodate bike traffic, no bike safety fencing on the bridge structure itself and the slope at the end of the bridge would require some type of fall protection.

24. **Eighth Street**
    Purpose: improve safety and provide interconnectivity to park and Island Greenway.

Treatment: add sharrows, signage, and high visibility crosswalks to existing roadways.
Constraints: route crosses a couple high volume traffic roadways.

25. **Annie Drive**
Purpose: improve safety and provide interconnectivity to existing multi-use path.
Treatment: add sharrows and signage to existing roadway.
Constraints: need to complete as part of overall phasing plan for improvements to have value.

26. **Tennessee Avenue**
Purpose: improve safety and provide interconnectivity from southern portions of town to beach areas.
Treatment: 90′ right-of-way supports dual multi-use paths providing 20′ separation from travel lane. Plan also includes the addition of high visibility crosswalks.
Constraints: dual multi-use paths may initially be cost prohibitive. On an interim basis a more feasible option could include dual bike lanes.

27. **Snow's Cut Bike Path – Phase 2 (convert to asphalt surface)**
Purpose: provide interconnectivity to the Down Road Greenway and State Park.
Treatment: convert existing gravel trail to 10′ paved asphalt multi-use path.
Constraints: safety concerns in heavily wooded remote area.

28. **Snow's Cut Bridge – Phase 2 (at-grade multi-use path)**
Purpose: improve safety by providing interconnectivity to commercial area, the Snows Cut trail, the Dow Road Greenway, and the State Park.
Treatment: construct a single 10′ asphalt multi-use path beneath the bridge deck from Lewis Drive to the Snows Cut trail.
Constraints: would require NCDOT authorization for improvements.

29. **Island Greenway – Phase 2 (remaining portion)**
Purpose: provide regional trail link and interconnectivity to Kure Beach and southern Pleasure Island area attractors.
Treatment: construct a 10′ paved asphalt multi-use path.
Constraints: funding limitations and Sunny Point buffer area approvals.

30. **Bonito Lane**
Purpose: improve safety and provide interconnectivity from southern portions of town to beach areas.
Treatment: 90′ right-of-way supports dual multi-use paths providing 20′ separation from travel lane. Plan also includes the addition of high visibility crosswalks.
Constraints: dual multi-use paths may initially be cost prohibitive. On an interim basis a more feasible option could include dual bike lanes.

31. **Lake Park Boulevard (Lake Park to Fayetteville Avenue) ***
Purpose: Reinvigorate the Central Business District and create a successful downtown.
Treatment: Add dual bike lanes and sidewalks.
Constraints: Would require NCDOT authorization for improvements and an Encroachment Permit.

* All references to the design philosophy are based on the Carolina Beach, Central Business District, and Streetscape Design Development Study prepared by peter j. smith & company, inc. in October 2009.

32. **Cape Fear Boulevard (Third Street to Carolina Beach Avenue) ***
Purpose: Reinvigorate the Central Business District and create a successful downtown.
Treatment: Add dual bike lanes and sidewalks.
Constraints: Existing residents which currently park within the public right-of-way would lose some parking spaces with revision from 90° parking to parallel parking.

* All references to the design philosophy are based on the Carolina Beach, Central Business District, and Streetscape Design Development Study prepared by peter j. smith & company, inc. in October 2009.

33. **Harper Avenue (Third Street to Carolina Beach Avenue) ***
Purpose: Reinvigorate the Central Business District and create a successful downtown.
Treatment: Add dual bike lanes and sidewalks.
Constraints: Existing residents which currently park within the public right-of-way would lose some parking spaces with revision from 90° parking to parallel parking.

* All references to the design philosophy are based on the Carolina Beach, Central Business District, and Streetscape Design Development Study prepared by peter j. smith & company, inc. in October 2009.

34. **Greenville Avenue (Fourth Street to Island Greenway)**
Purpose: provide interconnectivity to regional greenway.
Treatment: Add sharrows and signage to existing roadway.
Constraints: need to complete after Island Greenway to avoid a dead-end bicycle boulevard.

35. **King Avenue (Lake Park Boulevard North to Carolina Beach Avenue North)**
Purpose: provide interconnectivity to Central Business District and beach area.
Treatment: Add sharrows, signage, high-visibility crosswalk, and single shared use path.
Constraints: limited right-of-way within a highly urbanized area with heavy traffic.

36. **Hamlet Avenue (Lake Park Boulevard to Carolina Beach Avenue South)**
Purpose: provide interconnectivity to Lake Park and Central Business District.
Treatment: Add sharrows, signage, and high-visibility crosswalk.
Constraints: crosswalk location occurs at the terminus of an "S" curve.

37. **Intersection Upgrades**

a. **Harper Avenue & Old Dow Road**
Treatment: Install high-visibility crosswalk, pedestrian activated crosswalk signal, and pedestrian warning and crossing signs (advance motorist warning sign, pedestrian warning sign, and motorist specific instance sign).

b. **Harper Avenue & Seventh Street**
Treatment: Install high-visibility crosswalk

c. **Harper Avenue & Carolina Beach Avenue North**
Treatment: Install high-visibility crosswalk

d. **Cape Fear Boulevard & Old Dow Road**
Treatment: Install high-visibility crosswalk

e. **Clarenden Avenue & Old Dow Road**
Treatment: Install high-visibility crosswalk

f. **Alabama Avenue & Lake Park Boulevard South**
Treatment: Install high-visibility crosswalk

g. **Ocean Boulevard & Lake Park Boulevard South**
Treatment: Install high-visibility crosswalk

h. **Tennessee Avenue & Lake Park Boulevard South**
Treatment: Install high-visibility crosswalk

i. **Carolina Beach Avenue South & Lake Park Boulevard South**
Treatment: Install high-visibility crosswalk

j. **Driftwood Lane & Lake Park Boulevard South**
Treatment: Install high-visibility crosswalk

k. **King Avenue & Lake Park Boulevard North**
Treatment: Install high-visibility crosswalk

l. **Lake Park Boulevard North & St. Joseph Street**
Treatment: Install high-visibility crosswalk

Combining the information from the Existing Roadway Conditions Inventory with the Overall Projects Priority Table enabled preparation of the Bicycle Multi-Use Network Plan, which follows this page.

Crosswalk by Tom Harned

TOWN OF CAROLINA BEACH BICYCLE/MULTI-USE TRANSPORTATION PLAN

RECOMMENDED BICYCLE/MULTI-USE NETWORK PLAN

CAPE FEAR RIVER

CAROLINA BEACH RECREATION CENTER

PARK MARINA

PARK ENTRANCE

CAMPING LOOP

CAROLINA BEACH STATE PARK

CAROLINA BEACH GREENWAY SYSTEM

PROPOSED DOW ROAD BIKE LANES & MULTIUSE TRAIL

SUNNY POINT BUFFER AREA

ICWW

SNOWS CUT BRIDGE (TO WILMINGTON)

MIKE CHAPPEL PARK

CAROLINA BEACH ELEMENTARY SCHOOL

SNOWS CUT BIKE PATH

PROPOSED ISLAND GREENWAY

WILDLIFE BOAT RAMP

MARINA

FREEMAN PARK

LAKE PARK

CAROLINA BEACH SENIOR CENTER

CAROLINA BEACH LIBRARY

CAROLINA BEACH BOARDWALK & PAVILION

PROPOSED AQUARIUM PIER AT CAROLINA BEACH

ATLANTIC OCEAN

LEGEND

- TOTAL BICYCLE/MULTI-USE PATH DISTANCE: 19.0 MILES
- EXISTING PAVED SHOULDERS
- DUAL MULTI-USE PATH
- SINGLE MULTI-USE PATH:
  - EXISTING
  - PROPOSED
- DUAL BICYCLE LANES AND SIDEWALKS
- DUAL BICYCLE LANES & SINGLE MULTI-USE PATH (DOW ROAD)
- BICYCLE BOULEVARD (PAVEMENT MARKINGS W/ PRIORITIZED TRAVEL)
- CONTRAFLOW BICYCLE LANE W/ STANDARD BICYCLE LANE
- DUAL BICYCLE LANES:
  - EXISTING
  - PROPOSED
- PROPOSED ROUNDABOUT
- HIGH VISIBILITY CROSSWALK

McKIM&CREED
243 NORTH FRONT STREET
WILMINGTON, NORTH CAROLINA 28401
TELE: (910) 343-1048
FAX: (910) 251-8282
NC License # C-0342

PROJECTS PRIORITIES

Projects were identified based on input from the steering committee meetings, input from the citizens / visitors' survey, input from the first public open house, the results of the existing roadway conditions, and the results of the Overall Projects Priority Table.

In order to identify project segments, a ranking system was used to evaluate the effectiveness of enhancing connectivity, improving safety, and the ease of implementation. The steering committee provided rankings to enable this determination. Public survey data also contributed to rankings on the more major project corridors. A prioritization table can be found in Appendix D.

In addition, each bicycle / multi-use path route had to be considered individually. A diversity of bicycle / multi-use path improvements is proposed, depending on existing conditions. In areas where the town has sufficient public street right-of-ways, dual multi-use paths were proposed. In areas where the town has narrow public street right-of-ways, bicycle boulevards utilizing pavement markings (sharrows) and prioritized travel were proposed.

The overall Bicycle Multi-Use Transportation Plan identified the needed town-wide improvements required for a comprehensive plan which complemented the ultimate project goal: Create a more bicycle / multi-use path friendly environment and provide interconnectivity to the various town destinations.

PRIORITIZED PROJECTS

The overall project corridor rankings were further evaluated to create the High-Priority Short-Term Project Phases table to develop a manageable plan for implementation. Project phases were identified where implementation could occur within a 5-year time frame. High-Priority projects that exceeded 5-years were placed on the High-Priority Long-Term Project Phases. These phasing tables follow this page.

A total of 14 short-term projects were identified within 6 phases. Clarenden Avenue, identified as Phase 1, received the highest priority demonstrating effectiveness to enhance connectivity, improve safety, and for ease of implementation. Since Clarenden Avenue connects to the elementary school and Lake Park, the benefits were more than apparent.

Phase 2 Short-Term projects included the dual multi-use paths along Harper Avenue and Cape Fear Boulevard. Cape Fear Boulevard was included within Phase 2 from a feasibility perspective. Since both Harper Avenue and Cape Fear Boulevard require the same construction details, an economy of scale is established when both projects are done together.

The High-Priority Long-Term Project Phases table continues to identify an additional 5 projects. While these projects are listed as long-term projects, they are equally important. However the ease of implementation and feasibility warrant them As High-Priority Long-Term projects.

Another project for consideration includes Lake Park Boulevard where the addition of bike lanes adjacent to diagonal parking has created safety concerns. The town is actively pursuing options and has retained the services of an outside consultant. A joint workshop is scheduled for early 2011. Attendees include town representatives, town consultant, and NCDOT. Since the outcome of the workshop wasn't known at the time of this plan preparation, specific recommendations are not included. Suffice it to say the town is actively pursuing design options which address citizens and business concerns.

The phases are noted as sequential; however, they can be deviated based on budget constraints and the Capital Improvement Plan. For instance, while the St. Joseph Bicycle Boulevard is shown as Phase 5 Short-Term projects, based on the construction budget it could potentially be elevated to Phase 2 or 3 Short-Term projects. When any phase is implemented, the project will include striping, signage, and intersection upgrades per the MUTCD standards.

The High-Priority Short-Term Project Phases Preliminary Opinion of Probable Construction Costs for the initial 6 project phases is included within the Appendices.

HIGH-PRIORITY SHORT-TERM PROJECT PHASES

Phase	Roadway Segment	From	To	Approx. Length (ft)	Costs
1	Clarendon Avenue	Dow Road	Terminus	2,850	$218,000
				Subtotal	$218,000
2	Cape Fear Boulevard	Dow Road	Third Street	3,385	$245,000
2	Cape Fear Boulevard	Third Street	Carolina Beach Avenue N	1,042	$715,000
2	Harper Avenue	Dow Road	Third Street	3,465	$260,000
2	Harper Avenue	Third Street	Carolina Beach Avenue N	608	$635,000
				Subtotal	$1,855,000
3	Lake Park Boulevard N	Carl Winner Boulevard	St. Joseph Street	1,042	$415,000
3	Lake Park Boulevard S	Alabama Avenue	Lake Park shared-use path	5,430	$200,000
				Subtotal	$615,000
4	Carolina Beach Avenue N	Harper Avenue	Salt Marsh Lane	8,800	$7,500
4	Salt Marsh Lane	Carolina Beach Avenue N	Canal Drive	288	$850
4	Canal Drive	Salt Marsh Lane	Virginia Avenue	988	$2,500
4	Virginia Avenue	Canal Drive	Maryland Avenue	1,305	$1,500

Phase	Roadway Segment	From	To	Approx. Length (ft)	Costs
4	Maryland Avenue	Virginia Avenue	Georgia Avenue	282	$800
4	Florida Avenue	Georgia Avenue	Canal Drive	2,218	$2,500
4	Canal Drive	Florida Avenue	Periwinkle Lane	140	$1,500
4	Periwinkle Avenue	Canal Drive	Carolina Beach Avenue N	286	$1,000
				Subtotal	$18,150
5	St. Joseph Street	Lake Park Blvd N	Lewis Drive	4,682	$8,000
5	Lewis Drive	St. Joseph Street	Snows Cut Bridge	2,246	$1,500
5	Otter Road	Lewis Drive	Teakwood Drive	428	$1,000
5	Teakwood Drive	Otter Road	Peninsula Drive	798	$1,500
5	Peninsula Drive	Teakwood Drive	Island Marina Drive	916	$1,500
5	Island Marina Drive	Peninsula Drive	Annie Drive	894	$1,500
5	Annie Drive	Island Marina Drive	Snows Cut Bike Path	550	$21,000
				Subtotal	$36,000
6	Seventh Street	Harper Avenue	Rec. Center	2,184	$88,000
				Subtotal	$88,000
7	Dow Road	Harper Avenue	Sumter Avenue	4,678	$515,000
				Subtotal	$515,000
				TOTAL	**$6,690,300**

High-Priority Long-Term Project Phases

Phase	*Corridor*
1	Island Greenway – Phase 1 (from Greenville Avenue to North Carolina Avenue)
2	Dow Road (from Harper Avenue to Sumter Avenue)
3	Snow's Cut Bridge – Phase 1 (bridge deck area)
4	Snow's Cut Bridge – Phase 2 (at-grade multi-use path)
4	Snow's Cut Bike Path – Phase 2 (convert to asphalt surface)
5	Island Greenway – Phase 2 (remaining portion)

These projects are illustrated on the following page represented by the Bicycle Multi-Use Network Plan.

Beach Lane by Laura Sandt

TOWN OF CAROLINA BEACH BICYCLE/MULTI-USE TRANSPORTATION PLAN

RECOMMENDED BICYCLE/MULTI-USE NETWORK PLAN

CAPE FEAR RIVER

CAROLINA BEACH RECREATION CENTER

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CAROLINA BEACH GREENWAY SYSTEM

PROPOSED DOW ROAD BIKE LANES & MULTIUSE TRAIL

SUNNY POINT BUFFER AREA

ICWW

SNOWS CUT BRIDGE (TO WILMINGTON)

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ATLANTIC OCEAN

LEGEND

- TOTAL BICYCLE/MULTI-USE PATH DISTANCE: 19.0 MILES
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McKIM&CREED
243 NORTH FRONT STREET
WILMINGTON, NORTH CAROLINA 28401
TELE: (910) 343-1048
FAX: (910) 251-8282
NC License # C-0342

SECTION 5 - BICYCLE FACILITY STANDARDS AND GUIDELINES

SECTION OVERVIEW

This section provides guidelines for the future development for the various types of bicycle facilities in the Town of Carolina Beach. The guidelines include the current proposed facility-types as well as future facility types which the town may "grow into."

The guidelines are just that – guidelines. As guidelines it may be necessary to implement design modifications to achieve the desired results. Each bicycle network addition should be evaluated individually based on current field conditions and design objectives.

GENERAL BICYCLE PLANNING AND DESIGN GUIDELINES

The predominate design standards and guidelines referenced in this section are from the North Carolina Bicycle Facilities Planning and Design Guidelines prepared by the North Carolina Department of Transportation (NCDOT) dated January 1994 and the Bicycle Boulevard Planning and Design Guidebook prepared by Lindsey Walker, Mike Tresidder, and Mia Birk dated July, 2009. The former document is considered current and has not been updated. Other references are made to the Federal Highway Association (FWA) Manual on Uniform Traffic Control Devices (MUTCD), as well as the American Association of State Highway and Transportation officials (AASHTO) Guidelines for the Development of Bicycle Facilities.

ON-ROAD BICYCLE FACILITIES

There are several treatment methodologies that can be applied to support on-road facilities. The selected treatment is guided by the right-of-way width, the existing pavement width, the presence or absence of curb and gutter, and the present or absence of on-street parking. Several on-road bicycle facility standards follow. Specific town location references are noted where applicable.

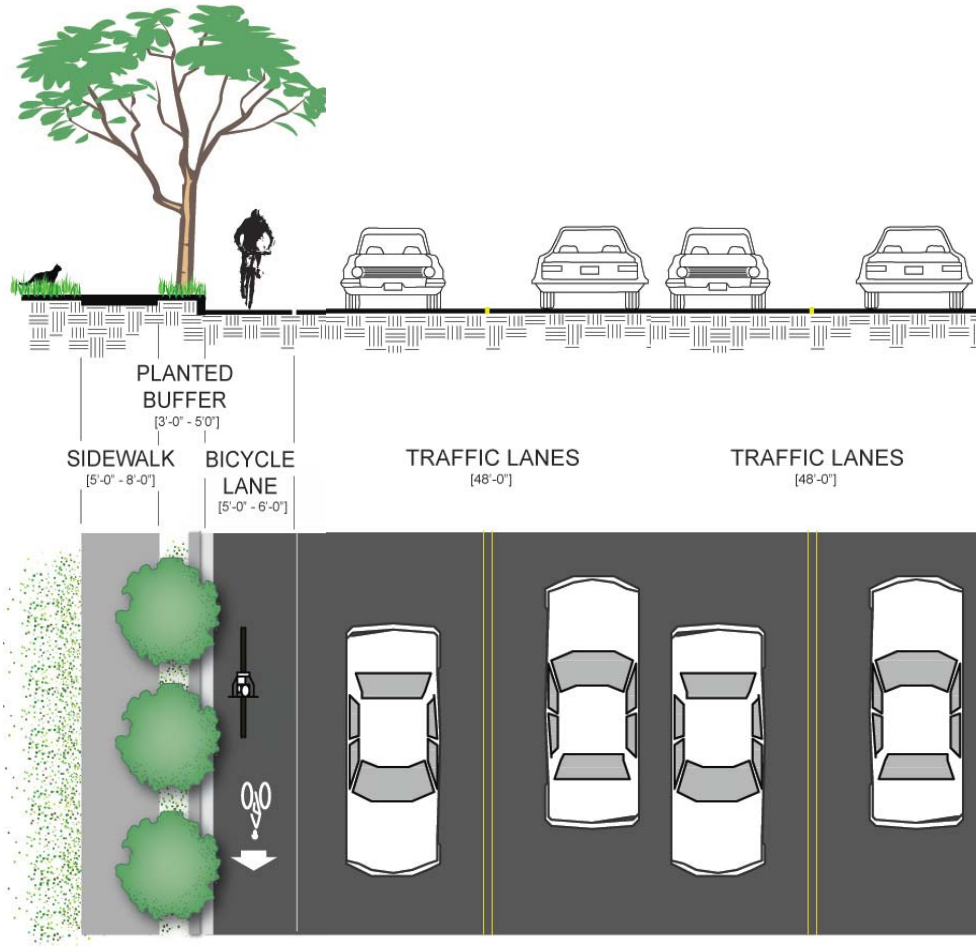
BICYCLE LANES

A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the exclusive use of bicyclists. Bicycle lanes are located on both sides of the road, and carry bicyclists in the same direction as adjacent motor vehicle traffic.

Recommended bicycle lane width:

- 6′ from the curb face when a gutter pan is present (or 4′ from the edge of the gutter pan)
- 4′ from the curb face when no gutter pan is present

- Should be used on roadways with average daily traffic (ADT) counts of 3,000 or more or a higher volume roadway with wide outside lanes.
- Not suitable where there are a high number of commercial driveways.



Proposed Treatment Location: Portion of Dow Road between Lake Park Boulevard and Harper Avenue

WIDE PAVED SHOULDERS

Wide paved shoulders may be added to sections of existing roadways where there is a need to more safely accommodate bicycles.

A paved shoulder refers to the part of the highway that is adjacent to the regularly traveled portion of the highway and is on the same level as the highway. Ideally, wide paved shoulders should be included in the construction of new highways and the upgrade of existing highways where there is a significant level of current/potential bicycle travel. A wide paved shoulder refers to additional pavement width of at least 4' that has been added to an existing roadway in order to more safely accommodate bicycles.

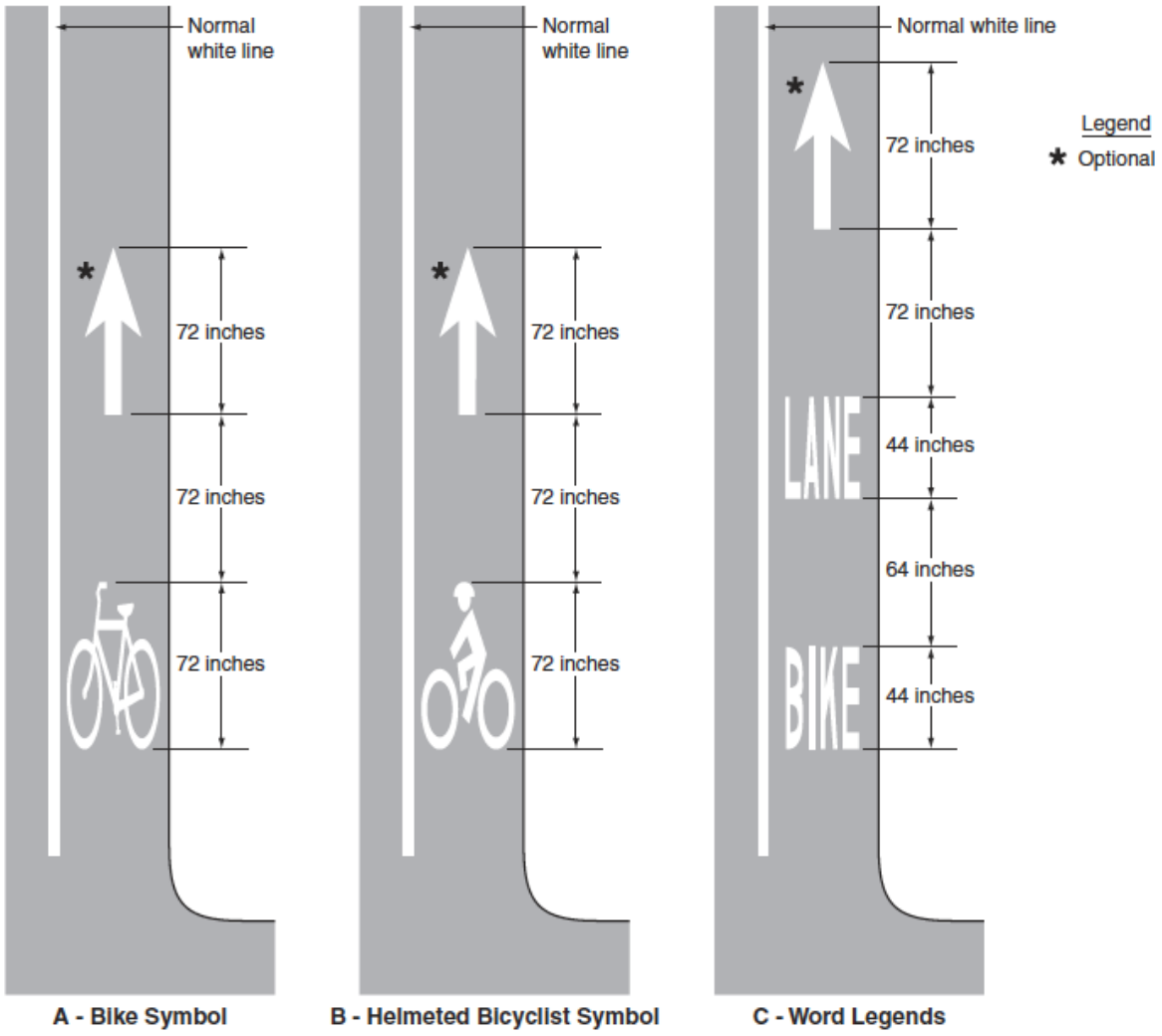
On urban streets with curb and gutter, wide outside lanes and bicycle lanes are usually the preferred facilities. Shoulders for bicycle use are not typically provided on roadways with curb and gutter.

- On rural roadways where bicycle travel is common, such as roads in coastal resort areas, wide paved shoulders are highly desirable.
- On secondary roadways without curb and gutter where there are few commercial driveways and intersections with other roadways, many bicyclists prefer riding on wide, smoothly paved shoulders.

This type of facility is most frequently used in rural areas on both primary and secondary roads. Sufficient right-of-way is needed to accommodate the addition of the paved shoulders and, if necessary, to relocate drainage ditches that run parallel to the roadway.

- Shoulders that are paved to accommodate bicycle traffic are generally full-depth or equal to the pavement depth of the adjacent roadway. Partial-depth paved shoulders are rarely recommended because of the tendency to crack under vehicular loads.
- Rumble strips and other devices used to alert sleepy motorists should be avoided, because they pose a safety hazard to bicyclists. If rumble strips are necessary, additional shoulder width should be provided for the bicyclists.

Bicycle Lane Pavement Marking
Reference: 2009 MUTCD



BIKE LANES WITH PARALLEL ON-STREET PARKING

Where on-street parking is permitted, and a bike lane is provided, the bike lane must be between parking and the travel lane. Appropriate space must be allocated to allow passing cyclists room to avoid open car doors. The distance between the curb face and the outer

marking of the bicycle lane is typically 13 to 15 feet (parking stall of 8 to 10 feet and bike lane of 5 feet).

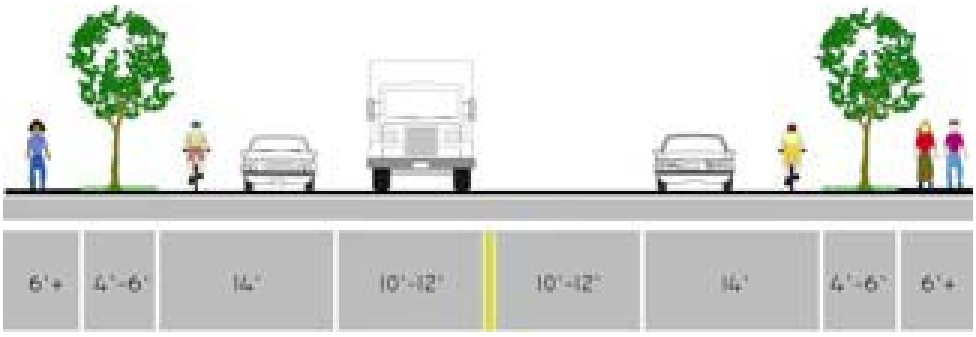
'Road Diets' for Bicycle Lanes

Road diets typically involve reducing the number of travel lanes (from a four-lane road to a two-lane road with center turn lane, for example) allowing adequate space for bicycle lanes. These are generally recommended only in situations where the vehicular traffic count can be safely and efficiently accommodated with a reduced number of travel lanes. Study may be necessary for recommended road diets to ensure that capacity and level-of-service needs are balanced against bicycle level of service needs.

Wide Outside Lanes

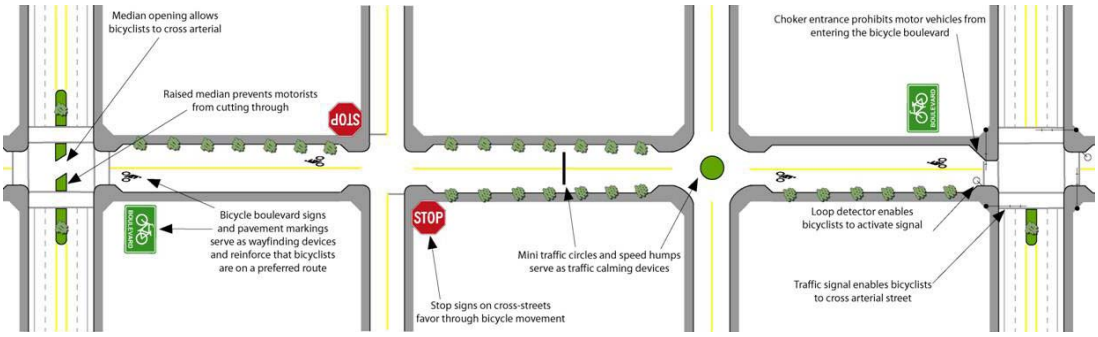
Even without a marked bicycle facility, the conditions for bicycling are improved when the outside travel lane in either direction is widened to provide enough roadway space so that bicyclists and motor vehicles can share the roadway without putting either in danger (e.g., higher volume roadways with wide (14') outside lanes). For outside lanes wider than 14', striping a bicycle lane should be considered.

Wide Outside Lane on a Typical Two Lane Roadway



Bicycle Boulevards

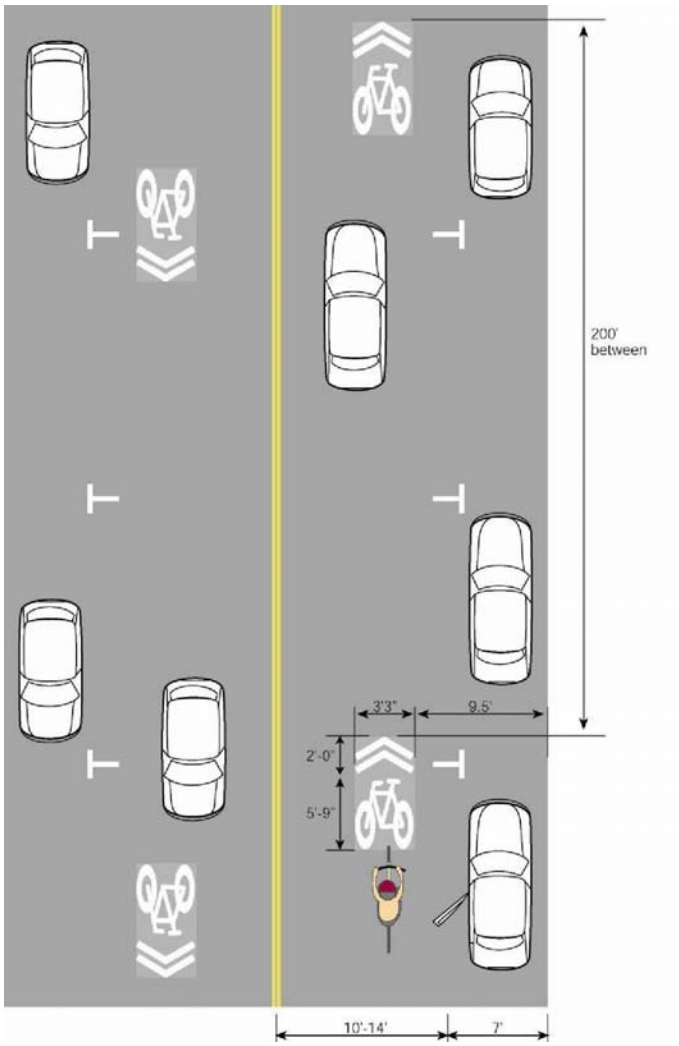
Lower volume roadways may be modified to function as a through street for bicycles while maintaining access for automobiles. Traffic calming devices reduce traffic speeds and through trips while limiting conflicts between motorists and bicyclists, as well as give priority to through bicycle movement.



Bicycle Boulevards allow you to pick and choose the appropriate mix of design elements needed along a particular corridor.

Proposed Treatment Locations: Several locations are proposed. A few include Carolina Beach Avenue North, Virginia Avenue, Maryland Avenue, St. Joseph Street, and Lewis Drive.

SHARED LANE MARKING



A bicycle shared lane marking (or 'sharrow') can serve a number of purposes, such as making motorists aware of bicycles potentially traveling in their lane, showing bicyclists the appropriate direction of travel, and, with proper placement, reminding bicyclists to bike further from parked cars to prevent "dooring" collisions. The shared lane marking stencil is used:

- Where lanes are too narrow for striping bike lanes
- Where the speed limit does not exceed 35 MPH
- With or without on-street parking (with on-street parking, the sharrow should be placed a minimum of 11 feet from the curb face; without on-street parking, the sharrow shall be placed 4 feet from the curb face or edge of pavement)
- Install markings just after each intersection and in intervals of approximately 200 feet.

SHARROWS WITH BACK-IN ANGLE PARKING

Back-in/head-out diagonal parking and conventional head-in/back-out diagonal parking have common dimensions, but the back-in / head-out is superior for safety reasons due to better visibility when leaving the parking stall. This is particularly important on busy streets or where drivers find their views blocked by large vehicles, tinted windows, etc. Furthermore, with back-in / head-out parking, drivers can see bicyclists as they prepare to pull out.

Back-In Parking by Carl Sundstrom

CONTRAFLOW LANES

A contraflow lane is a designated bicycle facility that allows cyclists to travel against the flow of traffic on a one-way street.

It provides direct access and improves cyclist connectivity, reducing cyclist travel time by eliminating out-of-direction detours and unauthorized wrong-way riding.

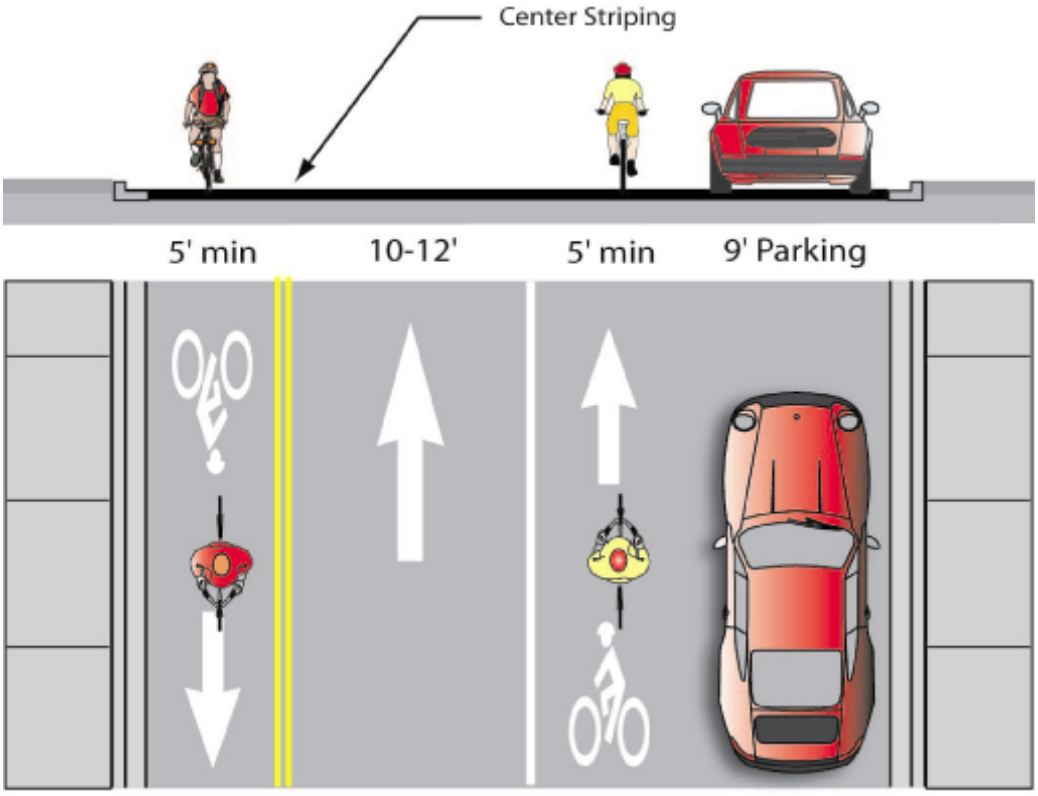
It is installed on left side of the street facing one-way traffic. The contraflow lane is generally separated from the motor vehicle lane with a double-yellow line.

In some cases, a contraflow may allow cyclists to avoid streets with high motor vehicle traffic speeds and volumes or create safer conditions at locations where cyclists frequently ride wrong-way.

