



Town of Carolina Beach Pedestrian Plan

MAY 2018



Prepared for:



Prepared by:





Acknowledgments

Steering Committee

The project team would like to thank the following Steering Committee members for providing guidance throughout the planning process:

- › Town of Carolina Beach, New Hanover County
- › Town of Carolina Beach, Operations and Public Works
- › Town of Carolina Beach, Parks and Recreation
- › Town of Carolina Beach, Planning and Zoning
- › New Hanover County
- › North Carolina Department of Transportation, Division 3
- › North Carolina Department of Transportation, Division of Bicycle and Pedestrian Transportation
- › Plantation Building Corp
- › US Army Corps – Military Ocean Terminal Sunny Point
- › Wilmington Urban Area Metropolitan Planning Organization
- › VHB Engineering NC, P.C.

Executive Summary

Project Background

This Plan is intended to provide a framework for identifying pedestrian needs, both in terms of physical infrastructure and encouragement programs for the Town of Carolina Beach (Town). The vision for this pedestrian master plan is to enhance the livability of Carolina Beach by creating an appealing, walkable environment for both residents and visitors. This Plan builds upon existing plans and prioritizes public involvement.

Through this Plan and its process, the Town hopes to accomplish the following:

- › Promote a culture of walking and active living.
- › Enhance access to local businesses, neighborhoods, parks, and the beach by foot.
- › Emphasize the safety of pedestrians while accommodating motorized traffic in an efficient manner.
- › Create an aesthetically attractive environment that will appeal to residents and visitors.
- › Develop a framework to update this Plan in the future.

Plan Components

This Plan assists the Town in moving from the planning stage into implementation. To do so, it establishes a clear purpose (Section 1), assesses current conditions (Section 2), recommends facility improvements (Section 3), includes program and policy recommendations (Section 4), and outlines a plan for implementation (Section 5). Appendices include a summary of facility types and guidelines, potential funding sources, proposed infrastructure projects, and public comments received by the project team.



Steering Committee

This planning process involved direct input from local stakeholders, collection and synthesis of existing conditions data, public outreach components, as well as guidance from a Steering Committee of project champions. The project Steering Committee included business owners, Town staff, North Carolina Department of Transportation (NCDOT), New Hanover County, the United States Army, and Wilmington Urban Area Metropolitan Planning Organization (WMPO). Building on the project vision, the Steering Committee adopted the following Goals and Objectives for the Plan:

1. Enhance a sense of pride within the Carolina Beach community by creating aesthetically appealing, safe, and socially-oriented pedestrian facilities.
2. Identify and address gaps in the pedestrian infrastructure network, particularly between existing facilities, as well as between residential and commercial neighborhoods.
3. Provide viable alternatives to driving, not only to reduce motor vehicle traffic, but to reduce the need to provide automobile-oriented facilities.
4. Prioritize facility recommendations and identify potential funding sources.

Public Involvement

Two (2) public meetings were held for the project team to engage the public. Public Meeting #1 presented existing conditions, as well as goals and objectives of the plan. Attendees were asked to identify typical destinations, potentially unsafe locations, and potential areas for future improvements. Public Meeting #2 presented priority corridors for discussion as well as draft priority locations and project and policy recommendations. Attendees

provided their input on priority locations, facility improvements, and general discussion on pedestrian issues.

In addition to public meetings, a public survey questionnaire was conducted to gather preference information from residents. The survey was available online and notices were posted in the water bill sent to Town residents, as well as linked through the Town Facebook and Twitter pages. In total, 1,006 responses were collected through this three-month survey.

Survey respondents expressed a strong desire to improve pedestrian safety, specifically a lack of connected sidewalks, unsafe vehicle speeds, and unsafe crossing locations, particularly along Lake Park Boulevard. Many residents are willing to be more active with the support of safe, connected infrastructure, lower vehicle speeds, and encouragement programming.



Data Collection and Analysis

Carolina Beach is a thriving beach community with many recreation opportunities for both residents and visitors. It also benefits from a dense, gridded street network that allows people to efficiently walk to their destinations. In addition to the beach itself, there are several parks, restaurants, and shopping destinations conveniently located for pedestrians in the community. Opportunities in Carolina Beach include attractive destinations, a dense and walkable street grid, planned facility improvements, existing pedestrian safety countermeasures, and ongoing municipal utility work that has the potential to add sidewalks to 50 blocks in Carolina Beach.

Some of the challenges to improving the pedestrian network include automobile-oriented commercial development along Lake Park Boulevard (US 421), high speed limits, limited sidewalk coverage, limited marked crosswalks, lack of public facilities connecting to the beach, narrow roadway rights-of-way, and high numbers of pedestrian crashes since 2007.



Plan Development and Recommendations

The Town has many advantages that encourage active transportation. As a beach community, it is a natural hub of recreation and social activity and encourages people to go outside and interact in community spaces. The need to build an everyday network for residents was a primary guiding principle in the Plan, as well as creating an aesthetically appealing network, safe crossings, and target both driver and pedestrian behavior.

A critical guiding principle in developing recommendations was the need to build an everyday network for residents, not just for seasonal visitors. As the Plan developed, other vital design principles were incorporated for the final recommendations, including:

- › Building an aesthetically appealing network that enhances the sense of community in Carolina Beach.
- › Creating safe crossings, particularly along Lake Park Boulevard and Dow Road, to encourage people to move more freely through the Town.
- › Taking approaches that target driver behavior as well as pedestrian behavior and making drivers more aware of their responsibility to share the roadway.

Qualitative data like these observations supplemented the existing quantitative data to shape the type and location of facility recommendations.

Priority Corridors

Priority corridors are the framework around which individual project recommendations were developed. These serve as the trunk of the network, with secondary corridors branching out and filling in neighborhood communities. Priority corridors represent

the most direct routes between residents and desired destinations and were identified as having conditions suitable for near-term facility construction. Secondary corridors support the primary corridors, though they may not form a complete network.

Facility Recommendations

The project team applied an iterative process involving stakeholder direction, geographic distribution, significant destinations, the existing pedestrian network, and priority corridors to identify potential facility recommendation projects. The final list of projects is displayed in Figure ES-1 and Table ES-2.

Each project was then evaluated and ranked using criteria that was adapted from WMPO's *Cape Fear Transportation 2040* plan and modified by the Steering Committee to align the priorities of this Plan with those of the community. More important factors received a score of 10, while less important factors received 5 or 3 points (Table ES-1).

Project rankings are merely a guide for future planning considerations and not necessarily the exact sequence for implementation. The success of certain projects may be contingent on the implementation of other planned recommendations that connect for form a complete network.

Table ES-1. Evaluation Criteria

Goal	Objective	Priority – Weight (Max Score)
Safety	Prioritize projects within a proximity of existing signalized intersections (within 400')	High – 10 points
Connectivity	Prioritize facilities within ¼ mile of an identified local community resource	High – 10 points
Implementation	Prioritize projects identified in previous plans	High – 10 points
Connectivity	Prioritize connectivity between residential neighborhoods and commercial district	Medium – 5 points
Connectivity	Prioritize extension of an existing sidewalk/shared-use path network (within 400')	Medium – 5 points
Cost	Prioritize projects that are cost efficient	Medium – 5 points
Connectivity	Prioritize facilities within ¼ mile of Carolina Beach Elementary School	Low – 3 points
Transportation Choice	Prioritize facilities within 0.25 miles of Wave Transit stops	Low – 3 points

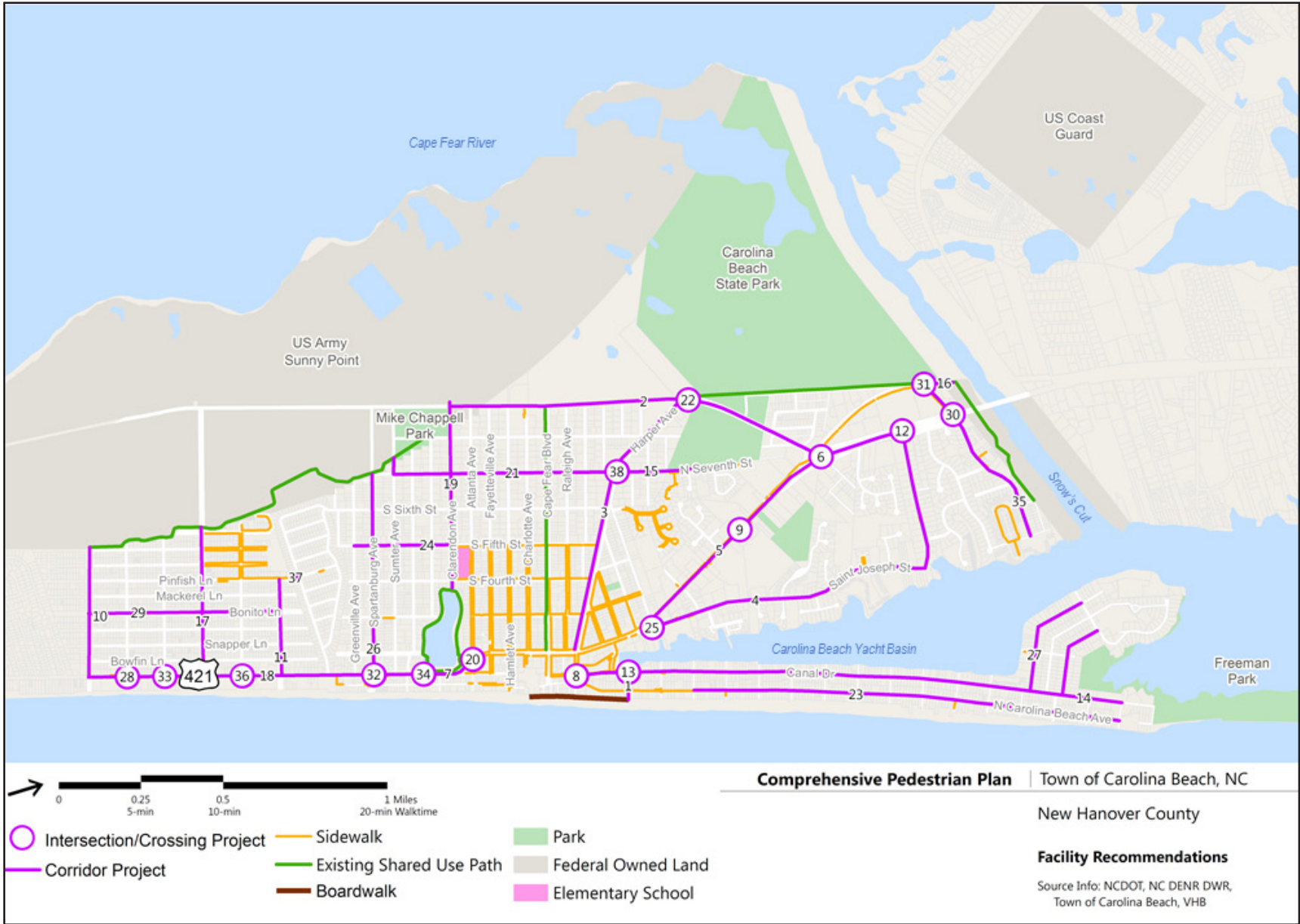


Figure ES-1. Facility Recommendations Map

Table ES-2. Facility Recommendations Table

Project ID	Project Type	Project Location	From	To	MTP 2040	NHC Greenway	CB Bicycle	Project Length (feet)	Roadway Maintenance	Improvement Type	Improvement Description
1	Corridor	Pelican Lane	Canal Drive	CB Waterfront Trail Extension		X		446	Local	New facility	Sidewalks on one/both sides
2	Corridor	Dow Road	Clarendon Avenue	Lake Park Boulevard	X		X	6,225	State	New facility	Multi-use path along east ROW. Vegetation and drainage may be obstacles.
3	Corridor	Harper Avenue	Dow Road	Lake Park Boulevard	X		X	4,510	Local	New facility	Multi-use path along south ROW. Driveways and utility poles may be obstacles.
4	Corridor	St. Joseph Street	Lake Park Boulevard	Lake Park Boulevard			X	6,925	Local	New facility	Sidewalks on both sides
5	Corridor	Lake Park Boulevard - North	St. Joseph Street	Lewis Drive			X	5,294	State	Operational	Fill sidewalk gaps where necessary, especially along east ROW. Consider advance warning signage
6	Point	Lake Park Boulevard	Dow Road	N/A			X	-	State	Safety	High-visibility crosswalks and pedestrian countdown signals at one or more legs
7	Corridor	Lake Park Boulevard - Central	Carolina Sands Drive	Atlanta Avenue			X	2,401	State	New facility	Sidewalks on both sides; fill gaps where necessary. Utility poles are obstacles.
8	Point	Harper Avenue	Canal Drive	N/A				-	Local	Safety	Additional pedestrian signal heads, pedestrian phasing, and raise the intersection
9	Point	Lake Park Boulevard	@ Potential Harris Teeter	N/A			X	-	State	Safety	High-visibility crosswalk and pedestrian countdown signals at proposed driveway
10	Corridor	Alabama Avenue	Island Greenway	Lake Park Boulevard		X	X	2,089	Local	New facility	Multi-use path along north ROW
11	Corridor	Tennessee Avenue	Pinfish Lane	Lake Park Boulevard			X	1,544	Local	New facility	Multi-use path along south ROW
12	Point	Lake Park Boulevard	Lewis Drive	N/A			X	-	State	Safety	High-visibility crosswalk and pedestrian countdown signals at south leg of the intersection
13	Point	Canal Drive	Pelican Lane	N/A				-	Local	Safety	Rectangular rapid flashing beacon & high-visibility crosswalk

Project ID	Project Type	Project Location	From	To	MTP 2040	NHC Greenway	CB Bicycle	Project Length (feet)	Roadway Maintenance	Improvement Type	Improvement Description
14	Corridor	Canal Drive	Carolina Beach Avenue	Salt Marsh Lane				8,804	Local	Operational	Sidewalk (5') along one/both sides of the ROW. Possible curb and gutter needed. ROW and stormwater drainage will be constraint.
15	Corridor	7th Street - North	Harper Avenue	@ Rec Center		X		1,831	Local	New facility	Sidewalks on one/both sides. Alternate sides if necessary to avoid utilities/impediments
16	Corridor	Bridge Barrier Road	Greenway Path	Old Dow Road	X			400	Local	Operational	Pedestrian path
17	Corridor	Ocean Boulevard	Island Greenway	Lake Park Boulevard		X	X	2,396	State	New facility	Multi-use path along north ROW
18	Corridor	Lake Park Boulevard - South	Alabama Avenue	Carolina Sands Drive		X	X	3,867	State	New facility	Sidewalks on both sides with lighting improvements. Utility poles are obstacles.
19	Corridor	Clarendon Avenue	Dow Road	4th Street	X	X	X	2,988	Local	New facility	Multi-use path along south ROW. Utility poles may be obstacles.
20	Point	Atlanta Avenue	Lake Park Boulevard	N/A				-	State	Operational	Intersection/Crossing improvement with 4'-6' pedestrian refuge treatment on the north leg
21	Corridor	7th Street - South	Sumter Avenue	Harper Avenue			X	3,824	Local	New facility	Sidewalks on one/both sides. Alternate sides if necessary to avoid utilities/impediments
22	Point	Dow Road	Harper Avenue	N/A	X		X	-	State	Operational	Rectangular rapid flashing beacon, high-visibility crosswalks, and median refuge island
23	Corridor	Carolina Beach Avenue	Scallop Lane	Salt Marsh Lane			X	6,866	Local	Operational	Extend sidewalk along east ROW. ROW and utility poles are obstacles. Stormwater drainage is an issue currently.
24	Corridor	5th Street	Greenville Avenue	Clarendon Avenue				1,565	Local	New facility	Sidewalks on one/both sides. Alternate sides if necessary to avoid utilities/impediments
25	Point	St. Joseph Street	Lake Park Boulevard	N/A			X	-	State	Operational	Pedestrian hybrid beacon (PHB)

Project ID	Project Type	Project Location	From	To	MTP 2040	NHC Greenway	CB Bicycle	Project Length (feet)	Roadway Maintenance	Improvement Type	Improvement Description
26	Corridor	Spartanburg Avenue	Island Greenway	Lake Park Boulevard				3,226	Local	New facility	Sidewalks on one/both sides. Utility poles are obstacles.
27	Corridor	Florida Avenue & Virginia Avenue	Maryland Avenue	Canal Drive				3,136	Local	New facility	Sidewalk constructed in conjunction with utility work
28	Point	Texas Avenue	Lake Park Boulevard	N/A				-	State	Operational	Rectangular rapid flashing beacon & high-visibility crosswalk
29	Corridor	Bonito Lane	Alabama Avenue	Tennessee Avenue			X	3,081	Local	New facility	Multi-use path along west ROW
30	Point	Lake Park Boulevard	Snows Cut Bridge	N/A				-	State	Safety	Watch/Warning signage
31	Point	Spencer Farlow Drive	Old Dow Road	N/A				-	Local	Operational	Intersection/Crossing improvement
32	Point	Spartanburg Avenue	Lake Park Boulevard	N/A				-	State	Operational	Rectangular rapid flashing beacon & high-visibility crosswalk
33	Point	South Carolina	Lake Park Boulevard	N/A				-	State	Operational	Rectangular rapid flashing beacon & high-visibility crosswalk
34	Point	Lake Park Boulevard	Carolina Beach Lake Park	N/A			X	-	State	Operational	Rectangular rapid flashing beacon & high-visibility crosswalk
35	Corridor	Spencer Farlow Drive	Old Dow Road	Risso Lane				3,077	Local	Operational	Sidewalks on one/both sides
36	Point	North Carolina Avenue	Lake Park Boulevard	N/A				-	State	Operational	Rectangular rapid flashing beacon & high-visibility crosswalk
37	Corridor	Carolina Sands Connection	Pinfish Lane	Carolina Sands Drive				155	Local	Operational	Sidewalk
38	Point	Harper Avenue	7th Street	N/A			X	-	Local	Operational	Intersection/Crossing improvement

Pilot Projects

Steering Committee members helped to identify four project locations that were commonly identified by residents as initial Pilot Project candidates. These identified projects would be highly visible to the community, and reflect design principals with planning-level guidance that would be consistent with other facility recommendations. Each of these Pilot Projects will require site-specific environmental, design, and engineering analysis before construction.