Design Recommendations

Allow contraflow lane width of 5 feet or greater.

Post signage indicating cyclists may enter the one-way streets. Place signage on all streets intersecting the contraflow lane indicating that to motorists to expect two-way bicycle traffic.



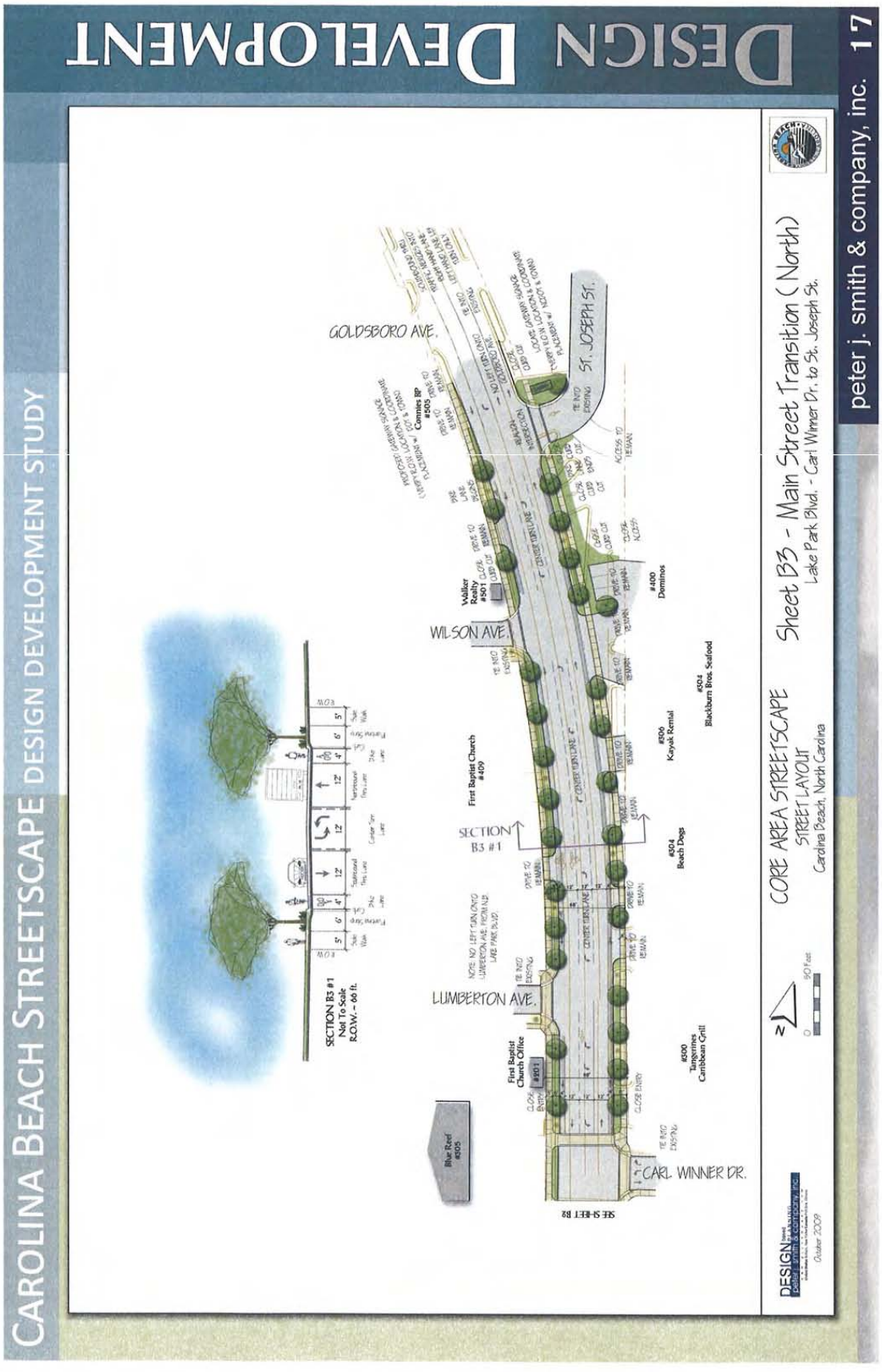
Proposed Treatment Location: Carolina Beach Avenue South

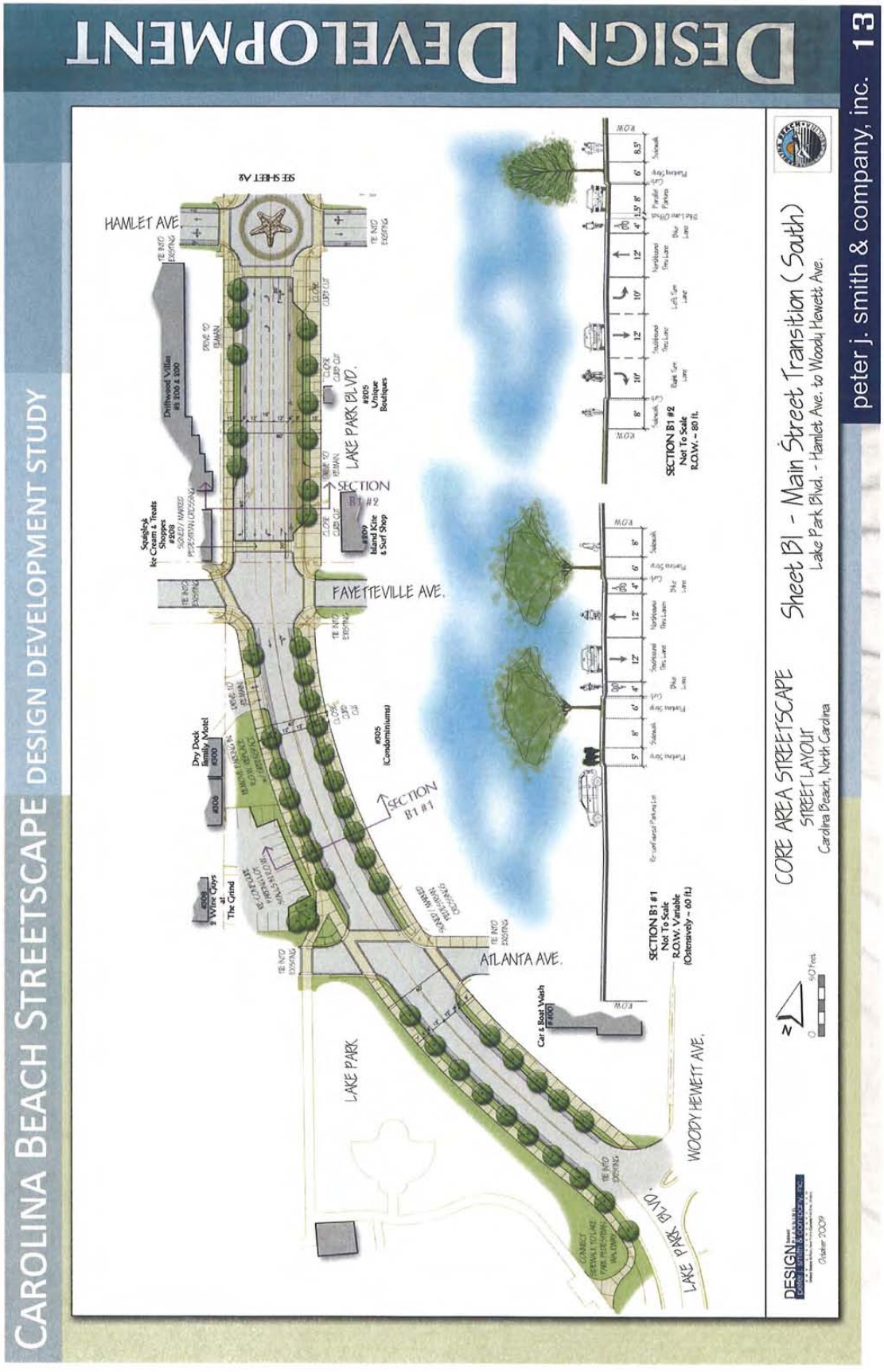
EXISTING BICYCLE LANE DESIGNS

There were several streetscape design concepts that were prepared by peter j. smith & company specifically as part of the Carolina Beach Streetscape Plan. These design concepts were specific to the Central Business District. Since bicycle multi-use improvements are proposed within these areas, this plan further supports those design concepts. These plans provide for a combination of bicycle lanes, sidewalks, residential to business transition areas, and traffic calming roundabouts. Selected area design plans follow this page.

Bike Lane Sidewalk by Lyubov Zuyeva


CAROLINA BEACH STREETSCAPE DESIGN DEVELOPMENT STUDY
DESIGN DEVELOPMENT
HARPER AVENUE
CAPE FEAR BOULEVARD
SECTION C1 #1
Not To Scale
R.O.W. ~ 100 ft.
SECTION C2 #1
Not To Scale
SEE SHEET A1
SEE SHEET A2
SEE SHEET B2
HARPER AVE.
3RD STREET
CAPE FEAR BLVD.
CORE AREA STREETSCAPE
STREET LAYOUT
Carolina Beach, North Carolina
Sheet C1 - Transit Streets
Harper Ave. & Cape Fear Blvd. - Lake Park Blvd. to 3rd St.
peter j. smith & company, inc.
19
DESIGN
October 2009

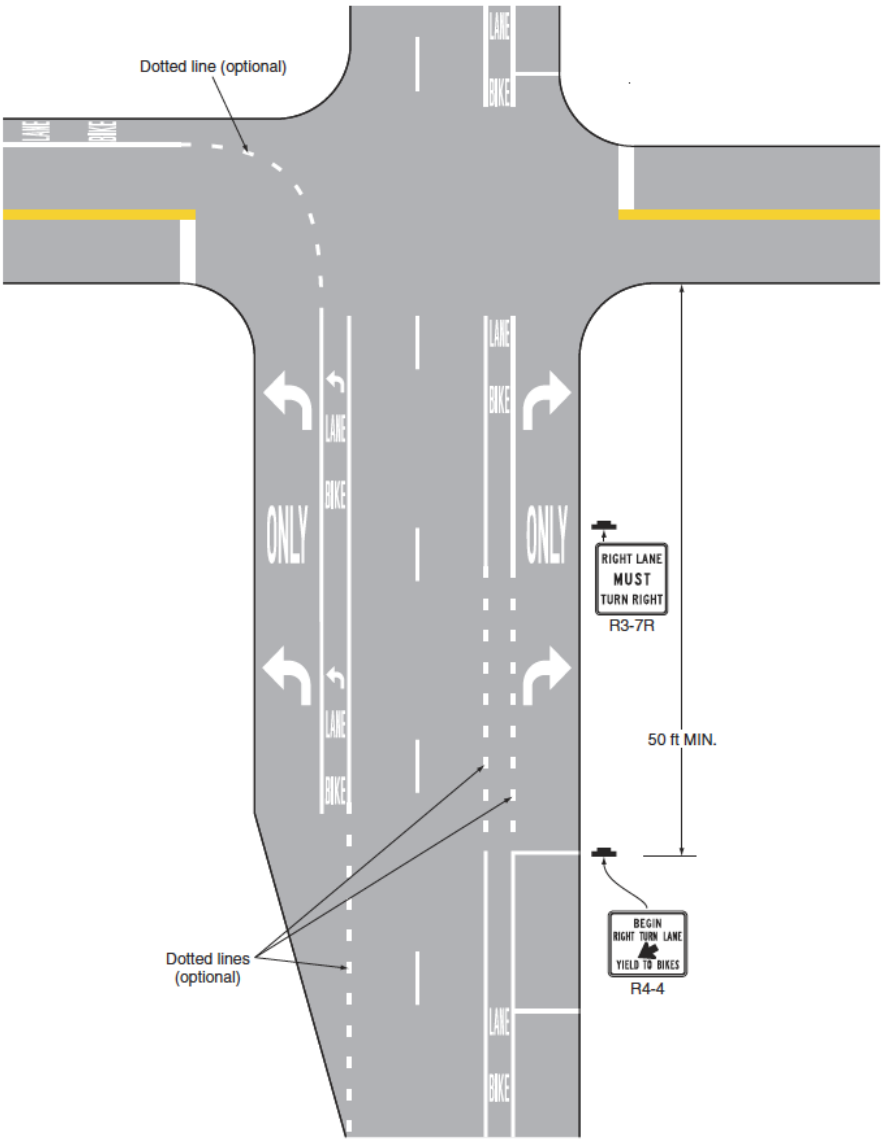

CAROLINA BEACH STREETSCAPE DESIGN DEVELOPMENT STUDY
DESIGN DEVELOPMENT
peter j. smith & company, inc. 17
CORE AREA STREETSCAPE
STREET LAYOUT
Carolina Beach, North Carolina
Sheet B3 - Main Street Transition (North)
Lake Park Blvd. - Carl Winner Dr. to St. Joseph St.
GOLDSBORO AVE.
WILSON AVE.
LUMBERTON AVE.
CARL WINNER DR.
ST. JOSEPH ST.
SECTION B3 #1
SECTION B3 #1
Not To Scale
R.O.W. - 66 ft.
Connies RP #505
Walker Realty #501
First Baptist Church #409
First Baptist Church Office #501
Blue Reef #505
#500 Jimmy Buffetts Caribbean Grill
#504 Beach Dogs
#506 Kayak Rental
#504 Blackburn Bros. Seafood
#400 Dominos
SEE SHEET B2
DESIGN
October 2009


CAROLINA BEACH STREETSCAPE DESIGN DEVELOPMENT STUDY
DESIGN DEVELOPMENT
peter j. smith & company, inc. 13
CORE AREA STREETSCAPE
STREET LAYOUT
Carolina Beach, North Carolina
Sheet B1 - Main Street Transition (South)
Lake Park Blvd. - Hamlet Ave. to Woody Hewett Ave.
HAMLET AVE.
FAYETTEVILLE AVE.
ATLANTA AVE.
LAKE PARK BLVD.
WOODY HEWETT AVE.
LAKE PARK
SECTION B1 #1
SECTION B1 #2
SECTION B1 #1 Not To Scale R.O.W. Variable (Ostensively - 60 ft.)
SECTION B1 #2 Not To Scale R.O.W. - 80 ft.
Driftwood Villas #s 150 & 180
Squidpink Ice Cream & Treats Shoppe #208
#205 Unique Boutiques
#209 Island Kite & Surf Shop
#205 (Condominiums)
Dry Dock Family Motel #300
#308
#309 2 Wine Guys at The Grind
Car & Boat Wash (#600)
DESIGN
Outer 2009

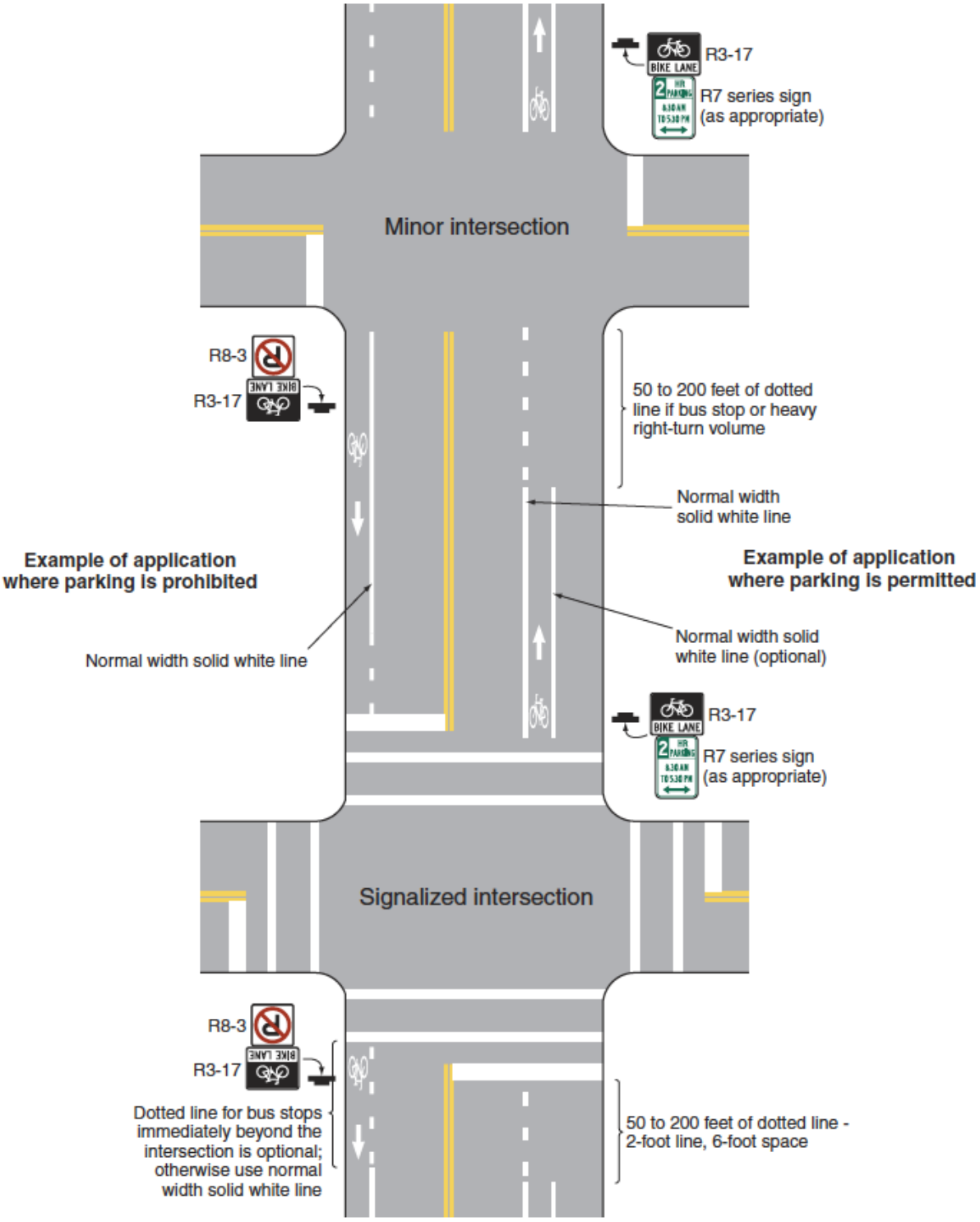
Intersection Treatments

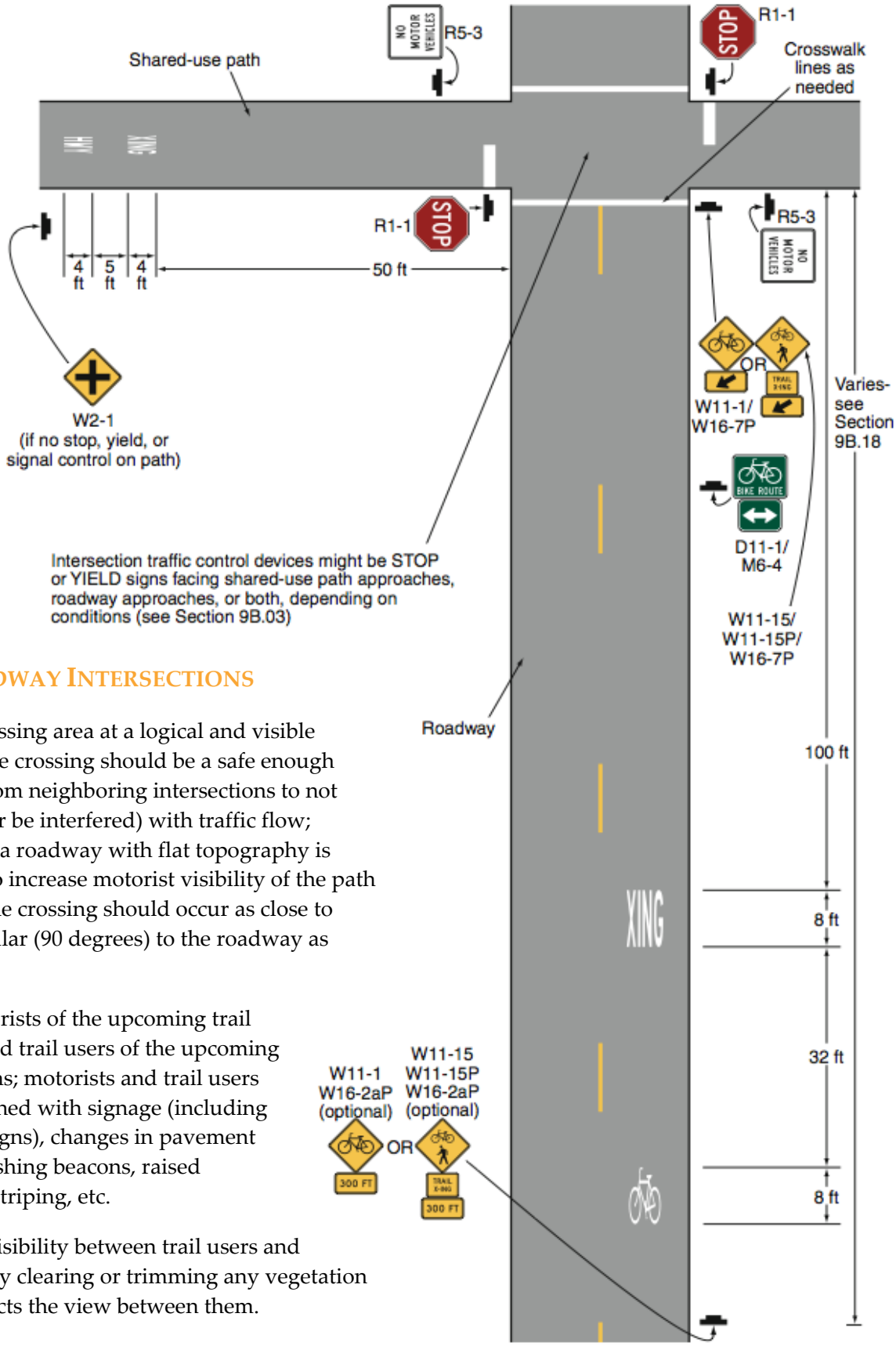
At intersections, bicyclists proceeding straight through and motorists turning right must cross paths. Marking and signing configurations which encourage these crossings through merging in advance of the intersection are generally preferable to those that force the crossing in the immediate vicinity of the intersection. To a lesser extent, the same is true for left-turn bicyclists. However, in this maneuver, the rules of the road allow bicyclists to make either a "vehicular style" left turn (where the bicyclist merges left to the same lane used for motor vehicles left turns) or a "pedestrian style" left turn (where the bicyclist proceeds straight through the intersection, dismounts and then walks across the intersection on the cross street).

Typical Intersection Pavement Marking-Designated Bicycle Lane with Left-Turn Area (Reference 2009 MUTCD)



TYPICAL INTERSECTION CONFIGURATION FOR BIKE LANES (REFERENCE 2009 MUTCD)





Trail-Roadway Intersections

- Site the crossing area at a logical and visible location; the crossing should be a safe enough distance from neighboring intersections to not interfere (or be interfered) with traffic flow; crossing at a roadway with flat topography is desirable to increase motorist visibility of the path crossing; the crossing should occur as close to perpendicular (90 degrees) to the roadway as possible.
- Warn motorists of the upcoming trail crossing and trail users of the upcoming intersections; motorists and trail users can be warned with signage (including trail stop signs), changes in pavement texture, flashing beacons, raised crossings, striping, etc.
- Maintain visibility between trail users and motorists by clearing or trimming any vegetation that obstructs the view between them.

- Intersection approaches should be made at relatively flat grades so that cyclists are not riding down hill into intersections.
- If the intersection is more than 75 feet from curb to curb, it is preferable to provide a center median refuge area; a refuge is needed in conditions exhibiting high volumes/speeds and where the primary user group crossing the roadway requires additional time, such as school children and the elderly.
- If possible, it may be desirable to bring the path crossing up to a nearby signalized crossing in situations with high speeds/ADT and design and/or physical constraints.

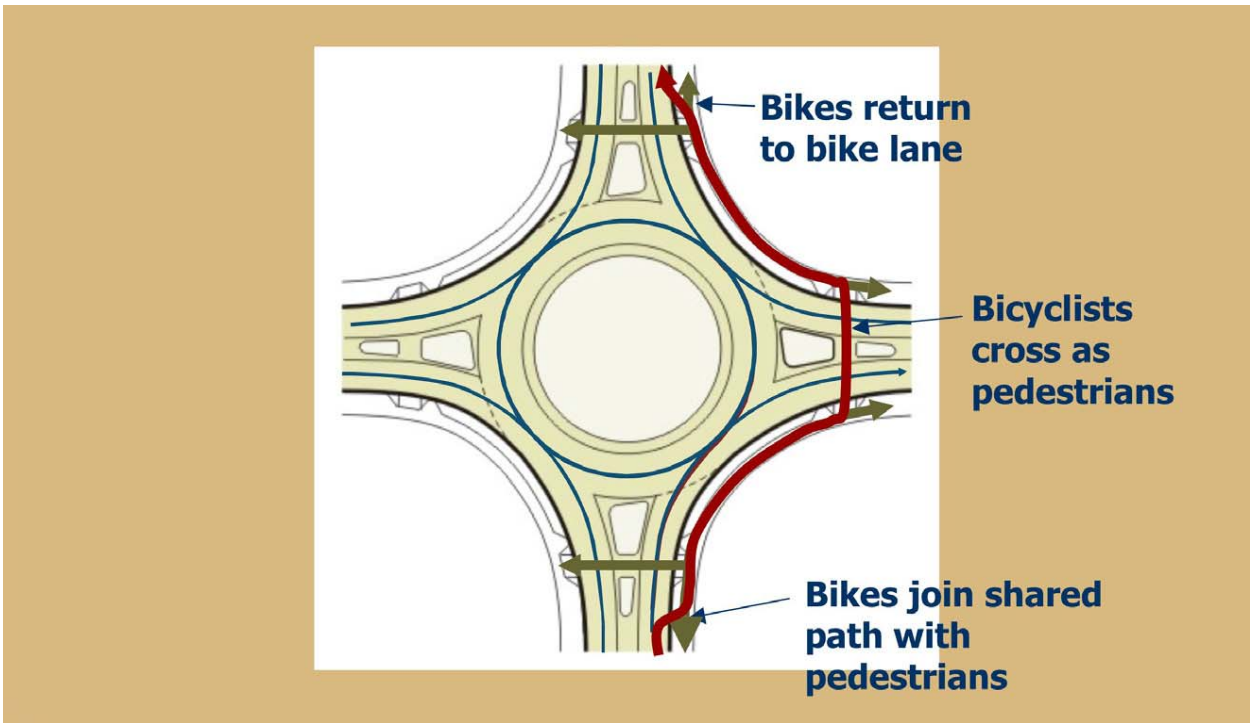
ROUNDABOUTS/TRAFFIC CIRCLES

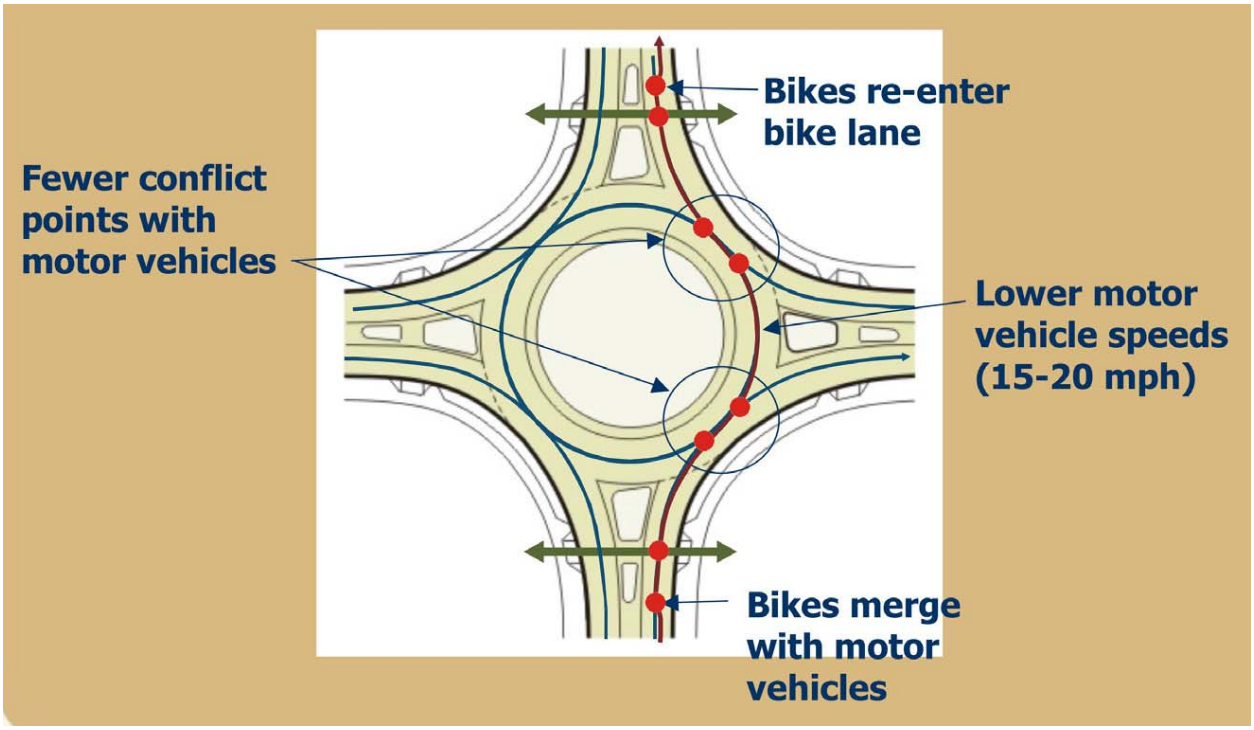
Roundabouts are one-way circular intersections in which traffic flows around a center island without stop signs or signals. Because roundabout traffic enters and exits through right turns only and speeds are reduced, the occurrence of severe crashes is substantially less than in many traditional four-way intersections.

Modern roundabouts greatly reduce the potential for high-speed, right-angle, rear-end and left turn/head-on collisions. In traditional four-way traffic intersections, there are 32 points of conflict in which two vehicles may collide. Modern roundabouts have only eight conflict areas, greatly reducing potential crashes.

- For bicyclists, roundabouts with only one circulating lane are much safer to navigate than are multi-lane roundabouts.
- Diagrams below show two ways for bicyclists to navigate roundabouts.

Below: Circulating as a Pedestrian





Above: Circulating as a Vehicle

Proposed Treatment Location: Harper Avenue & Third Street and Cape Fear Boulevard & Third Street

OFF-ROAD FACILITIES

MULTI-USE PATH

Multi-use paths are completely separated from motorized vehicular traffic and are constructed in their own corridor, often within an open-space area. Multi-use trails typically have a concrete or paved asphalt surface

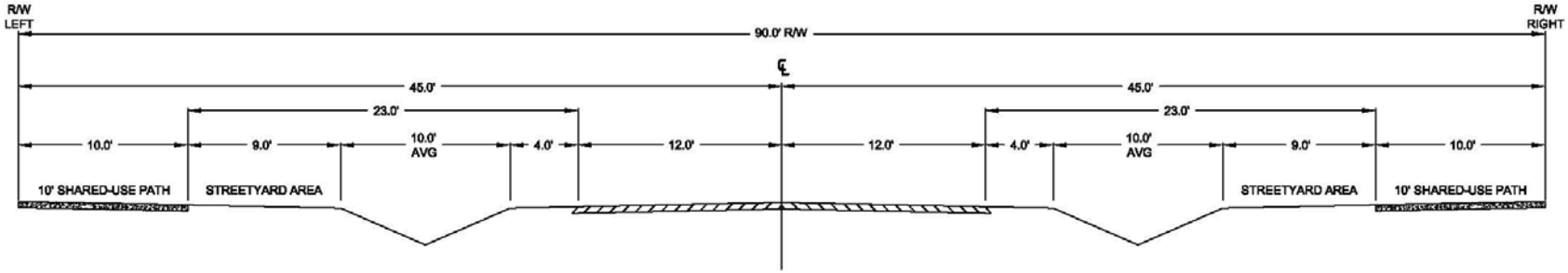
Proper trail foundation will increase the longevity of the trail; two inches surfacing material over four inches (min.) of base course gravel over geotextile fabric is recommended.

Centerline stripes should be considered for trails that generate substantial amounts of traffic.

Multi-use paths are paved surfaces a minimum of 10′ in width to accommodate bicyclists, walkers, joggers, etc. The multi-use path is separated by a minimum of 5′ from the adjacent motorized travel lane. If a 5′ separation cannot be obtained due to limited right-of-way, a suitable barrier should be provided. A 10′ width allows for two-directional travel. The 10′ multi-use path should have 2′ crushed stone shoulders. This 2′ crushed stone area supports the pavement edge and also provides a recovery area if a bicyclist gets off the path.

Proposed Treatment Location: Several areas of town where 90′ right-of-ways allow a 20′ separation from the road. Some include Harper Avenue, Clarendon Avenue, and Cape Fear Boulevard.

DUAL MULTI-USE PATH



DUAL SHARED-USE PATH SECTION
NOT TO SCALE

Proposed treatment location: Street roads with 90′ right-of-way.

SIDEPATHS

Multi-use paths located within the roadway corridor right-of-way, or adjacent to roads, are called 'Sidepaths'.

This configuration works best along roadways with limited driveway crossings.

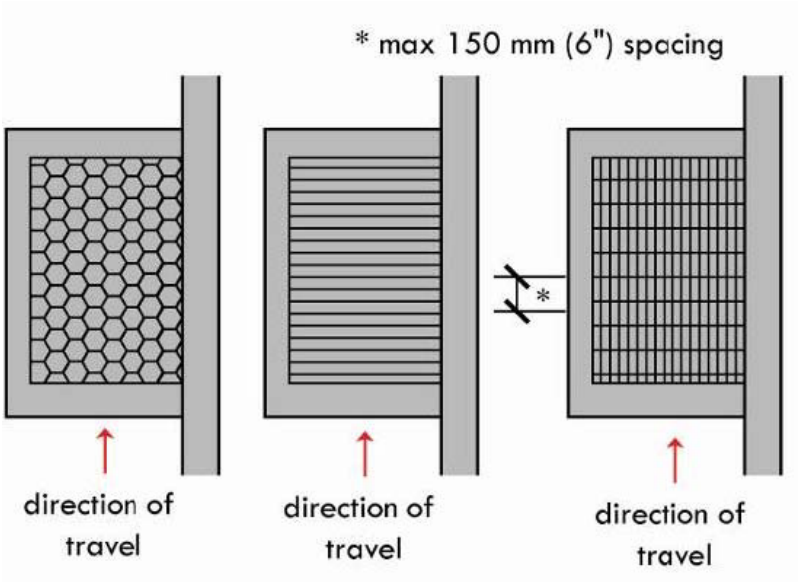
- A minimum 10' width is necessary on sidepaths for bicyclists to pass one another safely (12' for areas expecting high use)
- A 6' or greater vegetated buffer between the sidepath and the roadway should be provided where possible.
- Roadway corridors where side paths are recommended should also have adequate on-road bicycle facilities (such as shared lane markings, paved shoulders, or bicycle lanes), so that all levels of bicyclists are accommodated.

ROADWAY IMPROVEMENTS

Bicycles are allowed to be ridden on all public roads except where they are expressly prohibited. Bicycle-safe design practices should be followed when roadway improvements are made. Examples of bicycle-safe design details follow:

BICYCLE FRIENDLY DRAINAGE GRATES

Drainage grates usually occupy portions of roadways, such as bicycle lanes, where bicycles frequently travel. Often drainage grates are poorly maintained or are of a design that can damage a bicycle wheel or in severe circumstances, cause a bicyclist to crash. Improper drainage grates create an unfriendly obstacle a cyclist must navigate around, often forcing entrance into a motor vehicle lane in severe cases.



TRAFFIC CONTROL DEVICES

Bicyclists have special needs in two primary areas – signal timing / actuation and bicycle-related signing and marking.

Signal Timing / Actuation

Intervals should be long enough to allow bicyclists to cross multi-lane streets. Detectors should be sensitive to bicycles to enable signal actuation.

Pedestrian signal heads / push buttons to traffic signal.

Signing and Marking

The MUTCD guidance for installing signing or marking for bicycles states:

Traffic control devices, whether they are intended for motorists or bicyclists, must adhere to five basic requirements to be able to perform their intended function. They must:

- Fulfill a need
- Command attention
- Convey a clear, simple meaning
- Command respect of road users
- Give adequate time for proper response

The Manual for Uniform Traffic Control devices (MUTCD) guidelines should be incorporated into all existing and proposed bicycle multi-use paths.