Alabama Avenue Shared Use Path (SUP) – Project #10

In line with the Town's Bicycle Master Plan, the project team identified all 90-foot wide rights-of-way in Carolina Beach as locations for future SUPs. Using the existing SUP along Cape Fear Boulevard as an example, these facilities will accommodate both pedestrian and bicycle traffic outside of the motor vehicle travel way. Alabama Avenue represents the boundary between the Town of Carolina Beach and Kure Beach, and this proposed project will connect the Island Greenway (from the west) to Lake Park Boulevard (to the east) as well as one of the many beach access points. All intersection crossings should be marked by striped crosswalks and yield to pedestrian signage where necessary.

Canal Drive Sidewalk – Project #14

Survey respondents, workshop attendees, and Steering Committee members identified Canal Drive and Carolina Beach Avenue (project #23) as top locations where residents would favor the installation of a new sidewalk. Currently, both streets accommodate pedestrians within a marked, 4-foot paved shoulder along one side of the roadway that is also shared with bicyclists. This shoulder is not wide enough to accommodate two-way traffic and is often covered by beach sand. Installing a concrete sidewalk would

provide a clearer distinction between the pedestrian and motor vehicle travel lanes. Sidewalks along both sides of the road may be feasible in certain locations, however the Town should consider impacts of more impervious surface along this corridor as well as stormwater drainage implications.

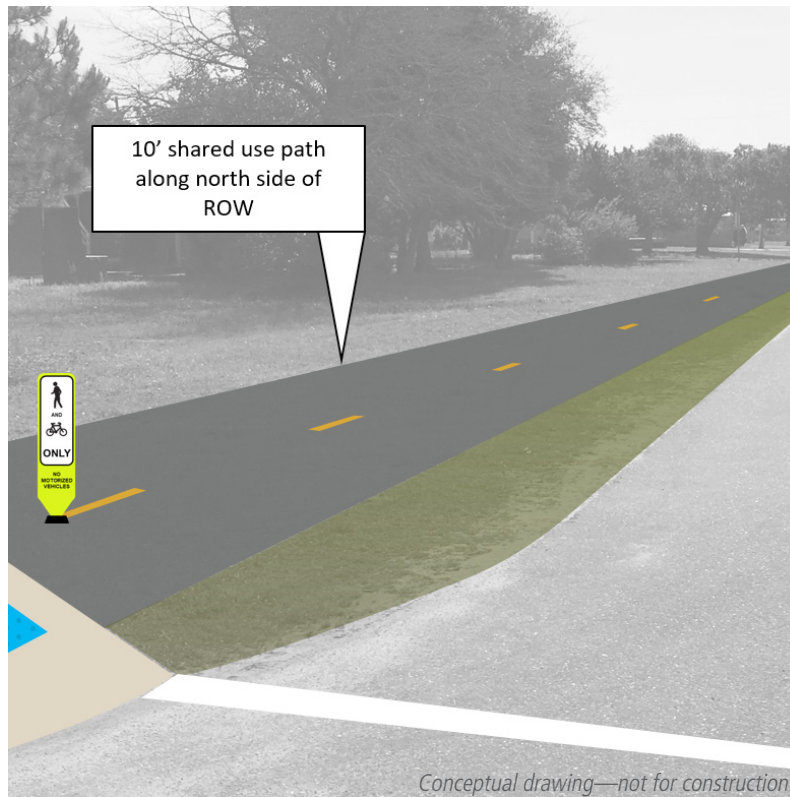
Lake Park Boulevard at Atlanta Avenue – Project #20

This project illustrates a potential median improvement along Lake Park Boulevard. Edge striping and the concrete pedestrian refuge island should have a traffic calming effect around a significant bend in the road, and provide a safe place for pedestrians to wait for on-coming traffic to pass. A high-visibility crosswalk across Atlanta Avenue on the west leg of the intersection will connect downtown with Carolina Lake multi-use path and provide a continuous corridor parallel to Lake Park Boulevard.

Dow Road at Harper Avenue – Project #22

The intersection of Dow Road and Harper Avenue represents a critical junction where the existing Carolina Beach Greenway along Old Dow Road connects with the Dow Road and Harper Avenue greenways (projects #2 and #3). Steering Committee members discussed this location as a significant barrier due to high volumes and speed of motor vehicle traffic. The RRFB and pedestrian refuge island could improve pedestrian visibility while attempting to cross the intersection along Dow Road. A new high-visibility crosswalk across Harper Avenue would connect the future Dow Road and Harper Avenue greenway projects.

Alabama Avenue SUP – Project #10



Location: North side of Alabama Avenue from Island Greenway to Lake Park Boulevard

Length: 2,100 feet (0.40 miles)

Planning-Level Cost Estimate: \$197,000

Amenities:

- Install 10' shared use path along the north side of Alabama Avenue.
- Striped crosswalks and warning signage at intersections with in-street yield to pedestrian signage at non-controlled intersection legs, based on engineering standards at the time of construction.

Estimated Unit Costs:

- Shared Use Path @ \$480,000/mile.
- Striped Crosswalk @ \$800 each, nine intersection locations.

Canal Drive Sidewalk – Project #14



Location: Canal Drive from Carolina Beach Avenue to Salt Marsh Lane

Length: 8,800 feet (1.67 miles)

Planning-Level Cost Estimate: \$282,000 (sidewalk only)

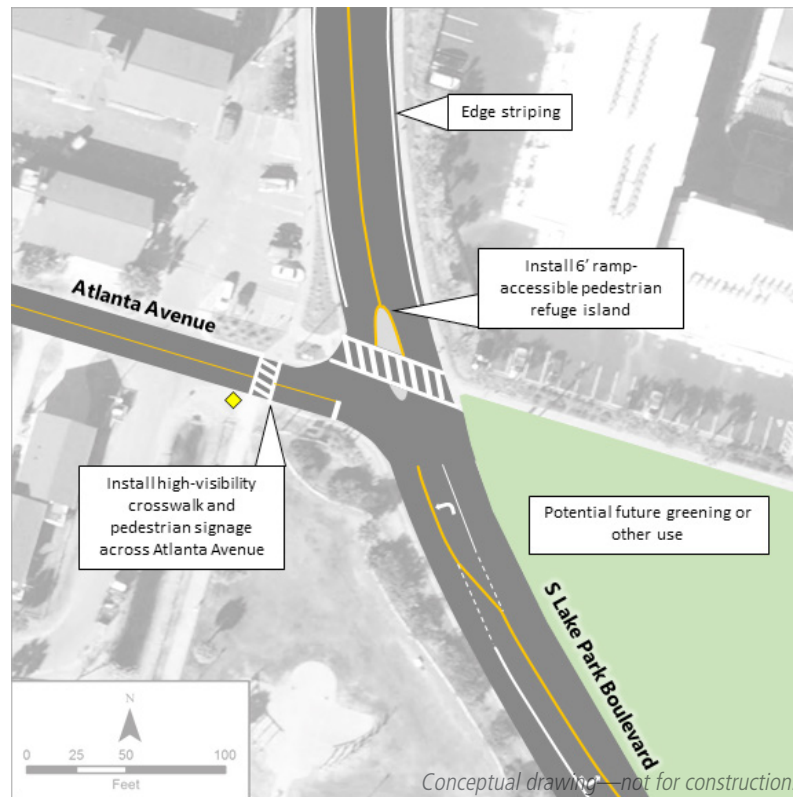
Amenities:

- Install 5' sidewalk along west side of the ROW to replace existing paved shoulder (fewer utility impediments).
- Encourage bicyclists to ride within the roadway along this 25 mph roadway, and reserve the sidewalk for pedestrians.

Estimated Unit Costs:

- Sidewalk @ \$32/linear foot (\$170,000/mile).

Lake Park Boulevard at Atlanta Avenue – Project #20



Location: Intersection of Lake Park Boulevard and Atlanta Avenue

Length: N/A

Planning-Level Cost Estimate: \$16,000

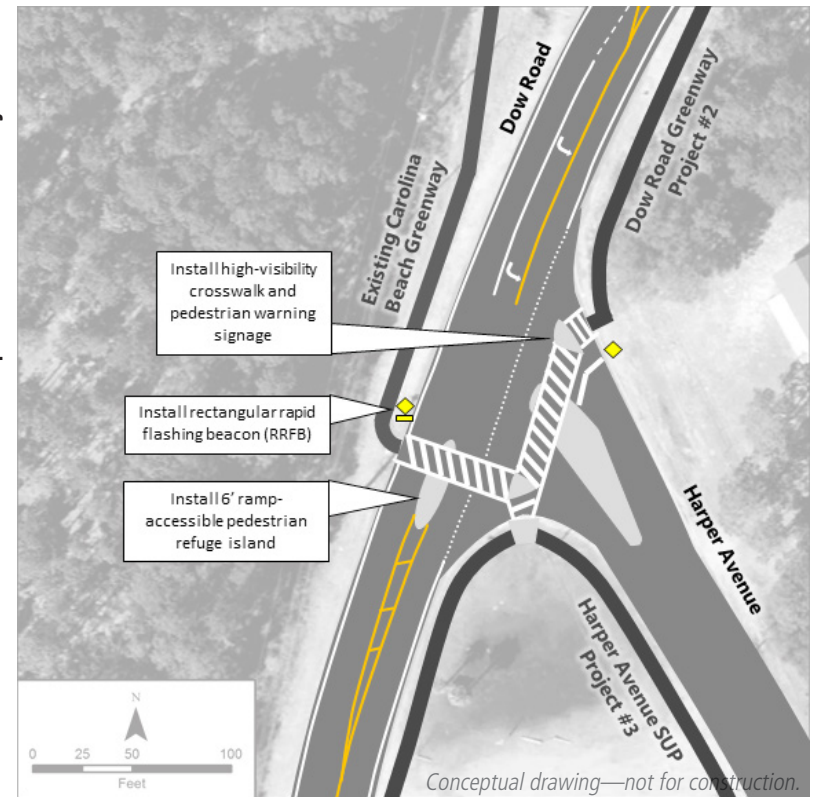
Amenities:

- Install 6' median pedestrian refuge island at north leg of the intersection.
- Edge striping to limit travel lane width leading up to the median refuge.
- Install high-visibility crosswalk across west leg of Atlanta Avenue with yield to pedestrian signage based on engineering standards at the time of construction.

Estimated Unit Costs:

- Median Island @ \$13,500 each.
- High Visibility Crosswalk @ \$2,500 each.
- Signage @ \$300 each.

Dow Road at Harper Avenue – Project #22



Location: Intersection of Dow Road and Harper Avenue

Length: N/A

Planning-Level Cost Estimate: \$40,000

Amenities:

- Install 6' median pedestrian refuge island at south leg of the intersection.
- Install RRFB at south leg of the intersection.
- Install high-visibility crosswalk across east leg of Harper Avenue with yield to pedestrian signage based on engineering standards at the time of construction.

Estimated Unit Costs:

- RRFB @ \$22,250 each.
- Median Island @ \$13,500 each.
- High Visibility Crosswalk @ \$2,500 each.
- Signage @ \$300 each.
- Curb Ramps @ \$80 each.

Programs and Policies

In addition to engineered infrastructure, strong programs and policies can help encourage and support pedestrians within the Town. This plan includes recommendations for the other four of the five E's: encouragement, education, enforcement, and evaluation:

- › Use encouragement programs to strengthen culture for walking and bicycling within the community.
- › Take advantage of existing educational materials from state or federal programs and tailor these to promote safety, traffic rules, and responsibilities for all roadway users.
- › Use enforcement programs to inform all roadway users about State or Town traffic laws and incentivizing or rewarding appropriate behavior.
- › Establish evaluation efforts to measure or track the performance of strategies over time, including setting goals, collecting baseline data, establishing timelines, and collecting follow up data.



Many of the following activities represent continuations and/or enhancements of programs and policies that the Town is already administering. Recommendations in this section seek to enhance ongoing activities and enhance overall livability and walkability for the Town's diverse and unique population.

Previous Outreach

Carolina Beach Elementary School has frequently participated in National Walk to School Day, observed annually in October. Carolina Beach Police Department, New Hanover County Sheriff's Department, Active Routes to School Region 8, Safe Kids Cape Fear, and WMPO were all active supports in past events.

Steering Committee members identified two groups related to active transportation: Island Greenway Committee and the Wayfinding Committee. Although both groups have since disbanded, previous members of those groups may be potential partners in promoting, implementing, or assisting with the implementation of this Plan.



Source: Town of Carolina Beach



Encouragement Programs

The Town can use encouragement programs to strengthen culture for walking and bicycling within the community. Local businesses and Town agencies can all play a role in encouraging pedestrian and bicycling through a variety of opportunities and incentives, such as:

- › Active Routes to School Coordinator
- › Walking Maps
- › Self-Guided and Group Walking Tours
- › Wayfinding Signs
- › Awareness Days and Events
- › Town Designations



Education Programs

Members of the Steering Committee noted that the educational component will be one of the most important elements to the Plan. The Town can take advantage of existing educational materials from state or federal programs and tailor these to the specific needs of the community. The educational materials should promote safe behaviors, rules, and responsibilities for all roadway users including pedestrians, bicyclists, and motorists. Local businesses, Town agencies, and local advocates can all play a role in developing and distributing educational materials. Examples of such education programs include:

- › Driver Education
- › Internal Education
- › Let's Go NC – Pedestrian and Bicycle Curriculum
- › Eat Smart, Move More NC



Enforcement Programs

Much like education programs, the purpose of enforcement programs can be used to educate all roadway users about traffic laws and encourage safer behaviors. Programs include periodic reminders or events to obey traffic rules and ongoing monitoring of public spaces. Enforcement programs also reinforce and support the other E's. Successful enforcement programs may include:

- › Watch for Me NC
- › SeeClickFix
- › Speed Feedback Signs
- › Motorist Enforcement







Evaluation Efforts

The Town can use evaluation efforts to understand how well the strategies in the plan are working over time. Evaluation activities include setting goals, collecting baseline data (where possible), setting timetables, and collecting follow up data for all projects. Not all evaluation activities are data-driven; qualitative feedback and partnerships can assist with achieving the goal of evaluating program/strategy effectiveness and identifying improvements. Several evaluation efforts identified during this planning process include:

- › Bicycle and Pedestrian Committee
- › Annual Pedestrian Count Program
- › Conduct Road Safety Audits (RSA)
- › Commuter Surveys
- › Facility Inspection and Maintenance

Table ES-3. Four E's Recommendation Overview

Strategy	Target Audience	Lead Agency/ Stakeholder	Partnerships for Success	Time Frame	Duration	Costs
 Encouragement						
Active Routes to School Coordinator	Schoolchildren, Parents	Town of Carolina Beach	County Department of Public Health	Immediate	Ongoing	\$
Walking/Bicycling Maps	General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Volunteers	Near Future – Long-Range	Ongoing	\$ - \$\$
Self-Guided/Group Walking Tours	General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Volunteers	Near Future – Long-Range	Periodic	\$
Wayfinding Signs	General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Volunteers	Immediate	Ongoing	\$ - \$\$
Awareness Days/Events	General Public	Town of Carolina Beach	Bicycle Pedestrian Committee, Volunteers	Immediate – Long-Range	Ongoing	\$
Town Designations	General Public	Town of Carolina Beach	Bicycle Pedestrian Committee	Long-Range	Ongoing	\$
 Education						
Project-Related Efforts	General Public	Town of Carolina Beach	NCDOT	Immediate – Long-Range	Ongoing	\$
Driver Education	General Public	Town of Carolina Beach	NCDOT	Near Future – Long-Range	Ongoing	\$ - \$\$\$
Internal Education	Town staff/ Representatives	Town of Carolina Beach	NCDOT, Regional, County staff	Immediate – Long-Range	Periodic	\$
Let's Go NC	General Public, schoolchildren	Town of Carolina Beach	NCDOT, Active Route to School Coordinator	Immediate	Periodic	\$
Eat Smart, Move More NC	General Public	Town of Carolina Beach	NCDPH, ESMM	Immediate	Ongoing	\$

Strategy	Target Audience	Lead Agency/ Stakeholder	Partnerships for Success	Time Frame	Duration	Costs
 Enforcement						
Watch for Me NC	Motorists	Town of Carolina Beach	Law Enforcement, NCDOT	Immediate – Long-Range	Periodic	\$
SeeClickFix	General Public	Town of Carolina Beach	—	Immediate – Long-Range	Ongoing	\$
Speed Feedback Signs	Motorists	Town of Carolina Beach	—	Long-Range	Ongoing	\$\$ - \$\$\$
Motorist Enforcement	Motorists	Town of Carolina Beach	Law Enforcement	Immediate	Periodic	\$\$ - \$\$\$
 Evaluation						
Bicycle and Pedestrian Committee	Town Staff / General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Steering Committee	Near Future – Long-Term	Ongoing	\$
Annual Pedestrian Count Program	General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Steering Committee	Near-Future – Long-Range	Periodic	\$ - \$\$\$
Road Safety Audits	Town Staff	Town of Carolina Beach	Bicycle Pedestrian Committee	Near-Future – Long-Range	Periodic	\$\$ - \$\$\$
Community Surveys	General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Steering Committee	Near Future – Long-Range	Periodic	\$\$ - \$\$\$
Facility Inspection/ Maintenance	Town Staff	Town of Carolina Beach	Facilities	Near Future – Long-Range	Periodic	\$\$\$

Time Frame: Immediate = initial steps in Plan, short-term; Near Future = implementation phases; Long-Range = post-implementation, evaluation and maintenance phases

Duration: Ongoing = continual updates needed, no clear end; Periodic = occasional, non-specified milestones

Costs: \$ = Minimal costs/free; \$\$ = Moderate costs, may be available through local funds/investments; \$\$\$ = Requires investment, grants, additional funding resources

Plan Implementation

Through adoption of this plan, the Town will be empowered to act as a champion for pedestrian needs. Steering Committee members should transition to form a Bicycle and Pedestrian committee to guide the implementation of future projects.

Successful implementation of this plan will require the cooperation of the Bicycle and Pedestrian Committee with a variety of agencies and organizations. Several of these partnerships already exist, and this Plan will build on those partnerships between the Town, NCDOT, the Wilmington Urban Area MPO, and local community groups.

Role of NCDOT

As the administrator of the Bicycle and Pedestrian Planning Grant Initiative, NCDOT will be an important partner in the implementation of this Plan. After the adoption of this Plan, NCDOT should continue to provide technical assistance and consulting regarding pedestrian transportation planning in Carolina Beach.

Role of the Wilmington Urban Area MPO

As the metropolitan planning organization (MPO) responsible for transportation planning within New Hanover County and the Town of Carolina Beach, the WMPO should consider implementing the projects recommended in this Plan. For the infrastructure needs of Carolina Beach to be met, WMPO should continue to consider the multimodal transportation needs of the Town in its comprehensive transportation plan (CTP), last updated in 2015. Opportunities to improve the pedestrian environment should be taken when roadways are scheduled for maintenance or construction.

Role of New Hanover County

Planning by the New Hanover County government has a very tangible effect on the Town of Carolina Beach. The County is the primary organization governing land use planning, transportation planning, and public health initiatives in and around the Town. It is vital that these plans align with common goals that span municipal boundaries.

Role of the Town of Carolina Beach

Carolina Beach is responsible for implementing this Plan. Through its adoption, the Town will be empowered to act as a champion for pedestrian needs. The Town should reconstitute or form pedestrian (and bicycle) advisory committees that will serve as champions for pedestrian planning in Carolina Beach. As champions of active transportation, committee members should encourage the full implementation of this Plan. This includes advocating for the project and programmatic recommendations in this Plan, as well as developing other events and programs as they work in the community. Let's get moving!



Table ES-4. Plan Implementation Action Item Timeline

Strategy	Contributing Stakeholders	Lead Agency/ Stakeholder	Time Frame	Duration	Related Section(s)
Policy					
Adopt This Plan	Town Council	Town of Carolina Beach	Immediate	Initial	—
Finalize the Bicycle and Pedestrian Committee	Town Staff, Bicycle Pedestrian Advisory Committee	Town of Carolina Beach	Immediate	Periodic	4.2, 4.3
Continue to Enforce State and Local Regulations	Town Staff, Law Enforcement, Bicycle Pedestrian Advisory Committee	Police	Near Future – Long-Range	Periodic	4.3.3, 4.4
Program					
Create Educational Outreach Programs	Bicycle Pedestrian Advisory Committee	Town of Carolina Beach	Near Future – Long-Range	Ongoing	4.3.2, 4.4
Create Encouragement Outreach Programs	Bicycle Pedestrian Advisory Committee	Town of Carolina Beach	Near Future – Long-Range	Ongoing	4.3.1
Establish a Monitoring and Benchmarking Program	Town Staff, Bicycle Pedestrian Advisory Committee	Town of Carolina Beach	Immediate – Long-Range	Ongoing	4.3.4
Become Registered as a Bike Friendly Community	Town Staff, Bicycle Pedestrian Advisory Committee	Town of Carolina Beach	Near Future – Long-Range	Periodic	4.3
Infrastructure					
Identify Funding Sources	Town Staff, Bicycle Pedestrian Advisory Committee	NCDOT & Town of Carolina Beach	Immediate – Long-Range	Periodic	5.5
Perform a Road Safety Audit	NCDOT Transportation Safety & Mobility Unit, FHWA Division Office, Town Staff	NCDOT & Town of Carolina Beach	Near Future – Immediate	Once	—
Build the Priority Projects Outlined in this Plan	NCDOT, WMPO, New Hanover County, Town Staff	NCDOT	Near Future – Immediate	Ongoing	3.4
Review the Applicability of Future Projects	NCDOT, WMPO, New Hanover County, Town Staff, Bicycle Pedestrian Advisory Committee	NCDOT	Long-Range	Periodic	3.4

Time Frame:

- Immediate = initial steps in Plan, short-term
- Near Future = implementation phases
- Intermediate = final implementation phases
- Long-Range = post-implementation, evaluation and maintenance phases

Duration:

- Initial = preliminary action
- Once = single, stand-alone action
- Ongoing = continual updates needed, no clear end
- Periodic = occasional, non-specified milestones

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1 Introduction

The Town of Carolina Beach Pedestrian Master Plan (“the Plan”) provides guidance for the Town, North Carolina Department of Transportation (NCDOT), and other local and regional stakeholders in developing improvements to its pedestrian infrastructure, programs and policies. The Plan serves as a decision-making tool to assist leaders in prioritizing, funding, and implementing projects. The Town should evaluate and update this Plan over time.

1.1 Project Background

In 2016, NCDOT awarded the Town of Carolina Beach a grant from its Bicycle and Pedestrian Planning Grant Initiative. Instituted in 2004, the grant encourages local communities to develop comprehensive bicycle plans and pedestrian plans. The program is open to all municipalities, as well as counties with populations of less than 50,000 in North Carolina. NCDOT’s Division of Bicycle and Pedestrian Transportation (DBPT) administers the program, and has allocated over \$5 million to 183 North Carolina communities as of March 2018.

This plan is intended to provide a framework for identifying pedestrian needs, both in terms of physical infrastructure and encouragement programs. The opportunities and challenges identified in this plan will match the content standards set by NCDOT DBPT regarding the Planning Grant Initiative. The project recommendations outlined in this document will be eligible for inclusion in local Comprehensive Transportation Plans (CTP) and project prioritization.

1.2 Project Goals & Objectives

The vision for this comprehensive pedestrian plan is to enhance the livability of Carolina Beach by creating an appealing, walkable environment for both residents and visitors.

Building on this Vision, the Steering Committee adopted the following Goals and Objectives for the Plan:

1. Enhance a sense of pride within the Carolina Beach community by creating aesthetically appealing, safe, and socially-oriented pedestrian facilities.
2. Identify and address gaps in the pedestrian infrastructure network, particularly between existing facilities, as well as between residential and commercial neighborhoods.
3. Provide viable alternatives to driving, not only to reduce motor vehicle traffic, but to reduce the need to provide automobile-oriented facilities.
4. Prioritize facility recommendations and identify potential funding sources.

This Plan heavily prioritizes public involvement in the planning process to identify potential barriers to walking in Carolina Beach as well as opportunities to connect destinations that are important to the community. Additionally, this Plan builds upon the existing plans and documentation pertaining to the Town. Using these projects as a foundation for further analysis, this master plan will consolidate the existing work by the County, the MPO, and the State to continue building a more vibrant and livable Carolina Beach.

1.3 Plan Components

This Plan assists the Town in moving from the planning stage into implementation. To do so, it establishes a clear purpose (Section 1), assesses current conditions (Section 2), recommends facility improvements (Section 3), includes program and policy recommendations (Section 4), and outlines a plan for implementation (Section 5). Appendices include a summary of facility types and guidelines, potential funding sources, proposed infrastructure projects, and public comments received by the project team.



Photo: Paul Baroznoff, Southern Digital Art

1.3.1 Why this Plan is Important

A walkable community offers residents the choice of active transportation over traditional motorized transportation. Connecting existing facilities, limiting the physical and psychological barriers that may be preventing people from walking, and creating a more safe and appealing space for public interaction is the next step.

Through this Plan and its process, the Town hopes to:

- › Promote a culture of walking and active living.
- › Enhance access to local businesses, neighborhoods, parks, and the beach by foot.
- › Emphasize the safety of pedestrians while accommodating motorized traffic in an efficient manner.
- › Create an aesthetically attractive environment that will appeal to residents and visitors.
- › Develop a framework to update this Plan in the future.

In addition to the specific goals set forth, there is a spectrum of tangible benefits for a municipality that chooses to prioritize active transportation. These include accessibility to local destinations from residential neighborhoods, safer roads for residents as well as visitors, and a healthier, more active community.

1.3.2 Accessibility

Improving accessibility to local destinations by foot and reducing the dependence of many residents on a motor vehicle is a top priority. To do this, many highly-trafficked corridors will need dedicated pedestrian facilities installed along the roadside and safety countermeasures will need to be installed for safe crossing locations. These will be especially important along Dow Road, Ocean Boulevard, Harper Avenue, and Lake Park Boulevard (US 421). Figure 1 shows a detailed map of the existing pedestrian facilities.

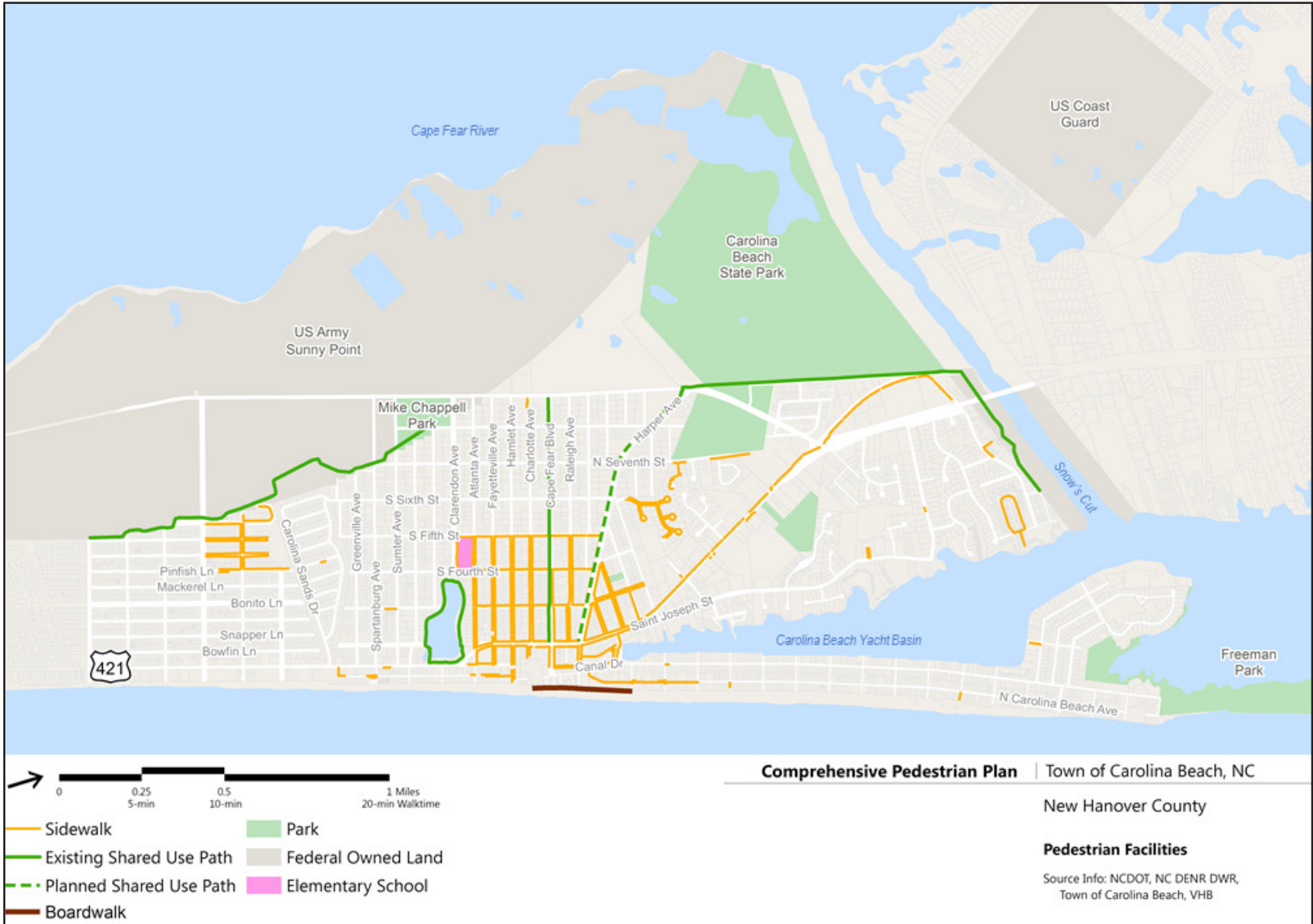


Figure 1. Town of Carolina Beach Pedestrian Facilities

Many residential neighborhoods beyond the core of downtown lack dedicated sidewalk facilities. This is further complicated by physical constraints for new infrastructure, such as above-ground utilities, narrow rights-of-way, and roadside drainage ditches. An essential aspect of this Plan is providing dedicated corridors for pedestrians to travel from their residences to downtown, the parks, Carolina Beach Elementary, or the beach, without the need to walk within the roadway.



1.3.3 Safety

From a national perspective, pedestrian and bicycle fatalities have increased both in number of fatalities and proportion of all traffic fatalities in recent years. Pedestrian fatalities in the United States rose by 12 percent from 2006 to 2015, even though total traffic fatalities declined nearly 18 percent during the same time period.¹ According to the Pedestrian and Bicycle Information Center (PBIC), 5,376 pedestrians and 818 bicyclists were killed in collisions with motor vehicles in the United States in 2015. These trends underscore the need for safety improvements to protect these vulnerable users through active safety-focused planning and programming.

Roadways that lack sidewalks indirectly encourage pedestrians to walk with vehicular traffic, leading to potentially unsafe conditions. Likewise, the absence of adequate crossing facilities along certain corridors within Carolina Beach may force pedestrians to cross at unsafe intersections or mid-block locations. Section 2.1.4 presents crashes within the Town of Carolina Beach between 2007 and 2014.



According to the Walk Bike NC, North Carolina’s comprehensive plan for walking and bicycling (2012), investments in infrastructure can significantly improve pedestrian safety. The Statewide Ped/Bike Plan cites a 2008 Federal Highway Administration publication that suggests sidewalk installation results in a 65- to 89-percent reduction in pedestrian crashes.² The safety benefits reported not only include collisions with motor vehicles, but other types of injuries as well. Many injuries sustained by pedestrians and bicyclists do not involve a motor vehicle.³ Sufficient infrastructure and routine maintenance help reduce many incidents of tripping or falling.

1.3.4 Public Health

Choosing to walk for short trips to and from school, local parks, restaurants, retail stores, or even work is one of the best ways to lead a healthier lifestyle. The Centers for Disease Control and Prevention (CDC) recommends 150 minutes of moderate physical activity per week. Infrastructure and encouragement programs can directly support this physical activity goal.⁴ Additionally, a 2010 study found that communities were more likely to achieve that activity goal and have lower incidences of diabetes and obesity if they tended to commute to work by bicycle or on foot.⁵

By connecting residences with desired destinations, residents feel empowered to walk and bike to complete daily activities for recreation. Social interactions between neighbors are another benefit of being more physically active. Steering Committee members discussed their desire for Carolina Beach residents to be more engaged and active in the community. This not only contributes to a stronger sense of place, but it also instills civic pride and reinforces the perception that Carolina Beach is a wonderfully unique place to live and work.



1.3.5 Economic Impacts

Walkability can have a positive economic benefit to the local community through indirectly increasing property values, job creation, economic development, and tourism. WalkBikeNC suggested that a one-time public investment of \$6.7 million in paths and paved shoulders along the Outer Banks has returned \$60 million in annual revenue from tourism and supported 1,400 jobs.⁶ The Ecusta rails-to-trails project in Henderson County, North Carolina was estimated to potentially generate \$50 million in total benefit for the local community based on a \$13.4 million project cost.⁷ The Swamp Rabbit Trail in South Carolina is estimated to be worth several million dollars in revenue to local Greenville businesses. Additionally, 20 percent of visitors to the trail were tourists coming from somewhere beyond upstate South Carolina.⁸

Investing in active transportation may also have indirect economic benefits of lowering health care costs, improving safety, and reducing congestion or improving commute times. These benefits stem from lower incidents of chronic disease, reduced injuries from crashes, and fewer vehicle miles driven.⁹ For instance, the American Heart Association estimated that every \$1 spent on building bicycle and pedestrian trails could yield \$3 in savings on medical costs.¹⁰ While these are not the most visible results of encouraging active transportation, they are essential in achieving the goals of making Carolina Beach a more livable community for residents and visitors.

1.3.6 Environmental Benefits

Choosing an active transportation option rather than using a traditional vehicle—called mode shift—will reduce vehicular traffic along roadways and shift capacity to sidewalks or bicycle lanes. This moves toward a more efficient use of space in the transportation system. In addition to reduced roadway demand, this shift towards alternative transportation also reduces parking demand. Provision of parking is particularly important for downtowns and environmentally-sensitive areas where impervious surfaces generate the need to manage stormwater runoff. Travel mode shifts also indirectly improve air quality and reduce greenhouse gas emissions. According to the Environmental Protection Agency, transportation accounts for roughly a quarter of all greenhouse gas emissions in the United States.¹¹ By allowing for walking or biking for short trips or trip-chaining with public transportation instead of driving, walkable communities can help reduce the number of vehicular miles traveled, and, consequently, vehicular emissions.¹²

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1.4 Planning Process

This Plan involved direct input from local stakeholders, collection and synthesis of existing conditions data, and public outreach components. Each of these are described in more detail in this section.

1.4.1 Steering Committee

The project Steering Committee included residents, business owners, Town staff, Town police, NCDOT, New Hanover County, the United States Army, and the Wilmington Urban Area Metropolitan Planning Organization (WMPO). The Steering Committee met four (4) times throughout the planning process to discuss goals and objectives, review existing conditions, formulate draft recommendations, and review the Final Plan.