BRIDGES

Bridges can be made bicycle-safe when they are originally constructed. Retrofitting bridges for bicycles after the fact can be challenging, as is the case with Snows Cut Bridge.

Regardless, the four areas of concern include static obstructions, surface conditions, bridge deck width, and bridge approaches.

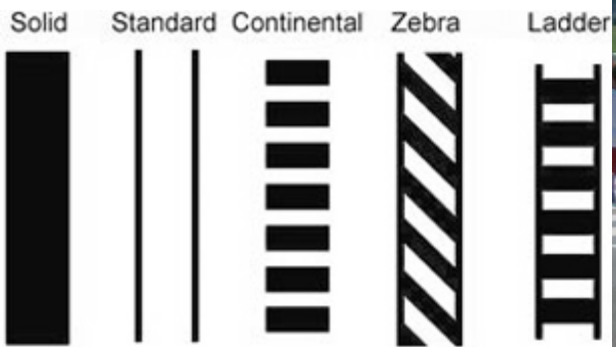
Simply stated, static obstructions include bicycle-safe railings, surface conditions include bicycle-safe expansion joints and deck finish, bridge deck width includes a minimum 4' paved shoulder or a minimum 14' widened outside lane, and, lastly, bridge approaches of 100 linear feet to ensure a safe transition are required.

MARKED CROSSWALKS

A marked crosswalk designates a pedestrian right-of-way across a street. It is often installed at controlled intersections or at key locations along the street (a.k.a. mid-block crossings). Marked pedestrian crosswalks may be used under the following conditions: 1) At locations with stop signs or traffic signals, 2) At non-signalized street crossing locations in designated school zones, and 3) At non-signalized locations where engineering judgment dictates that the use of specifically designated crosswalks are desirable.

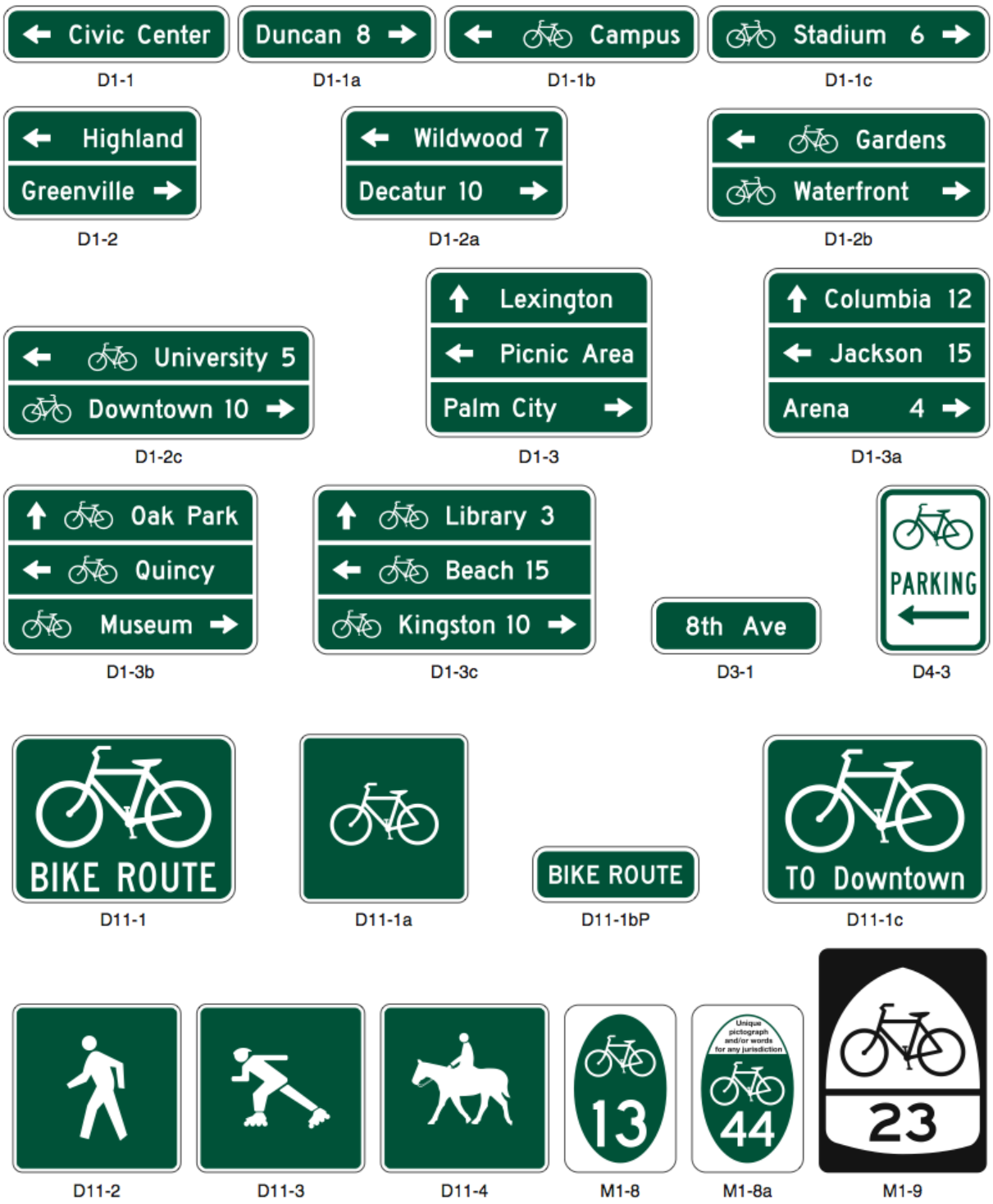
Crosswalk Guidelines:

- Should not be installed in an uncontrolled environment [at intersections without traffic signals] where speeds exceed 40 mph. (AASHTO, 2004)
- Crosswalks alone may not be enough and should be used in conjunction with other measures to improve pedestrian crossing safety, particularly on roads with average daily traffic (ADT) above 10,000
- Width of marked crosswalk should be at least six feet; ideally ten feet or wider in downtown areas.
- Curb ramps and other sloped areas should be fully contained within the markings.
- Crosswalk markings should extend the full length of the crossings.
- Crosswalk markings should be white per MUTCD.
- Either the 'continental' or 'ladder' patterns are recommended for intersection improvements for aesthetic and visibility purposes. Lines should be one to two feet wide and spaced one to five feet apart.



SIGNAGE

Examples of bicycle-related directional Signs (from the 2009 MUTCD)

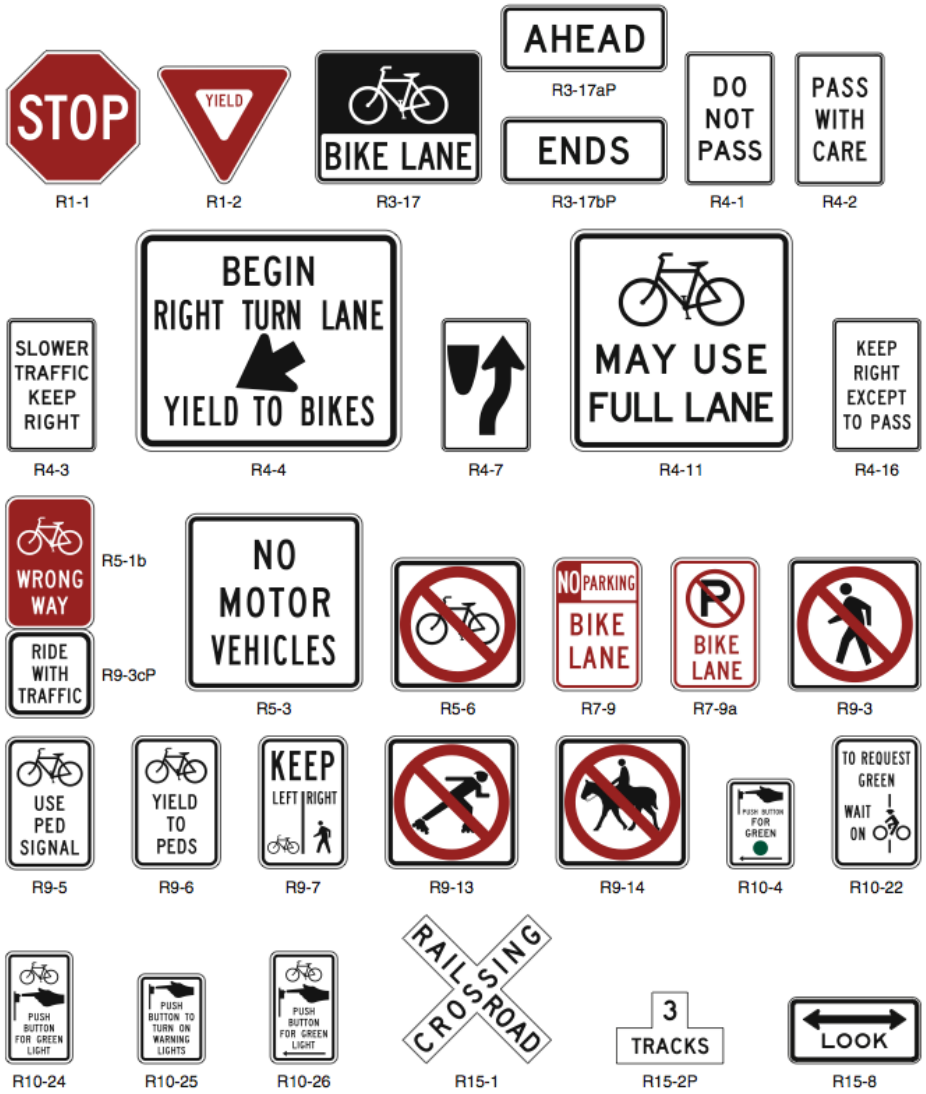


Regulatory/Warning Signs

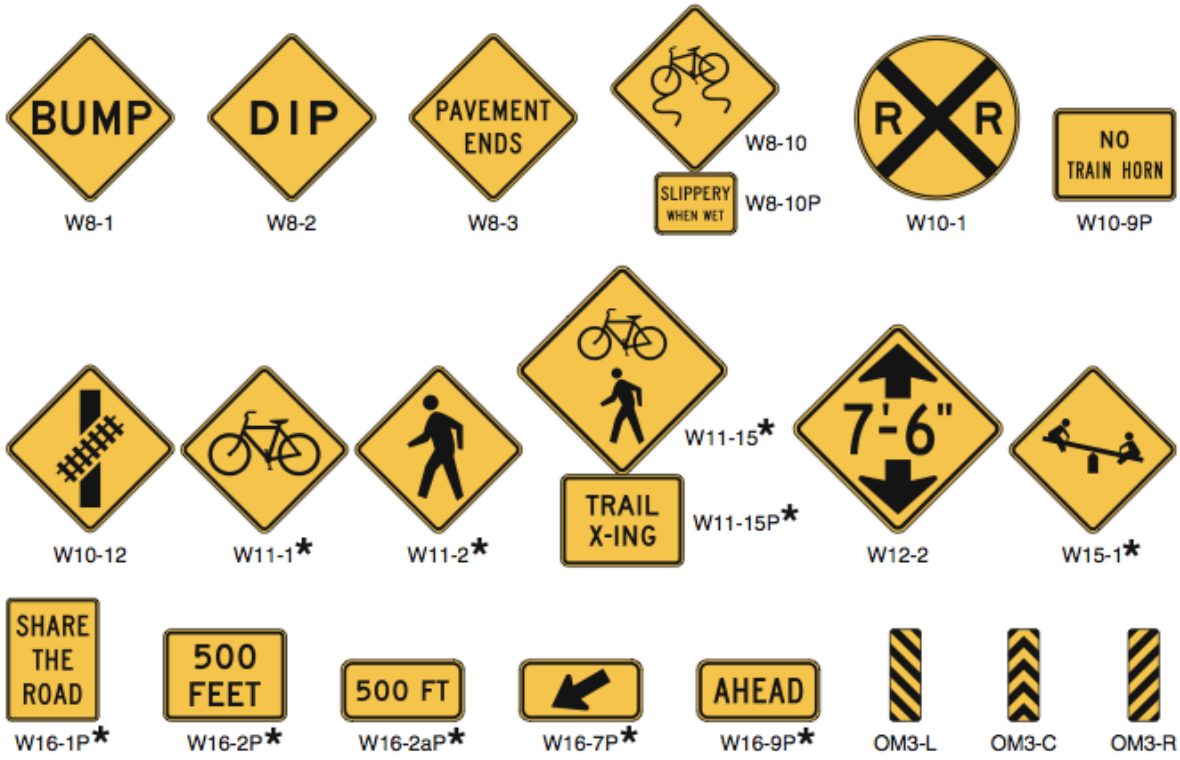
Located throughout the trail system, these signs inform trail users of rules and regulations along the trail, hours of trail operation, upcoming street and trail crossings and other potential hazards such as trail width changes.

- Post trail rules and regulations as well as hours of operation at trail heads or in kiosks.
- Locate warning signs appropriately ahead of the specific hazards to which they refer, such as road crossings, steep terrain, trail narrowing, and stop signs.
- All signage should conform to the Manual on Uniform Traffic Control Devices (MUTCD).

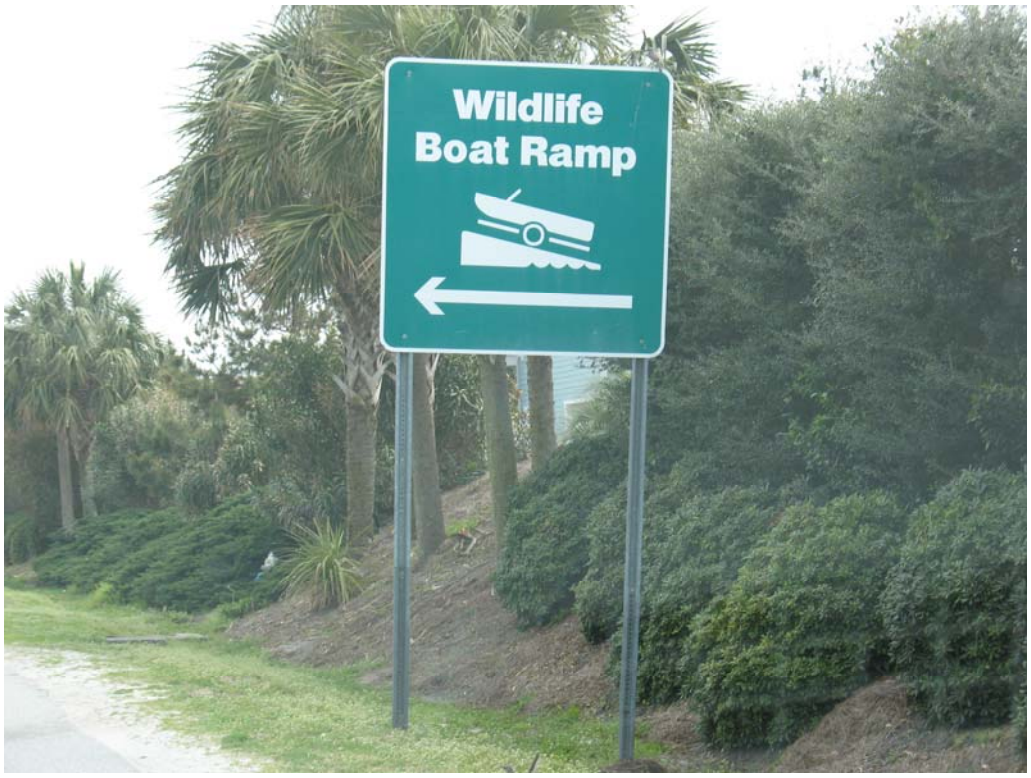
Examples of bicycle-related regulatory signs (from the 2009 MUTCD)



Examples of bicycle-related warning signs (from the 2009 MUTCD)



* A fluorescent yellow-green background color may be used for this sign or plaque. The background color of the plaque should match the color of the warning sign that it supplements.



Educational / Interpretive Signage

Educational signage provides trail users with information about the greenway, native flora and fauna, history and culture, and significance of elements along the trail.

- There is a wide variety of interpretive signage styles and the amount/type of information they provide.
- Consider the character of the trail and surrounding elements when designing educational signage.
- A skilled graphic designer should be used for sign design.
- Locate interpretive signage 3-feet from the edge of the trail.

Educational signage provides opportunities for gathering and learning about local environment.

Directional/Way-finding Signs

The purpose of the directional sign is to direct trail users and motorists to the location of trail heads, provide incremental distances along the trail, as well as illustrate overall maps of the trail network.

- Kiosks are a great facility for directional signage by providing a wealth of information at once, including trail opportunities, regional maps, or local/ seasonal events occurring along the greenway.
- Locate informative signs and overall trail maps at trail access points to help users entering the trail determine their next destination.
- Locate directional signs at intervals along the trail to help users identify their locations or orient their position.
- Locate mile markers 3-feet from the edge of the trail and approximately one mile intervals beginning at the northern and southern ends of the trail network.

BICYCLE PARKING

As more bikeways are constructed and bicycle usage grows, the need for bike parking will increase.

When choosing bike racks, there are a number of things to keep in mind:

- The rack element (part of the rack that supports the bike) should keep the bike upright by supporting the frame in two places allowing one or both wheels to be secured.
- Install racks so there is enough room between adjacent parked bicycles. A row of inverted "U" racks should be installed with 15" minimum between racks.
- Empty racks should not pose a tripping hazard for visually impaired pedestrians.
- When possible, racks should be in a covered area protected from the elements. Long-term parking should always be protected.

The table below provides basic guidelines on ideal locations for parking at several key activity centers as well as an optimum number of parking spaces.

BICYCLE PARKING LOCATIONS AND QUANTITIES

Use Category	Specific Use	Required Long-term Parking Spaces	Required Short-term Parking Spaces
Residential	Boarding houses	2, or 1 per ten sleeping rooms	None
	Hotels, motels	2, or 1 per 50 employees	None
Commercial / Industrial	Retail sales, service operations *	2, or 1 per 50,000 square feet of gross floor area	2, or 1 per 25,000 square feet of gross floor area
	Office buildings **	2, or 1 per 50,000 square feet of gross floor area	2, or 1 per 50,000 square feet of gross floor area
	Museums, libraries	2, or 1 per 50 employees	4, or 1 per 25,000 square feet of gross floor area
	Movie theaters	2, or 1 per 50 employees	4, or 1 per 50 seats
	Restaurants, ice cream shops, coffee shops	2, or 1 per 50 employees	4, or 1 per 50 seats
	Recreation centers	2, or 1 per 50 employees	4, or 1 per 25,000 square feet of gross floor area
	Major event entertainment (e.g., stadiums, arenas)	2, or 1 per 50 employees	8, or 1 per 500 seats
	Manufacturing	2, or 1 per 50 employees	None
	Warehousing	2, or 1 per 50 employees	None
Institutional	Medical centers	2, or 1 per 50 employees	2, or 1 per 25,000 square feet of gross floor area
	Transit park and ride lots	1 per 50 daily boardings	None

* Retail businesses below 3,000 square feet of gross floor area are exempt from bicycle parking requirements
** Office buildings below 10,000 square feet of gross floor area are exempt from bicycle parking requirements

BICYCLE RACK STANDARDS

The rack element should:

- Support the bicycle upright by its frame in two places
- Prevent the wheel of the bicycle from tipping over
- Enable the frame and one or both wheels to be secured
- Support bicycles without a diamond-shaped frame with a horizontal top tube (e.g. a mixte frame)
- Allow front-in parking: a U-lock should be able to lock the front wheel and the down tube of an upright bicycle
- Allow back-in parking: a U-lock should be able to lock the rear wheel and seat tube of the bicycle

Recommended guidelines for bicycle parking from the Association of Pedestrian and Bicycle Professionals, 2002, www.apbp.org.

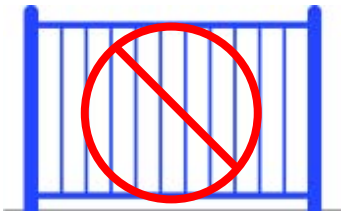
"A"

One rack element supports two bikes.

Not Recommended

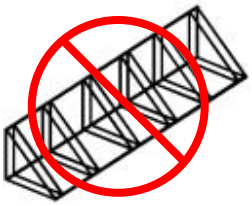
POST AND LOOP

One rack element supports two bikes.



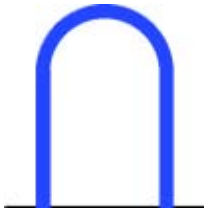
COMB

One rack element is a vertical segment of the rack.



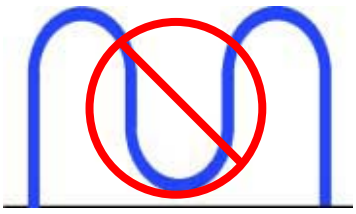
TOAST

One rack element holds one wheel of a bike.



INVERTED "U"

One rack element supports two bikes



WAVE

One rack element is a vertical segment of the rack.

LANDSCAPING GUIDANCE

- Use native plant species and plants appropriate to the region that are already adapted to the local soil and climate, reducing overall maintenance costs and enhancing local identity.
- Design with a combination of evergreen and deciduous plants for year-round interest.
- Plant with a combination of trees and large shrubs, understory plantings, and ground cover.
- Keep the vegetation buffer maintained so that it does not impede views or interfere with trail circulation.
- Avoid vegetation "walls" that box-in trail users.
- Select and place trail vegetation to provide seasonal comfort: shade on trails in the warmer months and warming sunlight on trails in colder months.
- Street and sidewalk landscaping can be used to provide separation between pedestrians and motorists, reduce the width of a roadway, calm traffic by creating a visual narrowing of the roadway, enhance the street environment, and help to generate a desired aesthetic.
- Growth pattern and space for maturation, particularly with larger tree plantings, are important to avoid cracking sidewalks and other pedestrian obstructions.
- Islands of vegetation can be created to collect and filter stormwater from nearby streets and buildings.

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SECTION 6 - RECOMMENDATIONS FOR ANCILLARY FACILITIES, PROGRAMS, AND POLICIES 1

SECTION 6 - RECOMMENDATIONS FOR ANCILLARY FACILITIES, PROGRAMS, AND POLICIES

ANCILLARY FACILITIES

Ancillary facilities are items that provide benefit and complement the primary feature. In the case of the bicycle multi-use path network, those items would include:

- Mapping and signage
- Traffic devices
- Bicycle parking
- Park and bike share stands

MAPPING AND SIGNAGE

Based on feedback from the citizens / visitors survey, this was a frequent comment: "Need an area-wide bicycle network map and more signage." These can be fairly easy "fixes." A Bicycle Multi-Use Network Map can be easily prepared by the town's GIS department. The base map for this effort would be the Project Opportunities Map that is a result of this plan. As project phases are implemented, the Bicycle Multi-Use Network Plan can be updated. Features to note include identified routes, route type, surface features, destinations, bicycle parking, and pedestrian signalized intersections. Ultimately, the Bicycle Multi-Use Network Plan will encompass both Carolina Beach and Kure Beach.

Signage details need to be designed town-wide. Thought needs to be given to logos, standardization and maintenance. The town does have some existing signage. That signage theme could continue or the use of MUTCD standard signage can be implemented. Regardless of the signage type, selection and implementation are key.

Traffic Devices

There are several roadway enhancements that create safer conditions for both bicyclists and pedestrians. These enhancements need to be made when and where roadway improvements occur. These features include:

- Roundabouts (several are already proposed per the Carolina Beach Streetscape Plan)
- Striped, exclusive bike lanes
- Speed reductions

- Prioritized travel
- Bicycle/pedestrian activated signals
- Contraflow bicycle lane
- High visibility crosswalks (several were recently installed on Lake Park Boulevard)
- Bicycle Parking

KEY BICYCLE DESTINATIONS FROM THE CITIZENS / VISITORS SURVEY INCLUDED:

- Boardwalk / pavilion area
- Beach and beach access areas
- Lake Park
- Carolina Beach State Park

All of these areas should be sufficiently equipped with designated bicycle parking areas. As with the signage selection, the town needs to select a bicycle rack to be utilized town wide. These are fairly simple additions that can be made to create a bicycle-friendly town.

PARK AND BIKE SHARE STANDS

The Carolina Beach State Park was listed as a favorite destination for bicyclists for obvious reasons: the scenery, low volume of traffic and low traffic speeds. These features make it equally enticing to park visitors and campers, all of who may not transport bikes. With a park and bike share stand in the park, others could also enjoy the bicycling experience. Understandably, this would have to be negotiated with the state park's representatives.

PROGRAMS

Various programs can be implemented by the town to support a Bicycle Multi-Use Trail Network. Based on the program-type, these can be short-term, long-term, and / or intermittent programs.

EDUCATIONAL PROGRAMS

Specific educational programs available to the town include bike rodeos. The Division of Bicycle and Pedestrian Transportation also has educational safety resources - http://www.ncdot.gov/bikeped/safetyeducation/materials/ as well as other Safety & Education resources and links - http://www.ncdot.gov/bikeped/safetyeducation/.

In addition to bicycle rodeos, the town can conduct bicycle helmet use forums. The use of bicycle helmets is essential to reducing rider injuries and fatalities. The town can partner with

NCDOT to undertake a helmet promotion. NCDOT has created brochures and materials to support helmet usage and these materials are predominately free of charges. The town can request helmets through DBPT's Bicycle Helmet Initiative if conducting safety events for underprivileged children.

To further support the town's safety educational initiatives the town has existing NCDOT resources which it can tap into. These include pamphlets, handouts, videos, posters, manuals, and guidebooks. These materials can be ordered online @ www.ncdot.gov/bikeped/safetyeducation/materials, by phone (919) 807-0777 or by fax (919) 807-0768.

Educational programs are a good venue to address bicycle safety. Educational programs increase awareness of both motorists and bicyclists. The town's bicycle crash data illustrated equal fault percentages for the bicyclist, the motorist, and both at fault. Safety education can play an important role in reducing bicycle crashes.

Below is a list of other agencies and resources:

- North Carolina State Highway Patrol – Bicycle Safety Program
- University of North Carolina Highway Safety Research Center
- Safe Kids North Carolina
- AAA Foundation for Traffic Safety – Traffic Safety Materials
- Pedestrian and Bicycle Information Center
- Bicycle Helmet Safety Institute
- Federal Highway Administration – Bicycle & Safety
- 4-H National Cooperative Curriculum Systems - Bicycle Adventures
- National Highway Traffic Safety Administration - Traffic Safety Materials Catalog
- National Safe Kids Campaign

POLICE-ON-BICYCLES PROGRAM

A Police-on-Bicycles Program can be extremely valuable as an educational tool for both the motorist and bicyclist. When roadway travel patterns are changed to accommodate bicyclists, motorists can be unsure and / or unknowledgeable of the right-of-way hierarchy.

This program can be short term as resident and visitor understanding increases. And this program can move from area to area as bicycle / multi-use phases are developed. This program is predominately needed in areas where a form of bicycle boulevard is proposed. Bicycle

boulevards blend bicycle movement with vehicular movement, providing prioritized travel to the bicyclist.

A Police-on-Bicycles program helps phase in the implementation of bicycle boulevards by having a presence, providing an example, enhancing knowledge, creating safety, and expanding the sense of community.

SAFE ROUTES TO SCHOOL PROGRAM (SRTS)

http://safety.fhwa.dot.gov/saferoutes/

Established in May 2006, the National Center for Safe Routes to School assists communities in enabling and encouraging children to safely walk and bike to school. The center strives to equip Safe Routes to School programs with the knowledge and technical information to implement safe and successful strategies.

The National Center for Safe Routes to School is maintained by the University of North Carolina Highway Safety Research Center, with funding from the US Department of Transportation Federal Highway Administration.

Although the town was not successful in obtaining funding with the SRTS grant application, it should endeavor to re-submit. The Carolina Beach Elementary School is located on a key bicycle multi-use corridor, which further links the East Coast Greenway (http://www.greenway.org/) and Lake Park Improvements within this corridor would serve multiple purposes.

PUBLIC AWARENESS PROGRAM

Public awareness should continue as portions of the bicycle multi-use network are implemented. Both the motorists and the bicyclists need to be made aware of new roadway conditions. New roadway conditions could include the additions of bike lanes, the establishment of bicycle boulevards, the additions of high visibility crosswalks, the addition of pedestrian signalization, and the establishment of contraflow bicycle lanes on one-way streets. This outreach can occur through the town's website, the local newspapers, and announcements at the regional cycling clubs and parks and recreation department.

BICYCLE FRIENDLY COMMUNITY PROGRAM

http://www.bikeleague.org/programs/bicyclefriendlyamerica/communities/

The League of American Bicyclists offers a Bicycle Friendly Community program, which provides incentives, hands-on assistance, and award recognition for communities that actively support bicycling. A Bicycle Friendly Community welcomes cyclists by providing safe accommodation for cycling and encouraging people to bike for transportation and recreation.

Encouraging bicycling is a simple way to improve public health. With more people bicycling, communities experience reduced traffic demands, improved air quality and greater physical fitness. In addition, Bicycle Friendly Communities are places with a high quality of life, where people want to live, work, and visit. Building such a community can translate into a more

connected, physically active, and environmentally sustainable community that enjoys increased property values, business growth, increased tourism, and more transportation choices for citizens.

A committee reviews and scores the application and consults with local cyclists in your community. An award of platinum, gold, silver or bronze status is designated for four years. Every community that applies, awarded or not, receives feedback on how to improve the community for cycling.

The town should apply for this designation as the Bicycle Multi-Use Network Plan implementation progresses.

SMART CYCLING PROGRAM

http://www.bikeleague.org/programs/education/

As roadways and bike trails become increasingly complex and congested, do you know all you need to know to safely ride a bicycle? Do you feel you know enough to teach your children how to ride cautiously and conspicuously while on their own? When you drive your car, are you confident on how to share the road with bicyclists? The Smart Cycling program gives you the tips, tools, and techniques to confidently to answer YES to each of those questions.

On our roadways, bikes are treated as vehicles. Simply knowing how to ride a bike is not the same as knowing how to operate a bike safely and legally.

The Smart Cycling program is a set of curricula for adults and children and the certified instructors that teach it. Smart Cycling classes are taught across the United States by certified League Cycling Instructors (LCI) represented by the League of American Bicyclists. The town should enlist their services as an educational program.

NATIONAL BIKE MONTH PROGRAM

http://www.bikeleague.org/programs/bikemonth/

May is national bike month. Program events could be sponsored by the town, including bike week and bike-to-work day. Using the publicity that abounds with this national event, the town could promote local events as well.

BICYCLE PARKING PROGRAM

The citizens / visitors survey listed events and destinations that were most frequented. The town should implement assessment and installation of bicycle parking areas for these most-frequented areas. These areas include: beach access areas, Lake Park, and the boardwalk / pavilion area.

The phasing of these programs should complement the implementation of the bicycle multi-use plan. For instance the police-on-bicycle programs would occur during the implementation of bicycle boulevards. Public awareness programs would concurrently bolster the police-on-

bicycle program by elevating public knowledge. These programs would be phased as an intermittent effort until public awareness and safety had been established. A long-term phased program would include educational programs. Elevating the safety knowledge of both the cyclist and the motorist is an on-going requirement as the population of the town continually changes.

POLICIES

There are several policies the town could adopt to further enhance and support the Bicycle Multi-Use Network. While Section 3 discussed existing plans, programs, and policies, this section discusses proposed policies. As with all policies, they need to be adopted when the "critical mass" can be affected with the adopted policy. Some of the policies could be adopted immediately, while others need the "critical mass" for the policy to be effective.

ZONING TEXT AMENDMENTS

Some zoning text amendments that would further support bicycling could include:

1. Specific site uses could be permitted a 50 percent reduction in the minimum number of required parking spaces provided that a walking amenity and bike racks are provided (walking amenities may include but are not limited to public courtyards, drinking water fountains, benches, shade structures, pocket green spaces and public access restrooms).

2. Project densities could be increased where greenway easements are publically dedicated.

BICYCLE PARKING ORDINANCE

The town should consider adoption of a bicycle parking ordinance to create a more bicycle-friendly atmosphere. Fairly simple measures can be implemented to require bicycle parking. An example of a local ordinance is described below:

Bicycle parking – Each new multifamily, commercial, or office development or major redevelopment requiring twenty-five (25) or more automobile parking spaces shall make provisions for parking a minimum of five (5) bicycles. Each additional one hundred (100) automobile parking spaces above the twenty-five (25) minimum shall require provisions for parking an additional five (5) bicycles up to a bicycle parking system that can accommodate a maximum of twenty (20) bicycles. The bicycle parking provisions shall allow for bicyclists to secure their vehicle against theft. Bicycle parking facilities shall be provided with twenty (20) feet of the primary entrance to the facility. In the event of multiple entrances, bicycle-parking facilities shall be dispersed for easy access to the multiple entrances.

BICYCLE MULTI-USE NETWORK FUNDING

The town should consider allocating funding for bicycle multi-use phased improvements. This plan provides cost estimates for the 5-year high priority projects. The town should support

these projects by providing funding in the Capital Improvements Plan, even if the phasing has to be further broken down into sections allocating funding initiates the primary implementation. Funding should be earmarked for new construction and ongoing maintenance.

BICYCLE MULTI-USE NETWORK MAINTENANCE

The town will need to include bicycle multi-use path maintenance with its street maintenance efforts. A vast majority of the network is within the town streets public right-of-ways, so this can be easily implemented. However, the network maintenance will need to occur on a more frequent interval, primarily as it pertains to debris removal. A comprehensive network maintenance schedule needs to be prepared.

BICYCLE ON BOARDWALK POLICY

The town should consider allowing bicycles on the boardwalk. The boardwalk area is listed as one of the favorite destinations for cyclists. A compromise policy to allow bicyclists on the boardwalk without affecting the safety of pedestrians could be developed.

BICYCLE CONTRAFLOW POLICY

Town should adopt a policy / ordinance to allow contraflow of bicycles on one-way streets where contraflow bike lanes are indicated with pavement markings.

BICYCLE MULTI-USE TRANSPORTATION PLAN UPDATE POLICY

The town should adopt a policy to update the Bicycle Multi-Use Transportation Plan every five years. For the document to continue to be effectively implemented, it will need to be updated. Similar to the CAMA Land Use Plan that is required to be updated every five years, this plan is a living document.

TOWN CODE

Sec. 9-84. Riding on roadways and bicycle paths.

(a) Every person operating a bicycle upon a roadway shall ride as near to the right-hand side of the roadway as practicable, exercising due care when passing a standing vehicle or one proceeding in the same direction.

(b) Persons riding bicycles upon a roadway shall not ride more than two abreast, except on paths or parts of roadways set aside for the exclusive use of bicycles. ***The town should amend this section requiring that motorists respect a 3 foot passing distance when overtaking bicyclists.***

(c) Whenever a usable path for bicycles has been provided adjacent to a roadway, bicycle riders shall use the path and shall not use the roadway. ***The town should remove the requirement that***

cyclists use paths, when available, adjacent to roadway. In North Carolina, cyclists have as much right to a road as a vehicle.

(Ord. No. 97-403, 8-12-97; Ord. No. 98-416, 1-13-98)

RELATED LAWS

LAWS

In North Carolina, the bicycle has the legal status of a vehicle. This means that bicyclists have full rights and responsibilities on the roadway and are subject to the regulations governing the operation of a motor vehicle.

North Carolina traffic laws require bicyclists to:

- Ride on the right in the same direction as other traffic
- Obey all traffic signs and signals
- Use hand signals to communicate intended movements
- Equip their bicycles with a front lamp visible from 300 feet and a rear reflector that is visible from a distance of 200 feet when riding at night.
- Wear a bicycle helmet on public roads, public paths and public rights-of-way if the bicyclists is under 16 years old
- Secure child passengers in a child seat or bicycle trailer if under 40 pounds or 40 inches

Bicycle & Bikeway Act

With the passage of comprehensive Bicycle and Bikeway Act of 1974, North Carolina established the first state bicycle program in the nation, which quickly became a national model. The legislation granted authority for the North Carolina Bicycle Program (now the Division of Bicycle and Pedestrian Transportation) to undertake comprehensive bicycle planning and programming.

Bicycle Laws

In North Carolina, the bicycle has the legal status of a vehicle. This means that bicyclists have full rights and responsibilities on the roadway and are subject to the regulations governing the operation of a motor vehicle.