1.4.2 Data Collection, Analysis and Documentation

Using data collected from previous related projects, available GIS data, and historic and recent crash data, the project team documented and mapped existing conditions. This assessment also included field investigations to confirm physical conditions, photo-document the project area, and observe pedestrian and automobile behavior. The project team presented the existing conditions mapping, as well as preliminary findings and observations, to the Steering Committee and at a public meeting in May 2017.

1.4.3 Plan Development & Public Involvement

The planning process began with a Kickoff Meeting on May 23, 2017, at the Carolina Beach Town Hall. The 13-member Steering Committee was asked to provide initial impressions of the active transportation environment in Carolina Beach and what would help this plan to be successful. The need to make Carolina Beach a safe place for pedestrians, directly connect recreation facilities, and gain citizen buy-in to the Plan were identified as essential to the success of this initiative.

Two Steering Committee Meetings and public workshops followed the initial kickoff meeting, the first held in July 2017 and the second in October 2017. At these events, the project team gathered observations of existing conditions and engaged the public to identify potential opportunities and obstacles within the Town. Based on these discussions, the project team determined priorities for future pedestrian improvement projects and encouragement programs.

At the July 18, 2017 meeting, the project team presented existing conditions, goals and objectives. Attendees identified their typical destinations within Carolina Beach, pointed out potentially unsafe

locations for pedestrians, and outlined areas for future improvements. At the October 17, 2017 meeting, the project team presented a draft of priority corridors, as well as project and policy recommendations, and sought feedback during a question, answer, and comment period. Appendix C provides summary documentation of the public comments and themes from this meeting.

Town of Carolina Beach – Pedestrian Plan PUBLIC WORKSHOP #2


Tuesday, October 17th, 2017, from 5:30-7:30 PM
Carolina Beach Town Hall
1121 North Lake Park Blvd.

The Town of Carolina Beach invites your participation to discuss draft recommendations. This public workshop will provide:

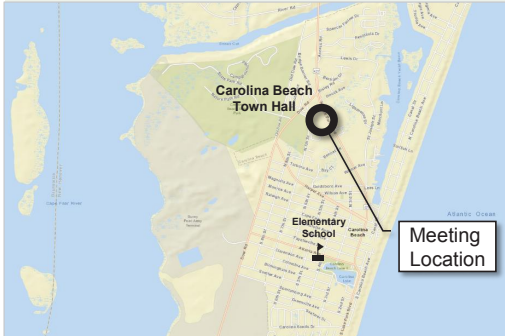
- Review of public input to date, including the online survey
- Draft project recommendations and policies
- Timeline for remaining project objectives

If you are unable to attend, please contact the Project Manager:
Jerry Haire, jerry.haire@carolinabeach.org 910.458.8380


**YOUR TOWN.
YOUR VOICE.**



**Oct
17th**



Meeting Location



In addition to public meetings, the project team conducted a 17-question survey to gather input from residents. The survey was available online and notices were distributed through the municipal water bill to Carolina Beach residents. To incentivize participation, the project team gathered contact information from individual survey respondents to award a \$50 gift card prize to one randomly selected respondent. In total, 1,006 responses were collected through this three-month survey.

After a review of the draft report and the project recommendations generated through public engagement and the planning process, a final Steering Committee meeting was conducted on January 19, 2018. Revisions to the plan were incorporated into the final plan. The completed plan was presented to the Town Council for adoption on May 22, 2018.



2 Current Conditions

A Comprehensive Pedestrian Master Plan builds upon and enhances the existing network of sidewalks, paths, and roadway crossing infrastructure. An important first step is to accurately document the current conditions as a benchmark for moving forward.

2.1 Local Context

The Town of Carolina Beach is a beach community of nearly 6,000 residents, located in southern New Hanover County—15 miles south of Wilmington—on North Carolina’s Atlantic coastline. The Town is on the north end of Pleasure Island, which is separated from the mainland by Snow’s Cut to the north and the Cape Fear River to the west. It is neighbored by the Town of Kure Beach to the south.

There are a wide variety of natural resources and attractions that make Carolina Beach a thriving place to live and visit. The Town features miles of beach access along its east coast, Carolina Beach State Park to the northwest of downtown, and numerous local parks. Residents and visitors alike can hike, fish, camp, and play without leaving this quintessential beach community. In addition to natural treasures, the Town features a wide-range of activities from night life, live music, and movies on Carolina Lake, to nearby community attractions such as the North Carolina Aquarium and Fort Fisher Historic Site.

The majority of residents work in the retail, accommodation, and food services industries. This is reflective of the tourism-based economy of the Town and the region. In addition to tourism, many residents are working professionals, engaging in educational



services, construction, real estate, and administration. Carolina Beach Elementary is in the heart of Town, and is both an educational resource and employment center.

Carolina Beach's downtown street pattern is a highly organized, regularly spaced, urbanized grid. Most blocks are a mix of residential and commercial space with residential neighborhoods being concentrated to the west of downtown and more commercial space to the east. Lake Park Boulevard (US 421) is the main thoroughfare that connects Carolina Beach with Wilmington and the mainland. It is the most heavily trafficked road in the Town, carrying between 10,000 and 25,000 vehicles per day. Lake Park Boulevard bisects the Town and separates downtown from the beach.

Wave Transit provides fixed-route transit service for the Wilmington area and New Hanover County. The 301 route, which operates seven days a week on three-hour headways, connects Carolina Beach with the mainland. The route terminates at the Monkey Junction Walmart south of Wilmington. From this location, riders can transfer onto the 201 route to downtown Wilmington or the 107 to the University of North Carolina at Wilmington. As of 2017, a standard one-way fare is \$2.00, but reduced fares are available for students, seniors, and individuals with qualifying disabilities.



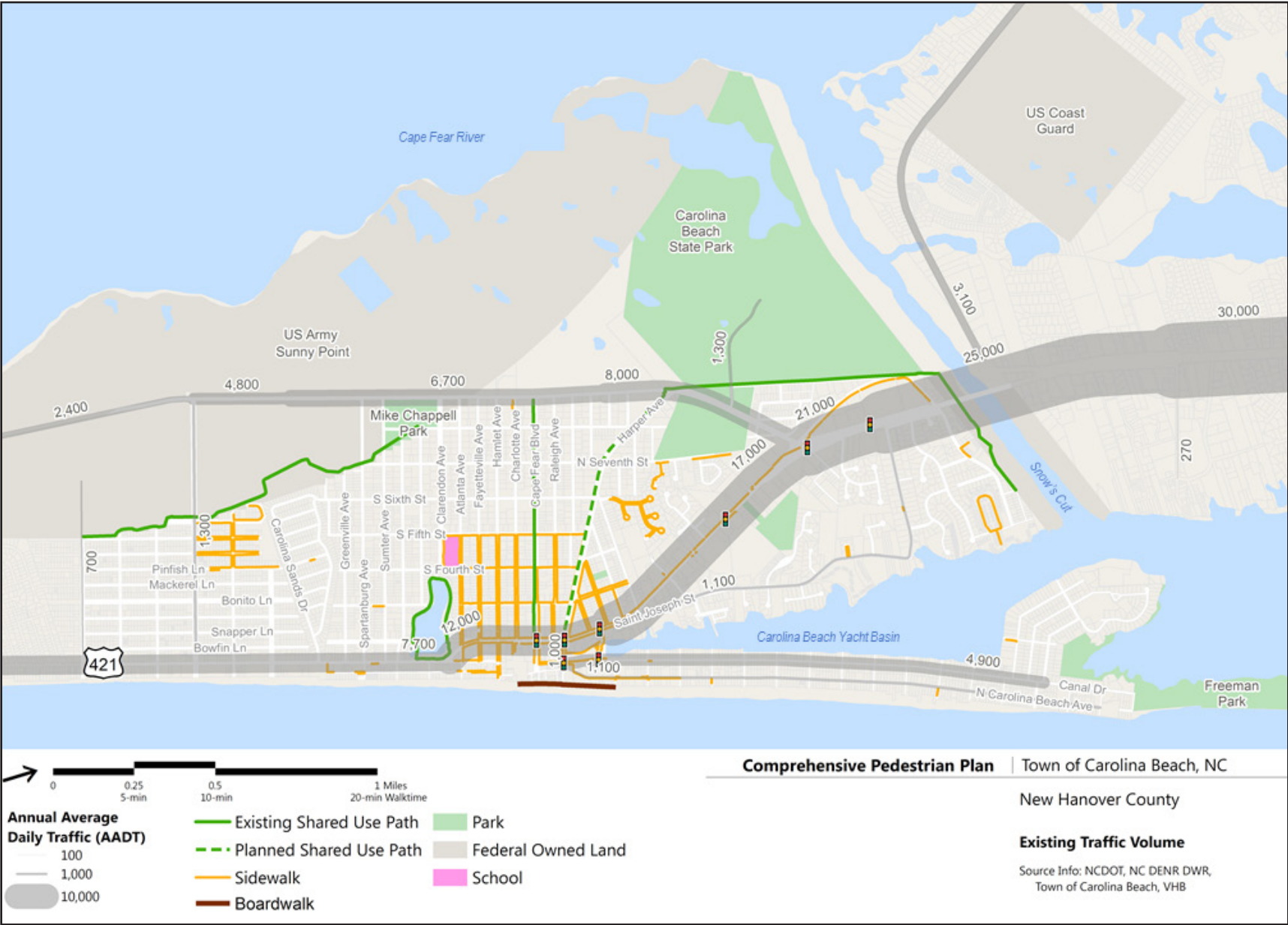


Figure 2. Existing Traffic Volume

2.1.1 Demographics and Mode Share

Since local travel and commuting data is typically unavailable, the next best available dataset is the US Census Bureau's American Community Survey (ACS). This dataset is a rolling five-year average, indicating that the latest year in the five-year window would only account for 20 percent of the data.

According to the 2011-2015 ACS 5 Year estimates, Carolina Beach had a population of 5,970 with a median age of 43. This is roughly similar to many of its North Carolina beach community peers. The median age is higher than New Hanover County and the State. An estimated four percent of Carolina Beach residents walk to work for their daily commute. This is more than double the estimate for New Hanover County and the State, and higher than many peer municipalities. These data support the need for a system that supports the daily needs of the residents of Carolina Beach, in addition to many of the out-of-town visitors that arrive each year.



Table 1. Demographics Comparison

Location	Total Population	Median Household Income	Median Age	Zero-Vehicle Households	% Zero Vehicle Households	% Walk to Work
Carolina Beach	5,970	\$60,057	43.4	133	6%	4.1%
Atlantic Beach	1,596	\$41,622	51.6	26	3%	2.5%
Kure Beach	2,286	\$71,750	55.3	13	1%	1.1%
Wrightsville Beach	2,540	\$64,167	38.6	17	1%	1.8%
Beaufort	4,153	\$33,701	39.7	245	12%	6.3%
Morehead City	9,162	\$39,117	43.3	370	9%	2.6%
Wilmington	111,998	\$42,128	34.9	4,492	9%	2.8%
New Hanover County	213,091	\$50,088	37.8	5,822	7%	1.9%
North Carolina	9,845,333	\$46,868	38.0	246,069	7%	1.8%

*Based on the 2011-2015 ACS 5-Year estimates. The ACS uses sample data to estimate these figures. Only trips to work are considered in ACS survey data.

2.1.2 Opportunities

Carolina Beach is a thriving beach community with many recreation opportunities for both residents and visitors. It also benefits from a dense, well connected street network that allows people to efficiently walk to their destinations. In addition to the beach itself, there are several parks, restaurants, and shopping destinations conveniently located for pedestrians in the community.

Attractors in Carolina Beach include:

- › Carolina Beach State Park
- › Freeman Park
- › Carolina Beach Elementary School
- › Carolina Beach Boardwalk (Waterfront Trail)
- › Carolina Lake
- › Bill McDonald Park
- › Mike Chappell Park

There are also several future facilities that will be available to the Carolina Beach community. These include the proposed Ryder Lewis Park, as well as the East Coast Greenway. The latter will be an important regional connection that will benefit both residents and visitors to Carolina Beach.

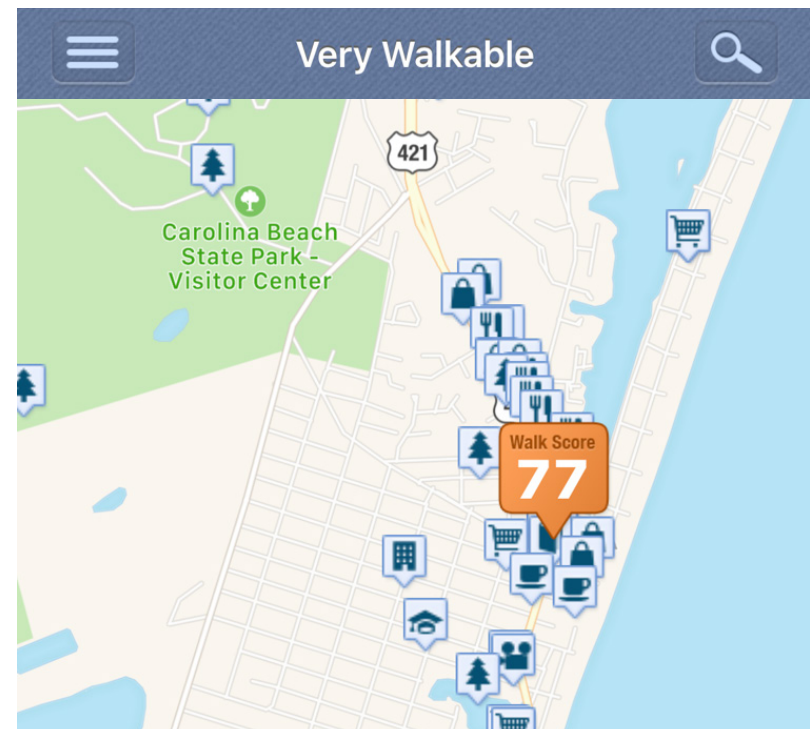
ATTRACTIVE DESTINATIONS

Carolina Beach features many appealing destinations within the town limits. These encourage locals and visitors to walk between destinations around town, rather than drive. Connecting these places with more formal and safe facilities will spur further pedestrian activity within the Town and continue to encourage a multimodal environment.

DENSE & WALKABLE STREET GRID

The urban form of Carolina Beach is ideal for creating efficient connections between origins and destinations. The direct, dense grid pattern of streets is more conducive to pedestrian travel than a more curvilinear street network and block design.

Walk Score is an online service that provides measures of walkability and search tools for apartments and retail businesses. Walk Score helps people find walkable places to live. Carolina Beach has a Walk Score of 77 (www.walkscore.com), with above average scores for proximity to parks, grocery stores, restaurants, and culture/entertainment venues. This score indicates a highly walkable community, where most errands can be accomplished by foot.



PLANNED FACILITY IMPROVEMENTS

The WMPO includes five bicycle and pedestrian improvement projects in Carolina Beach within its fiscally-constrained metropolitan transportation plan (MTP), Transportation 2040. These projects are located on the following roadways:

- › Harper Avenue (BP-20)
- › Dow Road (BP-23)
- › Cape Fear Boulevard (BP-34)
- › Bridge Barrier Road (BP-63)
- › Clarendon Avenue (BP-69)

EXISTING PEDESTRIAN SAFETY COUNTERMEASURES

Prior to this Plan, the Town and NCDOT installed numerous sidewalks, high-visibility crosswalks, and rectangular rapid flashing beacons (RRFBs) in Carolina Beach. These are particularly prominent along Lake Park Boulevard (US 421) south of St. Joseph Street.



CONTINUING UTILITY WORK

In the very near term from the implementation of this Plan, the Town is performing rolling underground utility work within the downtown grid. As this work is performed, the Town has the opportunity to reinvent many of the residential streetscapes at a lower cost than would otherwise be possible. Improvements may include providing dedicated pedestrian facilities or improving pavement markings and street lighting.





Figure 3. Existing Community Features



2.1.3 Challenges

Some of the challenges to improving the pedestrian network in Carolina Beach include:

- › Automobile-oriented commercial development along US 421 (Park Lake Boulevard). Wide roadways, high vehicle traffic, and densely placed driveways create conflict points between pedestrians and motor vehicles.
- › High speed limits on certain corridors, including Dow Road, Ocean Boulevard, Cape Fear Boulevard, and Harper Avenue.
- › Limited sidewalk network to core areas of downtown. Areas north of St. Joseph Street, west of Fifth Street, and south of Atlanta Avenue are rarely connected by dedicated sidewalks.
- › Limited pedestrian connections between commercial and residential locations.
- › Lack of public sidewalk facilities connecting to the beach.
- › High frequency of pedestrian crashes. Between 2007 and 2014, there were 21 pedestrian crashes on roadways, driveways, and parking lots in Carolina Beach.
- › Narrow public right-of-way, above-ground utility poles, or drainage constraints in downtown Carolina Beach, limiting the potential for easy improvements.
- › A U.S. Army facility (Military Ocean Terminal at Sunny Point) that maintains a no-trespassing buffer zone that extends to the western boundary of the Town.

2.1.4 Crash Data

The NCDOT DBPT provides a database of Bicycle and Pedestrian crashes that have occurred between 2007 and 2014 for the entire state. These data are maintained by the University of North Carolina's Highway Safety Research Center, which locates crashes and inputs the available data from police department crash reports and supplemental roadway information. This statewide resource is valuable to bicycle and pedestrian initiatives such as this Plan. Figure 4 indicates that 21 reported pedestrian crashes occurred in Carolina Beach between 2007 and 2014.

The police crash reports provide additional detail on the circumstances surrounding the crashes. Analyzing the data helps identify contributing factors and common trends in the crashes. These findings inform decision-makers to consider projects that will target specific contributing factors and trends with the goal to reduce the severity and number of crashes in the future. Table 2 presents a summary of the pedestrian crash data.



Photo: Paul Baroznoff, Southern Digital Art



Figure 4. Pedestrian Crashes (2007-2014)

Table 2. Pedestrian Crash Data Summary (2007-2014)

ID*	Month	Year	Severity	Location	Light Conditions	Crash Type	Alcohol
1	August	2007	O: No Injury	Travel Lane	Dark—Lighted Roadway	Pedestrian on Vehicle	Yes
2	February	2008	B: Evident Injury	Travel Lane	Dark—Roadway Not Lighted	Walking Along Roadway with Traffic—From Behind	Yes
3	February	2008	Unknown Injury	Driveway/Alley	Dark—Lighted Roadway	Pedestrian on Vehicle	Yes
4	February	2008	Unknown Injury	Driveway/Alley	Dark - Lighted Roadway	Pedestrian on Vehicle	Yes
5	March	2008	Unknown Injury	Travel Lane	Daylight	Pedestrian Failed to Yield	No
6	May	2008	O: No Injury	Travel Lane	Dark—Lighted Roadway	Pedestrian on Vehicle	No
7	May	2008	B: Evident Injury	Non-Roadway—Parking Lot/Other	Dark—Lighted Roadway	Off Roadway—Other/Unknown	No
8	June	2008	C: Possible Injury	Travel Lane	Daylight	Dash	No
9	October	2008	C: Possible Injury	Non-Roadway—Parking Lot/Other	Daylight	Off Roadway—Parking Lot	No
10	December	2008	O: No Injury	Non-Roadway—Parking Lot/Other	Dark—Lighted Roadway	Other Unusual Circumstances	No
11	April	2009	Unknown Injury	Travel Lane	Daylight	Pedestrian Failed to Yield	No
12	April	2009	O: No Injury	Travel Lane	Dark—Lighted Roadway	Pedestrian Failed to Yield	Yes
13	July	2010	O: No Injury	Travel Lane	Dark—Lighted Roadway	Dart-Out	No
14	July	2010	O: No Injury	Non-Roadway—Parking Lot/Other	Dawn	Off Roadway—Other/Unknown	No
15	July	2010	Unknown Injury	Travel Lane	Dark—Lighted Roadway	Pedestrian Failed to Yield	Yes
16	August	2010	O: No Injury	Travel Lane	Daylight	Multiple Threat	No
17	October	2010	C: Possible Injury	Travel Lane	Daylight	Pedestrian Failed to Yield	No
18	September	2011	O: No Injury	Driveway/Alley	Daylight	Motor Vehicle Loss of Control	No
19	March	2013	O: No Injury	Travel Lane	Dark—Lighted Roadway	Walking Along Roadway Against Traffic—From Front	No
20	December	2013	C: Possible Injury	Travel Lane	Dark—Roadway Not Lighted	Pedestrian Failed to Yield	No
21	July	2014	K: Fatality	Travel Lane	Dark—Roadway Not Lighted	Pedestrian Failed to Yield	No

*corresponds to Figure 4 labels

The crash data analysis resulted in the following:

- › One fatal pedestrian crash was reported in 2014.
- › 10 out of 21 (48 percent) crashes occurred in the warmer months between May and September.
- › 9 out of 21 (43 percent) crashes occurred in 2008 alone.
- › 14 out of 21 (67 percent) crashes occurred in the travel lane.
- › 13 out of 21 (62 percent) crashes occurred in dark conditions.
- › 6 out of 21 (29 percent) crashes involved a pedestrian that was impaired by alcohol. No crashes involved a driver under the influence of alcohol, but data was missing for four crashes.

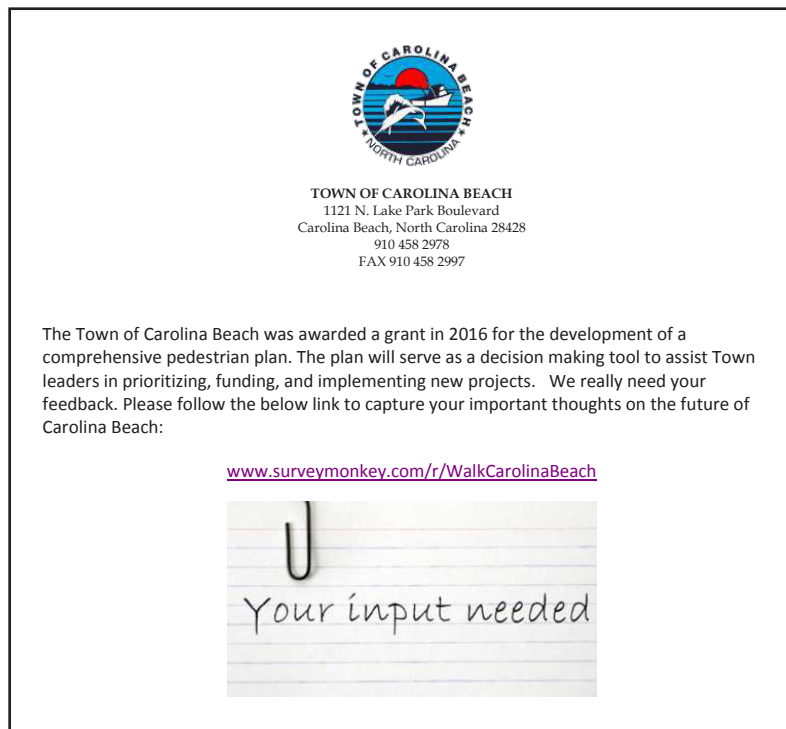


Figure 5. Survey Flier Announcement

2.2 Public Input

Public input from the residents of Carolina Beach supplemented the quantitative data gathered by the project team. The public had the opportunity to provide input at two public meetings, as well as through the public survey. This section summarizes the findings from these comments.

2.2.1 Public Comments on Current Conditions

The project team asked Carolina Beach residents to describe their impressions of the pedestrian network in the community. These prompts included where they felt barriers to walking and where they saw opportunities to improve the Town's accommodation of pedestrians. At public meetings, residents showed the project team where they currently walked in the community and where they would like to go if there were fewer barriers to pedestrians.

In June 2017, more than 6,000 survey announcements were distributed within resident water/utility bills. The Town also added a link to the survey on their Facebook and Twitter pages (Figure 5). The volume of responses and interest in the project indicate that residents of Carolina Beach have a tremendous desire to actively participate in their community. Less than half of all respondents felt that the pedestrian network in Carolina Beach was either poor or very poor (Figure 6). The most popular reasons cited by the public were a lack of connected sidewalks, unsafe vehicle speeds, and unsafe crossing locations, particularly along Lake Park Boulevard.

New sidewalk installation has proven to be a key issue for Town officials in the past. Residents appear to be split on their preference for new sidewalks along private property frontage, sometimes concerned that the new facilities would harm the community's aesthetic and lead to unforeseen changes. These concerns have made it difficult to organize support for a sidewalk along an entire

street. According the public survey, over half of all respondents (51 percent) seem to be in favor of a new sidewalk in front of their house, with 33 percent indicating that they would be opposed (Figure 7). While this survey confirms the tension observed by officials in the past, it appears that the concept of residential sidewalks has significant (though not a large majority of) public support. The strongest support for a new sidewalk, according to survey respondents, is along Carolina Beach Avenue, Canal Drive, St. Joseph Street, Spencer-Farlow Drive, and Lake Park Boulevard.

The Carolina Beach community expressed a strong desire to improve pedestrian safety. Many residents are willing to be more

active with the support of safe, connected infrastructure, lower vehicle speeds, and encouragement programming (Figure 8). This Plan makes recommendations for facilities and programs that will enable the Town staff and the residents of Carolina Beach to realize their combined vision of a more active, healthy, and social community.

2.2.2 Public Survey Results

The following charts summarize the results of the public survey, which was open between May and September 2017.

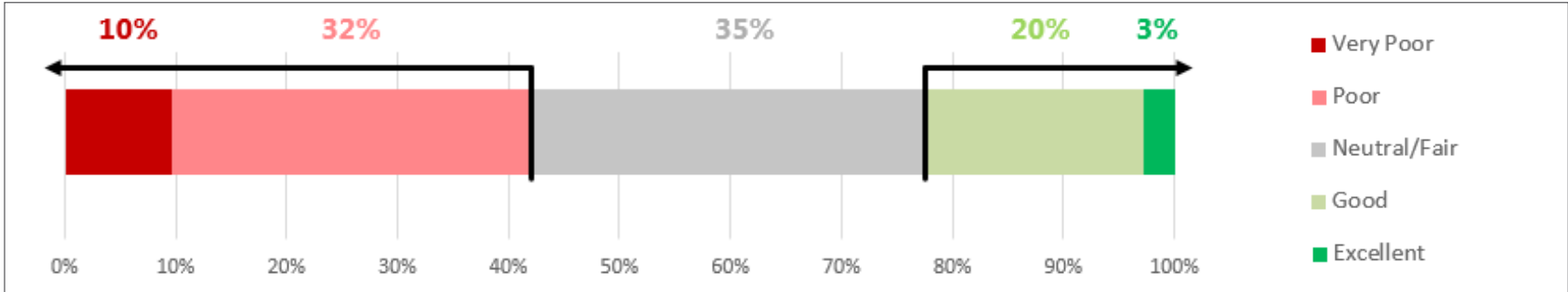


Figure 6. Public Rating of the Existing Pedestrian Network

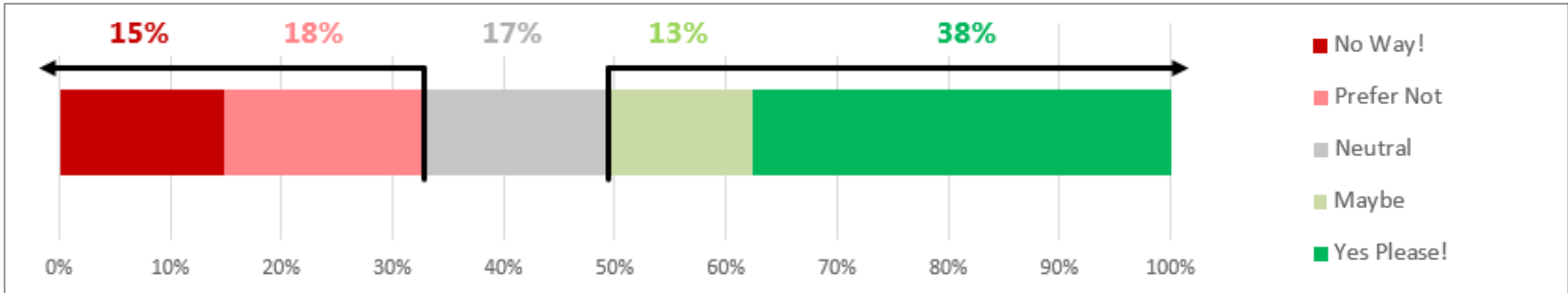


Figure 7. Resident Support for New Sidewalk Installation

In your opinion, which of the following infrastructure or program improvements would encourage you to walk more frequently, rather than drive? (Select your top three)

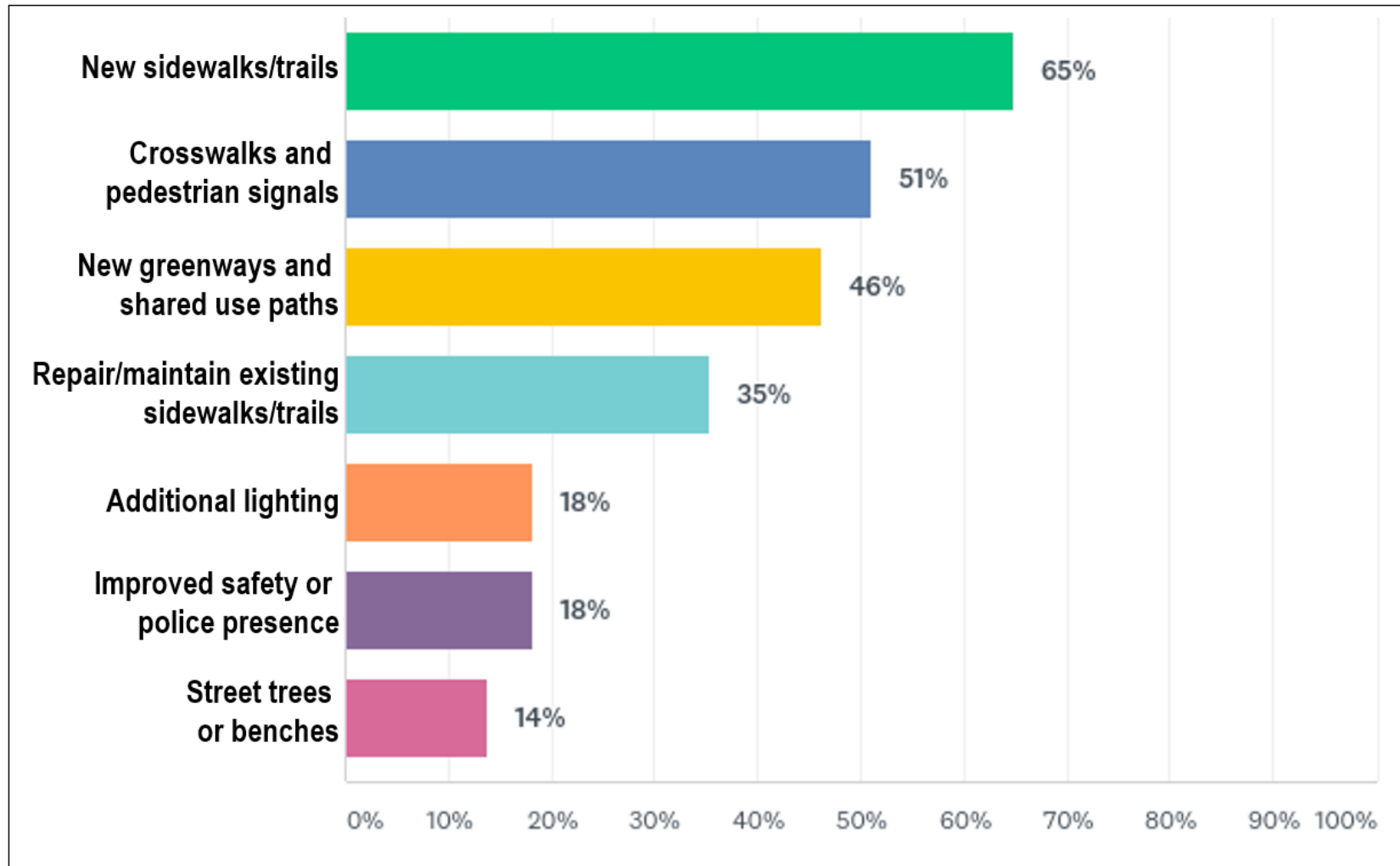


Figure 8. Encouragement Improvements

2.3 Existing Institutional Framework

Carolina Beach falls within New Hanover County, and it is under the planning purview of the WMPO. Many of the infrastructure projects undertaken in the Town, particularly those related to NCDOT initiatives, are planned through the inter-related Town, County, and WMPO planning processes. Section 2.4 outlines the most recent and relevant plans guiding planning in Carolina Beach.

The Town of Carolina Beach Zoning Ordinance governs development within the town limits. This document provides regulations and minimum requirements for sidewalks and other pedestrian infrastructure, including minimum dimensions, site design, and street trees. Section 4 of this Plan provides a more detailed analysis of existing policies.



Aerial view of Carolina Beach, 1955. Source: Town of Carolina Beach

2.4 Related Plans and Initiatives

In preparation of this Plan, the project team reviewed relevant past plans developed by the Town and other similar agencies. This section summarizes the important information in those plans.

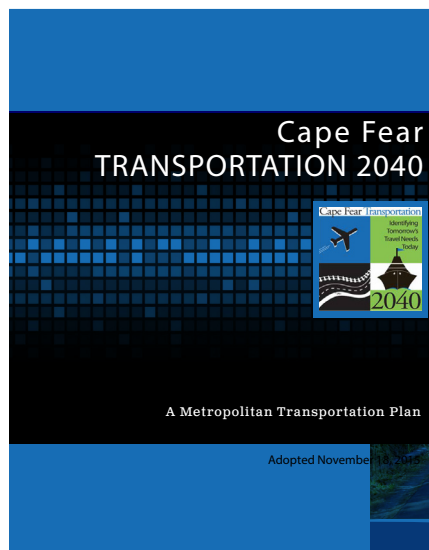
CAROLINA BEACH PARKS, RECREATION, AND OPEN SPACE MASTER PLAN UPDATE (2017)

Originally approved in 2008, the Carolina Beach Parks, Recreation, and Open Space Master Plan was updated in 2017 to reflect the new state of recreational facilities in the community. This document assessed the current conditions, as well as the future needs of recreation and open space in Carolina Beach. This document shares many of the goals, recommendations, and potential sources of funding with the Carolina Beach Comprehensive Pedestrian Plan.



WMPO MTP CAPE FEAR TRANSPORTATION 2040 (2015)

WMPO is the agency responsible for regional planning in New Hanover County, eastern Brunswick County, and southern Pender County. The MTP is the federally-mandated long-range transportation plan required under the MAP-21 law. Unlike the comprehensive transportation plan, the MTP must be fiscally constrained for projects listed in the Plan to be considered in the State Transportation Improvement Plan (STIP) for federal funding. The Cape Fear Transportation 2040 plan proposed five bicycle and pedestrian projects and three transit projects in the Carolina Beach community. Projects included a pedestrian improvement along Dow Road, as well as a park-and-ride facility at Carolina Beach Road and Snow's Cut Bridge.



WMPO COMPREHENSIVE TRANSPORTATION PLAN (2015)

The WMPO CTP is a comprehensive list of projects that the MPO would ideally pursue without fiscal and resource constraints. The projects listed in the MTP are included in the CTP, as well as many others. Projects proposed within Carolina Beach included construction of several new on-road pedestrian facilities and multi-use paths.