Bicycle Helmet Law

On July 5, 2001, North Carolina became a safer place to ride bicycles through the enactment of the "Child Bicycle Safety Act". This law requires every person under 16 years old to wear an approved bicycle helmet when operating a bicycle on any public road, public bicycle path, or other public right-of-way. The purpose of this law is to reduce the number of head-related injuries and deaths from bicycle crashes. Studies show that helmets prevent 60 percent of head injury deaths and reduce the overall risk of head injuries by 85 percent.

In addition, this law specifies that all child passengers falling at or below 40 pounds/40 inches must be carried in a separate restraining seat. Any parent or legal guardian who knowingly allows a child to ride without a helmet or to ride as a passenger not secured in a restraining seat (when applicable), will be in violation of the law. Violation of the law carries a $10 civil fine. The fine may be waived upon the receipt of satisfactory proof of purchase of helmet or restraining seat. This law went into effect October 1, 2001.

Bicycle Racing Guidelines

Legislation passed in 1977 by the North Carolina General Assembly requires that all bicycle races involving state and local roads must be authorized by designated state and local authorities.

PEDESTRIAN LAWS

Under North Carolina law, pedestrians have the right of way at all intersections and driveways. However, pedestrians must act responsibly, using pedestrian signals where they are available. When crossing the road at any other point than a marked or unmarked crosswalk or when walking along or upon a highway, a pedestrian has a statutory duty to yield the right of way to all vehicles on the roadway. It is the duty of pedestrians to look before starting across a highway, and in the exercise of reasonable care for their own safety, to keep a timely lookout for approaching motor vehicle traffic. On roadways where there is no sidewalk, pedestrians should always walk facing traffic.

SCHOOL CROSSING GUARD LAWS

According to the office of the North Carolina Attorney General, school crossing guards may be considered traffic control officers when proper training is provided. Law enforcement agencies responsible for recruiting and training school crossing guards are expected to adhere to the requirements of following statute, which governs traffic control officers.

NC BICYCLE COMMITTEE BYLAWS

The North Carolina Bicycle Committee is composed of seven members appointed by the Secretary of Transportation who discuss, resolve, and recommend to the Secretary actions on bicycle projects, issues, interests and concerns. This Committee was established through General Statute 136-71.13 within the Bicycle and Bikeway Act. The bylaws direct rules for the duties, members, officers, meetings, sub-committees, parliamentary authority, and amendments that may transpire through this Committee.

CONSIDERATIONS ABOUT BICYCLING WHERE THE LAW IS SILENT

Laws pertaining to the operation of a bicycle vary from state to state. Below are three issues of bicycling that North Carolina law currently does not clarify.

Bicycling on Interstate or fully controlled limited access highways, such as beltlines, is prohibited by policy, unless otherwise specified by action of the Board of Transportation. Currently, the only exception to the policy is the US 17 bridge over the Chowan River between Chowan and Bertie Counties.

There is no law that requires bicyclists to ride single file, nor is there a law that gives cyclists the right to ride two or more abreast. It is important to ride responsibly and courteously, so that cars may pass safely.

There is no law that prohibits wearing headphones when riding a bicycle; however, it is not recommended. It is important to use all your senses to ensure your safety when riding in traffic.

Back-In Parking by Carl Sundstrom

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SECTION 7 - PROJECT DEVELOPMENT

FUNDING SOURCES

The implementation of the Bicycle Multi-Use Transportation Plan will require the commitment of funding. Some of the funding can be earmarked within the town's Capital Improvement Plan.

Other sources of funding are identified below. These funding resources typically require the adoption of a town-wide bicycle multi-use plan to ensure their dollars are well invested; thus, the importance of this plan.

NCDOT FUNDING

As part of the Bicycle and Bikeway Act of 1974, the North Carolina General Assembly authorized the North Carolina Department of Transportation (NCDOT) "to spend any federal, state, local, or private funds available to the Department and designated for the accomplishment" of fulfilling the duties laid out through the Act, and clearly stated that bicycle facilities "are a bona fide highway purpose, subject to the same rights and responsibilities, and eligible for the same considerations as other highway purposes and functions."

In addition, the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which is the most recent funding authorization legislation for federal-aid programs, requires each state DOT to set aside federal funds from eligible categories for the construction of bicycle and pedestrian transportation facilities. Funds for bicycle and pedestrian projects, programs and activities may be funded through many different sources, of which the federal-aid program is only one. Each funding source may have specific criteria for eligibility of project or program types, physical locations in which they may be implemented or other constraints on how the funds are used.

In North Carolina, all bicycle and pedestrian projects are prioritized and scheduled into the State Transportation Improvement Program. These may be projects funded through federal-aid funds or state funds.

Independent bicycle and pedestrian projects across North Carolina are included in NCDOT's State Transportation Improvement Program (STIP), which outlines transportation priorities for the next 10 years. The STIP indicates when each phase of a project is slated to begin and the cost of each project phase. Improvements for bicycling and walking may also be included in the STIP as part of the construction of a highway project.

The STIP is determined through the strategic prioritization process. Every two years, Metropolitan Planning Organizations (MPOs) and Rural Planning Organizations (RPOs) are given an opportunity to recommend bike and pedestrian projects to be included in the STIP.

Projects are prioritized and ranked through a methodology created by division staff. The STIP is included in the 5-year Work Program and the 10-year Program & Resource Plan.

Bicycle and pedestrian accommodations such as bike lanes, widened paved shoulders, sidewalks and bicycle-safe bridge design are frequently included as incidental features of highway projects. In addition, bicycle-safe drainage grates are a standard feature of all highway construction. Most bicycle and pedestrian safety accommodations built by NCDOT are included as part of scheduled highway improvement projects.

Through NCDOT, there are a variety of funding programs comprised of federal aid and / or state dollars. There are also other funding opportunities for projects and programs related to bicycle and pedestrian transportation which are not administered by NCDOT.

Much of the funding that passes through NCDOT is derived from the varying categories of Federal Aid Construction Funds, including National Highway System (NHS), Surface Transportation Program, or Congestion Mitigation and Air Quality funds. However, the state does provide some state construction funds for the construction of sidewalks and bicycle accommodations that are part of roadway improvement projects.

Safe Routes to School Programs (State)

Safe Routes to School (SRTS) is an international movement that has taken hold in communities throughout the United States. The concept is to increase the number of children who walk or bicycle to school by funding projects that remove the barriers that currently prevent them from doing so. Those barriers include lack of infrastructure, unsafe infrastructure, lack of programs that promote walking and bicycling through education/encouragement programs aimed at children, parents, and the community.

Eligible Projects	Infrastructure projects
Local Match	10% minimum required
Restriction on Infrastructure Projects	Must be located in the vicinity of a school
Targeted Beneficiaries	Children in grades K-12

The SRTS program is structured with infrastructure funds, non-infrastructure funds, action plan funds, and funding allocations to NCDOT Highway Divisions. The Town should contact both Division 3 and the state's SRTS Coordinator for funding opportunities.

Ed Johnson, ASLA, RLA
SRTS Coordinator
NCDOT, Division of
Transportation Mobility and
Safety Traffic Management Unit
1561 Mail Service Center
Raleigh, NC 27699-1561

Email: erjohnson2@ncdot.gov
Direct: 919-329-8497
Branch: 919-773-2800

CONGESTION MITIGATION AND AIR QUALITY PROGRAM

Transportation conformity ("conformity") is a way to ensure that federal funding and approval go to those transportation activities that are consistent with air quality goals. Conformity applies to transportation plans, Transportation Improvement Programs (TIPs), and projects funded or approved by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) in areas that do not meet or previously have not met air quality standards for ozone, carbon monoxide, particulate matter, or nitrogen dioxide.

Programs for improving public transit include:

- developing high-occupancy vehicle (HOV) facilities
- ordinances to promote non-motor vehicle travel
- transit improvements
- signal timing
- bicycle and pedestrian facilities
- land use planning

Mike Kozlosky
Executive Director
Wilmington Urban Area
305 Chestnut Street, Floor 4
Wilmington, NC 28401

mike.kozlosky@wilmingtonnc.gov
phone (910) 341-3258
fax (910) 341-7801

HIGH HAZARD ELIMINATION FUNDS

Background

The High Hazard Elimination program is a federally funded safety program which requires that a systematic approach be used to add eligible safety projects to the TIP. These projects typically cost in the range of several hundred thousand dollars.

Already in place is a rigorous and definitive procedure approved by the Federal Highway Administration (FHWA) for ranking such projects for funding.

All projects considered for this program must go through this evaluation and ranking procedure and all projects funded will be based on this ranking process.

Benefit Cost Analysis

- This method, approved by the FHWA, prioritizes safety projects based on benefit versus cost. The analysis evaluates savings in traffic accident reductions and the annual cost of the safety improvement project.
- The result of the analysis is expressed as a ratio of the annual accident cost reduction divided by the annual cost of the improvement. To be a viable project, the benefit cost ratio must exceed 1.0 and the higher the ratio, the better.
- If this criterion is not met, the FHWA will not allow federal safety funds to be used.

GOVERNOR'S HIGHWAY SAFETY PROGRAM (GHSP)

General Guidelines

- All funding from the GHSP must be for highway safety purposes only.
- All funding must be NECESSARY and REASONABLE.
- All funding is performance-based. Substantial progress in reducing crashes, injuries and fatalities is required as a condition of continued funding.
- All funding is passed through from the federal government and is subject to both federal and state regulations.
- Funding cycles run from October 1st to September 30th (the federal fiscal year).
- All funding is considered to be "seed money" to get programs started. The grantee is expected to provide a portion of the project costs and is expected to continue the program after GHSP funding ends.

- Projects are only approved for one full or partial federal fiscal year at a time. However, projects may be funded for up to three consecutive years.
- Funding cannot be used to replace or supplant existing expenditures, nor can they be used to carry out the general operating expenses of the grantee.
- All funding is on a reimbursement basis. The grantee must pay for all expenses up front and then submit a reimbursement request to receive the funds.

STATE STREET-AID (POWELL BILL) PROGRAM

Annually, state street-aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. The general statutes require that a sum be allocated to the qualifying municipalities equal to the amount produced during the fiscal year by 1-3/4 cents on each taxed gallon of motor fuel. The statutes also provide that funds be disbursed to the qualified municipalities on or before October 1, thereby allowing sufficient time after the end of the fiscal year for verification of information and to determine the proper allocations and preparation of disbursements. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways.

OTHER FUNDING RESOURCES

1. **FHWA Guidance** - (Updated October 22, 2008) Bicycle and Pedestrian Provisions of Federal Transportation Legislation

    a. General Funding Requirements

        1) Flexibility.
        Federal surface transportation law provides tremendous flexibility to states and MPOs to fund bicycle and pedestrian improvements from a wide variety of programs. Virtually all the major transportation funding programs can be used for bicycle and pedestrian-related projects. When considering ways to improve conditions for bicycling and walking, states and MPOs are specifically encouraged to:

            - Include bicycle and pedestrian improvements as an incidental part of larger projects, as described above, and
            - To review and use the most appropriate funding source for a particular project and not rely primarily on the Transportation Enhancement activities. Many bicycle and pedestrian projects are more suitable for funding under the Congestion Mitigation and Air Quality Improvement Program, and the Surface Transportation Program.

2) Transportation Purpose.

Section 217(i) of Title 23 requires that bicycle projects be "principally for transportation rather than recreation purposes," with the exception of the Recreational Trails Program under which projects should be for recreational use. FHWA has determined that to meet the "transportation purpose" requirement, a bicycle facility must be more than a closed loop trail within a park that can only be used for recreational purposes - users must be able to get somewhere other than back to their starting point. Beyond this, any bicycle facility providing access from one point to another can and will be used for transportation purposes and is therefore eligible for federal-aid funding. Section 217(i) only applies to bicycle projects, not to projects to accommodate pedestrians and other users.

Handicap Access by Jan Moser

Fig. 1 Bicycle/Pedestrian Funding Opportunities

	NHS	STP	HSIP	SRTS	TEA	CMAQ	RTP	FTA	TE	BRI	402	PLA	TCSP	JOBS	FLH	BYW
Bicycle and pedestrian plan		*				*						*	*			
Bicycle lanes on roadway	*	*	*	*	*	*		*	*	*					*	*
Signed bike route	*	*		*	*	*									*	*
Shared use path/trail	*	*		*	*	*	*			*					*	*
Maps		*		*		*					*					
Bicycle parking facilities		*		*	*	*		*	*							*
Crosswalks, new or retrofit	*	*	*	*	*	*		*	*						*	*
Signal improvements	*	*	*	*	*	*										
Curb cuts and ramps	*	*	*	*	*	*										
Traffic calming		*	*	*									*			
Safety/education position		*		*		*					*					
Police Patrol		*		*							*					

KEY

NHS	National Highway System
STP	Surface Transportation Program
HSIP	Highway Safety Improvement Program
SRTS	Safe Routes to School Program
TEA	Transportation Enhancement Activities
CMAQ	Congestion Mitigation/Air Quality Program
FLH	Federal Lands Highway Program
BYW	Scenic Byways
BRI	Bridge
402	State and Community Traffic Safety Program
PLA	State/Metropolitan Planning Funds
TCSP	Transportation and Community and System Preservation Pilot Program
JOBS	Access to Jobs/Reverse Commute Program
RTP	Recreational Trails Program
FTA	Federal Transit Capital, Urban & Rural Funds
TE	Transit Enhancements

2. Federal Transit Administration – Grant Programs

Program Summary

Flexible funds are certain legislatively specified funds that may be used either for transit or highway purposes. This provision was first included in the Intermodal Surface Transportation Efficiency Act of 1999 (ISTEA) and was continued with the Transportation Equity Act for the 21st Century (TEA-21). The idea of flexible funds is that a local area can choose to use certain federal surface transportation funds based on local planning priorities, not on a restrictive definition of program eligibility. Flexible funds include Federal Highway Administration (FHWA) Surface Transportation Program (STP) funds, and Congestion Mitigation and Air Quality Improvement Program (CMAQ), and Federal Transit Administration (FTA) Urban Formula Funds.

a. Surface Transportation Program (STP)

1) The Surface Transportation Program (STP) (23 U.S.C. 133) provides the greatest flexibility in the use of funds. These funds may be used (as capital funding) for public transportation capital improvements, car and vanpool projects, fringe and corridor parking facilities, bicycle and pedestrian facilities, and inter-city or intra-city bus terminals and bus facilities. As funding for planning, these funds can be used for surface transportation planning activities, wetland mitigation, transit research and development, and environmental analysis. Other eligible projects under STP include transit safety improvements and most transportation control measures.

2) STP funds are distributed among various population and programmatic categories within a state. Some program funds are made available to metropolitan planning areas containing urbanized areas over 200,000 population; STP funds are also set aside to areas under 200,000 and 50,000 population. The largest portion of STP funds may be used anywhere within the state to which they are apportioned.

b. Congestion Mitigation and Air Quality Improvement Program (CMAQ)

1) The Congestion Mitigation and Air Quality Improvement Program (CMAQ) (23 U.S.C. 149) has the objective of improving the nation's air quality and managing traffic congestion. CMAQ projects and programs are often innovative solutions to common mobility problems and are driven by Clean Air Act mandates to attain national ambient air quality standards. Eligible activities under CMAQ include transit system capital expansion and improvements that are projected to realize an increase in ridership; travel demand management strategies and shared ride services; pedestrian and bicycle facilities and promotional activities that encourage bicycle commuting. Programs and projects are funded in air quality nonattainment and

maintenance areas for ozone, carbon monoxide (CO), and small particulate matter (PM-10) that reduce transportation-related emissions.

c. National Highway System

1) The National Highway System (NHS), established in 1995, provides funding for a wide range of transportation activities (23 U.S.C. 103(b)). Eligible transit projects under the NHS program include fringe and corridor parking facilities, bicycle and pedestrian facilities, carpool and vanpool projects, and public transportation facilities in NHS corridors, where they would be cost effective and improve the level of service on a particular NHS limited access facility.

d. Safe Routes to School Programs (Federal)

1) Safe Routes to School is an international movement that has taken hold in communities throughout the United States. The concept is to increase the number of children who walk or bicycle to school by funding projects that remove the barriers that currently prevent them from doing so. Those barriers include lack of infrastructure, unsafe infrastructure, lack of programs that promote walking and bicycling through education/encouragement programs aimed at children, parents, and the community.

Eligible Projects	Stand-alone infrastructure or non-infrastructure projects
Local Match	None
Restriction on Infrastructure Projects	Infrastructure projects must be within 2 miles of a grade school or middle school
Targeted Beneficiaries	Children in grades K-8

e. National Park Service

1) River, Trails, and Conservation Assistance Program

- About the Program – The National Park Service (NPS) manages some of our nation's most historic sites, scenic resources, and critical natural areas. NPS also provides assistance to locally-led natural resource conservation and outdoor recreation projects through the Rivers, Trails, and Conservation Assistance (RTCA) Program. RTCA staff work in urban, rural, and suburban communities to help applicants conserve rivers, preserve natural areas, and develop trails and greenways. Our staff helps on a variety of natural resource conservation and outdoor recreation projects including multi-use paths, single purpose trails,

greenways, water trails (also called blue ways), river corridor conservation, land protection, and park planning.

- Project Selection Criteria –
  - The project has specific, partner-defined goals and results expected in the near future (miles of trail or protected river, acres of open space, etc.)
  - The project protects or improves important natural resources or enhances outdoor recreation opportunities.
  - Roles and contributions of project partners are substantive and well-defined.
  - There is evidence of broad community support for the project.
  - The anticipated role for RTCA is clear and appropriate.

f. Bureau of Land Management (BLM)

1) Travel Management Implementation

- BLM's travel management program goal is to implement travel plans via a holistic approach that provides clear direction for access and recreation opportunities, while protecting sensitive areas. The implementation process of the program includes signs, maps, information and education, maintenance, construction, reconstruction, closures, reclamation, site and area staff supervision, law enforcement, and monitoring.
  - Specific examples of travel management implementation include the following:
    - Publishing and disseminating motor vehicle use maps;
    - Signing;
    - Educating visitors on travel management regulations and designations;
    - Amending existing authorizations to provide for needed motor vehicle access;
    - Enforcing travel management restrictions;
    - Constructing and reconstructing roads, trails, and associated facilities;
    - Maintaining designated roads and trails;

- Decommissioning unauthorized roads and trails;
- Rehabilitating environmental damage;
- Establishing cooperative and volunteer agreements, fee programs, or other resources for sustainable funding; and
- Monitoring impacts.

g. Advocacy Advance Grants

1) Bicycle and pedestrian advocacy organizations play the most important role in improving and increasing biking and walking in local communities, states, and provinces. Advocacy Advance Grants enable state and local bicycle and pedestrian advocacy organizations to develop, transform, and provide innovative strategies in their communities.

h. Bikes Belong Grant Program
http://www.bikesbelong.org/grants

1) The Bikes Belong Grant Program strives to put more people on bicycles more often by funding important and influential projects that leverage federal funding and build momentum for bicycling in communities across the US. These projects include bike paths and rail trails, as well as mountain bike trails, bike parks, BMX facilities, and large-scale bicycle advocacy initiatives.

2) Since 1999, Bikes Belong has awarded 209 grants to municipalities and grassroots groups in 49 states and the District of Columbia, investing nearly $1.6 million in community bicycling projects and leveraging close to $550 million in federal, state, and private funding.

i. N.C. Parks and Recreation Trust Fund (PARTF)
http://www.ncparks.gov/About/grants/partf_main.php

The Parks and Recreation Trust Fund (PARTF) provides dollar-for-dollar matching grants to local governments for the acquisition and/or development of park and recreational projects to serve the general public.

1) Eligible projects

- Applicants can buy land to use as recreational projects for the public or to protect the natural or scenic resources of the property. Applicants can also request money to build or renovate recreational and support facilities. A project must be located on a single site. Sports equipment, maintenance equipment, office equipment and indoor furniture cannot be purchased with PARTF grants.

2) Other Requirements

- **Matching Requirement**
  An applicant must match the grant dollar-for-dollar, 50% of the total cost of the project, and may contribute more than 50%. The appraised value of land to be donated to the applicant can be used as part of the match. The value of in-kind services, such as volunteer work, cannot be used as part of the match.

- **Applicants must have control of the PARTF park site**
  An applicant must own or have at least a 25-year signed lease or easement for the property where a PARTF facility will be located.

- **Public use**
  Property acquired with PARTF must be dedicated forever for public recreational use. Facilities built or renovated with a PARTF grant must be available for public recreational use for at least 25 years.

j. Land and Water Conservation Trust Fund (LWCF)

1) The LWCF Act authorizes the Secretary of Interior to provide financial assistance to States for the acquisition and/or development of public outdoor recreation areas and facilities found to be in accord with the Statewide Comprehensive Outdoor Recreation Plan (SCORP). The States are encouraged to share the benefits derived from the LWCF program among all state and local agencies responsible for providing public outdoor recreation opportunities.

- Available funding. Up to 50% of the total cost of an eligible planning project is available to a State, on a reimbursement basis, from its LWCF apportionment account.

2) Types of Projects

- Acquisition. These include the acquisition of land and waters or partial rights to them. There must also be public access, however, access may be controlled, but not prohibited.

- Development. These include the development of certain outdoor recreation activities and support facilities needed by the public for recreation use of an area.

- Combination. When it is advantageous to do so, a State may submit projects which combine acquisition and development.

k. Roadway Resurfacing Projects

1) When a roadway is resurfaced there may be opportunities to restripe the road or add a few feet of additional pavement to better accommodate bicyclists. NCDOT Highway Division 3 – District 3 covering Brunswick and New Hanover counties should be contacted regarding the resurfacing schedule.

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SECTION 8 - IMPLEMENTATION

OVERVIEW

Plan implementation to "create a more bicycle / multi-use path friendly environment and provide interconnectivity to the various town destinations" can occur through several venues, the most obvious being through construction of projects outlined in the Bicycle Multi-Use Transportation Plan. Other venues to support the bicycle multi-use network trails include ancillary facilities, mapping and signage, traffic devices, bicycle parking, and park and bike share stands.

As each of the project phases are implemented, they need to be considered in their entirety, including the ancillary facilities. In this manner, the town can create a sense of identity that the town is bicycle and multi-use path friendly with interconnected trails.

Additional venues to support implementation include funding, program implementation, and policy adoption. Funding is the most challenging component. Where budget constraints in the Capital Improvement Plan limit funding for project phase implementation, grants should be pursued by the town. Grants should be submitted on an annual basis targeted toward specific phase components, i.e., signage, mapping, intersection treatment, etc. There is a vast array of funding resources identified in Section 7.

KEY PARTNERS

The town council will ultimately be responsible for formally adopting this plan. Through this adoption, the town's leadership is recognizing the value of the plan and their intent to pursue bicycle and multi-use path improvements. In addition to improving the quality of life for the citizens of the town, this plan also provides economic benefit to the tourism industry, which is important to the town.

Adoption of this plan by town council provides support to town staff who helped prepare the plan, and to the town board which also advised on this plan prior to the town council hearing. Supporting roles for the continued implementation efforts are as follows:

Parks & Recreation Department

The Carolina Beach Parks & Recreation Department offers a variety of programs and events with focus on providing opportunities that contribute to the enhancement of life for citizens of all ages. They partner with local civic groups in order to provide many enjoyable and cost-effective recreation, sports, youth and adult programs and special events.

The Parks & Recreation Department will:

- Pursue grants for the phased improvements for the bicycle and multi-use path system and ancillary facilities.
- Communicate with regional and local bicycle groups to ensure continued plan compatibility.
- Communicate with the Operations Department Environmental Division to ensure a maintenance schedule for the bicycle / multi-use path system and components.
- Work with local advocacy groups to promote bicycle / multi-use path related events, educational activities, and summer camps.

Planning & Development Department

This department focuses on respect and integrity as it serves the public in planning and developing properties through educating, guiding, assisting, and overseeing the town's rules and regulations. The department provides services to maintain a sustainable community, and exists to help preserve the community's character while working with the town's growth, needs, and changes.

The Town of Carolina Beach Planning & Development Department provides support services which guide development from concepts to completed projects.

The Planning & Development Department will:

- Communicate with town staff, board, and council to develop supporting ordinances and / or policies for bicycle / multi-use paths and components.
- Communicate with neighboring towns and regional bicycle advocacy groups to assist with project implementation and phasing sequence.

Operations Department Environmental Division

The Environmental Division collects the public-generated solid waste year round from town-owned collection facilities (public trash cans - approximately 150); maintains the town-owned buildings including custodial service, 9 public restroom facilities and beach crossovers; and handles all town-owned street maintenance and street signs.

The Operations Department Environmental Division will:

- Become familiar with the germane sections of this plan.
- Become familiar with striping and signing requirements of bicycle / multi-use paths per the MUTCD.

- Provide a public street maintenance schedule to the Parks & Recreation Department for consideration of bicycle / multi-use plan phase improvements.
- Provide bicycle / multi-use path maintenance efforts.
- Develop a bicycle / multi-use path maintenance schedule and budget as plan phases are constructed.

Police Department

The Police Department has a community-oriented policing program. The department actively participates in a partnership with the community to identify factors contributing to crime; create and implement action strategies that reduce crime and enhance the quality of life for all individuals, families, and neighborhoods.

The Police Department will:

- Become familiar with new ordinances or revised policies which support this plan.
- Participate in bicycle boulevard education programs.
- Enforce laws affecting bicyclists and pedestrians.

Community Partners

Community group partners such as the Pleasure Island Camber, P.I.R.A., Island Women, local businesses, Corporations, foundations, estates and individuals could pursue funding opportunities in a variety of manners to create a patchwork of funding / volunteer sources for the Bike Plans build out and maintenance.

Performance Measures

Performance measures need to be created and monitored to determine plan compliance. The performance measures should be reviewed and updated every two years. Performance measures to evaluate include project phasing implementation, ancillary facilities, ordinance and policy compatibility, maintenance program, and funding acquisitions.

This performance monitoring will be led by the Parks & Recreation Department. Input will also be provided by the Planning Department & Operations Department Environmental Division. Course corrections and / or plan modifications may need to be developed, dependent upon the success of the performance measures to achieve plan goals.

ACTION STEPS TABLE

Task	Lead Agency	Support	Details	Phase	Page Reference
Adopt The Plan	Carolina Beach Parks And Recreation Department	Project Consultant	Council Meeting January 2011	Short-Term 2011	n/a
Adopt Bicycle Policies	Carolina Beach Planning Department	Carolina Beach Parks And Recreation Department	Adopt policies per plan recommendations	Continuous / Ongoing	Section 6 – Page 6
Create Bicycle Multi-Use Network Map In Town GIS Database	Carolina Beach GIS Department	Project Consultant	Prepare plan for project phases implementation	Continuous / Ongoing	Section 6 – Page 1
Adopt Bicycle Standards	Carolina Beach Parks And Recreation Department	Carolina Beach Planning Department	Adopt town wide bicycle signage and parking rack standard details.	Spring 2011	Section 5 – Page 22, 27, & 28
Enhance Bicycle Parking At Key Destinations	Carolina Beach Parks And Recreation Department	Island Women	Field assess existing bicycle parking areas at key destinations	Spring 2011	Section 2 - Page 14
Bicycle Parking Area Funding Campaign	Island Women	Carolina Beach Parks And Recreation Department	Obtain local and / or grant funding	Spring 2011	Section 7

Task	Lead Agency	Support	Details	Phase	Page Reference
Create High Priority Short Term Projects Implementation Schedule	Carolina Beach Parks And Recreation Department	Town Manager	Include in CIP	Short-Term Summer 2011 / Ongoing	Section 4 – Page 10
Seek Funding Opportunities Per Schedule Above	Carolina Beach Parks And Recreation Department	Island Women, Project Consultant	Submit funding applications	Short-Term Fall 2011 / On-Going	Section 7
Launch Programs As New Project Phases Are Built	Carolina Beach Parks And Recreation Department	Other Town Departments	Expand educational, safety, public awareness, and community programs	Short-Term Spring 2012 / On-Going	Section 6 – Page 2
Establish Bicycle Multi-Use Path Maintenance Schedule	Carolina Beach Parks And Recreation Department	Operations Department, Environmental Division	Debris removal and repair, acquire equipment as necessary	Continuous / On-Going	Section 6 – Page 6
Produce A Bicycle Map	Carolina Beach GIS Department	Carolina Beach Parks And Recreation Department	Prepare bicycle map that allows updates as project phases occur	Mid-Term (2013)	Section 6 – Page 1
Reassess Project Priorities	Carolina Beach Parks And Recreation Department	Town Manager	Reconfirm phasing plan meets town objectives	Long-Term (2014)	Section 4 – Page 3

Task	Lead Agency	Support	Details	Phase	Page Reference
Update Bicycle Multi-Use Transportation Plan	Carolina Beach Parks And Recreation Department	Town Manager, Other Town Departments, And Project Consultant	Prepare a new bicycle multi-use transportation plan every 5 years	Long-Term (2016) / On-Going	Section 6 – Page 7

APPENDIX A - CRASH DATA

Crash Type

Crash Type	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
Bicyclist Left Turn - same direction	-	-	-	-	-	-	-	-	1	-	-	1
Bicyclist Ride-Out - sign control	-	-	-	-	-	-	-	-	1	-	-	1
Bicyclist Ride-Through - sign control	-	-	-	-	-	-	-	-	1	-	-	1
Motorist Drive-Out - sign control	1	1	-	-	2	-	-	-	-	-	-	4
Motorist Left Turn - opposite direction	-	1	-	-	-	-	-	-	-	-	-	1
Motorist Right Turn - same direction	-	-	-	-	-	-	-	-	-	-	1	1
Unknown/Insufficient Information	-	-	-	1	1	-	-	-	-	-	-	2
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Position

Position	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
On a driveway or alley	-	1	-	-	-	-	-	-	-	-	-	1
On a separate bicycle/multi-use path	-	-	-	-	-	-	-	-	-	-	-	-
On a sidewalk, crosswalk, or driveway crossing	-	-	-	-	-	-	-	-	-	-	-	-
On a street, in a bicycle lane or on a paved shoulder	-	-	-	-	-	-	-	-	-	-	-	-
On a street, in a shared travel lane	1	1	-	-	2	-	-	-	3	-	1	8
Other	-	-	-	-	-	-	-	-	-	-	-	-
Other non-roadway area	-	-	-	-	-	-	-	-	-	-	-	-
Unknown	-	-	-	1	1	-	-	-	-	-	-	2
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Crash Location

Crash Location	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
Intersection	1	1	-	-	3	-	-	-	2	-	1	8
Intersection Related	-	1	-	-	-	-	-	-	-	-	-	1
Non-intersection	-	-	-	1	-	-	-	-	1	-	-	2
Non-roadway	-	-	-	-	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Direction

Direction	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
Facing Traffic	-	1	-	-	-	-	-	-	1	-	-	2
N / A	-	1	-	-	-	-	-	-	-	-	-	1
Unknown	-	-	-	1	2	-	-	-	1	-	-	4
With Traffic	1	-	-	-	1	-	-	-	1	-	1	4
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Fault

Fault	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
Bicyclist at Fault	-	-	-	1	-	-	-	-	2	-	-	3
Both at Fault	-	2	-	-	-	-	-	-	-	-	-	2
Fault cannot be determined	-	-	-	-	-	-	-	-	-	-	-	-
Motorist at Fault	1	-	-	-	1	-	-	-	-	-	1	3
Neither at Fault	-	-	-	-	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	2	-	-	-	1	-	-	3
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Age Grouped

Age Grouped	97	98	99	00	01	02	03	04	05	06	07	Totals
0 – 5	-	-	-	-	-	-	-	-	-	-	-	-
06 – 10	-	-	-	-	-	-	-	-	-	-	-	-
11 – 15	-	-	-	-	-	-	-	-	1	-	-	1
16 – 19	-	-	-	-	-	-	-	-	-	-	-	-
20 – 24	1	1	-	-	-	-	-	-	-	-	-	2
25 – 29	-	-	-	-	-	-	-	-	-	-	-	-
30 - 39	-	-	-	-	1	-	-	-	-	-	-	1
40 - 49	-	1	-	-	1	-	-	-	2	-	-	4
50 - 59	-	-	-	1	-	-	-	-	-	-	-	1
60 - 69	-	-	-	-	1	-	-	-	-	-	1	2
Unknown	-	-	-	-	-	-	-	-	-	-	-	-
70 +	-	-	-	-	-	-	-	-	-	-	-	-
Missing	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of bicyclists.

Gender

Gender	97	98	99	00	01	02	03	04	05	06	07	Totals
Male	1	1	-	1	1	-	-	-	1	-	1	6
Female	-	-	-	-	2	-	-	-	2	-	-	4
Unknown	-	1	-	-	-	-	-	-	-	-	-	1
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of bicyclists.

Road Type (Classification)

Road Type (Classification)	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
Interstate Route	-	-	-	-	-	-	-	-	-	-	-	-
United States Route	-	1	-	-	1	-	-	-	1	-	-	3
North Carolina Route	-	-	-	-	-	-	-	-	-	-	-	-
State Secondary Route	-	-	-	-	-	-	-	-	-	-	-	-
Local City Street	1	1	-	1	2	-	-	-	2	-	1	8
Public Vehicular Area (ex. Parking lot)	-	-	-	-	-	-	-	-	-	-	-	-
Private Property	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Speed Limit

Speed Limit	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
5 Mph	-	-	-	-	-	-	-	-	-	-	-	-
10 Mph	-	-	-	-	-	-	-	-	-	-	-	-
15 Mph	-	-	-	-	-	-	-	-	-	-	-	-
20 Mph	-	-	-	-	-	-	-	-	-	-	-	-
25 Mph	1	-	-	-	2	-	-	-	2	-	-	5
30 Mph	-	-	-	-	-	-	-	-	-	-	-	-
35 Mph	-	2	-	-	1	-	-	-	-	-	-	3
40 Mph	-	-	-	-	-	-	-	-	-	-	-	-
45 Mph	-	-	-	-	-	-	-	-	1	-	-	1
50 Mph	-	-	-	-	-	-	-	-	-	-	-	-
55 Mph	-	-	-	1	-	-	-	-	-	-	-	1
60 Mph	-	-	-	-	-	-	-	-	-	-	-	-
65 Mph	-	-	-	-	-	-	-	-	-	-	-	-

Speed Limit	97	98	99	00	01	02	03	04	05	06	07	Totals
70 Mph	-	-	-	-	-	-	-	-	-	-	-	-
85 Mph	-	-	-	-	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-	-	-	1	1
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Number of Through Lanes

Number Of Through Lanes	97	98	99	00	01	02	03	04	05	06	07	Totals
Unknown	-	-	-	-	-	-	-	-	-	-	-	-
1 Lane	-	-	-	-	-	-	-	-	-	-	-	-
2 Lanes	-	1	-	1	2	-	-	-	2	-	-	6
3 Lanes	1	-	-	-	-	-	-	-	-	-	-	1
4 Lanes	-	1	-	-	1	-	-	-	1	-	1	4
5 Lanes	-	-	-	-	-	-	-	-	-	-	-	-
6 Lanes	-	-	-	-	-	-	-	-	-	-	-	-
7 Lanes	-	-	-	-	-	-	-	-	-	-	-	-
8 Lanes	-	-	-	-	-	-	-	-	-	-	-	-
9 or more lanes	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Road Feature

Road Feature	97	98	99	00	01	02	03	04	05	06	07	Totals
No Special Feature	-	-	-	1	1	-	-	-	3	-	-	5
Bridge	-	-	-	-	-	-	-	-	-	-	-	-
Bridge Approach	-	-	-	-	-	-	-	-	-	-	-	-
Underpass	-	-	-	-	-	-	-	-	-	-	-	-

Road Feature	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
Driveway - Public	-	-	-	-	-	-	-	-	-	-	-	-
Driveway - Private	-	-	-	-	-	-	-	-	-	-	-	-
Alley Intersection	-	-	-	-	-	-	-	-	-	-	-	-
Four-Way Intersection	1	2	-	-	-	-	-	-	-	-	1	4
T-Intersection	-	-	-	-	2	-	-	-	-	-	-	2
Y-Intersection	-	-	-	-	-	-	-	-	-	-	-	-
Traffic Circle/Roundabout	-	-	-	-	-	-	-	-	-	-	-	-
Five-Point Or More	-	-	-	-	-	-	-	-	-	-	-	-
Related To Intersection	-	-	-	-	-	-	-	-	-	-	-	-
Non-intersection Median Crossing	-	-	-	-	-	-	-	-	-	-	-	-
End Or Beginning-divided Highway	-	-	-	-	-	-	-	-	-	-	-	-
On or Off Ramp	-	-	-	-	-	-	-	-	-	-	-	-
Railroad Crossing	-	-	-	-	-	-	-	-	-	-	-	-
Multi-Use Paths Or Trails	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Time of Day

Time Of Day	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
A. 6:00 AM - 9:59 AM	1	-	-	-	-	-	-	-	-	-	-	1
B. 10:00 AM - 1:59 PM	-	-	-	1	-	-	-	-	-	-	1	2
C. 2:00 PM - 5:59 PM	-	2	-	-	3	-	-	-	-	-	-	5
D. 6:00 PM - 9:59 PM	-	-	-	-	-	-	-	-	3	-	-	3
E. 10:00 PM - 1:59 AM	-	-	-	-	-	-	-	-	-	-	-	-
F. 2:00 AM - 5:59 AM	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Light Condition

Light Condition	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
Daylight	1	1	-	1	2	-	-	-	1	-	1	7
Dusk	-	1	-	-	1	-	-	-	-	-	-	2
Dawn	-	-	-	-	-	-	-	-	-	-	-	-
Dark - Lighted Roadway	-	-	-	-	-	-	-	-	1	-	-	1
Dark - Roadway Not Lighted	-	-	-	-	-	-	-	-	1	-	-	1
Dark - Unknown Lighting	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

Weather Condition

Weather Condition	*97*	*98*	*99*	*00*	*01*	*02*	*03*	*04*	*05*	*06*	*07*	*Totals*
Clear	1	1	-	1	3	-	-	-	3	-	1	10
Cloudy	-	1	-	-	-	-	-	-	-	-	-	1
Rain	-	-	-	-	-	-	-	-	-	-	-	-
Fog - Smog – Smoke	-	-	-	-	-	-	-	-	-	-	-	-
Snow - Sleet - Hail - Freezing Rain / drizzle	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**1**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**3**	**-**	**1**	**11**

Counts are of Crashes where at least one (1) unit was a bicycle.