WILMINGTON/NEW HANOVER COUNTY COMPREHENSIVE GREENWAY PLAN (2013)

The Comprehensive Greenway Plan is a local planning initiative aimed at addressing the active transportation network within the New Hanover County community. The Plan details four specific projects within Carolina Beach:

- › The Island Greenway
- › The Dow Road Trail
- › The Harper Ave Trail
- › The Carolina Beach Boardwalk (Waterfront Trail)

These projects are also found in the WMPO's CTP, but this document included a more detailed planning-level analysis of each project. Furthermore, this document recommended the proposed alignment for the Dow Road Greenway along the east side of Dow Road, in contrast with previous plans.

CAROLINA BEACH BICYCLE MULTI-USE TRANSPORTATION PLAN (2011)

The Carolina Beach Bicycle Multi-Use Transportation Plan makes recommendations to improve the bicycle and greenway infrastructure in Carolina Beach. It recommended 48 projects and improvements, some of which are shared use paths and crosswalks that would be accessible by pedestrians. The locations for shared use paths identified in this document include the following (project numbers are listed in parentheses):

- › Clarendon Avenue (1)
- › Harper Avenue (2)
- › The Island Greenway (10 & 29)
- › Cape Fear Boulevard (16)
- › Dow Road (18)
- › Alabama Avenue (19)
- › Lake Park Boulevard (20 & 31)
- › Ocean Boulevard (21)
- › 7th Street (22)
- › Tennessee Avenue (26)
- › Snow's Cut Bike Path (27)
- › Snow's Cut Bridge (28)
- › Bonito Lane (30)

Some of these projects have been incorporated into WMPO documents and have been constructed as of 2017.

WMPO DOW ROAD CORRIDOR STUDY (2009)

The WMPO commissioned the Dow Road Corridor Study to assess the widening of Dow Road in Carolina Beach and potential extension of Dow Road beyond K Avenue in Kure Beach. The extension of Dow Road was dropped from consideration early in the planning process, and the document recommended that Dow Road remain a two-lane road with defined improvements at certain intersections. In the pedestrian recommendations section, the Study proposed a 10-foot wide multi-use path along the west-side of Dow Road.

REFERENCES

1. <https://www.carolinabeach.org/Planning/2016%20Zoning%20Ordinance.pdf>
2. http://www.carolinabeach.org/Master_Plan_2017%204-12-17.pdf
3. http://www.transportation2040.org/PDFs/CFT2040_adoptiondate_111815.pdf
4. http://wdc.wmpo.s3.amazonaws.com/wp-content/uploads/2016/12/2016-01-13_CTP_FinalDraftDocsCombined_small.pdf
5. <http://www.wilmingtongreenway.com/the-plan.html>
6. http://www.carolinabeach.org/BicycleMulti_UseTransportationPlan.pdf
7. <http://www.wmpo.org/plans/corridor-plans/>

3 Recommended Facilities

This section outlines the infrastructure recommendations intended to promote the development of a coherent and navigable network for a sustainable active transportation network. It also outlines the planning process and pedestrian facilities available to the Town, as well as provides guidance for planning and implementation.



3.1 Overview

Input from the public and Steering Committee assisted in prioritizing the most important opportunities for the Town, and determined the most relevant projects to meet the Town's near-term needs. These recommendations will serve to enhance an already active community that can safely and conveniently access its daily and recreational needs.

3.2 Key Inputs for Recommendations

The Town has many opportunities to encourage active transportation. As a beach community, it is a natural hub of recreation and social activity, encouraging people, both residents and visitors alike, to go outside and interact in community spaces. A critical guiding principle in developing recommendations was the need to build an everyday network for residents, not just for seasonal visitors. As the Plan developed, other vital design principles were incorporated for the final recommendations, including creating:

- › An aesthetically appealing network and develop a sense of Carolina Beach as a community.

- › Safe crossings, particularly along Lake Park Boulevard and Dow Road, to encourage people to move more freely through the Town.
- › Recommendations that target driver behavior as well as pedestrian behavior and make drivers more aware of their responsibility to share the roadway.

Qualitative data like these observations supplemented the existing quantitative data to shape the type and location of facility recommendations. They provided the foundation for the prioritization methodology utilized by the project team when ranking potential facility recommendations.

3.3 Priority Corridors

Priority corridors are the framework around which individual project recommendations were developed. These serve as the trunk of the network, with secondary corridors branching out and filling in neighborhood communities. Priority corridors (purple lines on Figure 9) represent the most direct routes between residents and desired destinations and were identified as having conditions suitable for near-term facility construction. Secondary corridors (yellow lines) support the primary corridors, though they may not form a complete network. These are the corridors future iterations of the Carolina Beach Pedestrian Plan should consider for improvement.



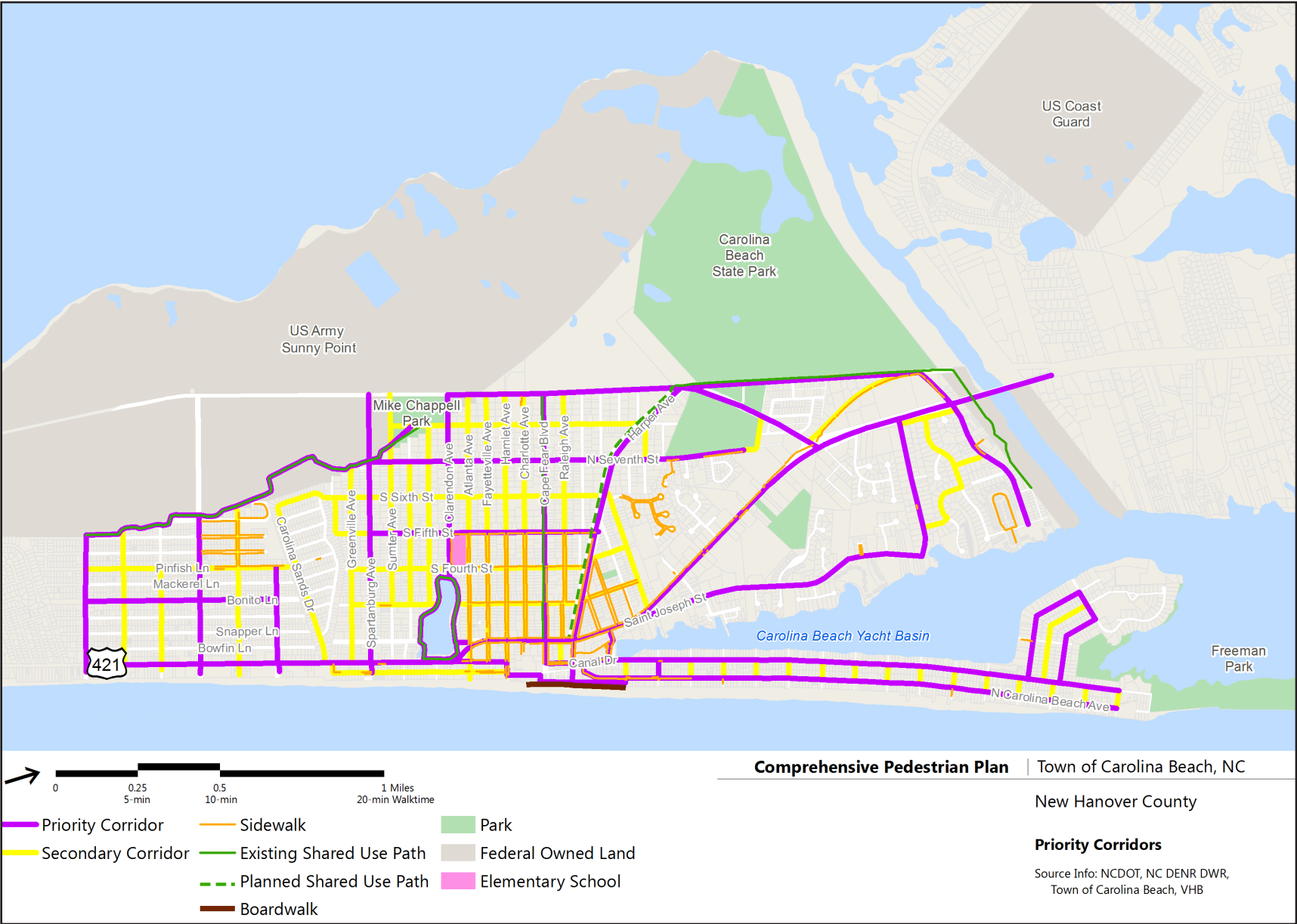


Figure 9. Priority Corridors

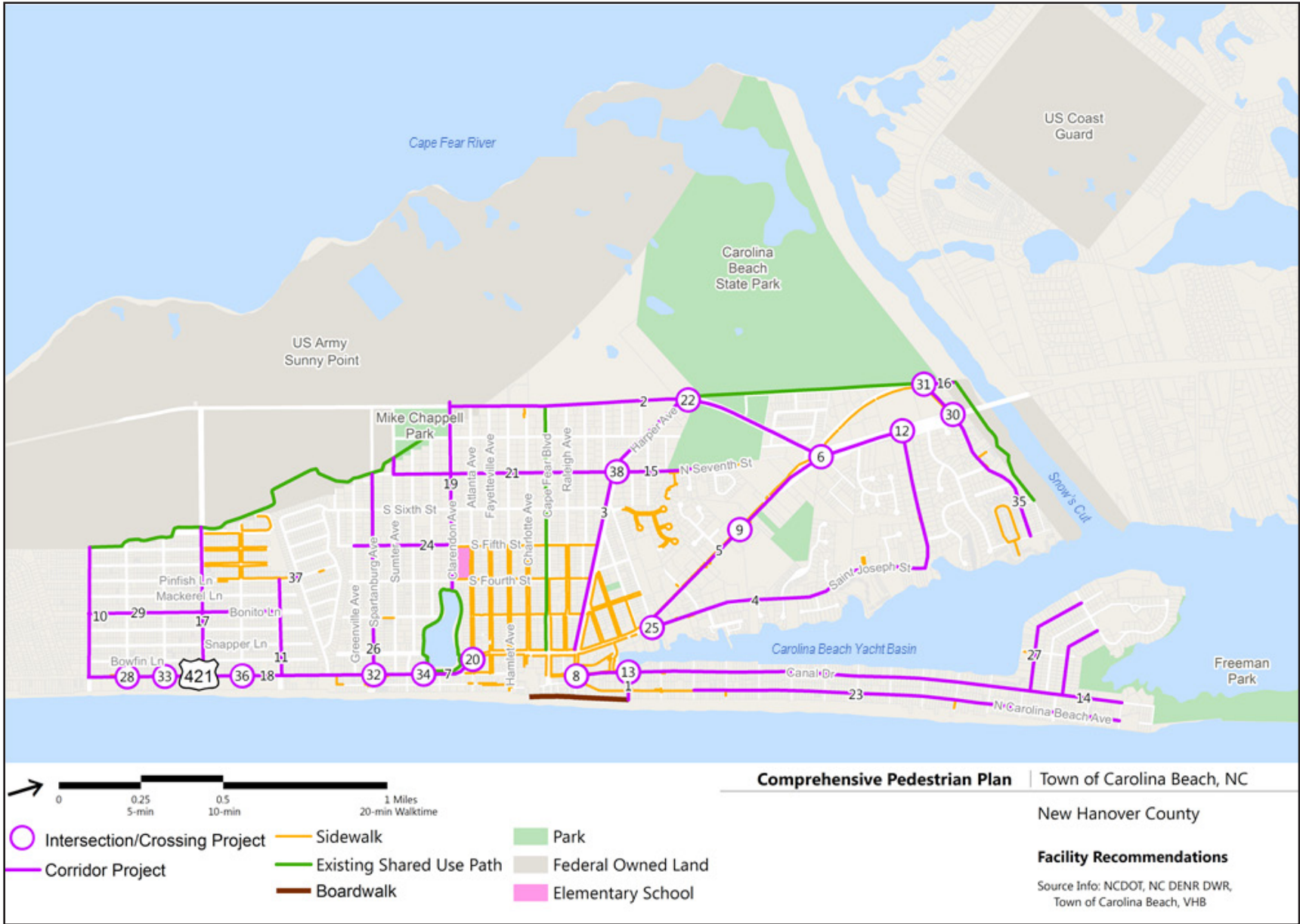


Figure 10. Facility Recommendations Map

3.4 Facility Recommendations

This section outlines the final list of recommended infrastructure projects. These projects have been scored and ranked according to a set of evaluation criteria described in the following section. Figure 10 maps these projects and Table 3 provides additional project

details. The project team applied an iterative process involving stakeholder direction, geographic distribution, significant destinations, the existing pedestrian network, and priority corridors to identify these projects.

Table 3. Facility Recommendations Table

Project ID	Project Type	Project Location	From	To	MTP 2040	NHC Greenway	CB Bicycle	Project Length (feet)	Roadway Maintenance	Improvement Type	Improvement Description
1	Corridor	Pelican Lane	Canal Drive	CB Waterfront Trail Extension		X		446	Local	New facility	Sidewalks on one/both sides
2	Corridor	Dow Road	Clarendon Avenue	Lake Park Boulevard	X		X	6,225	State	New facility	Multi-use path along east ROW. Vegetation and drainage may be obstacles.
3	Corridor	Harper Avenue	Dow Road	Lake Park Boulevard	X		X	4,510	Local	New facility	Multi-use path along south ROW. Driveways and utility poles may be obstacles.
4	Corridor	St. Joseph Street	Lake Park Boulevard	Lake Park Boulevard			X	6,925	Local	New facility	Sidewalks on both sides
5	Corridor	Lake Park Boulevard - North	St. Joseph Street	Lewis Drive			X	5,294	State	Operational	Fill sidewalk gaps where necessary, especially along east ROW. Consider advance warning signage
6	Point	Lake Park Boulevard	Dow Road	N/A			X	-	State	Safety	High-visibility crosswalks and pedestrian countdown signals at one or more legs
7	Corridor	Lake Park Boulevard - Central	Carolina Sands Drive	Atlanta Avenue			X	2,401	State	New facility	Sidewalks on both sides; fill gaps where necessary. Utility poles are obstacles.
8	Point	Harper Avenue	Canal Drive	N/A				-	Local	Safety	Additional pedestrian signal heads, pedestrian phasing, and raise the intersection
9	Point	Lake Park Boulevard	@ Potential Harris Teeter	N/A			X	-	State	Safety	High-visibility crosswalk and pedestrian countdown signals at proposed driveway

Project ID	Project Type	Project Location	From	To	MTP 2040	NHC Greenway	CB Bicycle	Project Length (feet)	Roadway Maintenance	Improvement Type	Improvement Description
10	Corridor	Alabama Avenue	Island Greenway	Lake Park Boulevard		X	X	2,089	Local	New facility	Multi-use path along north ROW
11	Corridor	Tennessee Avenue	Pinfish Lane	Lake Park Boulevard			X	1,544	Local	New facility	Multi-use path along south ROW
12	Point	Lake Park Boulevard	Lewis Drive	N/A			X	-	State	Safety	High-visibility crosswalk and pedestrian countdown signals at south leg of the intersection
13	Point	Canal Drive	Pelican Lane	N/A				-	Local	Safety	Rectangular rapid flashing beacon & high-visibility crosswalk
14	Corridor	Canal Drive	Carolina Beach Avenue	Salt Marsh Lane				8,804	Local	Operational	Sidewalk (5') along one/both sides of the ROW. Possible curb and gutter needed. ROW and stormwater drainage will be constraint.
15	Corridor	7th Street - North	Harper Avenue	@ Rec Center		X		1,831	Local	New facility	Sidewalks on one/both sides. Alternate sides if necessary to avoid utilities/impediments
16	Corridor	Bridge Barrier Road	Greenway Path	Old Dow Road	X			400	Local	Operational	Pedestrian path
17	Corridor	Ocean Boulevard	Island Greenway	Lake Park Boulevard		X	X	2,396	State	New facility	Multi-use path along north ROW
18	Corridor	Lake Park Boulevard - South	Alabama Avenue	Carolina Sands Drive		X	X	3,867	State	New facility	Sidewalks on both sides with lighting improvements. Utility poles are obstacles.
19	Corridor	Clarendon Avenue	Dow Road	4th Street	X	X	X	2,988	Local	New facility	Multi-use path along south ROW. Utility poles may be obstacles.
20	Point	Atlanta Avenue	Lake Park Boulevard	N/A				-	State	Operational	Intersection/Crossing improvement with 4'-6' pedestrian refuge treatment on the north leg
21	Corridor	7th Street - South	Sumter Avenue	Harper Avenue			X	3,824	Local	New facility	Sidewalks on one/both sides. Alternate sides if necessary to avoid utilities/impediments
22	Point	Dow Road	Harper Avenue	N/A	X		X	-	State	Operational	Rectangular rapid flashing beacon, high-visibility crosswalks, and median refuge island

Project ID	Project Type	Project Location	From	To	MTP 2040	NHC Greenway	CB Bicycle	Project Length (feet)	Roadway Maintenance	Improvement Type	Improvement Description
23	Corridor	Carolina Beach Avenue	Scallop Lane	Salt Marsh Lane			X	6,866	Local	Operational	Extend sidewalk along east ROW. ROW and utility poles are obstacles. Stormwater drainage is an issue currently.
24	Corridor	5th Street	Greenville Avenue	Clarendon Avenue				1,565	Local	New facility	Sidewalks on one/both sides. Alternate sides if necessary to avoid utilities/impediments
25	Point	St. Joseph Street	Lake Park Boulevard	N/A			X	-	State	Operational	Pedestrian hybrid beacon (PHB)
26	Corridor	Spartanburg Avenue	Island Greenway	Lake Park Boulevard				3,226	Local	New facility	Sidewalks on one/both sides. Utility poles are obstacles.
27	Corridor	Florida Avenue & Virginia Avenue	Maryland Avenue	Canal Drive				3,136	Local	New facility	Sidewalk constructed in conjunction with utility work
28	Point	Texas Avenue	Lake Park Boulevard	N/A				-	State	Operational	Rectangular rapid flashing beacon & high-visibility crosswalk
29	Corridor	Bonito Lane	Alabama Avenue	Tennessee Avenue			X	3,081	Local	New facility	Multi-use path along west ROW
30	Point	Lake Park Boulevard	Snows Cut Bridge	N/A				-	State	Safety	Watch/Warning signage
31	Point	Spencer Farlow Drive	Old Dow Road	N/A				-	Local	Operational	Intersection/Crossing improvement
32	Point	Spartanburg Avenue	Lake Park Boulevard	N/A				-	State	Operational	Rectangular rapid flashing beacon & high-visibility crosswalk
33	Point	South Carolina	Lake Park Boulevard	N/A				-	State	Operational	Rectangular rapid flashing beacon & high-visibility crosswalk
34	Point	Lake Park Boulevard	Carolina Beach Lake Park	N/A			X	-	State	Operational	Rectangular rapid flashing beacon & high-visibility crosswalk
35	Corridor	Spencer Farlow Drive	Old Dow Road	Risso Lane				3,077	Local	Operational	Sidewalks on one/both sides
36	Point	North Carolina Avenue	Lake Park Boulevard	N/A				-	State	Operational	Rectangular rapid flashing beacon & high-visibility crosswalk
37	Corridor	Carolina Sands Connection	Pinfish Lane	Carolina Sands Drive				155	Local	Operational	Sidewalk
38	Point	Harper Avenue	7th Street	N/A			X	-	Local	Operational	Intersection/Crossing improvement

3.4.1 Evaluation Criteria

The project team identified evaluation criteria for the purpose of ranking projects. Criteria were adapted from WMPO's Cape Fear Transportation 2040 plan to align the priorities of this Plan with those of the community. The project team and the Steering Committee modified the methodology to include a final eight categories (Table 4).