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APPENDIX B - PUBLICBINVOLVEMENT STRATEGY

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STEERING COMMITTEE

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McKIM&CREED
ENGINEERS SURVEYORS PLANNERS

MEETING MINUTES

Town of Carolina Beach Steering Committee Meeting #1

Bicycle Multiuse Transportation Plan

McKim & Creed Project No. 0103-0008

Town Hall @ 2 pm

ATTENDEES:				
NAME	**COMPANY**	**PHONE**	**FAX**	**E-MAIL**
Margaret Gray	M&C	910-342-1048	910-251-8282	mgray@mckimcreed.com
Brenda Butler	Carolina Beach	910-458-8218		Brenda.Butler@carolinabeach.org
John Vine-Hodge	NCDOT-DBPT	919-807-0772		Javinehodge@ncdot.gov
Ted Lashley	Carolina Beach	910-458-7416		Ted.Lashley@carolinabeach.org
Bd Parvin	Carolina Beach	910-200-6070		Bd.Parvin@carolinabeach.org
Gary Ferguson	Carolina Beach	910-458-2986		Gary.Ferguson@carolinabeach.org
Tim Owens	Carolina Beach	910-458-2996		Tim.Owens@carolinabeach.org
Kurt Bartley	Carolina Beach	910-458-2540	910-458-2588	Kurt.Bartley@carolinabeach.org

- NCDOT – funding predominately TRIAD. More recently some beach towns.
- Timeline – living document. Five high priority based on funding.
- Can trials go on and off-road? Yes they can be local and/or NCDOT. They can also be located in the Sunny Point buffer. Getting more relaxed with mike trail in fire breaks along federal property line.
- Service component of CTP plan. May not be here yet. Can incorporate into zoning.
- Incorporate planned MPO, Dow Road Corridor Study, Buffer Zone, Streetscape Master Plan, Pleasure Island Greenway Plan, and Safe Roads to School grant.
- Get off Dow Road onto secondary roads like 6th Street.
- Ted Lashley to be point person to obtain studies, reports, and plans.
- Goals – interconnectivity is key like Wrightsville Loop, right-of-way's 90' to offer, features to link schools, state parks, recreation, CBD, public facilities.
- Steering Committee Meetings – John to make all these. Will review draft plan and attend four meetings.
- Submit financial admin monthly by 5th. Pay by 15th. NCDOT – 3 payment, 1 payment, etc. John will provide Ted form for NCDOT.
- NCDOT has template for comp plan and examples. Send examples to Ken.

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- Public notification – web site, utility bills, Gazette notification, church, recreation center. Goal is to reach out to get input on options.
- GIS – Brenda can ID major features, beach, beach access, sidewalk, right-of-ways. Brenda ARC GIS 0.3 shape files, existing tracts, 11x17 maps, base maps and nodes. Determine how to get base map created. One on one dialogue.
- Survey to Board, Recreation Committee, etc.
- Public advertisements by Town.
- Multiuse versus bike path differences. State and federal standards sometimes vary.
- Any bike clubs? NHC has club. Cape Fear cyclists. Good resource.
- Bike path and economic benefits add to report. John will send link. Important factor for funding.
- Any linkage / node bike ratios, interconnectivity. Level of service numbers provided similar for cars / bikes but not as accurate.
- Steering Committee 2 – intro as to policies, programs, community goals, project policies.
- Possible Routing
  - Sunny Point Bike Path
  - Island Greenway
  - Ocean Boulevard
  - Lake Park
  - Aspen Avenue
  - Cape Fear
  - Dow Road
  - Clarendon
  - St. Joseph / Lewis
  - Bridge over to River Road
  - Tract Beltline (State Park)
  - Town Hall into State Park
  - Lake trail
  - Eighth Street
  - 90' right of ways

- Key Nodes
  - New pier and park
  - Boardwalk
  - North end
  - Lake
  - Mike Chappell
  - State Park
  - School
  - Beach & Beach Access (larger ones)
  - Library / Senior Center
  - Recreation Center
  - Freeman Park
  - Town Marina
- Need Way Finding type signage
- Could do educational stops at areas or nodes to learn more about Carolina Beach

Submitted by: _____ Date: March 25, 2010
Margaret A. Gray, RLA
Sr. Project Manager

cc: Ted Lashley, Town of Carolina Beach
John Vine-Hodge, NCDOT

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McKIM&CREED
ENGINEERS SURVEYORS PLANNERS

MEETING MINUTES

Town of Carolina Beach Steering Committee Meeting #2

Bicycle Multiuse Transportation Plan

McKim & Creed Project No. 0103-0008

Town Hall @ 2 pm

ATTENDEES:				
NAME	**COMPANY**	**PHONE**	**FAX**	**E-MAIL**
Ed Parvin	Carolina Beach	910-200-6070		Ed.Parvin@carolinabeach.org
Gary Ferguson	Carolina Beach	910-458-2986		Gary.Ferguson@carolinabeach.org
Kurt Bartley	Carolina Beach	910-458-2540	910-458-2588	Kurt.Bartley@carolinabeach.org
Ted Lashley	Carolina Beach	910-458-7416		Ted.Lashley@carolinabeach.org
Tim Owens	Carolina Beach	910-458-2996		Tim.Owens@carolinabeach.org
Margaret Gray	M&C	910-343-1048	910-251-8282	mgray@mckimcreed.com
John Vine-Hodge	NCDOT-DBPT	919-807-0772		Jvinehodge@ncdot.gov
Alan Pacek	Pleasure Island CoC	724-422-0506		alandpacek@yahoo.com
Michael Kirkbride	WMPO Bike	910-616-2421		Michael@KirkbrideHomes.com
Bill Pizarro		919-474-5600		bpiz@yahoo.com

- Attached to these meeting minutes are the meeting agenda and PowerPoint presentation
- The meeting opened with a PowerPoint presentation
- Reviewed work in progress, inventory, and opportunities map.
  - Edits were verbally noted
  - A PDF of the map will be sent to all members for final edits
- The Citizens survey questions and format were discussed.
  - Additional questions need to be added regarding residency location, specific improvement areas, and age group of riders.
  - Example surveys will be provided by NCDOT to M&C.
  - M&C will distribute surveys and request committee feedback by May 10th to incorporate into final survey.
  - Survey will be provided on-line electronically (Survey Monkey or other) as well as hard copies delivered to strategic locations (recreation center, state park, library, schools, etc.

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Town of Carolina Beach
Steering Committee Meeting #2
Page 2 of 2

- Public notifications of the survey and intent will be disseminated via several venues; Gazette legal notice, Island Greenway announcement, Chamber announcement, Town web page, and Parks & Recreation Postings.

- Allowing 3 weeks for citizens to complete the survey allows responses through June 3rd.
- Public House #1 meeting
  - Due to several conflicts the public house meeting date was moved from May 12th (7-9 pm) to May 19th. It will be held in the Council Chambers.
  - Members of the Steering Committee are encouraged to attend.
  - NCDOT may also be in attendance (undetermined at this time).
  - The Citizens survey will be handed out at this meeting.
- The next Steering Committee meeting is scheduled for June 9, 2010.

Submitted by: _____ Date: May 11, 2010
Margaret A. Gray, RLA
Sr. Project Manager

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MEETING MINUTES

Town of Carolina Beach Steering Committee Meeting #3

Bicycle Multiuse Transportation Plan

Town Hall on June 9, 2010 @ 2 pm

ATTENDEES:				
NAME	COMPANY	PHONE	FAX	E-MAIL
Ed Parvin	Carolina Beach	910-200-6070		Ed.Parvin@carolinabeach.org
Gary Ferguson	Carolina Beach	910-458-2986		Gary.Ferguson@carolinabeach.org
Kurt Bartley	Carolina Beach	910-458-2540	910-458-2588	Kurt.Bartley@carolinabeach.org
Lonnie Lashley	Carolina Beach	910-458-7418		Lonnie.Lashley@carolinabeach.org
Ted Lashley	Carolina Beach	910-458-7416		Ted.Lashley@carolinabeach.org
Tim Owens	Carolina Beach	910-458-2996		Tim.Owens@carolinabeach.org
Bill McDow	ILM MPO	910-341-7819	910-341-7801	Bill.McDow@Wilmingtonnc.gov
Margaret Gray	M&C	910-343-1048	910-251-8282	mgray@mckimcreed.com
John Vine-Hodge	NCDOT-DBPT	919-807-0772		Javinehodge@ncdot.gov
Michael Kirkbride	WMPO Bike	910-616-2421		Michael@KirkbrideHomes.com

- Attached to these meeting minutes are the meeting agenda, the Citizen's Input Survey, the survey summary report through June 9, 2010, and the corridor rankings table.
- Discussed Citizen's Survey Summary
  - Mix of responses although not truly stratified
  - Although we received 143 responses that is only 2% of the population.
  - Town's Master Planning survey efforts experienced a less response.
  - Extended survey through end of June to help facilitate / reach- out to kids for their input.
- Discussed corridor ranking table.
  - Refrain from focusing on design detail.
  - Objectives are to rank corridors based on improved connectivity, safety, and ease of implementation.
  - Cost is a factor but divorce it from implementation so we identify the preferred projects. Then we will prioritize after the ranking efforts.
  - Adding several project corridors for ranking.
- Discussed general design details.
  - Can combine safe routes to schools with project priorities.
  - Give consideration to the Wilmington Beach project.
  - Consider over or under pass at Dow Road and Harper Road.

Town of Carolina Beach
Steering Committee Meeting #3

- Consider signalization or roundabout at Dow Road and Harper Road.
- On oversized right-of-ways, provide a separate bicycle / multiuse trail rather than paved shoulder or oversized road.

- The next Steering Committee meeting is scheduled for July 6, 2010.
- The next Public Open House is tentatively scheduled for August 11, 2010 (pushed out two weeks to allow for additional citizen / visitor survey input).

Submitted by: _____ Date: June 15, 2010

Margaret A. Gray, RLA
Sr. Project Manager

MEETING MINUTES

Town of Carolina Beach Steering Committee Meeting #4

Bicycle Multiuse Transportation Plan

Town Hall on July 21, 2010 @ 2 pm

ATTENDEES:				
NAME	COMPANY	PHONE	FAX	E-MAIL
Gary Ferguson	Carolina Beach	910-458-2986		Gary.Ferguson@carolinabeach.org
Ted Lashley	Carolina Beach	910-458-7416		Ted.Lashley@carolinabeach.org
Tim Owens	Carolina Beach	910-458-2996		Tim.Owens@carolinabeach.org
Margaret Gray	M&C	910-343-1048	910-251-8282	mgray@mckimcreed.com
Michael Kirkbride	WMPO Bike	910-616-2421		Michael@KirkbrideHomes.com

- Attached to these meeting minutes are the meeting agenda and the meeting attachments.
  - Existing roadway conditions inventory
    - Reviewed data collected, included snap-shot cross section of roadway which omitted some on-street parking. Revise table to include partial parking and designations.
  - Add Lewis Street to inventory.
- Corridor rankings
  - Reviewed corridor rankings
  - Explained point system variable of 60 or 80 points. Percentages were calculated based on total ratios so percentages weren't skewed.
- Bicycle Multiuse Network Plan
  - Add / extend pier at proposed aquarium
  - Align Carl Winner bicycle boulevard to match proposed aquarium improvements. Town to provide PDF of concept.
  - Add shared-use trails below Snow's Cut Bridge. May require small retaining wall.
  - Eliminate advisory bicycle lanes and replace with prioritized bike lanes.
  - Lake Park, from Carl Winner to St. Joseph, town has design plans. Obtain from Tim.
  - Connect Dow Road Greenway to back of Food Lion.
  - Add Lewis Street as prioritized travel.
  - Contraflow design acceptable for Carolina Beach Avenue South.
  - Crosswalk at Carolina Sands to be aligned with bicycle lanes from Carolina Avenue South. Design concept to be presented at public meeting.

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Town of Carolina Beach
Steering Committee Meeting #4
Page 2 of 2

- There may be an ally that can link Seventh Street to the State Park. Gary to check town / county records.
- Intersection upgrades at Dow and Harper to include signal.
- Upgrade stormwater grates as part of construction estimates in high priority projects.
- Shared-use path acceptable on Ocean based on expansive separation from pavement edge.

- High Priority Phased Projects
  - Projects grouped in phases to create complete segmental link. May deviate from corridor rankings but plausibly makes sense.
  - Good locations in response to citizens survey
- Chapter 6 Review
  - Endorsement of policies and programs but check with Police Chief on Police on Bicycles Program.
- The next Steering Committee meeting is scheduled for August 18, 2010 (2 – 4 pm).
- The next Public Open House is scheduled for August 11, 2010. (7 – 9 pm)

Submitted by: _____ Date: July 22, 2010
Margaret A. Gray, RLA
Sr. Project Manager

MEETING MINUTES

Town of Carolina Beach Steering Committee Meeting #5

Bicycle Multiuse Transportation Plan

Town Hall on August 18, 2010 @ 2 pm

ATTENDEES:				
NAME	COMPANY	PHONE	FAX	E-MAIL
Gary Ferguson	Carolina Beach	910-458-2986		Gary.Ferguson@carolinabeach.org
Kurt Bartley	Carolina Beach	910-458-2540	910-458-2588	Kurt.Bartley@carolinabeach.org
Ted Lashley	Carolina Beach	910-458-7416		Ted.Lashley@carolinabeach.org
Tim Owens	Carolina Beach	910-458-2996		Tim.Owens@carolinabeach.org
Bill McDow	ILM MPO	910-341-7819	910-341-7801	Bill.McDow@Wilmingtonnc.gov
Margaret Gray	M&C	910-343-1048	910-251-8282	mgray@mckimcreed.com
John Vine-Hodge	NCDOT-DBPT	919-807-0772		Javinehodge@ncdot.gov
Michael Kirkbride	WMPO Bike	910-616-2421		Michael@KirkbrideHomes.com

- Attached to these meeting minutes is the meeting agenda.
- Presented the DRAFT bicycle Multiuse Transportation Plan
  - Review Comments
    - Add short term project corridors
    - Add long term project corridors including Dow Road, Island Greenway, Snows Cut Bridge, and Snows Cut Bridge supporting routes
    - Remove Dow road From High Priority page
    - Expand Implementation Section to include P.I.R.A. and Island Women
    - Under plan recommendations add bike racks at all beach access areas
    - Signage details – WMPO recommends MUTCD standards
  - Distributed additional rankings sheet for long term projects
  - Need comments / feedback / rankings sheet on draft report by August 28th
- Tentative next meetings
  - The next Planning Board meeting is scheduled for December 9, 2010
  - The next Town Council scheduled for December 14, 2010

Submitted by: _____ Date: September 7, 2010

Margaret A. Gray, RLA, Sr. Project Manager

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PUBLIC OPEN HOUSES

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McKIM&CREED
ENGINEERS SURVEYORS PLANNERS

MEETING MINUTES

Town of Carolina Beach Open House Meeting #1

Bicycle Multiuse Transportation Plan

McKim & Creed Project No. 0103-0008

May 19, 2010 – Council Chambers @ 7 pm

ATTENDEES:	
NAME	**Address**
Ted Lashley	Town of Carolina Beach
Margaret Gray	McKim & Creed, P.A.
Tim Owens	Town of Carolina Beach
Gordon Beckhart	415 Carolina Beach Avenue, North
Bob Stephens	247 Silver Sloop Way
Chad Trivette	222 Carolina Beach Avenue, North
Charma McKnight	400 Virginia Avenue, Unit 102-A
Tim McCormack	911 Carolina Sands Drive
Riley Kirby	927 Salt Water
Alan Pacek	101 Island Mimosa
Anne Terry	402 Mainship Court
Donna Moffitt	511 Surf Drive

- The Island Greenway routing was presented per the recent support by Sunny Point.
- Discussed alternative routing through conservation easement.
- Linkage to Pinfish creating loop if possible.
- Limited flexibility on relocation as this took 3 years to get approval (this is it).
- Need buffer at Carolina Sands.
- Discussed plan, status, and goals.
- Early stages of plan collecting data.
- Citizen survey has been distributed with 98 responses, great feedback.
- Open discussion on design details
  - Will motorized vehicles be allowed? Doubtful but part of plan evaluation.
  - Can bike trails be added to the State Park?
  - Survey is understandable with some confusion that only citizens respond. This was clarified.
  - Where will specific routes go? Undetermined at this time. Goal of survey is to help provide.

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Town of Carolina Beach
Open House Meeting #1
Page 2 of 2

- Interconnectivity is goal. There are lots of opportunities.
- Plan will be complete the end of this year.
- The $25,000 for the plan includes grant money from NCDOT.
- The finished plan will allow for a phased implementation with priority areas.
- Survey is on the Carolina Beach main page.

Submitted by: _____ Date: June 2, 2010

Margaret A. Gray, RLA
Sr. Project Manager

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McKIM&CREED ENGINEERS SURVEYORS PLANNERS

MEETING MINUTES

Town of Carolina Beach Public Open House Meeting #2

Bicycle Multiuse Transportation Plan

Council Chambers on August 11, 2010

ATTENDEES:			
NAME	ADDRESS	PHONE	E-MAIL
Margaret Gray	McKim & Creed, P.A.	910-343-1048	mgray@mckimcreed.com
Ted Lashley	City of Carolina Beach	910-458-7416	Ted.Lashley@carolinabeach.org
Sandra Feline	Kure Beach	910-707-0514	sfeline@hotmail.com
Shep Oliver	1508 Drill Shell Lane, Carolina Beach, NC	910-228-0096	ShepOliver@yahoo.com
Michael Kirkbride		910-616-2421	Michael@KirkbrideHomes.com

- Attached to these meeting minutes are the meeting agenda and the meeting attachments.
- Public open house meeting #2 occurred on August 11, 2010.
- The meeting lasted an hour.
- The topics of discussion included:
  - Section 4 – Strategic Bicycle Plan
  - Section 6 – Recommendations for Ancillary Facilities, Programs, and Policies
  - Multiuse Network Plan
  - Existing Conditions Inventory
  - High Priority Project Phases
  - Project Priorities
- The next Steering Committee meeting is scheduled for August 18, 2010 (2 – 4 pm).

Submitted by: _____ Date: August 17, 2010

Margaret A. Gray, RLA
Sr. Project Manager

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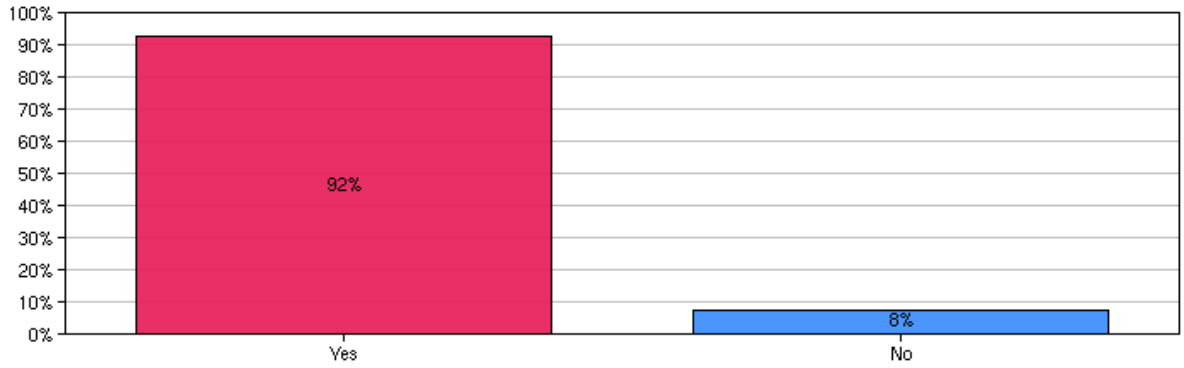
APPENDIX C – CITIZENS SURVEY SUMMARY REPORT – JULY 1, 2010

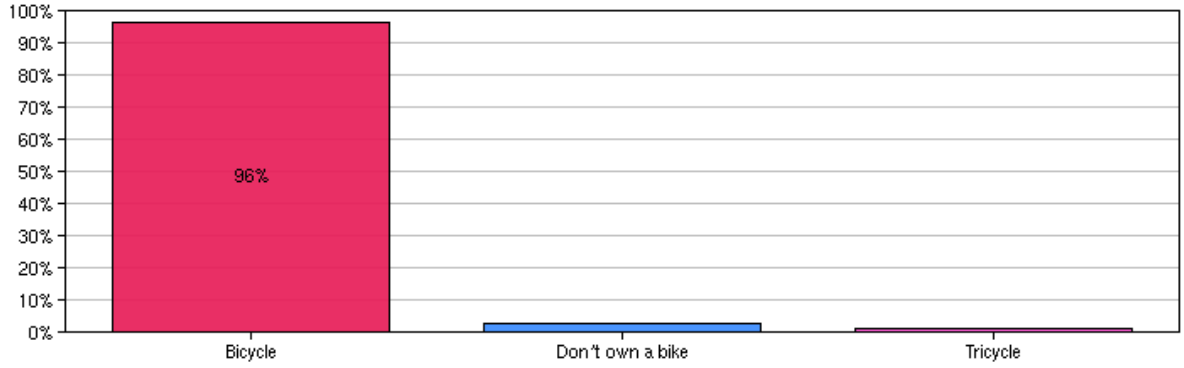
Town of Carolina Beach May & June 2010
Bicycle Multi-Use Transportation Plan Citizens / Visitors Input

Have you ridden a bicycle in the last six months?



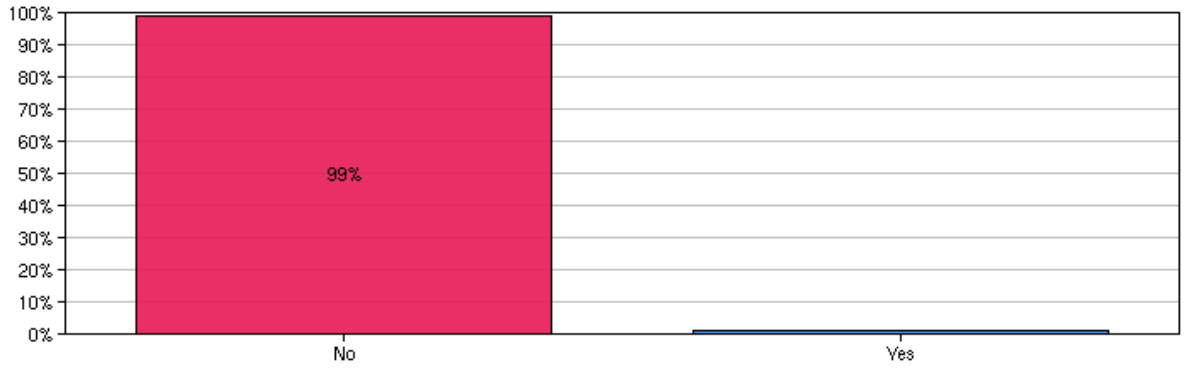
Value	*Count*	*Percent*
Yes	146	92.4%
No	12	7.6%

What type of bike do you ride?



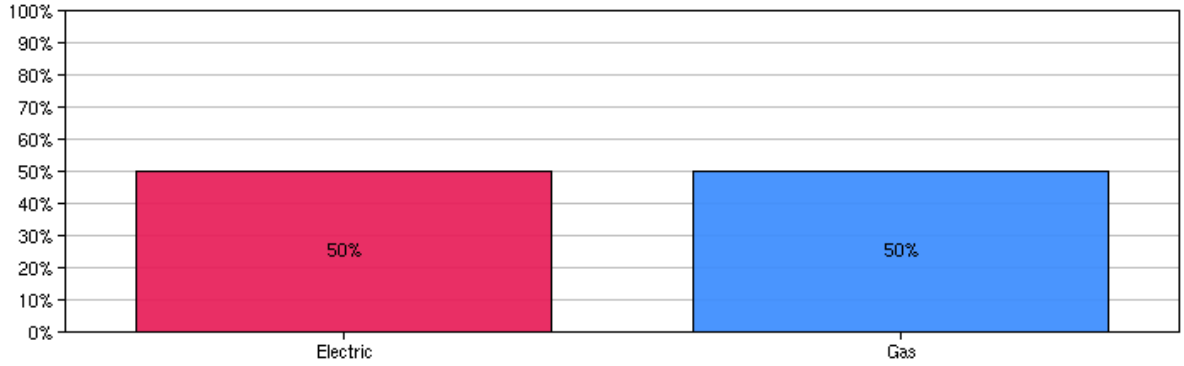
Value	*Count*	*Percent*
Bicycle	151	96.2%
Do not own a bike	4	2.5%
Tricycle	2	1.3%

Motorized?



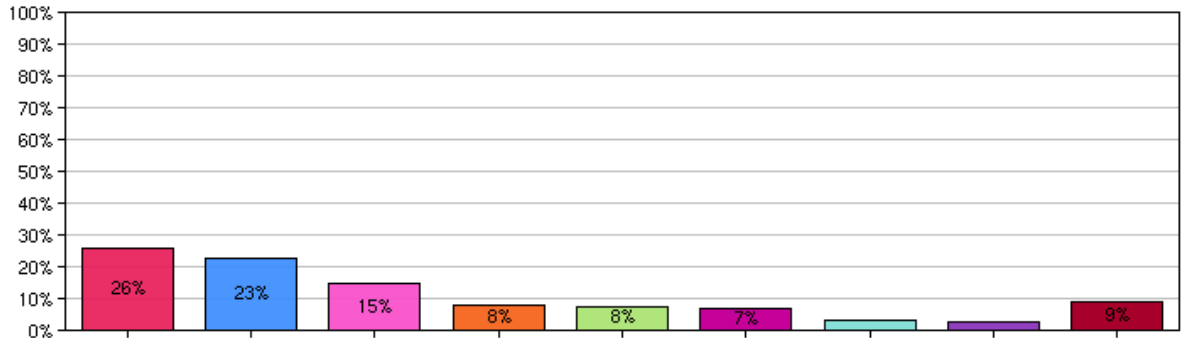
Value	*Count*	*Percent*
No	150	98.7%
Yes	2	1.3%

Gas or electric?



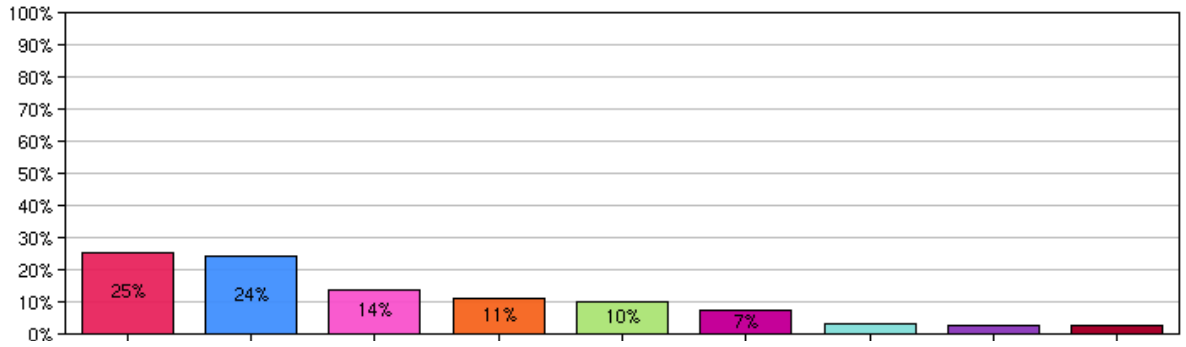
Value	*Count*	*Percent*
Electric	1	50.0%
Gas	1	50.0%

What has prevented you from biking to areas of interest?



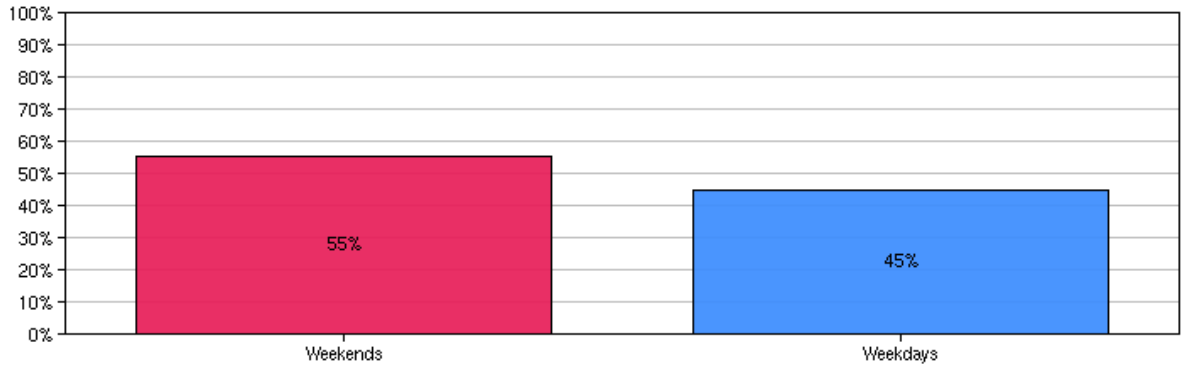
Value	*Count*	*Percent*
No continuous bikeway routes	119	25.9%
Heavy or fast traffic	104	22.6%
Bikeways are too narrow	67	14.6%
Bikeways are poorly marked	36	7.8%
No crosswalks / signalization at intersections	35	7.6%
Bikeways are poorly maintained	32	7.0%
It is easier to drive	15	3.3%
Weather (too hot, cold, rainy, etc.)	11	2.4%
All Other Categories:	41	9.0%
Other	10	2.2%
Destination is too far away to bike	10	2.2%
Too busy, no time	9	2.0%
I have too much stuff to carry	4	0.9%
Do not own a bike	3	0.7%
I need to keep a clean appearance	2	0.4%
Concern of crime	1	0.2%
Lack of interest	1	0.2%
My health does not permit me to bike	1	0.2%

What do you ride your bike for?



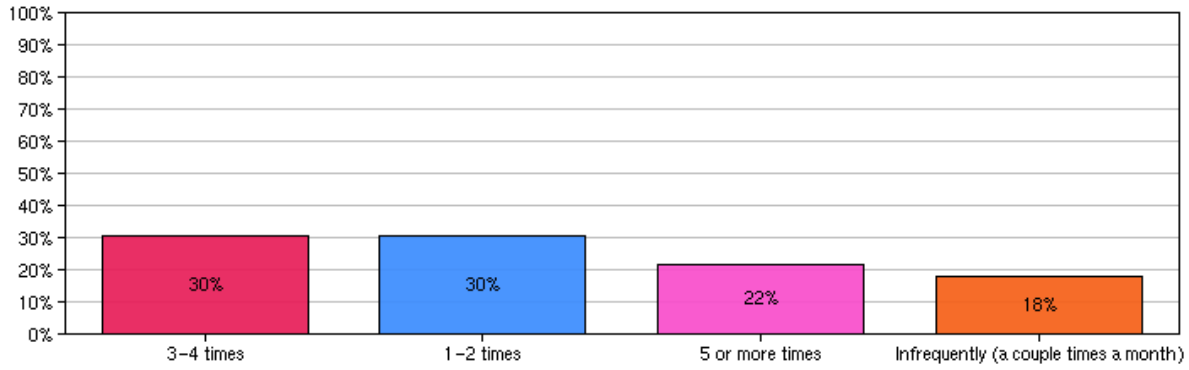
Value	*Count*	*Percent*
Recreation	141	25.3%
Exercise	134	24.0%
Errands	77	13.8%
Visit family / friends	63	11.3%
Shopping	57	10.2%
Family event	40	7.2%
School	18	3.2%
Other	14	2.5%
Work	14	2.5%

When do you usually bike?



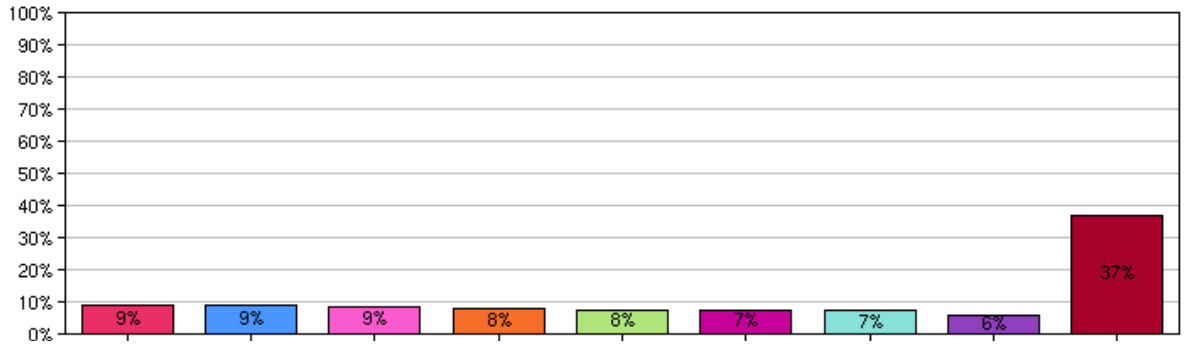
Value	*Count*	*Percent*
Weekends	135	55.3%
Weekdays	109	44.7%

How often during the week do you ride (round trip)?



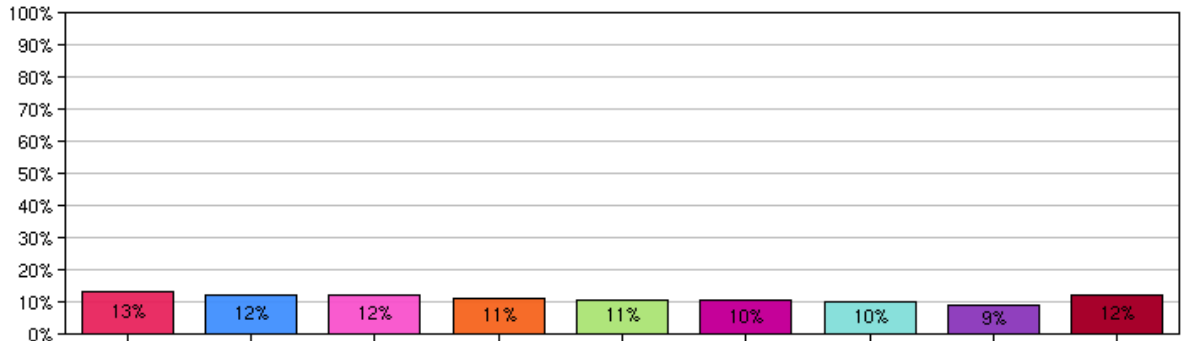
Value	*Count*	*Percent*
3-4 times	46	30.3%
1-2 times	46	30.3%
5 or more times	33	21.7%
Infrequently (a couple times a month)	27	17.8%

What areas would you enjoy biking to if access was easier?



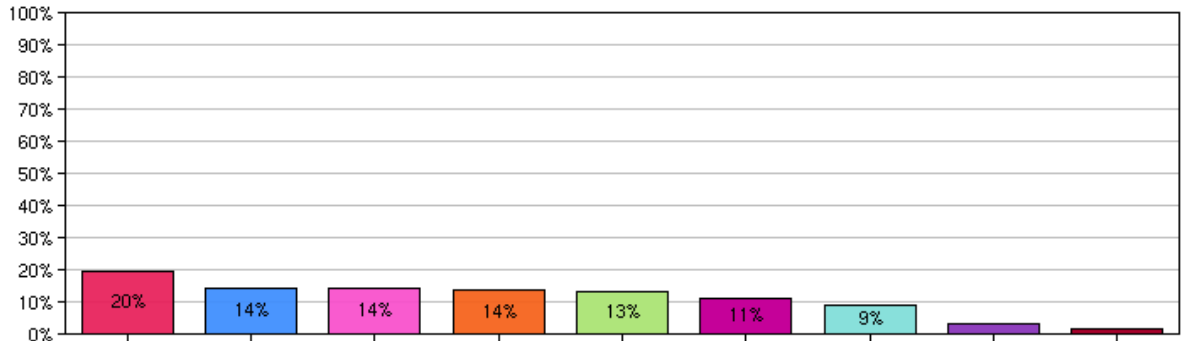
Value	*Count*	*Percent*
Boardwalk / Pavilion Area	111	9.0%
Beach and Beach Access Areas	108	8.8%
Carolina Beach State Park	105	8.6%
Proposed Ocean Pier and Park	100	8.1%
Snows Cut Bike Path	93	7.6%
Central Business District	91	7.4%
Lake Park	90	7.3%
Store	74	6.0%
All Other Categories:		37.0%
Recreation Center	65	5.3%
In neighborhood	62	5.0%
Freeman Park	55	4.5%
Wildlife Boat Ramp	52	4.2%
Town Marina	49	4.0%
Library	47	3.8%
Mike Chappell Park	45	3.7%
School	27	2.2%
Other	21	1.7%
Senior Center	17	1.4%
Work	16	1.3%

What events would you bike to?



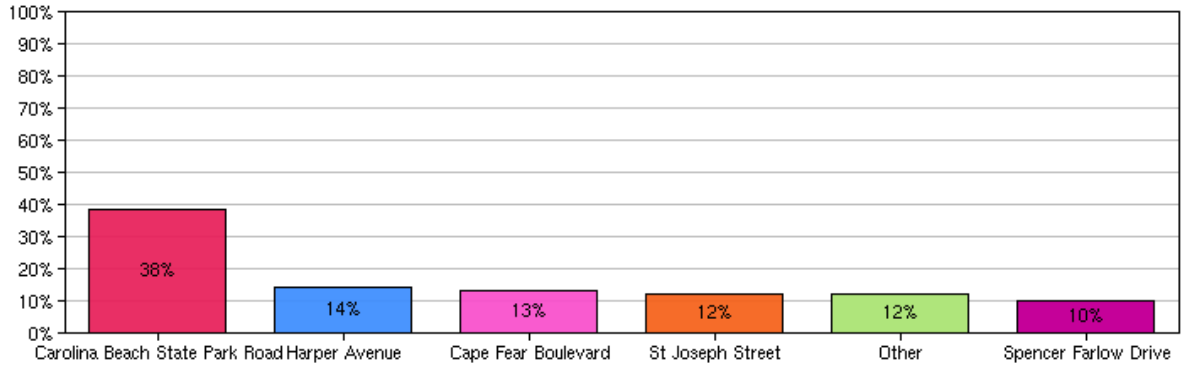
Value	*Count*	*Percent*
Farmers Market at the Lake	122	13.0%
Free Summer Concerts	114	12.2%
Boardwalk Events	112	12.0%
Fireworks on the Beach	104	11.1%
Free Movies at Lake Park	100	10.7%
Annual Chowder Cook-off	96	10.3%
Independence Day Fireworks	92	9.8%
Annual Beach Music Festival	82	8.8%
All Other Categories:	114	12.0%
Island of Lights Light Up Celebration at Lake Park	71	7.6%
Annual Salty Paws Festival	43	4.6%

Would you ride your bike more if:



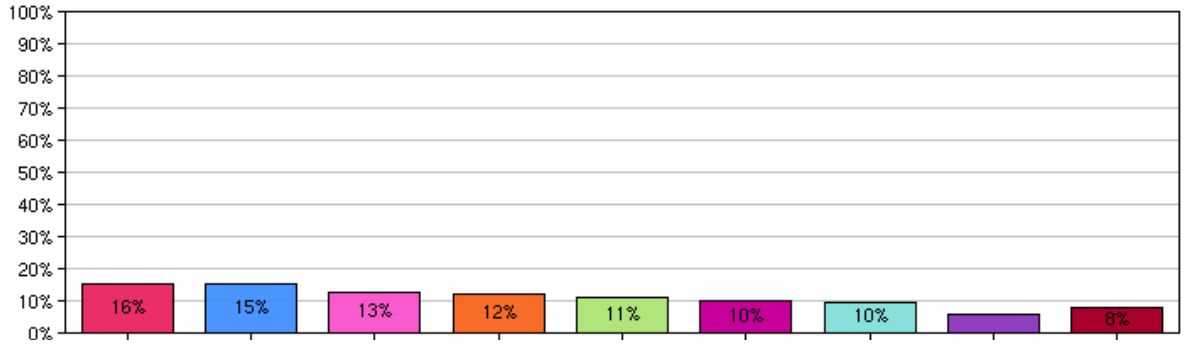
Value	*Count*	*Percent*
There were more clearly marked trails	119	19.5%
You felt safer	87	14.3%
There were wider roads to ride on	87	14.3%
You felt motorists respected cyclists and better understood cyclists' rights and responsibilities	83	13.6%
There were better roadway conditions, such as smoother pavement, less debris	81	13.3%
You had better places to ride to	69	11.3%
Drivers drove slower	53	8.7%
Other	21	3.4%
All Other Categories:	9	1.5%
You felt more confident on your bike	5	0.8%
You owned a bike	4	0.7%

Which roads do you feel are currently safe and comfortable for bicycling on in Carolina Beach?



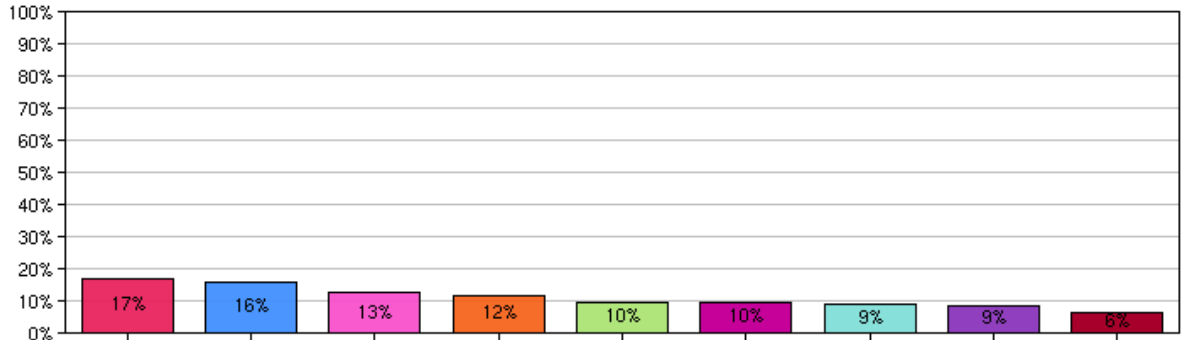
Value	*Count*	*Percent*
Carolina Beach State Park Road	122	38.4%
Harper Avenue	45	14.2%
Cape Fear Boulevard	42	13.2%
St Joseph Street	39	12.3%
Other	38	11.9%
Spencer Farlow Drive	32	10.1%

Which roads would you ride on if improvements were made to make it a more safe and comfortable experience?



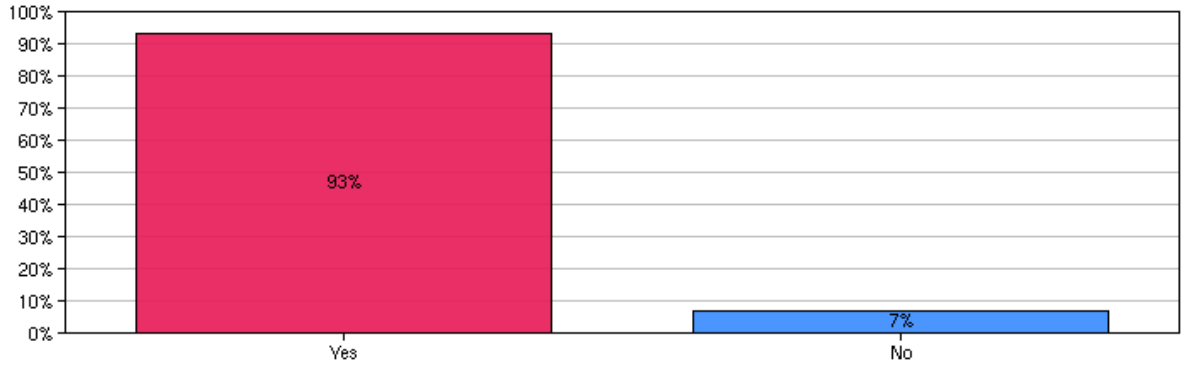
Value	*Count*	*Percent*
Lake Park	126	15.5%
Dow Road	124	15.3%
Boardwalk Area	103	12.7%
Ocean Boulevard	98	12.1%
Snows Cut Bridge	92	11.3%
Cape Fear Boulevard	82	10.1%
Harper Avenue	77	9.5%
Alabama Avenue	46	5.7%
Woody Hewitt	41	5.0%
Other	23	2.8%

What are some improvements you think Carolina Beach should do to make it better for bicycling in the Town?



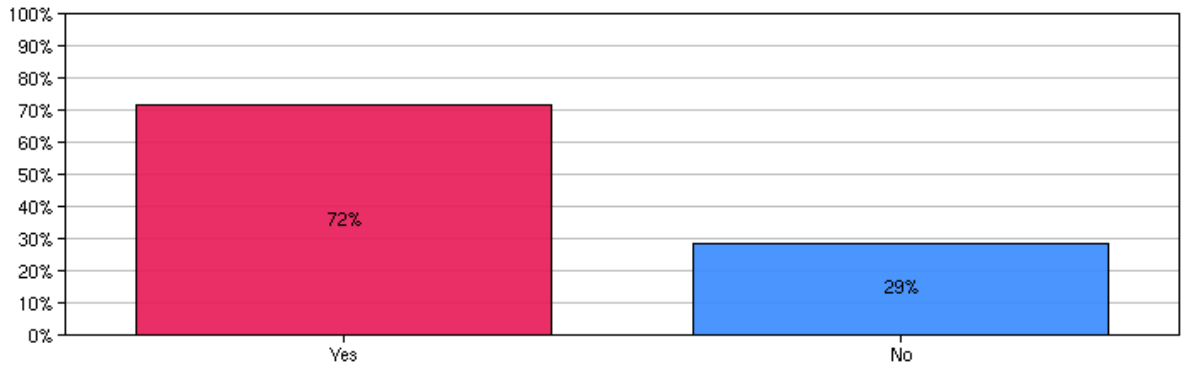
Value	*Count*	*Percent*
More bike lanes	130	16.9%
More off-road paths, like greenways	122	15.9%
More bike racks at destinations	97	12.6%
Bike boulevards, shared roadways, with bike speed limits	90	11.7%
More "Share the Road" signs	73	9.5%
Allow bikes on the Boardwalk, walk them when busy	73	9.5%
Police enforcement of a new Bike and Pedestrian friendly policy	69	9.0%
More crosswalks	65	8.5%
All Other Categories:	49	6.4%
Accommodations for bikes on buses	29	3.8%
Other	18	2.3%
None	2	0.3%

Would you support public development policies that encourage bicycle facilities?



Value	*Count*	*Percent*
Yes	147	93.0%
No	11	7.0%

Would you support tax increases for bicycle facilities?



Value	*Count*	*Percent*
Yes	108	71.5%
No	43	28.5%

Where are the bike problem areas in Carolina Beach?

	Total
Lake Park at the lake (curve in the road)	131
Dow Road and Harper Avenue and beginning of existing Island Greenway Path	130
Lake Park and Winner Boulevard	128
St. Joseph and Lake Park	126
Carolina Sands and Lake Park	119
Other	28

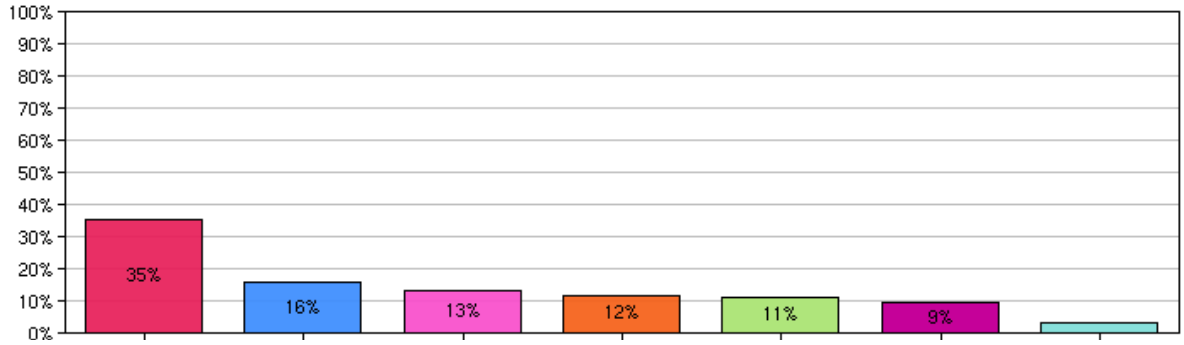
Other problem areas:

ID	*Response Data*
164	Canal - only marked on direction; and CB Ave N walk/bike path for part of road
182	No cut through from Augusta to Tennessee Ave.
184	Bridge over Snows Cut
185	Speed & narrowness on Dow Road!!!
188	Spencer Farlow
197	Spencer Farlow
198	We need a way to travel the island without accessing a major road.
215	Spencer Farlow- Too much boat traffic with no sidewalks/bike path
217	Spencer Farlow
218	Spencer Farlow with boat traffic. They are NOT watching the traffic, either on foot or bike.
219	loggerhead
221	Spencer Farlow to the Boardwalk
222	Hamlet and Lake Park Blvd.
223	Dow Road is by far the most dangerous
224	Spencer Farlow

ID	Response Data
225	Pretty much all of Dow
231	We have the biggest problem accessing the beach @ Hamlet Ave and Lake Park
232	Along lake park from surf house to Cape Fear Blvd
239	Spencer Farlow
240	canal drive and Carolina beach avenue north are both big problems
243	Carolina Sands to Kure Beach
248	snow's cut bridge- #1
250	Canal Drive and Winner Blvd
256	DOW ROAD is a death trap on a bike!!!
257	Dow road in general
267	Carolina Beach Ave and Canal during tourist season and use of Freeman Park
268	snows cut onto or off Carolina Beach
274	central business district to the bridge
280	snows cut bridge
287	Dow road between Carolina / Kure beaches
294	Canal and Carolina Beach Ave North - both pretty narrow for bikes
296	Central business district. Bike lanes behind cars that are backing up are not safe, especially for our kids
313	Spencer Farlow Dr b/c of boat trailer traffic.
317	The sidewalk on Lake Park is right next to the road. There is no patch of grass between the sidewalk and road. If my kids lose balance and swerve into the road he could get hit by a car flying by.
318	Snows Cut Bridge
331	No problems, but crosswalks would be nice
342	Carolina beach rd
347	Cape Fear Ave & Harper Ave

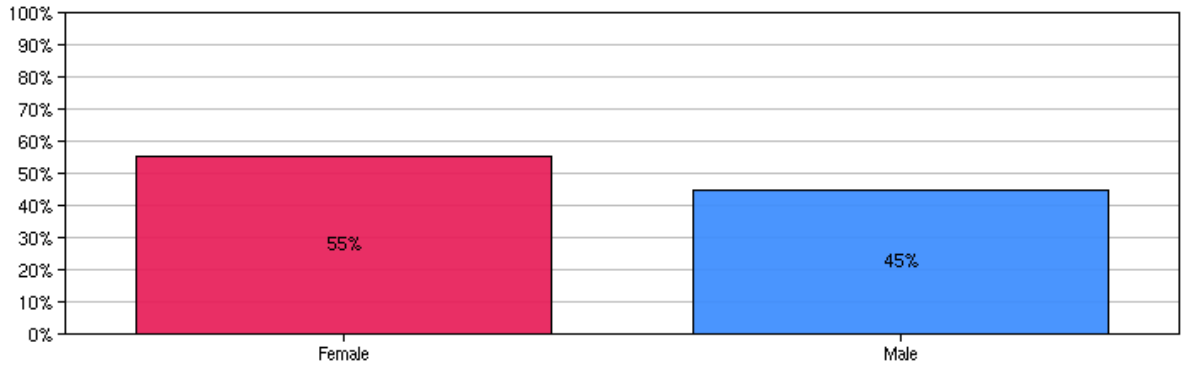
ID	Response Data
350	Making traffic congested and wanting to add bike lanes in main traffic needs to be replanned. Boardwalk is where we want to go so make a route to there and get off the downtown road.
354	Dow and N. Lake Park Blvd.

What area of Carolina Beach do you live in?



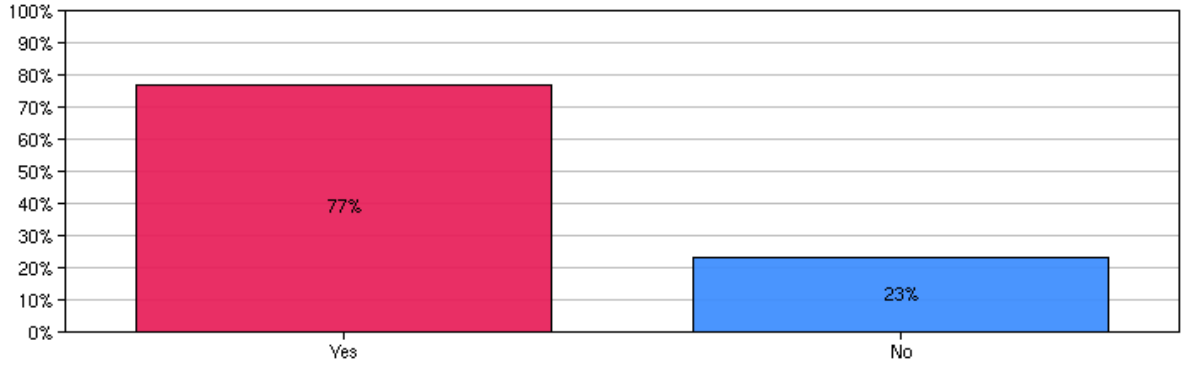
Value	Count	Percent
Beach Area North of Harper	45	35.4%
Between Alabama and Carolina Sands	20	15.7%
Between Carolina Sands and Clarendon	17	13.4%
Between Lake Park and Town Marina	15	11.8%
Beach Area South of Harper	14	11.0%
Between Clarendon and Harper	12	9.4%
Between Harper and Lake Park	4	3.1%

Gender:



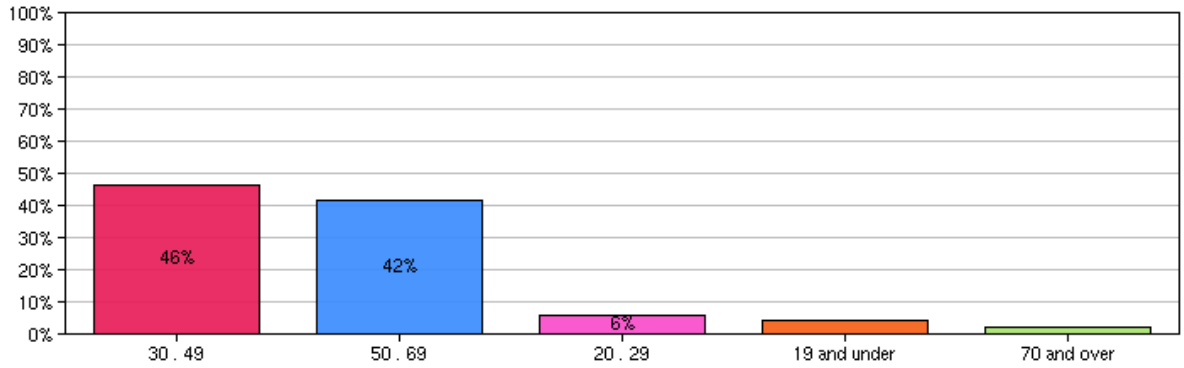
Value	*Count*	*Percent*
Female	82	55.4%
Male	66	44.6%

Are you a permanent resident?



Value	*Count*	*Percent*
Yes	113	76.9%
No	34	23.1%

What is your age?



Value	*Count*	*Percent*
30 – 49	70	46.4%
50 – 69	63	41.7%
20 – 29	9	6.0%
19 and under	6	4.0%
70 and over	3	2.0%

Are you handicapped?

Value	*Count*	*Percent*
No	150	99.3%
Yes	1	0.7%

Do you have specific suggestions to help the Town become safer and more practical for bicyclists and multi-use path enthusiasts?

ID	*Response Data*
165	Just do it...!
167	I favor the creation of a separate bike path/trail that runs from Snow's Cut Bridge to the Ferry at Ft. Fisher
169	For the town council to ride at least one day a week to work, for the police to have some bike police,
172	Change angle parking to parallel near bike lanes. Greedy merchants have insisted on an unsafe design. I can't believe the NCDOT allowed this. Stupid! Stupid! Stupid!
173	Would love to see a greenway system for biking and walking.
176	I think you are on the right track with these ideas!
178	Pave the Snow's Cut portion of the bike path because Spencer Farlow Drive is too dangerous to walk or bike due to heavy trailered boat traffic as well as too narrow a rode.
179	Thanks to Carolina Beach for pursuing this. Wish Kure Beach would be as open to such a study.
181	multi-use paths and marked bike lanes
182	Lake Park Blvd is not a safe route when riding with kids. I feel safe riding on 7th and 8th Streets, but cannot get through Carolina Sands to Tennessee Ave without dodging traffic on Lake Park. Buffer zone would be an ideal spot for a bike path.
184	finish the greenway from snows cut to fort fisher
185	Continue advocacy for greenway to connect Wilmington with Fort Fisher Ferry. The East Coast Greenway will bring visitors from all along the East Coast -- feature Carolina Beach as an attractive destination for cyclists to stay over and explore!!
187	Keep pushing with the effort to be a "bike friendly" community
188	Pave area beside Dow road to make it safer to travel by bike. Road has no shoulder and speed if 55-not safe for bikes at all!
190	encourage adoption of the greenway project which will provide a connected pathway throughout most of the town
192	more off road bike paths; change new traffic pattern through downtown to relocate bike paths next to sidewalks

ID	Response Data
196	More designated bike lanes would do it for me
197	Make greenway trail or bicycle path from snow's cut to Fort Fisher with crosswalk's to beach. And bike signs at them. Other beach areas have them and I love biking safely
198	Start the Greenway
200	Have more bike lanes! I know everyone else is complaining but I love the new road diet with bike lanes those should be everywhere on the beach!!!
210	First, if it is going to raise taxes, I am against it. We [home owners] have already bared the burden of increased taxes, without everyone having to participate, meaning; only homeowners end-up having to pay the taxes. Apartment dwellers who live on the island, do not bare any burden. Secondly, if this is about bicyclists, let them pay for any increases; tax anyone who owns a bike, a road tax.
213	I would encourage more greenways. They can be shared by walkers and bikers alike and would serve our community well.
214	keep doing what you're doing - the Greenway across Pleasure Island near the town but off the main thoroughfares (not Dow Road and not Lake Park) seems like the best bet. Thanks!
215	Police presence @ bike path under the bridge to cut down on shady activities and make it feel safe for walking/biking. Currently, I won't go there unless my husband is with me.
217	Approve and fund the greenway! If not for the locals, then make the investment for the financial boost to the economy. Many young professionals with and without families look for just this type of infrastructure when deciding where to spend their vacation dollars. I know this to be true! I used to live in Durham and would make the same decision. Wrightsville Beach has the loop, and I know we miss out on folks because we don't have something promoting healthy living of our own. And, Lake Park, while nice, is not an attraction! Supporting the greenway is an easy decision for me to make. In fact, I'm looking to purchase a property directly adjacent to the proposed greenway.
218	Dedicated recreational trails
219	Carolina Beach could and should take on the moniker as THE Cape Fear designation for bikes and bikers. A bike friendly place does not yet exist in Cape Fear area. Become that, welcome this nonpolluting, family past time and differentiate Carolina Beach from all other towns in the area.
221	Having a well-marked, preferably paved, trail connecting various parts of Carolina Beach to the boardwalk area would be an excellent addition to our area. Whatever we can do to

ID	Response Data
	encourage less use of CO2 producing emission and noise production would be a real plus to the environment... quality of life.
222	I see many, many cyclists on Dow Rd. It's my opinion, based on other coastal areas I've visited, that there is great potential for our area to become a cycling destination for tourists. It is also my opinion that bicycling greatly enhances CB residents' quality of life and makes our beach a much more desirable place to live and conduct business. Bicycling accounts for 90% of our transportation on the island.
223	My first priority would be to complete the Greenway to Kure Beach and then on to Ft. Fisher.
227	Yes CROSS WALKS at beach accesses! Police need to monitor them to get the point across! Carolina Beach is NOT pedestrian friendly and we walk and ride bikes every where! Also a bike lane from the Carolina sands to at least the Ocean Grill
230	I like the idea of a multi-use path, but think it is a bad idea to place the path behind people's homes. The cost is too high and the security risk is too great. At this point in time, our town cannot afford the required additional expense to securely monitor this type of amenity to our island. The unruly and destructive behavior at the skate park is the perfect example of a great idea not fully thought out, planned and funded. Dow Road would be a much better place for a path. Also, area streets are perfectly safe for biking and could easily and inexpensively be marked accordingly. The danger areas come as people need to cross Dow Road and Lake Park and effort should be made to make these crossing points safer for bikes and pedestrians. Cars typically do not stop for people walking or on bikes unless you walk out in front of them and wave your hand.
231	We love this town! We love the active community and option of biking to almost all of your needs including grocery shopping, medical facilities, and other events. We do wish that it were easier (or at least safe) for the people that call CB "home" to get around on their bikes, especially to the beach. I pull my 15 month old daughter in a bike trailer and we have almost been backed into (illegally) and hit by a motorist trying to get around the standstill traffic at Hamlet and Lake Park avenue. We have noticed much more traffic in residential neighborhoods from people looking to dodge the traffic on Lake Park and other negative results from impatient tourists who aren't paying attention to the people on bikes. Almost every time we've made it across Lake Park @ Hamlet it has been because my husband has walked out into traffic and blocked it for us to cross safely, or because a well meaning motorist has blocked traffic for us with his/her car. Please help keep our town a place where it is safe to bike to destinations!
232	Encourage visitors to respect bikes and SLOW down so people can cross major intersections...especially at the beach accesses like Hamlet Street where you have to step out into traffic to try to cross the road!

ID	Response Data
233	I would love a longer dedicated bike path!
234	Think about our town as a green, safe place. Make safe riding a priority and advertise it as one of the benefits of living here and visiting here.
235	I think the town is doing an awesome job. I am trying to ride my bike more and more as much as possible, weather permitting.
237	Greenway from existing one all the way to Kure beach!
239	For me, living at Harbour Point, Spencer Farlow is the most unsafe due to heavy boat trailer and car travel. A bike lane on at least one side might help.
240	Repave and make canal and Carolina beach avenue north smooth!!! It is a nightmare to ride a bike down those roads. Make bike path wider. Approve Greenway and add a Bike lane on Dow Road
242	A BIKE PATH WOULD BE GREAT ALONG DOW ROAD. I USE THE PATH THAT GOES BESIDE THE STATE PARK ON A REGULAR BASIS AND WOULD LOVE TO SEE IT CONTINUE ON DOWN DOW ROAD. I DO NOT WANT TO SEE A PATH GO BEHIND HOUSES AS THIS POSES A SECURITY RISK THAT WOULD COST TOO MUCH TO MAINTAIN AND MONITOR.
244	More paths and routes off highway.
247	Do NOT put a trail behind the Carolina Sands neighborhood. This would pose a significant security risk. I am all too aware of the crowd that the skate park attracts and do not want that kind of atmosphere traveling back and forth behind our neighborhood. This would provide all too easy access to the backs of people's homes, where children play unattended in the backyards. It would also give easy access to families' homes at night. A bike path or lane added to Dow road would be much better and not put anyone at risk.
248	We live over the bridge and think it is too dangerous for our kids to ride across. Otherwise, we would ride to the beach! Bike racks would be good, too- maybe in some of the bigger parking lots. Thanks!
249	Have more bike racks and improve on theft and security.
252	I think the more bike-friendly, the better. We need more crosswalks especially to be pedestrian and bike friendly.
254	more continuous, safe pathways to allow runners, bikers, strollers that run the length of town on both sides
256	The town should put a shoulder along both sides of Dow Road. They also should increase

ID	Response Data
	biking area along Lake Park. Thank you
260	I think that Carolina Beach is actually already a great place to bike - that was one of the reasons for relocating there, that we wouldn't have to get in the car anytime we wanted to go anywhere. We just moved in January and are loving it! I would support any improvements. Right now the trickiest place we bike is getting from St Joseph's to the boardwalk. We would probably go to the businesses on Lake Park from that intersection back towards the bridge more if we could bike there.
261	Bike paths period.
267	It is a great asset to be able to ride your bike at the beach and just as many tourists would like to do it which in the end helps our economy if we can become labels a bike friendly island. I as a Realtor get asked about this and many of my clients that have purchased are concerned about it. Since we are accentuating the natural assets and parks in a future development plan, it goes directly in hand and I believe a huge plus. As a resident, I would love to travel by bike at all times that I don't have to use my car for work but do not feel comfortable presently with the lack of space on the roads. Thanks for working on this.
269	Try to keep bikes off of Lake Park Blvd. as much as possible
274	Currently biking on CB is manageable for experienced older riders; family biking with younger kids is extremely difficult and in areas (Central Business District, Lake Park, Cape Fear, Harper, Dow,) are very dangerous. There is a given lack of respect for bicyclists by motorists and I believe there is a lack of knowledge by motorists and people in general about bike lanes and right of way.
275	Nope
276	Bike lanes are not continuous all over island. They should all connect from food lion to Kure beach.
277	NO
280	Link existing trails. Create a bicycle path/link between Carolina Sands and SeaGrove (off Ocean Blvd.) so bicyclists don't have to use N. Lake Blvd. for several blocks to travel between Kure Beach & Carolina Beach. Designate a bike lane on roads one block off N. Lake Blvd. so bicyclists can avoid the "road diet" area in the central business district.
288	Bike path on Dow and all along Lake Park and Fort Fisher Blvd.
290	More and continuous bike trails from one end of the island to the other (ferry to wildlife boat ramp and also across Snows Cut bridge. and around the boardwalk area. Ideally with the bike path separated from the main roadways. And with as much greenery as possible

ID	Response Data
	as in the plan to run the path along the firebreak behind Carolina Sands. I also think the path should be limited to bikes and people on foot and perhaps skaters, but not skateboards or motorized vehicles.
296	Making our town more bike friendly will take a lot of time and financial support that may come slowly. In the meantime, paint and a few hours of labor could create much needed crosswalks, making a huge difference for very little money. PLEASE consider a crosswalk for walkers and bikers at Carolina Sands Drive/ Lake Park. There are so many kids riding bikes and walking in this area. Thanks for getting citizen input!
297	None except to continue to support the plan for the continuous bike path from one end of Carolina Beach to the other. Also, continue to try and get Kure Beach to work with Carolina Beach to extend the path from one end of the island to the other.
302	We need wider bike lanes and make them visible. It's not safe for our kids to ride on these streets. We have so many out of town beach goers and none of the drivers aren't paying attention to bikers on the side of the road. It's not safe.
304	The continuation of the bike trail from Paradise Cove along the State Park along Dow Road would be great. A connection of this to the Lake and boardwalk would also be great.
305	Look into other states or counties with more user friendly facilities for bikers.
311	Complete the Greenway Project.
312	MORE Greenways!!!
313	It would be very beneficial to have another crosswalk location at Dow & Harper. It's quite scary to have to switch to the other side of the road to cross back over onto the paved area. It would also be great if the road could be widened a little on Spencer Farlow to accommodate a small bike lane. And of course it would be AWESOME if a larger bike lane was installed along Dow to provide safe access to the southern part of the island. Good luck with this! :)
317	The greenway that ends at Dow and Harper is great. This should be extended down Harper to the Boardwalk. It would give greenway users beach and boardwalk access without having to worry about cars. I like the new single lane road with bike lane along Lake Park Blvd in the down town area. This is good for adults but still too dangerous for kids under age 12. Thanks for the survey; I see many people bike around Carolina Beach. It's a nice biking community. Anyway to improve safety and accessibility will only improve the town.
318	I ride mainly for exercise and find that Dow Road and the Snows Cut Bridge are dangerous for bicycles. A clearly marked and enforced bike lane on Dow Road across the

ID	Response Data
	bridge connecting to the bike lanes on River Road would be a great improvement and would better connect Wilmington to the beaches.
323	Education for both motorists and bicyclists. Speeding on secondary roads is a big problem. People also seem to forget what stop signs are for.
329	Add any multi-use paths. Add bike lane to both sides of Dow Rd. Lake Park is not bad, except for the 3 blocks downtown. All the neighborhoods are pretty good. But many, many cyclists use Dow Rd. and it has no shoulder whatsoever, let alone an actual bike lane. This would be the single most important thing to do, all else does not even compare.
331	I don't think greenway trails are needed. The streets in town are safe for bikes. You just have to be careful at major intersections, so additional crosswalks for bikes would be nice.
333	Keep doing what you are doing in promoting non auto facilities
343	Safe place to put bikes when riding
345	more bike lanes and bigger bike lanes
346	more bike signs
347	Need these services to help folks that no longer can drive such as senior citizens etc enjoy freedom to go to store, CVS, and enjoy all the amenities we pay for but are not allowed to access because of transportation hindrances.
350	I love activities, adventure, and being safe. There should be some sort of crossing at the Marriot to get to Boardwalk so us bicyclers can get off the road and avoid over heated road congestion seems like traffic is only going to get worse so plan a better path to Boardwalk.
352	Separate greenways from the roads for biking. Florida and Hilton Head have done this exceptionally well.
353	no
354	The current greenway is wonderful. The bike lanes going through downtown behind parked cars are scary and I will not take my children through there. The crosswalk at Dow and N. Lake Park Blvd. is also scary because if you are trying to cross Dow, you have to be super cautious because the turn lane has a green light at the same time that you get the signal to safely cross the intersection. The same happens with the right turn off of Winner Blvd. onto Lake Park. You really don't have enough time to safely cross Winner and once you do, there is not really enough space on the corner in front of the gas station for more than a couple of pedestrians, let alone bikes. The same applies to the area in front of the Blue Water store; there is just not a lot of room on the sidewalk to wait for the crossing

ID	Response Data
	signal. I ride with a small child on the back of my bike in a child seat and have my 7 year old son riding his bike. It is very hard for us to safely cross at that intersection.
356	I think that residents in general need to be open to change in CB to make it a more desirable place for vacationers. This is after all, a family vacation location. Making it more current with "green thinking" ideas and attractions will bring more affluent beach vacationers with money to spend at local businesses and restaurants thereby making our town thrive.
357	A bicycle path along Dow Road continuing with the bike path that is currently in place next to the State Park would help. Dow Road is heavily traveled at high speeds making it unsafe for riders.