The project team and Steering Committee weighted each category according to the priorities and goals of the community. More important factors received a score of 10, while less important factors received 5 or 3 points. This allowed a maximum of 51 available points for a potential project (Table 4).



Table 4. Evaluation Criteria

Goal	Objective	Priority – Weight (Max Score)
Safety	Prioritize projects within a proximity of existing signalized intersections (within 400')	High – 10 points
Connectivity	Prioritize facilities within ¼ mile of an identified local community resource	High – 10 points
Implementation	Prioritize projects identified in previous plans	High – 10 points
Connectivity	Prioritize connectivity between residential neighborhoods and commercial district	Medium – 5 points
Connectivity	Prioritize extension of an existing sidewalk/shared-use path network (within 400')	Medium – 5 points
Cost	Prioritize projects that are cost efficient	Medium – 5 points
Connectivity	Prioritize facilities within ¼ mile of Carolina Beach Elementary School	Low – 3 points
Transportation Choice	Prioritize facilities within 0.25 miles of Wave Transit stops	Low – 3 points

3.4.2 Project Scoring

Table 5 represents the project evaluation results ranked from highest to lowest score. These rankings are merely a guide for future planning considerations and not necessarily the exact sequence for implementation. The efficacy of certain projects may be contingent on the implementation of other planned recommendations.

Table 5. Evaluation Results

ID	Name	Safety	Transportation Choice	School Connectivity	Neighborhood Connectivity	Community Resource Connectivity	Pedestrian Facilities Connectivity	Implementation	Cost	Score
Intersection/Crossing Projects										
6	Lake Park Boulevard	10	3	0	5	10	5	0	5	38
8	Harper Avenue	10	3	0	5	10	5	0	5	38
9	Lake Park Boulevard	10	3	0	5	10	5	0	5	38
12	Lake Park Boulevard	10	3	0	5	10	0	0	5	33
13	Canal Drive	10	3	0	5	10	5	0	0	33
20	Atlanta Avenue	0	0	3	5	10	5	0	5	28
22	Dow Road	0	0	0	0	10	5	10	0	25
25	St. Joseph Street	0	3	0	5	10	5	0	0	23
28	Texas Avenue	0	0	0	5	10	5	0	0	20
30	Lake Park Boulevard	0	0	0	0	10	5	0	5	20
31	Spencer Farlow Drive	0	0	0	0	10	5	0	5	20
32	Spartanburg Avenue	0	0	0	5	10	5	0	0	20
33	South Carolina	0	0	0	5	10	0	0	0	15
34	Lake Park Boulevard	0	0	0	5	10	0	0	0	15
36	North Carolina Avenue	0	0	0	5	10	0	0	0	15
38	Harper Avenue	0	0	0	0	10	0	0	0	10

ID	Name	Safety	Transportation Choice	School Connectivity	Neighborhood Connectivity	Community Resource Connectivity	Pedestrian Facilities Connectivity	Implementation	Cost	Score
Corridor Projects										
1	Pelican Lane	10	3	0	5	10	5	10	5	48
2	Dow Road	10	3	0	5	10	5	10	0	43
3	Harper Avenue	10	3	0	5	10	5	10	0	43
4	St. Joseph Street	10	3	0	5	10	5	10	0	43
5	Lake Park Boulevard - North	10	3	0	5	10	5	10	0	43
7	Lake Park Boulevard - Central	0	0	3	5	10	5	10	5	38
10	Alabama Avenue	0	0	0	5	10	5	10	5	35
11	Tennessee Avenue	0	0	0	5	10	5	10	5	35
14	Canal Drive	10	3	0	5	10	5	0	0	33
15	7th Street - North	0	3	0	0	10	5	10	5	33
16	Bridge Barrier Road	0	0	0	0	10	5	10	5	30
17	Ocean Boulevard	0	0	0	5	10	5	10	0	30
18	Lake Park Boulevard - South	0	0	0	5	10	5	10	0	30
19	Clarendon Avenue	0	0	3	0	10	5	10	0	28
21	7th Street - South	0	0	3	0	10	0	10	5	28
23	Carolina Beach Avenue	0	0	0	0	10	5	10	0	25
24	5th Street	0	0	3	0	10	5	0	5	23
26	Spartanburg Avenue	0	0	3	5	10	5	0	0	23
27	Florida Ave. & Virginia Ave.	0	0	0	0	10	5	0	5	20
29	Bonito Lane	0	0	0	0	10	0	10	0	20
35	Spencer Farlow Drive	0	0	0	0	10	5	0	0	15
37	Carolina Sands Connection	0	0	0	0	0	5	0	5	10

Project scoring revealed the following insights:

- › These scores are guidelines; the ranking of certain projects (#2, Dow Road Multi-use Path, for example) is contingent on other planned improvements that would connect to this new facility.
- › Projects identified from previous plans scored higher than newly identified projects; this is partially due to the implementation criteria, but these projects also scored well in the safety and neighborhood connectivity categories.
- › Projects along Lake Park Boulevard and within downtown should be highly prioritized over potential projects in more residential areas west of Lake Park Boulevard.
- › Beach access is a critical factor when justifying projects outside of the core downtown neighborhood.

In addition to project evaluation criteria scoring, the Town and the project team recognize additional constraints to implementing these projects. Above-ground utilities limit the available right-of way for several residential streets and along Lake Park Boulevard. Many of these utilities would need to be buried or avoided during construction. Furthermore, many residents' homes are directly adjacent to the public right-of-way, particularly those closer to the beach. One third of property owners surveyed would prefer to not have a sidewalk in front of their property, although half of survey respondents were in favor of a sidewalk adjacent to their property. Finally, stormwater drainage is a concern for certain streets, although projects along Canal Drive show that the Town is actively seeking an engineering improvement to address drainage.

3.5 Pilot Projects

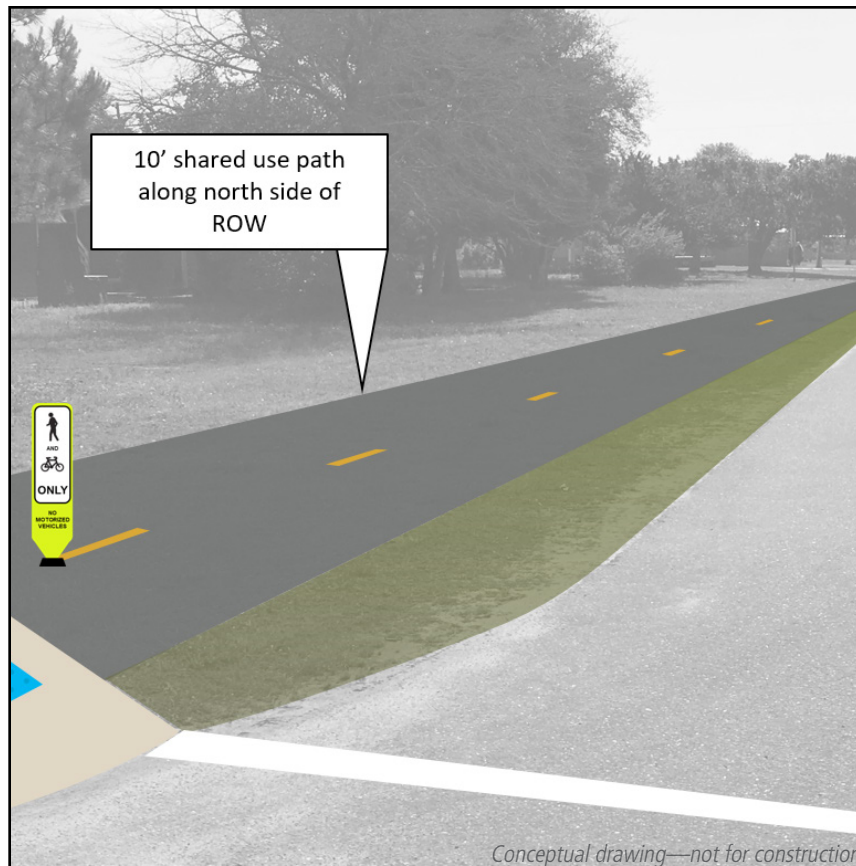
This section outlines four general project types recommended by this Plan. Although the specific context will change between locations, many of the design principles and planning-level guidance will remain consistent. These projects are examples of potential improvements, and will require site-specific environmental, design, and engineering analysis before construction.



Project #10: Alabama Avenue Shared Use Path (SUP)

In line with the Town's Bicycle Master Plan, the project team identified all 90-foot wide rights-of-way in Carolina Beach as locations for future SUPs. Using the existing SUP along Cape Fear Boulevard as an example, these facilities will accommodate both pedestrian and bicycle traffic outside of the motor vehicle travel way. Alabama Avenue represents the boundary between the Town

of Carolina Beach and Kure Beach, and this proposed project will connect the Island Greenway (from the west) to Lake Park Boulevard (to the east) as well as one of the many beach access points. All intersection crossings should be marked by striped crosswalks and yield to pedestrian signage where necessary.



Project #10: Alabama Avenue Shared Use Path (SUP)

Location: North side of Alabama Avenue from Island Greenway to Lake Park Boulevard

Length: 2,100 feet (0.40 miles)

Planning-Level Cost Estimate: \$197,000

Amenities:

- Install 10' shared use path along the north side of Alabama Avenue.
- Striped crosswalks and warning signage at intersections with in-street yield to pedestrian signage at non-controlled intersection legs, based on engineering standards at the time of construction.

Estimated Unit Costs:

- Shared Use Path @ \$480,000/mile.
- Striped Crosswalk @ \$800 each, nine intersection locations.

Figure 11. Shared Use Path along Alabama Avenue

Project #14: Canal Drive Sidewalk

Survey respondents, workshop attendees, and Steering Committee members identified Canal Drive (project #14) and Carolina Beach Avenue (project #23) as top locations where residents would favor the installation of a new sidewalk. Currently, both streets accommodate pedestrians within a marked, 4-foot paved shoulder along one side of the roadway that is also shared with bicyclists. This shoulder is not wide enough to accommodate two-way traffic

and is often covered by beach sand. Installing a concrete sidewalk would provide a clearer distinction between the pedestrian and motor vehicle travel lanes. Sidewalks along both sides of the road may be feasible in certain locations, however the Town should consider impacts of more impervious surface along this corridor as well as stormwater drainage implications.



Project #14: Canal Drive Sidewalk

Location: Canal Drive from Carolina Beach Avenue to Salt Marsh Lane

Length: 8,800 feet (1.67 miles)

Planning-Level Cost Estimate: \$282,000 (sidewalk only)

Amenities:

- Install 5' sidewalk along west side of the ROW to replace existing paved shoulder (fewer utility impediments).
- Encourage bicyclists to ride within the roadway along this 25 mph roadway, and reserve the sidewalk for pedestrians.

Estimated Unit Costs:

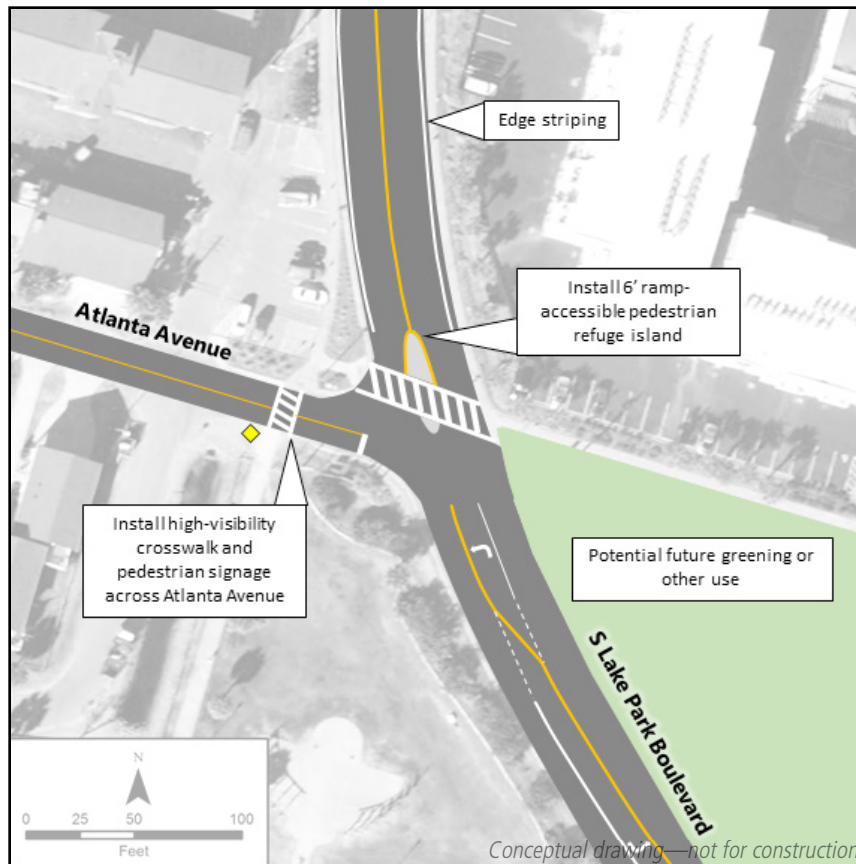
- Sidewalk @ \$32/linear foot (\$170,000/mile).

Figure 12. Canal Drive Sidewalk

Project #20: Lake Park Boulevard at Atlanta Avenue

This project illustrates a potential median improvement along Lake Park Boulevard. Edge striping and the concrete pedestrian refuge island should have a traffic calming effect around a significant bend in the road, and provide a safe place for pedestrians to wait

for on-coming traffic to pass. A high-visibility crosswalk across Atlanta Avenue on the west leg of the intersection will connect downtown with Carolina Lake multi-use path and provide a continuous corridor parallel to Lake Park Boulevard.



Project #20: Lake Park Boulevard at Atlanta Avenue

Location: Intersection of Lake Park Boulevard and Atlanta Avenue

Length: N/A

Planning-Level Cost Estimate: \$16,000

Amenities:

- Install 6' median pedestrian refuge island at north leg of the intersection.
- Edge striping to limit travel lane width leading up to the median refuge.
- Install high-visibility crosswalk across west leg of Atlanta Avenue with yield to pedestrian signage based on engineering standards at the time of construction.

Estimated Unit Costs:

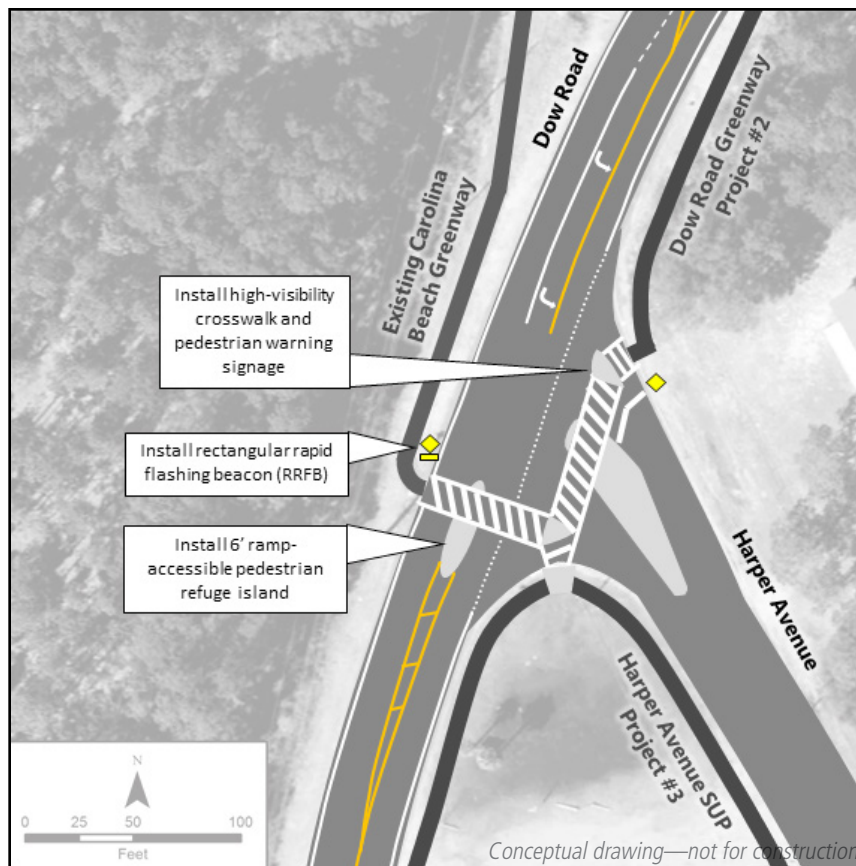
- Median Island @ \$13,500 each.
- High Visibility Crosswalk @ \$2,500 each.
- Signage @ \$300 each.