APPENDIX D – PRIORITIZATION TABLES

High-Priority Project Phases Opinion of Probable Construction Costs

Phase	Road Class.	Type of Project	Roadway Segment	From	To	Approx. Length (ft)	Details / Purpose	Preferred Treatments	Costs	
1	Town	Dual shared-use paths, high visibility crosswalks	Clarendon Avenue	Dow Road	Terminus	2,850	Improve safety on school route & connect to Lake Park	Asphalt paths & high visibility crosswalks	$ 218,000	
								Subtotal	$ 218,000	
2	Town	Dual shared-use paths, high visibility crosswalks	Cape Fear Boulevard	Dow Road	Third Street	3,385	Provide interconnectivity to Central Business District	Asphalt paths & high visibility crosswalks	$ 245,000	
2	Town	Dual bike lanes and sidewalks	Cape Fear Boulevard	Third Street	Carolina Beach Avenue N	1,042	Main street transition from residential to business	Roundabout, stripped/marked bike lanes, side walks & on street parking	$ 715,000	1
2	Town	Dual shared-use paths, high visibility crosswalks	Harper Avenue	Dow Road	Third Street	3,465	Provide interconnectivity to Central Business District	Asphalt paths & high visibility crosswalks	$ 260,000	
2	Town	Dual bike lanes and sidewalks	Harper Avenue	Third Street	Carolina Beach Avenue N	608	Main street transition from residential to business	Roundabout, stripped/marked bike lanes, side walks & on street parking	$ 635,000	1
								Subtotal	$ 1,855,000	
3	NCDOT	Dual bike lanes and sidewalks	Lake Park Boulevard N	Carl Winner Boulevard	St. Joseph Street	1,042	Main street transition	Bike lanes, sidewalks & no on-street parking	$ 415,000	2
3	NCDOT	Single shared-use path (west side)	Lake Park Boulevard S	Alabama Avenue	Lake Park shared-use path	5,430	Improve safety & provide interconnectivity to town core	Asphalt path & high visibility crosswalks	$ 200,000	
								Subtotal	$ 615,000	
4	Town	Bicycle Boulevard	Carolina Beach Avenue N	Harper Avenue	Salt Marsh Lane	8,800	Improve safety & provide interconnectivity to beach area	Sharrows, signage & high visibility crosswalks	$ 7,500	
4	Town	Bicycle Boulevard	Salt Marsh Lane	Carolina Beach Avenue N	Canal Drive	288	Improve safety & provide interconnectivity to beach area	Sharrows, signage & high visibility crosswalks	$ 850	
4	Town	Bicycle Boulevard	Canal Drive	Salt Marsh Lane	Virginia Avenue	988	Improve safety & provide interconnectivity to beach area	Sharrows, signage & high visibility crosswalks	$ 2,500	
4	Town	Bicycle Boulevard	Virginia Avenue	Canal Drive	Maryland Avenue	1,305	Improve safety & provide interconnectivity to beach area	Sharrows, signage & high visibility crosswalks	$ 1,500	
4	Town	Bicycle Boulevard	Maryland Avenue	Virginia Avenue	Georgia Avenue	282	Improve safety & provide interconnectivity to beach area	Sharrows & signage	$ 800	
4	Town	Bicycle Boulevard	Florida Avenue	Georgia Avenue	Canal Drive	2,218	Improve safety & provide interconnectivity to beach area	Sharrows & signage	$ 2,500	
4	Town	Bicycle Boulevard	Canal Drive	Florida Avenue	Periwinkle Lane	140	Improve safety & provide interconnectivity to beach area	Sharrows, signage & high visibility crosswalks	$ 1,500	

Phase	Road Class.	Type of Project	Roadway Segment	From	To	Approx. Length (ft)	Details / Purpose	Preferred Treatments	Costs
4	Town	Bicycle Boulevard	Periwinkle Avenue	Canal Drive	Carolina Beach Avenue N	286	Improve safety & provide interconnectivity to beach area	Sharrows, signage & high visibility crosswalks	$ 1,000
								Subtotal	$ 18,150
5	Town	Bicycle Boulevard	St. Joseph Street	Lake Park Blvd N	Lewis Drive	4,682	Improve safety & provide interconnectivity to commercial area & existing shared-use paths	Sharrows, signage & high visibility crosswalks	$ 8,000
5	Town	Bicycle Boulevard	Lewis Drive	St. Joseph Street	Snows Cut Bridge	2,246	Improve safety & provide interconnectivity to commercial area	Sharrows & signage	$ 1,500
5	Town	Bicycle Boulevard	Otter Road	Lewis Drive	Teakwood Drive	428	Provide interconnectivity to existing shared-use paths & linkage to State Park	Sharrows & signage	$ 1,000
5	Town	Bicycle Boulevard	Teakwood Drive	Otter Road	Peninsula Drive	798	Provide interconnectivity to existing shared-use paths & linkage to State Park	Sharrows & signage	$ 1,500
5	Town	Bicycle Boulevard	Peninsula Drive	Teakwood Drive	Island Marina Drive	916	Provide interconnectivity to existing shared-use paths & linkage to State Park	Sharrows & signage	$ 1,500
5	Town	Bicycle Boulevard	Island Marina Drive	Peninsula Drive	Annie Drive	894	Provide interconnectivity to existing shared-use paths & linkage to State Park	Sharrows & signage	$ 1,500
5	Town	Bicycle Boulevard	Annie Drive	Island Marina Drive	Snows Cut Bike Path	550	Provide interconnectivity to existing shared-use paths & linkage to State Park	Pavement, sharrows & signage	$ 21,000
								Subtotal	$ 36,000
6	Town	Single shared-use path (east side)	Seventh Street	Harper Avenue	Rec. Center	2,184	Improve safety on route to recreation center	Asphalt path & high visibility crosswalks	$ 88,000
								Subtotal	$ 88,000
7	NCDOT	Dual bike lanes & single shared-use path (east side)	Dow Road	Harper Avenue	Sumter Avenue	4,678	Improve safety & provide interconnectivity to regional attractors/destinations	Per the Dow Road Corridor Study adopted by WMPO	$ 515,000
								Subtotal	$ 515,000
								Grand total	$ 6,690,300

Footnotes:

1. Excludes costs associated with roundabout.
2. Estimate based on the Central Business District Streetscape Design Development Study dated October 2009 by peter j. smith & company, inc.

Notes: Project costs do not include any potential additional costs that may include right-of-way acquisition, utility relocations, fill, etc.

APPENDIX E – COST ESTIMATES

A preliminary range of costs for specific bicycle / multi-use paths and ancillary features is provided in this appendix. These costs are generic for the Southeast region. These costs should be used as a guide only, since they are not site specific. Other factors influencing these costs include land acquisition, utilities, demolition, environmental permits, and professional services.

- Lane striping (4" white solid, 120 mils) for delineation of bike lanes — $4,500 - $5,000 / mile
- Sharrow (includes bicycle symbol and directional arrows) — $150 - $250 / each
- High-Visibility Crosswalk (painted, not raised) 24' pavement section — $500 - $800 / each
- Signage — $250 - $350 / each
- 2-way Pedestrian Bicycle Signal — $5,000 - $8,000 / each
- 4-way Pedestrian Bicycle Signal — $15,000 - $20,000 / each
- Shared Use Trail 10' asphalt — $30 - $35 / foot
- Bicycle rack (6 spaces) — $400 - $600 / each
- Landscaping – Street trees 3" caliper — $250 - $400 / each

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APPENDIX F – FUNDING SOURCES

STATE AND FEDERAL

Federal funding is typically directed through State agencies to local governments either in the form of grants or direct appropriations. These projects do not qualify for the recently passed federal stimulus funding (2009 American Recovery and Reinvestment Act) since they are not "shovel ready." Also, State budget shortfalls may make it extremely difficult to accurately forecast available funding for future project development. The following is a list of possible Federal and State funding sources that could be used to support construction of the many bicycle projects. Federal funding requires a 20% local match, however the recent stimulus money does not require a match. Since these funding categories are difficult to forecast, it is recommended that the Town continue to work with the Triangle Area Rural Planning Organization (TARPO) on getting bicycle projects listed in the TIP (Transportation Improvement Program), as discussed below.

DEPARTMENT OF ENERGY (DOE)

The Department of Energy's Energy Efficiency and Conservation Block Grants (EECBG) grants may be used to reduce energy use and fossil fuel emissions and for improvements in energy efficiency. Section 7 of the funding announcement states that these grants provide opportunities for the development and implementation of transportation programs to conserve energy used in transportation including development of infrastructure such as bike lanes and pathways and pedestrian walkways. Although, this grant period has passed, more opportunities may arise. More information can be found at http://www.eecbg.energy.gov/

NC DEPARTMENT OF TRANSPORTATION AND SAFETEA-LU

The most likely source of funding for the bicycle projects would come from the North Carolina Department of Transportation and the federal funding program SAFETEA-LU. Some of the sub-programs within SAFETEA-LU and within NCDOT are listed below:

State Transportation Improvement Program (STIP): The STIP contains funding for various transportation divisions of NCDOT including: highways, aviation, enhancements, public transportation, rail, bicycle and pedestrians, and the Governor's Highway Safety Program. STIP is the largest single source of funding within SAFETEA-LU and NCDOT.

NCDOT Discretionary Funds: The Statewide Discretionary Fund consists of $10 million and is administered by the Secretary of the Department of Transportation. This fund can be used on any project at any location within the State. Primary, urban, secondary, industrial access, and spot safety projects are eligible for this funding. The Town would have to make a direct appeal to the Secretary of NCDOT to access these funds.

NCDOT Contingency Fund: The Statewide Contingency Fund is a $10 million fund administered by the Secretary of Transportation. Again, the Town would have to appeal directly to the Secretary.

NCDOT Enhancement Funding: Federal Transportation Enhancement funding is administered by NCDOT and serves to strengthen the cultural, aesthetic, and environmental aspects of the State's intermodal transportation system. Transportation Enhancement (TE) funding is awarded through NCDOT. The State typically will make a Call for Projects, and each project must benefit the traveling public and help communities increase transportation choices and access, enhance the built or natural environment and create a sense of place.

NCDOT Bicycle and Pedestrian Project: Funds for bicycle and pedestrian projects come from several different sources. Allocation of funds depends on the type of project/program and other criteria. Projects can include independent and incidental projects.

NC Department of Environment – Recreational Trails and Adopt-A-Trail Grants

The State Trails Program is a section of the N.C. Division of Parks and Recreation. The program originated in 1973 with the North Carolina Trails System Act and is dedicated to helping citizens, organizations and agencies plan, develop and manage all types of trails ranging from greenways and trails for hiking, biking and horseback riding to river trails and off-highway vehicle trails. The Recreation Trails Program awards grants up to $75,000 per project. The Adopt-A-Trail Program awards grants up to $5,000 per project.

Powell Bill Funds

Annually, State street-aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways.

Community Development Block Grant Funds

Community Development Block Grant (CDBG) funds are available to local municipal or county governments for projects that enhance the viability of communities by providing decent housing and suitable living environments and by expanding economic opportunities, principally for persons of low- and moderate income. State CDBG funds are provided by the U.S. Department of Housing and Urban Development (HUD) to the state of North Carolina. Some urban counties and cities in North Carolina receive CDBG funding directly from HUD. Each year, CDBG provides funding to local governments for hundreds of critically-needed

community improvement projects throughout the state. These community improvement projects are administered by the Division of Community Assistance and the Commerce Finance Center under eight grant categories. Two categories might be of support to the Town of Carolina Beach Bicycle Projects: infrastructure and community revitalization.

LAND AND WATER CONSERVATION TRUST FUND

The Land and Water Conservation Fund (LWCF) has historically been a primary funding source of the US Department of the Interior for outdoor recreation development and land acquisition by local governments and state agencies. In North Carolina, the program is administered by the Department of Environment and Natural Resources.

N.C. PARKS AND RECREATION TRUST FUND (PARTF)

The Parks and Recreation Trust Fund (PARTF) provide dollar-for-dollar matching grants to local governments for parks and recreational projects to serve the general public. Counties, incorporated municipalities and public authorities, as defined by G.S. 159-7, are eligible applicants.

A local government can request a maximum of $500,000 with each application. An applicant must match the grant dollar-for-dollar, 50% of the total cost of the project, and may contribute more than 50%. The appraised value of land to be donated to the applicant can be used as part of the match. The value of in-kind services, such as volunteer work, cannot be used as part of the match. http://www.ncparks.gov/About/grants/partf_main.php

SAFE ROUTES TO SCHOOL PROGRAM (MANAGED BY NCDOT, DBPT)

The NCDOT Safe Routes to School Program is a federally funded program that was initiated by the passing of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEALU) in 2005, which establishes a national SRTS program to distribute funding and institutional support to implement SRTS programs in states and communities across the country. SRTS programs facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools. The Division of Bicycle and Pedestrian Transportation at NCDOT is charged with disseminating SRTS funding.

The state of North Carolina was allocated $15 million in Safe Routes to School funding for fiscal years 2005 through 2009 for infrastructure or non-infrastructure projects. In 2009, more than $3.6 million went to 22 municipalities and local agencies for infrastructure and non-infrastructure projects. All proposed projects must relate to increasing walking or biking to and from an elementary or middle school. An example of a non-infrastructure project is an education or encouragement program to improve rates of walking and biking to school. An example of an infrastructure project is construction of sidewalks around a school. Infrastructure

improvements under this program must be made within 2 miles of an elementary or middle school. The state requires the completion of a competitive application to apply for funding. For more information, visit www.ncdot.org/programs/safeRoutes/ or contact DBPT/NCDOT, (919) 807-0774.

LOCAL GOVERNMENT

Local funding sources that would support bike facility project construction will most likely be limited but should be explored.

LOCAL AREA RURAL PLANNING ORGANIZATION

The Cape Fear Area Rural Planning Organization (CFRPO) manages the transportation planning process required by Federal law. The RPO plans for the area's surface transportation needs, including highways, transit, bicycle, and pedestrian facilities. There are two subcommittees of the RPO: the Technical Advisory Committee and the Technical Coordinating Committee. An important part of the transportation planning process is to identify transportation needs and to explore feasible alternatives to meet those needs. Plans and programs are often conducted in partnership with the NC Department of Transportation to identify needs and projects to enhance the Cape Fear Area' transportation infrastructure.

It is suggested that the Town work closely with the RPO on getting these projects listed on the TIP since this may be the primary source of funding for the project. Typically, projects on this list require a 20% local match.

TOWN OF CAROLINA BEACH CAPITAL IMPROVEMENT PROGRAMMING AND RESERVE FUNDS

The Town of Carolina Beach may have funding available to support some elements of construction or repair. It will be important to meet with Town Council representatives and the Town Manager to judge the availability of this funding.

OTHER LOCAL FUNDING OPTIONS

- Bonds/Loans
- Taxes
- Impact fees
- Exactions
- Tax increment financing
- Partnerships

PRIVATE SECTOR

Many communities have solicited greenway funding assistance from private foundations and other conservation-minded benefactors. Below are several examples of private funding opportunities available.

LAND FOR TOMORROW CAMPAIGN

Land for Tomorrow is a diverse partnership of businesses, conservationists, farmers, environmental groups, health professionals and community groups committed to securing support from the public and General Assembly for protecting land, water and historic places. The campaign is asking the North Carolina General Assembly to support issuance of a bond for $200 million a year for five years to preserve and protect its special land and water resources. Land for Tomorrow will enable North Carolina to reach a goal of ensuring that working farms and forests; sanctuaries for wildlife; land bordering streams, parks and greenways; land that helps strengthen communities and promotes job growth; historic downtowns and neighborhoods; and more, will be there to enhance the quality of life for generations to come. Website: http://www.landfortomorrow.org/

THE ROBERT WOOD JOHNSON FOUNDATION

The Robert Wood Johnson Foundation was established as a national philanthropy in 1972 and today it is the largest U.S. foundation devoted to improving the health and health care of all Americans. Grant making is concentrated in four areas:

- To assure that all Americans have access to basic health care at a reasonable cost
- To improve care and support for people with chronic health conditions
- To promote healthy communities and lifestyles
- To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs

For more specific information about what types of projects are funded and how to apply, visit www.rwjf.org/applications/.

NORTH CAROLINA COMMUNITY FOUNDATION

The North Carolina Community Foundation, established in 1988, is a statewide foundation seeking gifts from individuals, corporations, and other foundations to build endowments and ensure financial security for nonprofit organizations and institutions throughout the state. Based in Raleigh, North Carolina, the foundation also manages a number of community

affiliates throughout North Carolina, that make grants in the areas of human services, education, health, arts, religion, civic affairs, and the conservation and preservation of historical, cultural, and environmental resources. The foundation also manages various scholarship programs statewide. Web site: http://nccommunityfoundation.org/

Z. Smith Reynolds Foundation

This Winston-Salem-based Foundation has been assisting the environmental projects of local governments and non-profits in North Carolina for many years. They have two grant cycles per year and generally do not fund land acquisition. However, they may be able to offer support in other areas of open space and greenways development. More information is available at www.zsr.org.

Bank of America Charitable Foundation, Inc.

The Bank of America Charitable Foundation is one of the largest in the nation. The primary grants program is called Neighborhood Excellence, which seeks to identify critical issues in local communities. Another program that applies to greenways is the Community Development Programs, and specifically the Program Related Investments. This program targets low and moderate income communities and serves to encourage entrepreneurial business development. Visit the web site for more information: www.bankofamerica.com/foundation.

Duke Energy Foundation

Funded by Duke Energy shareholders, this non-profit organization makes charitable grants to selected non-profits or governmental subdivisions. Each annual grant must have:

- An internal Duke Energy business "sponsor"
- A clear business reason for making the contribution

The grant program has three focus areas: Environment and Energy Efficiency, Economic Development, and Community Vitality. Related to this project, the Foundation would support programs that support conservation, training and research around environmental and energy efficiency initiatives. Web site: http:// www.duke-energy.com/community/foundation.asp.

American Greenways Eastman Kodak Awards

The Conservation Fund's American Greenways Program has teamed with the Eastman Kodak Corporation and the National Geographic Society to award small grants ($250 to $2,000) to stimulate the planning, design and development of greenways. These grants can be used for activities such as mapping, conducting ecological assessments, surveying land, holding conferences, developing brochures, producing interpretive displays, incorporating land trusts,

and building trails. Grants cannot be used for academic research, institutional support, lobbying or political activities. For more information visit The Conservation Fund's website at: www.conservationfund.org.

NATIONAL TRAILS FUND

American Hiking Society created the National Trails Fund in 1998; the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. 73 million people enjoy foot trails annually, yet many of our favorite trails need major repairs due to a $200 million backlog of badly needed maintenance. National Trails Fund grants help give local organizations the resources they need to secure access, volunteers, tools and materials to protect America's cherished public trails. To date, American Hiking has granted more than $240,000 to 56 different trail projects across the U.S. for land acquisition, constituency building campaigns, and traditional trail work projects. Awards range from $500 to $10,000 per project.

Projects the American Hiking Society will consider include:

Securing trail lands, including acquisition of trails and trail corridors, and the costs associated with acquiring conservation easements.

Building and maintaining trails which will result in visible and substantial ease of access, improved hiker safety, and/or avoidance of environmental damage.

Constituency building surrounding specific trail projects - including volunteer recruitment and support.

Web site: www.americanhiking.org/alliance/fund.html.

THE CONSERVATION ALLIANCE

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to protect wild and natural areas. One hundred percent of its member companies' dues go directly to diverse, local community groups across the nation - groups like Southern Utah Wilderness Alliance, Alliance for the Wild Rockies, The Greater Yellowstone Coalition, the South Yuba River Citizens' League, RESTORE: The North Woods and the Sinkyone Wilderness Council (a Native American-owned/operated wilderness park). For these groups, who seek to protect the last great wild lands and waterways from resource extraction and commercial development, the Alliance's grants are substantial in size (about $35,000 each), and have often made the difference between success and defeat. Since its inception in 1989, The Conservation Alliance has contributed $4,775,059 to grassroots environmental groups across the nation, and its member companies are proud of the results: To date the groups funded have saved over 34 million acres

of wild lands and 14 dams have been either prevented or removed-all through grassroots community efforts.

The Conservation Alliance is a unique funding source for grassroots environmental groups. It is the only environmental grant maker whose funds come from a potent yet largely untapped constituency for protection of ecosystems - the non-motorized outdoor recreation industry and its customers. This industry has great incentive to protect the places in which people use the clothing, hiking boots, tents and backpacks it sells. The industry is also uniquely positioned to educate outdoor enthusiasts about threats to wild places, and engage them to take action. Finally, when it comes to decision-makers - especially those in the Forest Service, National Park Service, and Bureau of Land Management, this industry has clout - an important tool that small advocacy groups can wield.

The Conservation Alliance Funding Criteria: The Project should be focused primarily on direct citizen action to protect and enhance our natural resources for recreation. We're not looking for mainstream education or scientific research projects, but rather for active campaigns. All projects should be quantifiable, with specific goals, objectives and action plans and should include a measure for evaluating success. The project should have a good chance for closure or significant measurable results over a fairly short term (one to two years). Funding emphasis may not be on general operating expenses or staff payroll.

Web site: www.conservationalliance.com/index.m

E-mail: john@conservationalliance.com

NATIONAL FISH AND WILDLIFE FOUNDATION (NFWF)

The National Fish and Wildlife Foundation (NFWF) is a private, nonprofit, tax-exempt organization chartered by Congress in 1984. The National Fish and Wildlife Foundation sustains, restores, and enhances the Nation's fish, wildlife, plants and habitats. Through leadership conservation investments with public and private partners, the Foundation is dedicated to achieving maximum conservation impact by developing and applying best practices and innovative methods for measurable outcomes.

The Foundation awards matching grants under its Keystone Initiatives to achieve measurable outcomes in the conservation of fish, wildlife, plants and the habitats on which they depend. Awards are made on a competitive basis to eligible grant recipients, including federal, tribal, state, and local governments, educational institutions, and non-profit conservation organizations. Project proposals are received on a year-round, revolving basis with two decision cycles per year. Grants generally range from $50,000-$300,000 and typically require a minimum 2:1 non-federal match.

Funding priorities include bird, fish, marine/coastal, and wildlife and habitat conservation. Other projects that are considered include controlling invasive species, enhancing delivery of

ecosystem services in agricultural systems, minimizing the impact on wildlife of emerging energy sources, and developing future conservation leaders and professionals. Website: http://www.nfwf.org/AM/Template.cfm?Section=Grants where additional grant programs are described.

THE TRUST FOR PUBLIC LAND

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land for human enjoyment and well being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities. TPL's legal and real estate specialists work with landowners, government agencies, and community groups to:

- Create urban parks, gardens, greenways, and river ways
- Build livable communities by setting aside open space in the path of growth
- Conserve land for watershed protection, scenic beauty, and close-to home recreation safeguard the character of communities by preserving historic landmarks and landscapes.

The following are TPL's Conservation Services:

- Conservation Vision: TPL helps agencies and communities define conservation priorities, identify lands to be protected, and plan networks of conserved land that meet public need.
- Conservation Finance: TPL helps agencies and communities identify and raise funds for conservation from federal, state, local, and philanthropic sources.
- Conservation Transactions: TPL helps structure, negotiate, and complete land transactions that create parks, playgrounds, and protected natural areas.
- Research and Education: TPL acquires and shares knowledge of conservation issues and techniques to improve the practice of conservation and promote its public benefits.

Since 1972, TPL has worked with willing landowners, community groups, and national, state, and local agencies to complete more than 3,000 land conservation projects in 46 states, protecting more than 2 million acres. Since 1994, TPL has helped states and communities craft and pass over 330 ballot measures, generating almost $25 billion in new conservation-related funding. For more information, visit www.tpl.org/.

BLUECROSS BLUESHIELD OF NORTH CAROLINA FOUNDATION (BCBS)

Blue Cross Blue Shield (BCBS) focuses on programs that use an outcome approach to improve the health and well-being of residents. The Health of Vulnerable Populations grants program focuses on improving health outcomes for at-risk populations. The Healthy Active Communities grant concentrates on increased physical activity and healthy eating habits. Eligible grant applicants must be located in North Carolina, be able to provide recent tax forms and, depending on the size of the nonprofit, provide an audit.

BlueCross BlueShield of NC Foundation
P.O Box 2291
Durham, NC 27702
919-765-7347
http://www.bcbsncfoundation.org/

LOCAL TRAIL SPONSORS

A sponsorship program for trail amenities allows smaller donations to be received from both individuals and businesses. Cash donations could be placed into a trust fund to be accessed for certain construction or acquisition projects associated with the greenways and open space system. Some recognition of the donors is appropriate and can be accomplished through the placement of a plaque, the naming of a trail segment, and/or special recognition at an opening ceremony. Types of gifts other than cash could include donations of services, equipment, labor, or reduced costs for supplies.

VOLUNTEER WORK

It is expected that many citizens will be excited about the development of a greenway corridor. Individual volunteers from the community can be brought together with groups of volunteers form church groups, civic groups, scout troops and environmental groups to work on greenway development on special community workdays. Volunteers can also be used for fund-raising, maintenance, and programming needs.

FUNDING SOURCES FOR BICYCLE AND PEDESTRIAN PROJECTS

Bicycle and pedestrian projects are broadly eligible for funding from almost all the major Federal-aid highway, transit, safety, and other programs. Bicycle projects must be "principally for transportation, rather than recreation, purposes" and must be designed and located pursuant to the transportation plans required of States and Metropolitan Planning Organizations.

FEDERAL-AID HIGHWAY PROGRAM

National Highway System funds may be used to construct bicycle transportation facilities and pedestrian walkways on land adjacent to any highway on the National Highway System, including Interstate highways. 23 USC Section 217 (b)

Surface Transportation Program (STP) funds may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or non-construction projects (such as maps, brochures, and public service announcements) related to safe bicycle use and walking. TEA-21 added "the modification of public sidewalks to comply with the Americans with Disabilities Act" as an activity that is specifically eligible for the use of these funds. 23 USC Section 217 (a)

Ten percent of each State's annual STP funds are set-aside for Transportation Enhancement Activities (TEAs). The law provides a specific list of activities that are eligible TEAs and this includes "provision of facilities for pedestrians and bicycles, provision of safety and educational activities for pedestrians and bicyclists," and the "preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails)." 23 USC Section 109 (a)(35)

Another 10 percent, of each State's STP funds, is set-aside for the Hazard Elimination and Railway-Highway Crossing programs, which address bicycle and pedestrian safety issues. Each State is required to implement a Hazard Elimination Program to identify and correct locations which may constitute a danger to motorists, bicyclists, and pedestrians. Funds may be used for activities including a survey of hazardous locations and for projects on any publicly owned bicycle or pedestrian pathway or trail, or any safety-related traffic calming measure. Improvements to railway-highway crossings "shall take into account bicycle safety." 23 USC Section 152

Congestion Mitigation and Air Quality Improvement Program funds may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or non-construction projects (such as maps, brochures, and public service announcements) related to safe bicycle use. 23 USC Section 217 (a)

Recreational Trails Program funds may be used for all kinds of trail projects. Of the funds apportioned to a State, 30 percent must be used for motorized trail uses, 30 percent for non-motorized trail uses, and 40 percent for diverse trail uses (any combination). 23 USC Section 206

Provisions for pedestrians and bicyclists are eligible under the various categories of the Federal Lands Highway Program in conjunction with roads, highways, and parkways. Priority for funding projects is determined by the appropriate Federal Land Agency or Tribal government. 23 USC Section 204

National Scenic Byways Program funds may be used for "construction along a scenic byway of a facility for pedestrians and bicyclists." 23 USC Section 162 (c)(4)

Job Access and Reverse Commute Grants are available to support projects, including bicycle-related services, designed to transport welfare recipients and eligible low-income individuals to and from employment. TEA-21 Section 3037

High Priority Projects and Designated Transportation Enhancement Activities identified by Section 1602 of TEA-21 include numerous bicycle, pedestrian, trail, and traffic calming projects in communities throughout the country.

Federal Transit Program

Title 49 U.S.C. (as amended by TEA-21) allows the Urbanized Area Formula Grants, Capital Investment Grants and Loans, and Formula Program for Other than Urbanized Area transit funds to be used for improving bicycle and pedestrian access to transit facilities and vehicles. Eligible activities include investments in "pedestrian and bicycle access to a mass transportation facility" that establishes or enhances coordination between mass transportation and other transportation. 49 USC Section 5307

TEA-21 also created a Transit Enhancement Activity program with a one percent set-aside of Urbanized Area Formula Grant funds designated for, among other things, pedestrian access and walkways, and "bicycle access, including bicycle storage facilities and installing equipment for transporting bicycles on mass transportation vehicles". 49 USC Section 5307(k)

Highway Safety Programs

Pedestrian and bicyclist safety remain priority areas for State and Community Highway Safety Grants funded by the Section 402 formula grant program. A State is eligible for these grants by submitting a Performance plan (establishing goals and performance measures for improving highway safety) and a Highway Safety Plan (describing activities to achieve those goals). 23 USC Section 402

Research, development, demonstrations and training to improve highway safety (including bicycle and pedestrian safety) is carried out under the Highway Safety Research and Development (Section 403) program. 23 USC Section 403

Federal/State Matching Requirements

In general, the Federal share of the costs of transportation projects is 80 percent with a 20 percent State or local match. However, there are a number of exceptions to this rule.

Federal Lands Highway projects and Section 402 Highway Safety funds are 100 percent federally funded.

Bicycle-related Transit Enhancement Activities are 95 percent federally funded.

Hazard elimination projects are 90 percent federally funded. Bicycle-related transit projects (other than Transit Enhancement Activities) may be up to 90 percent federally funded.

Individual Transportation Enhancement Activity projects under the STP can have a match higher or lower than 80 percent. However, the overall Federal share of each State's Transportation Enhancement Program must be 80 percent.

States with higher percentages of Federal Lands have higher Federal shares calculated in proportion to their percentage of Federal lands.

The State and/or local funds used to match Federal-aid highway projects may include in-kind contributions (such as donations). Funds from other Federal programs may also be used to match Transportation Enhancement, Scenic Byways, and Recreational Trails program funds. A Federal agency project sponsor may provide matching funds to Recreational Trails funds provided the Federal share does not exceed 95 percent.

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APPENDIX G – STATE AND FEDERAL POLICIES

UNITED STATES DEPARTMENT OF TRANSPORTATION STATEMENT ON BICYCLE AND PEDESTRIAN ACCOMMODATION REGULATIONS AND RECOMMENDATIONS POLICY

http://www.fhwa.dot.gov/environment/bikeped/policy_accom.htm

A United States Department of Transportation (US DOT) policy statement regarding the integration of bicycling and walking into transportation infrastructure recommends that, "bicycling and walking facilities will be incorporated into all transportation projects" unless exceptional circumstances exist. The Policy Statement was drafted by the U.S. Department of Transportation in response to Section 1202 (b) of the Transportation Equity Act for the 21st Century (TEA-21) with the input and assistance of public agencies, professional associations and advocacy groups. USDOT hopes that public agencies, professional associations, advocacy groups, and others adopt this approach as a way of committing themselves to integrating bicycling and walking into the transportation mainstream. The full statement reads as follows, with some minor adjustments for applicability in Butner:

1. Bicycle and pedestrian ways shall be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:

    - Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right of way or within the same transportation corridor.

    - The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project.

    - Where sparsity of population or other factors indicate an absence of need. For example, on low volume, low speed residential streets, or streets with severe topographic or natural resource constraints.

2. In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day. Paved shoulders have safety and operational advantages for all road users in addition to providing a place for bicyclists and pedestrians to operate. Rumble strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of four feet in which a bicycle may safely operate.

3. Sidewalks, shared use paths, street crossings (including over- and under-crossings), pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated and maintained so that all pedestrians, including people with disabilities, can travel safely and independently.

4. The design and development of the transportation infrastructure shall improve conditions for bicycling and walking through the following additional steps:

- Planning projects for the long-term. Transportation facilities are long-term investments that remain in place for many years. The design and construction of new facilities that meet the criteria in item 1) above should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements. For example, a bridge that is likely to remain in place for 50 years, might be built with sufficient width for safe bicycle and pedestrian use in anticipation that facilities will be available at either end of the bridge even if that is not currently the case.

- Addressing the need for bicyclists and pedestrians to cross corridors as well as travel along them. Even where bicyclists and pedestrians may not commonly use a particular travel corridor that is being improved or constructed, they will likely need to be able to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible and convenient.

- Getting exceptions approved at a senior level. Exceptions for the non-inclusion of bikeways and walkways shall be approved by a senior manager and be documented with supporting data that indicates the basis for the decision.

- Designing facilities to the best currently available standards and guidelines. The design of facilities for bicyclists and pedestrians should follow design guidelines and standards that are commonly used, such as the AASHTO Guide for the Development of Bicycle Facilities, AASHTO's A Policy on Geometric Design of Highways and Streets, and the ITE Recommended Practice "Design and Safety of Pedestrian Facilities. (Many of these guidelines are summarized in Chapter 4: Bicycle Facility Standards)

(Retrieved from http://www.fhwa.dot.gov/environment/bikeped/design.htm on 5/6/2008)

UNITED STATES DEPARTMENT OF TRANSPORTATION POLICY STATEMENT ON BICYCLE AND PEDESTRIAN ACCOMMODATION REGULATIONS AND RECOMMENDATIONS (MARCH 2010)

PURPOSE

The United States Department of Transportation (DOT) is providing this Policy Statement to reflect the Department's support for the development of fully integrated active transportation

networks. The establishment of well-connected walking and bicycling networks is an important component for livable communities, and their design should be a part of Federal-aid project developments. Walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use. Legislation and regulations exist that require inclusion of bicycle and pedestrian policies and projects into transportation plans and project development. Accordingly, transportation agencies should plan, fund, and implement improvements to their walking and bicycling networks, including linkages to transit. In addition, DOT encourages transportation agencies to go beyond the minimum requirements, and proactively provide convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when appropriate. Transportation programs and facilities should accommodate people of all ages and abilities, including people too young to drive, people who cannot drive, and people who choose not to drive.

POLICY STATEMENT

The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.

AUTHORITY

This policy is based on various sections in the United States Code (U.S.C.) and the Code of Federal Regulations (CFR) in Title 23—Highways, Title 49—Transportation, and Title 42—The Public Health and Welfare. These sections, provided in the Appendix, describe how bicyclists and pedestrians of all abilities should be involved throughout the planning process, should not be adversely affected by other transportation projects, and should be able to track annual obligations and expenditures on non-motorized transportation facilities.

RECOMMENDED ACTIONS

The DOT encourages States, local governments, professional associations, community organizations, public transportation agencies, and other government agencies, to adopt similar policy statements on bicycle and pedestrian accommodation as an indication of their commitment to accommodating bicyclists and pedestrians as an integral element of the transportation system. In support of this commitment, transportation agencies and local communities should go beyond minimum design standards and requirements to create safe, attractive, sustainable, accessible, and convenient bicycling and walking networks. Such actions should include:

- Considering walking and bicycling as equals with other transportation modes: The primary goal of a transportation system is to safely and efficiently move people and goods. Walking and bicycling are efficient transportation modes for most short trips and, where convenient intermodal systems exist, these non-motorized trips can easily be linked with transit to significantly increase trip distance. Because of the benefits they provide, transportation agencies should give the same priority to walking and bicycling as is given to other transportation modes. Walking and bicycling should not be an afterthought in roadway design.

- Ensuring that there are transportation choices for people of all ages and abilities, especially children: Pedestrian and bicycle facilities should meet accessibility requirements and provide safe, convenient, and interconnected transportation networks. For example, children should have safe and convenient options for walking or bicycling to school and parks. People who cannot or prefer not to drive should have safe and efficient transportation choices.

- Going beyond minimum design standards: Transportation agencies are encouraged, when possible, to avoid designing walking and bicycling facilities to the minimum standards. For example, shared-use paths that have been designed to minimum width requirements will need retrofits as more people use them. It is more effective to plan for increased usage than to retrofit an older facility. Planning projects for the long-term should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements.

- Integrating bicycle and pedestrian accommodation on new, rehabilitated, and limited-access bridges: DOT encourages bicycle and pedestrian accommodation on bridge projects including facilities on limited-access bridges with connections to streets or paths.

- Collecting data on walking and biking trips: The best way to improve transportation networks for any mode is to collect and analyze trip data to optimize investments. Walking and bicycling trip data for many communities are lacking. This data gap can be overcome by establishing routine collection of non-motorized trip information. Communities that routinely collect walking and bicycling data are able to track trends and prioritize investments to ensure the success of new facilities. These data are also valuable in linking walking and bicycling with transit.

- Setting mode share targets for walking and bicycling and tracking them over time: A byproduct of improved data collection is that communities can establish targets for increasing the percentage of trips made by walking and bicycling.

Removing snow from sidewalks and shared-use paths: Current maintenance provisions require pedestrian facilities built with Federal funds to be maintained in the same manner as other

roadway assets. State Agencies have generally established levels of service on various routes especially as related to snow and ice events.

Improving non-motorized facilities during maintenance projects: Many transportation agencies spend most of their transportation funding on maintenance rather than on constructing new facilities. Transportation agencies should find ways to make facility improvements for pedestrians and bicyclists during resurfacing and other maintenance projects.

CONCLUSION

Increased commitment to and investment in bicycle facilities and walking networks can help meet goals for cleaner, healthier air; less congested roadways; and more livable, safe, cost-efficient communities. Walking and bicycling provide low-cost mobility options that place fewer demands on local roads and highways. DOT recognizes that safe and convenient walking and bicycling facilities may look different depending on the context — appropriate facilities in a rural community may be different from a dense, urban area. However, regardless of regional, climate, and population density differences, it is important that pedestrian and bicycle facilities be integrated into transportation systems. While DOT leads the effort to provide safe and convenient accommodations for pedestrians and bicyclists, success will ultimately depend on transportation agencies across the country embracing and implementing this policy.

Ray LaHood, United States Secretary of Transportation

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION COMPLETE STREETS POLICY

http://www.bytrain.org/fra/general/ncdot_streets_policy.pdf

In 2009, NCDOT unveiled its efforts to routinely provide for all users of the roads - pedestrians, bicyclists, public transportation users, and motorists of all ages and abilities. The new document:

- Explains the scope and applicability of the policy ("all transportation facilities within a growth area of a town or city funded by or through NCDOT, and planned, designed, or constructed on state maintained facilities, must adhere to this policy");
- Asserts the Department's role as a partner to local communities in transportation projects;
- Addresses the need for context-sensitivity;
- Sets exceptions (where specific travelers are prohibited and where there is a lack of current or future need) and a clear process for granting them (approval by the Chief Deputy Secretary); and

- Establishes a stakeholders group, including transportation professionals and interest groups, tasked to create comprehensive planning and design guidelines in support of the policy.

Visit www.ncdot.gov for the full document.

FHWA MEMORANDUM ON MAINSTREAMING BICYCLE AND PEDESTRIAN PROJECTS

http://www.fhwa.dot.gov/environment/bikeped/bp-guid.htm

This memorandum transmits the Federal Highway Administration's (FHWA) Guidance on the Bicycle and Pedestrian Provisions of the Federal-aid Program and reaffirms our strong commitment to improving conditions for bicycling and walking. The non-motorized modes are an integral part of the mission of FHWA and a critical element of the local, regional, and national transportation system. Bicycle and pedestrian projects and programs are eligible for but not guaranteed funding from almost all of the major Federal-aid funding programs. We expect every transportation agency to make accommodation for bicycling and walking a routine part of their planning, design, construction, operations and maintenance activities.

The Transportation Equity Act for the 21st Century (TEA-21) continues the call for the mainstreaming of bicycle and pedestrian projects into the planning, design, and operation of our Nation's transportation system. Under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Federal spending on bicycle and pedestrian improvements increased from $4 million annually to an average of $160 million annually. Nevertheless, the level of commitment to addressing the needs of bicyclists and pedestrians varies greatly from State to State.

The attached guidance explains how bicycle and pedestrian improvements can be routinely included in federally funded transportation projects and programs. I would ask each division office to pass along this guidance to the State DOT and to meet with them to discuss ways of expediting the implementation of bicycle and pedestrian projects. With the guidance as a basis for action, States can then decide the most appropriate ways of mainstreaming the inclusion of bicycle and pedestrian projects and programs.

Bicycling and walking contribute to many of the goals for our transportation system we have at FHWA and at the State and local levels. Increasing bicycling and walking offers the potential for cleaner air, healthier people, reduced congestion, more livable communities, and more efficient use of precious road space and resources. That is why funds in programs such as Congestion Mitigation and Air Quality Improvement, Transportation Enhancements, and the National Highway System, are eligible to be used for bicycling and walking improvements that will encourage use of the two modes.

We also have a responsibility to improve the safety of bicycling and walking as the two modes represent more than 14 percent of the 41,000 traffic fatalities the nation endures each year.

Pedestrian and bicycle safety is one of FHWA's top priorities and this is reflected in our 1999 Safety Action Plan. As the attached guidance details, TEA-21 has opened up the Hazard Elimination Program to a broader array of bicycle, pedestrian, and traffic calming projects that will improve dangerous locations. The legislation also continues funding for critical safety education and enforcement activities under the leadership of the National Highway Traffic Safety Administration. If we are successful in improving the real and perceived safety of bicyclists and pedestrians, we will also increase use.

You will see from the attached guidance that the Federal-aid Program, as amended by TEA-21, offers an extraordinary range of opportunities to improve conditions for bicycling and walking. Initiatives such as the Transportation and Community and System Preservation Pilot Program and the Access to Jobs program offer exciting new avenues to explore.

Bicycling and walking ought to be accommodated, as an element of good planning, design, and operation, in all new transportation projects unless there are substantial safety or cost reasons for not doing so. Later this year (1999), FHWA will issue design guidance language on approaches to accommodating bicycling and pedestrian travel that will, with the cooperation of AASHTO, ITE, and other interested parties, spell out ways to build bicycle and pedestrian facilities into the fabric of our transportation infrastructure from the outset. We can no longer afford to treat the two modes as an afterthought or luxury.

The TEA-21 makes a great deal possible. However, in the area of bicycling and walking in particular, we must work hard to ensure good intentions and fine policies translate quickly and directly into better conditions for bicycling and walking. While FHWA has limited ability to mandate specific outcomes, I am committed to ensuring that we provide national leadership in three critical areas.

- The FHWA will encourage the development and implementation of bicycle and pedestrian plans as part of the overall transportation planning process. Every statewide and metropolitan transportation plan should address bicycling and walking as an integral part of the overall system, either through the development of a separate bicycle and pedestrian element or by incorporating bicycling and walking provisions throughout the plan. Further, I am instructing each FHWA division office to closely monitor the progress of projects from the long-range transportation plans to the STIPs and TIPs. In the coming months, FHWA will disseminate exemplary projects, programs, and plans, and we will conduct evaluations in selected States and MPOs to determine the effectiveness of the planning process.

- The FHWA will promote the availability and use of the full range of streamlining mechanisms to increase project delivery. The tools are in place for States and local government agencies to speed up the delivery of bicycle and pedestrian projects - it makes no sense to treat installation of a bicycle rack or curb cut the same way we treat a new Interstate highway project - and our division offices must take a lead in promoting and administering these procedures.

- The FHWA will help coordinate the efforts of Federal, State, metropolitan, and other relevant agencies to improve conditions for bicycling and walking. Once again, our division offices must ensure that those involved in implementing bicycle and pedestrian projects at the State and local level are given maximum opportunity to get their job done, unimpeded by regulations and red tape from the Federal level. I am asking each of our division offices to facilitate a dialogue among each State's bicycle and pedestrian coordinator, Transportation Enhancements program manager, Recreational Trails Program administrator, and their local and FHWA counterparts to identify and remove obstacles to the implementation of bicycle and pedestrian projects and programs.

In less than a decade, bicycling and walking have gone from being described by my predecessor Tom Larson as "the forgotten modes" to becoming a serious part of our national transportation system. The growing acceptance of bicycling and walking as modes to be included as part of the transportation mainstream started with passage of ISTEA in 1991 and was given a considerable boost by the Congressionally-mandated National Bicycling and Walking Study. That study, released in 1994, challenges the U.S. Department of Transportation to double the percentage of trips made by foot and bicycle while simultaneously reducing fatalities and injuries suffered by these modes by 10 percent - and we remain committed to achieving these goals.

The impetus of ISTEA and the National Bicycling and Walking Study is clearly reinforced by the bicycle and pedestrian provisions of the TEA-21. The legislation confirms the vital role bicycling and walking must play in creating a balanced, accessible, and safe transportation system for all Americans.

FHWA Guidance (1999) - Bicycle and Pedestrian Provisions of Federal Transportation Legislation

NCDOT Board of Transportation Resolution: Bicycling and Walking in North Carolina: A Critical Part of the Transportation System

http://www.ncdot.org/transit/bicycle/laws/laws_resolution.html

(ADOPTED BY THE BOARD OF TRANSPORTATION ON SEPTEMBER 8, 2000)

The North Carolina Board of Transportation strongly reaffirms its commitment to improving conditions for bicycling and walking, and recognizes nonmotorized modes of transportation as critical elements of the local, regional, and national transportation system.

WHEREAS, increasing bicycling and walking offers the potential for cleaner air, healthier people, reduced congestion, more liveable communities, and more efficient use of road space and resources; and

WHEREAS, crashes involving bicyclists and pedestrians represent more than 14 percent of the nation's traffic fatalities; and

WHEREAS, the Federal Highway Administration (FHWA) in its policy statement "Guidance on the Bicycle and Pedestrian Provisions of the Federal-Aid Program" urges states to include bicycle and pedestrian accommodations in its programmed highway projects; and

WHEREAS, bicycle and pedestrian projects and programs are eligible for funding from almost all of the major Federal-aid funding programs; and

WHEREAS, the Transportation Equity Act for the 21st Century (TEA-21) calls for the mainstreaming of bicycle and pedestrian projects into the planning, design and operation of our Nation's transportation system;

NOW, THEREFORE, BE IT RESOLVED, the North Carolina Board of Transportation concurs that bicycling and walking accommodations shall be a routine part of the North Carolina Department of Transportation's planning, design, construction, and operations activities and supports the Department's study and consideration of methods of improving the inclusion of these modes into the everyday operations of North Carolina's transportation system; and

BE IT FURTHER RESOLVED, North Carolina cities and towns are encouraged to make bicycling and pedestrian improvements an integral part of their transportation planning and programming.

NCDOT Policy on Street and Driveway Access to NC Highways

www.ncdot.org/doh/preconstruct/altern/value/manuals/pos.pdf

Refer to the NCDOT policy on 'Street and Driveway Access to North Carolina Highways' for examples on how to reduce conflict points between motor vehicles and pedestrians and bicyclists. Consider access management for both future development and retrofits to existing development:

NCDOT Administrative Action to Include Local Adopted Greenways Plans in the NCDOT Highway Planning Process

http://www.ncdot.gov/bikeped/download/bikeped_laws_greenway_admin_action.pdf

(ADOPTED JANUARY 1994)

In 1994 the NCDOT adopted administrative guidelines to consider greenways and greenway crossings during the highway planning process. This policy was incorporated so that critical corridors which have been adopted by localities for future greenways will not be severed by highway construction. Following are the text for the Greenway Policy and Guidelines for implementing it.

In concurrence with the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and the Board of Transportation's Bicycle Policy of 1978 (updated in 1991) and Pedestrian Policy of

1993, the North Carolina Department of Transportation recognizes the importance of incorporating local greenways plans into its planning process for the development and improvement of highways throughout North Carolina.

NCDOT Responsibilities: The Department will incorporate locally adopted plans for greenways into the ongoing planning processes within the Statewide Planning (thoroughfare plans) and the Planning and Environmental (project plans) Branches of the Division of Highways. This incorporation of greenway plans will be consistent throughout the department. Consideration will be given to including the greenway access as a part of the highway improvement.

Where possible, within the policies of the Department, within the guidelines set forth in provisions for greenway crossings, or other greenway elements, will be made as a part of the highway project or undertaken as an allowable local expenditure.

Local Responsibilities: Localities must show the same commitment to building their adopted greenway plans as they are requesting when they ask the state to commit to providing for a certain segment of that plan. It is the responsibility of each locality to notify the Department of greenway planning activity and adopted greenway plans and to update the Department with all adopted additions and changes in existing plans.

It is also the responsibility of each locality to consider the adopted transportation plan in their greenways planning and include its adopted greenways planning activities within their local transportation planning process. Localities should place in priority their greenways construction activities and justify the transportation nature of each greenway segment. When there are several planned greenway crossings of a proposed highway improvement, the locality must provide justification of each and place the list of crossings in priority order. Where crossings are planned, transportation rights of way should be designated or acquired separately to avoid jeopardizing the future transportation improvements.

NCDOT'S TRADITIONAL NEIGHBORHOOD DEVELOPMENT STREET DESIGN GUIDELINES

http://www.ncdot.org/doh/preconstruct/altern/value/manuals/tnd.pdf

These guidelines are available for proposed TND developments and permits localities and developers to design certain roadways according to TND guidelines rather than the conventional subdivision street standards. The guidelines recognize that in TND developments, mixed uses are encouraged and pedestrians and bicyclists are accommodated on multi-mode/shared streets.

GUIDELINES FOR NCDOT TO COMPLY WITH ADMINISTRATIVE DECISION TO INCORPORATE LOCAL GREENWAYS INTO HIGHWAY PLANNING PROCESS

- Thoroughfare plans will address the existence of greenways planning activity, which has been submitted by local areas. Documentation of mutually agreed upon interface points between the thoroughfare plan and a greenway plan will be kept, and this information will become a part of project files.

- Project Planning Reports will address the existence of locally adopted greenways segment plans, which may affect the corridor being planned for a highway improvement. It is, however, the responsibility of the locality to notify the Department of the adopted greenways plans (or changes to its previous plans) through its current local transportation plan, as well as its implementation programs.

- Where local greenways plans have not been formally adopted or certain portions of the greenways plans have not been adopted, the Department may note this greenway planning activity but is not required to incorporate this information into its planning reports.

- Where the locality has included adopted greenways plans as a part of its local transportation plan and a segment (or segments) of these greenways fall within the corridor of new highway construction or a highway improvement project, the feasibility study and/or project planning report for this highway improvement will consider the effects of the proposed highway improvement upon the greenway in the same manner as it considers other planning characteristics of the project corridor, such as archeological features or land use.

- Where the locality has justified the transportation versus the leisure use importance of a greenway segment and there is no greenway alternative of equal importance nearby, the project planning report will suggest inclusion of the greenway crossing, or appropriate greenway element, as an incidental part of the highway expenditure.

- Where the locality has not justified the transportation importance of a greenway segment, the greenway crossing, or appropriate greenway element, may be included as a part of the highway improvement plan if the local government covers the cost.

- A locality may add any appropriate/acceptable greenway crossing or greenway element at their own expense to any highway improvement project as long as it meets the design standards of the NCDOT.

- The NCDOT will consider funding for greenway crossings, and other appropriate greenway elements only if the localities guarantee the construction of and/or connection with other greenway segments. This guarantee should be in the form of inclusion in the local capital improvements program or NCDOT/municipal agreement.

- If the state pays for the construction of a greenway incidental to a highway improvement and the locality either removes the connecting greenway segments from its adopted greenways plans or decides not to construct its agreed upon greenway segment, the locality will reimburse the state for the cost of the greenway incidental feature. These details will be handled through a municipal agreement.

- Locality must accept maintenance responsibilities for state-built greenways, or portions thereof. Details will be handled through a municipal agreement.

NCDOT BICYCLE POLICY

GENERAL

Pursuant to the Bicycle and Bikeways Act of 1974, the Board of Transportation finds that bicycling is a bona fide highway purpose subject to the same rights and responsibilities and eligible for the same considerations as other highway purposes, as elaborated below.

1. The Board of Transportation endorses the concept that bicycle transportation is an integral part of the comprehensive transportation system in North Carolina.

2. The Board of Transportation endorses the concept of providing bicycle transportation facilities within the rights-of-way of highways deemed appropriated by the Board.

3. The Board of Transportation will adopt Design Guidelines for Bicycle Facilities. These guidelines will include criteria for selecting cost-effective and safety-effective bicycle facility types and a procedure for prioritizing bicycle facility improvements.

4. Bicycle compatibility shall be a goal for state highways, except on fully controlled access highways where bicycles are prohibited, in order to provide reasonably safe bicycle use.

5. All bicycle transportation facilities approved by the Board of Transportation shall conform with the adopted "Design Guidelines for Bicycle Facilities" on state-funded projects, and also to guidelines published by the American Association of State Highway and Transportation Officials (AASHTO) on federal aid projects.

PLANNING AND DESIGN

It is the policy of the Board of Transportation that bicycle facility planning be included in the state thoroughfare and project planning process.

1. The intent to include planning for bicycle facilities within new highway construction and improvement projects is to be noted in the Transportation Improvement Program.

2. During the thoroughfare planning process, bicycle usage shall be presumed to exist along certain corridors (e.g., between residential developments, schools, businesses and recreational areas). Within the project planning process, each project shall have a documented finding with regard to existing or future bicycling needs. In order to use available funds efficiently, each finding shall include measures of cost-effectiveness and safety-effectiveness of any proposed bicycle facility.

3. If bicycle usage is shown likely to be significant, and it is not prohibited, and there are positive cost-effective and safety-effective findings; then, plans for and designs of highway construction projects along new corridors, and for improvement projects along existing highways, shall include provisions for bicycle facilities (e.g., bike routes, bike lanes, bike paths, paved shoulders, wide outside lanes, bike trails) and secondary bicycle facilities (traffic control, parking, information devices, etc.).

4. Federally funded new bridges, grade separated interchanges, tunnels, and viaducts, and their improvements, shall be designed to provide safe access to bicycles, pursuant to the policies of the Federal Highway Administration.

5. Barriers to existing bicycling shall be avoided in the planning and design of highway projects.

6. Although separate bicycle facilities (e.g., bike paths, bike trails) are useful under some conditions and can have great value for exclusively recreational purposes, incorporation of on road bicycle facilities (e.g., bicycle lanes, paved shoulders) in highway projects are preferred for safety reasons over separate bicycle facilities parallel to major roadways. Secondary complementary bicycle facilities (e.g., traffic control, parking, information devices, etc.) should be designed to be within highway rights-of-way.

7. Technical assistance shall be provided in the planning and design of alternative transportation uses, including bicycling, for abandoned railroad rights-of way. This assistance would be pursuant to the National Trails act Amendment of 1983, and the resultant national Rails to Trails program, as will the Railway Revitalization Act of 1975.

8. Wherever appropriate, bicycle facilities shall be integrated into the study, planning, design, and implementation of state funded transportation projects involving air, rail, and marine transportation, and public parking facilities.

9. The development of new and improved bicycle control and information signs is encouraged for the increased safety of all highway users.

10. The development of bicycle demonstration projects which foster innovations in planning, design, construction, and maintenance is encouraged.

11. Paved shoulders shall be encouraged as appropriate along highways for the safety of all highway users, and should be designed to accommodate bicycle traffic.

12. Environmental Documents/Planning Studies for transportation projects shall evaluate the potential use of the facility by bicyclists and determine whether special bicycle facility design is appropriate.

13. Local input and advice shall be sought, to the degree practicable, during the planning stage and in advance of the final design of roadway improvements to ensure appropriate consideration of bicycling needs, if significant.

14. On highways where bicycle facilities exist, (bike paths, bike lanes, bike routes, paved shoulders, wide curb lanes, etc.), new highway improvements shall be planned and implemented to maintain the level of existing safety for bicyclists.

15. Any new or improved highway project designed and constructed within a public-use transportation corridor with private funding shall include the same bicycle facility considerations as if the project had been funded with public funds. In private transportation projects (including parking facilities), where state funding or Department approval is not involved, the same guidelines and standards for providing bicycle facilities should be encouraged.

CONSTRUCTION

It is the policy of the Board of Transportation that all state and federally funded highway projects incorporating bicycle facility improvements shall be constructed in accordance with approved state and federal guidelines and standards.

1. Bicycle facilities shall be constructed, and bicycle compatibility shall be provided for, in accordance with adopted Design Guidelines for Bicycle Facilities and with guidelines of the American Association of State Highway and Transportation Officials.

2. Rumble strips (raised traffic bars), asphalt concrete dikes, reflectors, and other such surface alterations, where installed, shall be placed in a manner as not to present hazards to bicyclists where bicycle use exists or is likely to exist. Rumble strips shall not be extended across shoulder or other areas intended for bicycle travel.

3. During restriping operations, motor vehicle traffic lanes may be narrowed to allow for wider curb lanes.

MAINTENANCE

It is the policy of the Board of Transportation that the state highway system, including state-funded bicycle facilities, shall be maintained in a manner conducive to bicycle safety.

1. State and federally funded and built bicycle facilities within the state right-of-way are to be maintained to the same degree as the state highway system.

2. In the maintenance, repair, and resurfacing of highways, bridges, and other transportation facilities, and in the installation of utilities or other structures, nothing shall be done to diminish existing bicycle compatibility.

3. Rough road surfaces which are acceptable to motor vehicle traffic may be unsuitable for bicycle traffic, and special consideration may be necessary for highways with significant bicycle usage.

4. For any state-funded bicycle project not constructed on state right-of-way, a maintenance agreement stating that maintenance shall be the total responsibility of the local government sponsor shall be negotiated between the Department and the local government sponsor.

5. Pot-holes, edge erosion, debris, etc., are special problems for bicyclists, and their elimination should be a part of each Division's maintenance program. On identified bicycle facilities, the bike lanes and paths should be routinely swept and cleared of grass intrusion, undertaken within the discretion and capabilities of Division forces.

OPERATIONS

It is the policy of the Board of Transportation that operations and activities on the state highway system and bicycle facilities shall be conducted in a manner conducive to bicycle safety.

1. A bicyclist has the right to travel at a speed less than that of the normal motor vehicle traffic. In exercising this right, the bicyclist shall also be responsible to drive his/her vehicle safely, with due consideration to the rights of the other motor vehicle operators and bicyclists and in compliance with the motor vehicle laws of North Carolina.

2. On a case by case basis, the paved shoulders of those portions of the state's fully controlled access highways may be studied and considered as an exception for usage by bicyclists where adjacent highways do not exist or are more dangerous for bicycling. Pursuant to federal highway policy, usage by bicyclists must receive prior approval by the Board of Transportation for each specific segment for which such usage is deemed appropriate, and those segments shall be appropriately signed for that usage.

3. State, county, and local law enforcement agencies are encouraged to provide specific training for law enforcement personnel with regard to bicycling.

4. The use of approved safety helmets by all bicyclists is encouraged.

EDUCATION

It is the policy of the Board of Transportation that education of both motorists and bicyclists, regarding the rights and responsibilities of bicycle riders, shall be an integral part of the

Department's Bicycle Program. School systems are encouraged to conduct bicycle safety education programs as a part of and in addition to the driver's education program, to the maximum extent practicable, and in conjunction with safety efforts through the Governor's Highway Safety Program. The Division of Motor Vehicles is also urged to include bicycle safety and user information in its motor vehicle safety publications.

PARKING

It is the policy of the Board of Transportation that secure and adequate bicycle parking facilities shall be provided wherever practicable and warranted in the design and construction of all state-funded buildings, parks, and recreational facilities.

APPENDIX H - GLOSSARY OF TERMS

"A" Cyclist – a term generally used to describe experienced or advanced bicyclists that are comfortable in all cycling environments, even busy roadways that lack bicycle facilities. "A" Cyclists will typically bicycle in any condition, whether hospitable or not.

"B" Cyclist – a term generally used to describe intermediate level cyclists, who bicycle for reasons ranging from recreation and fitness riding to commuting. "B" cyclists typically prefer on-street bicycle facilities, such as bicycle lanes and paved shoulder.

"C" Cyclist – a term generally used to describe beginner, juvenile or elderly cyclists who are not comfortable bicycling in an environment with significant motor vehicle traffic. Typically, "C" cyclists prefer to cycle on multi-use paths, greenways, and calm neighborhood streets.

AASHTO – American Association of State Highway and Transportation Officials: a nonprofit, nonpartisan association representing highway and transportation departments of all transportation modes in the 50 states, the District of Columbia and Puerto Rico.

ADA – American Disabilities Act of 1991: The Act gives civil rights protections to individuals with disabilities including equal opportunities in public accommodations, employment, transportation, state and local government services, and telecommunications.

Advance Stop lines – applies to a stop line placed prior to a crosswalk or bicycle box, to either prevent motor vehicle encroachment, or to improve visibility. It plays an important safety role especially in multi-lane roads.

Alternative Transportation Network – a connected system for travel using transportation other than private cars, such as walking, bicycling, rollerblading, carpooling and transit

Arterial Connections – interconnected corridors designed to accommodate a large volume of through traffic

Bicycle – every vehicle propelled solely by human power upon which any person may ride, having two tandem wheels, except scooters and similar devices. The term "bicycle" in this document also includes three- and four-wheeled human-powered vehicles, but not tricycles for children.

Bicycle Boulevard – is a shared roadway which has been optimized for bicycle traffic. In contrast with other shared roadways, bicycle boulevards discourage cut-through motor vehicle traffic, but typically allow local motor vehicle traffic. They are designed to give priority to cyclists as through-going traffic. They improve bicycle safety and circulation in various ways.

Bicycle Lane – a portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.

Bicycle Facilities – a general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically designated for bicycle use.

Bicycle Route System – a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational route markers, with or without specific bicycle route numbers. Bike routes should establish a continuous routing, but may be a combination of any and all types of bikeways.

Bikeway – a generic term for any road, street, path or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

Collector Streets – a public road designed to flow traffic from small neighborhood streets and connect to larger thoroughfares.

Community Park – a park that is intended for use by all residents of the town and is designated as a Community Park.

Concurrent Signal Timing – motorists running parallel to a crosswalk are allowed to turn into and through the crosswalk (left or right) after yielding to bicyclists or pedestrians.

Connectivity – the logical and physical interconnection of functionally related points so that people can move among them.

Corridor – a spatial link between two or more significant locations.

Crosswalk – a designated point on a road at which some means are employed to assist pedestrians who wish to cross a roadway or intersection. They are designed to keep pedestrians together where they can be seen by motorists, and where they can cross most safely with the flow of vehicular traffic.

Curb Cut – interruption in the curb, as for a driveway.

Curb Ramp – a ramp leading smoothly down from a sidewalk, greenway or multi-use path to an intersecting street, rather than abruptly ending with a curb.

Driveway Apron – the section of a driveway between a sidewalk or greenway and the curb.

FHWA – Federal Highway Administration

Grade-Separated Crossings – a grade-separated crossing that provides continuity of a bicycle/pedestrian facility over or under a barrier. A bicycle/pedestrian crossing structure may be either a bridge or an underpass.

Greenway – a linear path or open space, often composed of natural vegetation. Greenways can be used to create connected networks of open space that include traditional parks and natural areas specifically designed for pedestrian and bicycle use. Greenways provide an off-street component to the bicycle network.

High Volume Artery – an important transportation corridor that is used by large traffic levels.

Highway – a general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

Intersection – an area where two or more roadways join together.

ISTEA – Intermodal Surface Transportation Efficiency Act of 1991.

Median – a barrier, constructed of concrete, asphalt, or landscaping, that separates two directions of traffic.

MPO – Metropolitan Planning Organization.

Multi-Use Pathways – a multi-use pathway that is physically separated from motor vehicle traffic, and can be either within the highway right-of-way or within an independent right-of-way. Multi-Use pathways include bicycle paths, rail-trails or other facilities built for bicycle and pedestrian traffic.

MUTCD – Manual of Uniform Traffic Control Devices: National standards guidebook on signage and pavement marking for roadways.

NCDOT – North Carolina Department of Transportation.

Off-Road Trail – paths or trails in areas not served by the street system, such as parks and greenbelt corridors. Off-street paths are intended to serve both recreational uses and other trips, and may accommodate other non-motorized travel modes, such as bicycles in addition to walking.

On-Street Bicycle Facility – any bicycle facility that is constructed or marked on a roadway, such as a shared roadway, signed route, wide outside lane, bicycle lane, or paved shoulder.

Pedestrian – a person on foot or a person on roller skates, roller blades, child's tricycle, non-motorized wheelchair, skateboard, or other non-powered vehicles (excluding bicycles).

Public Access Easement – a voluntary legal agreement which grants a municipality a perpetual right-of-way and easement for public access and public benefit.

Public Street Right-of-Way – any public right-of-way set aside for public travel which is accepted or eligible to be accepted for maintenance by the State of North Carolina or the town.

Rail-Trail – a shared use path, either paved or unpaved, built within the right-of-way of an existing or former railroad.

Right-of-Way – the right of one vehicle or pedestrian to proceed in a lawful manner in preference to another vehicle or pedestrian.

Road Diet – reconfiguring or reducing the number or width of motorized vehicle lanes to provide room to integrate a bicycle facility into a roadway. Commonly used on 4 lane roads with moderate motorized traffic volumes. Generally roadways are reconfigured to include a center turn lane, two 5' bicycle lanes and two motor vehicle travel lanes on either side.

Roadway – the portion of the highway, including shoulders, intended for vehicular use.

Roundabout – traffic-calming device at which traffic streams circularly around a central island after first yielding to the circulating traffic.

Rumble Strips—a textured or grooved pavement sometimes used on or along shoulders of highways to alert motorists who stray onto the shoulder.

Safe Routes to School (SRTS) – a federal program that provides funding to encourage and facilitate the planning and implementation of bicycle and pedestrian projects near schools.

Shared Roadway – a roadway which is open to both bicycle and motor vehicle travel. This may be an existing roadway, street with wide curb lanes, or road with paved shoulders.

Sharrow – painted roadway marking that alerts motorists that bicyclists are present and frequently use the roadway.

Shoulder – the portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use and for lateral support of sub-base, base and surface courses.

Sidewalk – the portion of a street or highway right-of-way designed for preferential or exclusive use by pedestrians.

Signed Bicycle Routes – typically designated along more lightly traveled residential or secondary roads and indicated by signs with or without a specific route number. This type of facility should have appropriate directional and informational markers.

Street, Public – a right-of-way or fee-simple tract of land which has been set aside for public travel, dedicated to the public by the recording of a subdivision plat, built to public street standards, and eligible for maintenance by either the town or the State of North Carolina.

Thoroughfare – any street on the adopted thoroughfare plan or any street which is an extension of any street on the thoroughfare plan and which extends into the area not covered by the thoroughfare plan.

Traffic Calming – a range of measures that reduce the impact of vehicular traffic on residents, pedestrians and cyclists.

Traveled Way – the portion of the roadway for the movement of vehicles, exclusive of shoulders.

Unpaved Path – paths not surfaced with asphalt or Portland cement concrete.

Wide Paved Shoulders – additional pavement width of at least 4' that has been added to an existing roadway in order to more safely accommodate bicycles. A paved shoulder refers to the part of the highway that is adjacent to the regularly traveled portion of the highway and is on the same level as the highway. Ideally, wide paved shoulders should be included in the construction of new highways and the upgrade of existing highways where there is a significant level of current/potential bicycle travel.

Wide Outside Lanes – the through lane closest to the curb and gutter of a roadway. Dedicated right-turn-only lanes are not used for wide outside lanes.

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APPENDIX I - REFERENCES

- AASHTO, Guide for the Development of Bicycle Facilities, http://www.sccrtc.org/bikes/AASHTO_1999_BikeBook.pdf
- Association of Pedestrian and Bicycle Professionals, http://www.apbp.org/
- Bikes Belong Coalition, http://www.bikesbelong.org/
- Department of Army Ammunition and Explosives Safety Standards, http://www.army.mil/usapa/epubs/pdf/p385_64.pdf
- DOD Ammunition and Explosives Safety Standards (July 1999), http://www.ddesb.pentagon.mil/DoD6055.9-STD%205%20Oct%202004.pdf
- FHWA Policy for Mainstreaming Non-motorized Transportation (FHWA Guidance – Bicycling and Pedestrian Provision of Federal Transportation Legislation) - http://www.fhwa.dot.gov/environment/bikeped/bp-guid.htm
- Fundamentals of Bicycle Boulevard Planning & Design, July 2009
- Island Greenway, http://www.islandgreenway.org/
- Land and Water Conservation Fund, http://www.nps.gov/ncrc/programs/lwcf/
- League of American Bicyclists, http://www.bikeleague.org/
- National Center for Safe Routes to School, http://www.saferoutesinfo.org/about/
- National Complete Streets Coalition, The Complete Streets Act of 2009, http://www.completestreets.org/federal-policy/
- NCDOT Bicycle & Bikeway Act of 1974 Laws and Policies, http://www.ncdot.gov/bikeped/download/bikeped_laws_bikeway_act.pdf
- NCDOT Bicycle and Bikeway Act, http://www.ncdot.gov/bikeped/lawspolicies/laws/
- NCDOT Bicycle Helmet Law, http://www.ncdot.gov/bikeped/lawspolicies/laws/
- NCDOT Bicycle Policy Guidelines http://www.ncdot.gov/bikeped/download/bikeped_laws_Bicycle_Policy.pdf
- NCDOT Bicycle Racing Guidelines, http://www.ncdot.gov/bikeped/lawspolicies/laws/
- NCDOT Bicycling and Walking in North Carolina, A Long Range Transportation Plan, http://www.walkinginfo.org/library/details.cfm?id=90
- NCDOT Board of Transportation Resolution for Bicycling and Walking - http://www.ncdot.org/transit/bicycle/laws/laws_resolution.html

- NCDOT Complete Streets Policy http://www.bytrain.org/fra/general/ncdot_streets_policy.pdf
- NCDOT Division of Bicycle and Pedestrian Transportation, http://www.ncdot.org/bikeped/default.html
- NCDOT Governor's Highway Safety Program, http://www.ncdot.org/programs/ghsp/
- NCDOT Greenway Policy http://www.ncdot.gov/bikeped/download/bikeped_laws_Greenway_Admin_Action.pdf
- NCDOT North Carolina Bicycle Facilities Planning and Design Guidelines, http://www.ncdot.org/bikeped/projectdevelopment/design_guidelines/
- NCDOT Powell Bill Funds, http://ncdot.org/programs/powell_bill/
- NCDOT Safe Routes to School Program, http://www.ncdot.gov/bikeped/
- NCDOT The Economic Impact of Investments in Bicycle Facilities: A Case Study, http://www.ncdot.org/bikeped/researchreports/
- NCDOT Traditional Neighborhood Development Street Design Guidelines (http://www.ncdot.org/doh/preconstruct/altern/value/manuals/tnd.pdf). These guidelines are available for proposed TND developments and permits localities and developers to design certain roadways according to TND guidelines rather than the conventional subdivision street standards. The guidelines recognize that in TND developments, mixed uses are encouraged and pedestrians and bicyclists are accommodated on multi-mode/shared streets.
- NCDOT Transportation Enhancement Activities, http://www.ncdot.org/programs/enhancement/
- NCDOT Transportation Improvement Program, http://www.ncdot.org/performance/reform/
- North Carolina Clean Water Management Trust Fund, http://www.cwmtf.net
- North Carolina State Parks, Adopt-A-Trail Program, http://www.ncparks.gov/Visit/main.php
- North Carolina State Parks, Parks and Recreation Trust Fund Grant Program, http://www.ncparks.gov/About/grants/partf_main.php
- peter j. smith & company, inc., Master Development Plan, http://www.carolinabeach.org/site_new/pages/documents/CBMasterDev.PlanMay2008_pjs.pdf
- Pleasure Island Chamber of Commerce, http://www.pleasureislandnc.org/

- Southern Pines Bicycle Transportation Plan 2010, http://www.greenways.com/southernpines_download.html
- Town of Carolina Beach, 2007 CAMA Land Use Plan, http://www.carolinabeach.org/site_new/pages/documents/2007CRCapprovedLUP.pdf
- Town of Carolina Beach, 2008-2013 Parks, Recreation, and Open Space Master Plan, http://www.carolinabeach.org/site_new/pages/documents/MasterPlanC-B2.4.08.pdf
- Town of Carolina Beach, Bikeway Routing Plan
- Town of Carolina Beach, Code of Ordinances, http://www.carolinabeach.org/site_new/pages/adopt_ord05.html
- Town of Carolina Beach, http://www.carolinabeach.org
- Town of Carolina Beach, Master Development Plan
- United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations (March 2010) - http://www.fhwa.dot.gov/environment/bikeped/policy_accom.htm
- US Department of Transportation, Federal Highway Administration, SAFETEA-LU, http://www.fhwa.dot.gov/safetealu/factsheets/hsip.htm
- US Department of Transportation, Federal Highway Administration, American Recovery and Reinvestment Act of 2009, http://www.fhwa.dot.gov/economicrecovery/index.htm
- US Department of Transportation, Federal Highway Administration, Recreational Trails Program, http://www.fhwa.dot.gov/environment/rectrails/index.htm
- US Department of Transportation, Federal Highway Administration, Surface Transportation Program, http://www.fhwa.dot.gov/programadmin/113005.cfm
- US Department of Transportation, Federal Highway Administration, Hazard Elimination & Railroad-Highway Crossing Program, http://www.fhwa.dot.gov/tea21/factsheets/stp.htm
- US Department of Transportation, Federal Highway Administration, Congestion Mitigation and Air Quality Improvement Program, http://www.fhwa.dot.gov/environment/cmaqpgs/
- Walk Score, http://www.walkscore.com/
- Wilmington Urban Area Metropolitan Planning Organization, Dow Road Corridor Study, http://www.wmpo.org/plans.html

- Wilmington Urban Area Metropolitan Planning Organization, http://www.wmpo.org/