Figure 13. Pedestrian Refuge Island at Lake Park Boulevard and Atlanta Avenue

Project #22: Dow Road at Harper Avenue

The intersection of Dow Road and Harper Avenue represents a critical junction for planned pedestrian facilities in Carolina Beach. This is where the existing Carolina Beach Greenway along Old Dow Road connects with the Dow Road (project #2) and Harper Avenue (project #3) Greenways. Steering Committee members identified this location as a significant barrier due to high volumes and speed of

motor vehicle traffic. The RRFB and pedestrian refuge island could improve pedestrian visibility while attempting to cross the intersection along Dow Road. A new high-visibility crosswalk across Harper Avenue would connect the future Dow Road and Harper Avenue greenway projects.



Project #22: Dow Road at Harper Avenue

Location: Intersection of Dow Road and Harper Avenue

Length: N/A

Planning-Level Cost Estimate: \$40,000

Amenities:

- Install 6' median pedestrian refuge island at south leg of the intersection.
- Install RRFB at south leg of the intersection.
- Install high-visibility crosswalk across east leg of Harper Avenue with yield to pedestrian signage based on engineering standards at the time of construction.

Estimated Unit Costs:

- RRFB @ \$22,250 each.
- Median Island @ \$13,500 each.
- High Visibility Crosswalk @ \$2,500 each.
- Signage @ \$300 each.
- Curb Ramps @ \$80 each.

Figure 14. Improvements at Dow Road and Harper Avenue

4 Recommended Programs and Policies

In addition to engineered infrastructure (Section 3), strong programs and policies can help encourage and support pedestrians within the Town.

4.1 Overview

While development of facilities relates directly to engineering, pedestrian programs tend to focus on the other four of the five E's: encouragement, education, enforcement, and evaluation. Pedestrian policies can improve pedestrian friendly design and development of both public and private sector projects. The project team encourages the Town to explore a comprehensive approach to the five E's. This requires ongoing communication and collaboration with a wide range of government agencies, organizations, the community, and individual stakeholders.

Many of the following activities represent continuations and/or enhancements of programs and policies that the Town is already administering. Recommendations in this section seek to enhance ongoing activities and enhance overall livability and walkability for the Town's diverse and unique population. Many programs and resources listed in this section are subject to the availability of grant funding. The Town should follow up directly with the organizations listed for more information on the status of these programs or newer funding resources.



4.2 Existing Programs

The Town has coordinated more than 200 public events over a five-year period between 2013 and 2017, averaging more than 40 events per year. Common Town-sponsored events include parades, foot races, beach-related events, music festivals, and food festivals. The two busiest months of the year, May and October, average more than six events per month with as many as 12 events occurring in October 2013. Events are influenced by the weather. Nearly 90 percent of these Town events occurred between March and October, with the remaining 10 percent occurring between November and February.

4.2.1 Previous Outreach

Carolina Beach Elementary School has frequently participated in National Walk to School Day, observed annually in October. Carolina Beach Police Department, New Hanover County Sheriff's Department, Active Routes to School Region 8, Safe Kids Cape Fear, and WMPO were all active supports in past events.

4.2.2 Potential Partners

Steering Committee members identified two groups related to active transportation: Island Greenway Committee and the Wayfinding Committee. Although both groups have since disbanded, previous members of those groups may be potential partners in promoting, implementing, or assisting with the implementation of this Plan.



Source: Town of Carolina Beach



4.3 Program Recommendations and Resources

4.3.1 Encouragement Programs

The Town can use encouragement programs to strengthen culture for walking and bicycling within the community. Local businesses and Town agencies can all play a role in encouraging pedestrian and bicycling through a variety of opportunities and incentives, some of which are presented below.

Lead agencies and stakeholders:

- › Town staff
- › County health department
- › Community leaders/stakeholders

Elements of a good encouragement program:

- › Provides residents casual introductions to bicycling and walking in a non-competitive setting.
- › Uses a variety of print and electronic strategies to disseminate relevant bicycling and pedestrian information.
- › Celebrates and promotes community wins through print or online media, and word of mouth.

ACTIVE ROUTES TO SCHOOL COORDINATOR

NCDOT and NC Division of Public Health support Active Routes to School, a project under NC Safe Routes to School. Regional coordinators work to promote safe bicycling and walking to school for elementary and middle school students. The Town can receive support from the Region 8 Coordinator, who sits within the Robeson County Department of Public Health (Lumberton, NC). The project provides free support and training for education and encouragement programs.

WALKING MAPS

User maps are important tools for encouraging walking. The Town can develop print and/or electronic maps and smart phone applications that identify common walking routes, identify key destinations, and other available or planned facilities. The Town should refine and update the maps as they develop new facilities, and should seek opportunities to distribute to residents and visitors. Colorful, graphic maps should appeal to all ages and abilities and can also include educational information about the rules of the road for drivers and pedestrians, safety, and etiquette.

SELF-GUIDED AND GROUP WALKING TOURS

Walking tours encourage walking and present an opportunity for residents to socialize. By developing and advertising one or more formal tour routes in association with the walking and bicycling maps previously described, the Town could identify routes to connect pedestrians to recreational, shopping, dining, and scenic destinations. Tour routes could begin with existing facilities and expand as the pedestrian network develops. Walking tours could include organized groups with Town-sponsored tour guides.

<https://www.citywalkingguide.com/carolina-beach>

WAYFINDING SIGNS

As the pedestrian system develops, and especially as sidewalks are installed and neighborhoods are connected, wayfinding will help contribute to the overall pedestrian environment. Items such as mile markers, consistent themes and logos, and regular wayfinding kiosks will become important elements to encourage walking.

The Town can use services such as Walk [Your City] (<https://walkyourcity.org>) to purchase inexpensive, weather resistant signs to educate residents about the distance and direction between destinations.



AWARENESS DAYS AND EVENTS

The Town can devote specific days of the year to raise awareness related to pedestrian and bicycling issues and promotion. Events can be held in parks, schools, Town facilities, or similar venues.

The Town can use national events to increase use of pedestrian and bicycle facilities, create new versions specific to local events, and add pedestrian topics to existing Town events. Examples of national events include National Walk to Work Day (April), Earth Day (April 22), National Trails Day (First Saturday in June), and National Walk Bike to School (October).

TOWN DESIGNATIONS

Several national recognition programs encourage towns and cities to promote pedestrian activity. The Town can pursue or strive for progress towards one of the programs that recognize communities that are working to improve access, safety, mobility, and transportation options. Recognition programs include the following examples:

- › Walk Friendly Community <http://www.walkfriendly.org/>
- › Active Towns <https://www.activetowns.org/>

ENCOURAGEMENT PROGRAM RESOURCES

1. Active Living by Design.
<http://activelivingbydesign.org/resources/>
2. Active Routes to School.
http://www.communityclinicalconnections.com/What_We_Do/Active_Routes_To_School/index.html
3. Healthy Aging Research Network Archives.
<http://depts.washington.edu/hprc/resources/products-tools/healthy-aging-research-network-archives/>
4. Livable Communities: Livable in Action.
<http://www.aarp.org/livable-communities/livable-in-action/>
5. Move More Walking Map Guide.
<http://www.eatsmartmovemorenc.com/WalkingMapGuide/WalkingMapGuide.html>
6. National Center for Safe Routes to School.
<http://saferoutesinfo.org/>
7. Walk Wise, Drive Smart: A Senior Pedestrian Safety Program in Hendersonville, North Carolina.
http://www.pedbikeinfo.org/cms/downloads/WalkWise_Hunter.pdf





4.3.2 Education Programs

Members of the Steering Committee noted that the educational component will be one of the most important elements to the Plan. The Town can take advantage of existing educational materials from state or federal programs and tailor these to the specific needs of the community. The educational materials should promote safe behaviors, rules, and responsibilities for all roadway users including pedestrians, bicyclists, and motorists. Local businesses, Town agencies, and local advocates can all play a role in developing and distributing educational materials.

Lead agencies and stakeholders:

- › Town staff
- › County health department
- › Dedicated and committed community leaders/stakeholders

Elements of a good education program:

- › Provides the community with information on pedestrian laws, safe behaviors, and skills.
- › Reaches people of all skill levels, physical abilities, and ages.
- › Delivers information through a variety of print and electronic messages and hands-on training.
- › Includes all roadway users: motorists, bicyclists, and pedestrians.

PROJECT-RELATED EFFORTS

The Town should coordinate closely with NCDOT and other local stakeholders when elements of the Plan and other pedestrian roadway improvements are planned or implemented. Public involvement and education are essential throughout the project process. Communication with the public during the planning phase ensures the community is aware of upcoming events or potential impacts to their roadway, construction schedules, improvements, and proposed completion dates. This also provides an opportunity for community feedback, which can help inform future educational efforts on the project. Once a project is completed, education efforts should provide information on how to use the facility. Project-related coordination efforts can be distributed through local media outlets, on-site, at special events/community events, project-related meeting, local and Town websites, and in coordination with NCDOT outreach.

DRIVER EDUCATION

Stakeholders from the community expressed the need for driver education in the community. Town staff, Steering Committee members, and community leaders can work together to identify priority educational topics, key audiences, and outreach methods (e.g., signage, workshops, print media). Potential educational campaigns, as discussed by both community stakeholders and Steering Committee members, include the following:

- › RRFB awareness.
- › General rules of the road conducted at day cares and churches (for young residents).
- › General awareness signs for visitors entering Carolina Beach.



INTERNAL EDUCATION

Education is not limited to the community, but should also include all key staff involved in Plan implementation. This includes Town staff, Board members, and Steering Committee members as well as NCDOT Division staff and regional or county staff, when relevant. Opportunities for education include, but are not limited to, the following:

- › Staff presentations on sessions or conference events.
- › Meetings or retreats on the Plan to discuss the status of the Plan, potential funding opportunities, roadblocks to implementation, or other similar pertinent information.
- › Coordination between agencies and departments, such as information or resource sharing between transportation, planning, health, facilities, parks and recreation, and other such Town or county departments.

- › Training opportunities—webinars, brown bag lunch presentations—to educate staff on pedestrian guidelines and designs and best practices from across the state and nation.

LET'S GO NC – PEDESTRIAN AND BICYCLE CURRICULUM

NCDOT sponsors this free educational program and provides instructional lesson plans, videos, and other downloadable programming to teach elementary age children how to walk and bicycle safely. Instructors do not need to receive training; however, the Active Route to School District 8 Coordinator can provide the training if desired. The Town should work with local agencies, schools, or community organizations to identify one or more individuals willing to take responsibility for conducting the training.

EAT SMART, MOVE MORE NC

Eat Smart, Move More NC is a North Carolina movement that promotes physical activity and healthy eating. They provide free, downloadable resources to encourage communities, schools, grocery stores, and similar businesses to make the healthy choice the easier choice. Community-based tools support creating active outdoor play spaces, information on coalitions to support the movement, and handouts for distribution, among others.



EDUCATION PROGRAM RESOURCES

1. Eat Smart, Move More NC.
<http://www.eatsmartmovemorenc.com/index.html>
2. Guide to Creating Active Outdoor Play Spaces.
<http://www.eatsmartmovemorenc.com/ActivePlaySpaces/ActivePlaySpaces.html>
3. Eat Smart, Move More Coalitions.
<http://www.eatsmartmovemorenc.com/ESMMCoalitions/ESMMCoalitions.html>
4. Eat Smart, Move More Handouts.
<http://www.eatsmartmovemorenc.com/ESMMHandouts/ESMMHandouts.html>
5. Federal Highway Administration (FHWA) Pedestrian and Bicycle Safety.
http://safety.fhwa.dot.gov/ped_bike/
6. Institute for Transportation Research and Education: Education and Training – Bicycle and Pedestrian.
<https://itre.ncsu.edu/training/bike-ped/>
7. Let's Go, NC!
<https://www.ncdot.gov/bikeped/safetyeducation/letsгонc/>
8. National Highway Traffic Safety Administration Pedestrian Safety.
<https://www.nhtsa.gov/road-safety/pedestrian-safety>
9. NCDOT Bicycle and Pedestrian Division.
<https://connect.ncdot.gov/projects/BikePed/Pages/default.aspx>
10. Pedestrian and Bicycle Information Center.
<http://www.pedbikeinfo.org/>
11. WalkBikeNC.
<https://www.ncdot.gov/bikeped/walkbikenc/>



4.3.3 Enforcement Programs

Much like education programs, the purpose of enforcement programs can be used to educate all roadway users about traffic laws and encourage safer behaviors. Programs include periodic reminders or events to obey traffic rules and ongoing monitoring of public spaces. Enforcement programs also reinforce and support the other E's.

Lead agencies and stakeholders:

- › Law enforcement agencies
- › Town staff

Elements of a good enforcement program:

- › Reviews and updates State laws that impact bicycle safety.
- › Ongoing enforcement of relevant laws.
- › Reduces the number of pedestrian crashes.



WATCH FOR ME NC

This statewide pedestrian and bicycle safety campaign intends to reduce pedestrian and bicycle injuries and deaths through education and enforcement. Watch for Me NC targets all roadway users and provides useful resources and tools for municipalities and residents.

SEELICKFIX

Community members can use this website to report neighborhood concerns related to infrastructure, such as potholes, streetlight issues, or graffiti. The comments are routed to the local officials who can respond to the comment with information. The Town can use this resource to better track community concerns and identify areas in need of attention.

SPEED FEEDBACK SIGNS

The Town can use temporary traffic calming devices at key locations. Based on public input received at the second public meeting, the Town may consider using the signs along North Lake Park Boulevard (near Snow's Cut bridge).



MOTORIST ENFORCEMENT

Local police should work with Town officials to use any of the programs and resources to coordinate one-time or ongoing motorist enforcement campaigns. Enforcement may include monitoring vehicle speeds, pedestrian jaywalking, or RRFB compliance.

Another approach to motorist enforcement is to incentivize or offer rewards for appropriate behavior. Local law enforcement can conduct a pedestrian enforcement campaign that commends pedestrians for using crosswalks. The Town can work with local business owners to provide gift certificates, coupons, or other small tokens as rewards. The Town should conduct these enforcement efforts at highly visible locations and publicize them in the community and via social media.

ENFORCEMENT PROGRAM RESOURCES

1. Bike Law *Ride Guide for North Carolina Bicycle Laws*.
https://www.bikelaw.com/wp-content/uploads/2014/11/BIKELAW_RG_NC_Web.pdf
2. FHWA Partnering with Law Enforcement.
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/ntpp/partner_law.cfm
3. NCDOT Watch for Me NC.
<http://www.watchformenc.org/>
4. NHTSA Resource Guide on Laws Related to Pedestrian and Bicycle Safety.
<https://one.nhtsa.gov/people/injury/pedbimot/bike/resourceguide/index.html>
5. Pedestrian and Bicycle Information Center Training and Events.
<http://www.pedbikeinfo.org/training/index.cfm>
6. Pedestrian Safety Guide and Countermeasure Selection System.
<http://www.pedbikesafe.org/pedsafe/>



4.3.4 Evaluation Efforts

The Town can use evaluation efforts to understand how well the strategies in the plan are working over time. Evaluation activities include setting goals, collecting baseline data (where possible), setting timetables, and collecting follow up data for all projects. Not all evaluation activities are data-driven; qualitative feedback and partnerships can assist with achieving the goal of evaluating program/strategy effectiveness and identifying improvements.

Lead agencies and stakeholders:

- › Bicycle and Pedestrian Committee
- › Steering Committee
- › Town staff
- › Public Works maintenance staff

Elements of a good evaluation effort:

- › Dedicated staff or volunteer who will take responsibility of monitoring all elements of the Plan.
- › Established metrics that are measurable and have associated timelines.



Conducting a bicycle- and pedestrian-focused RSA in Asheville, NC

TOWN OF CAROLINA BEACH BICYCLE AND PEDESTRIAN COMMITTEE

The Town should establish a Bicycle and Pedestrian Committee and engage with the Steering Committee members. The Bicycle and Pedestrian Committee should be responsible for moving the Plan towards implementation and tracking success. Steering Committee members can help champion the Plan by working closely with the Bicycle and Pedestrian Committee to help measure success, work as liaisons with the greater community, and help identify solutions to barriers during implementation.

ANNUAL PEDESTRIAN COUNT PROGRAM

The Town and the Bicycle and Pedestrian Committee can work together to conduct annual pedestrian counts to identify high-traffic locations. Volunteers from schools or community organizations can conduct manual observational counts at different times of the day and days of the week. Counts for specific locations should be done prior to implementation of a project to establish a baseline and then continue annually or on a two-year cycle. Observational qualitative data can also be used to identify locations for specific safety, enforcement, and educational efforts.

CONDUCT ROAD SAFETY AUDITS (RSAs)

Town staff and representatives can conduct RSAs on priority corridors to identify more specific engineering-related improvements. This is a formal and detailed process that involves a multidisciplinary team to identify roadway elements that present the most safety concern and formulate solutions to eliminate or mitigate the safety issues. Technical assistance may be available from Federal Highway Administration or the Town can consider hiring an outside consultant to organize and conduct RSAs. Lake Park Boulevard (US 421) should be considered for an RSA in coordination with NCDOT and FHWA.

COMMUNITY SURVEYS

The Town can use surveys and other similar feedback mechanisms as tools to gauge community-wide acceptance and understanding of new projects; needs and interests for other future projects; and other community concerns that may be addressed through Encouragement and Education programming. The Town should work with stakeholder groups who reach broad audiences to help disseminate survey tools and collect the feedback.

FACILITY INSPECTION AND MAINTENANCE

A key piece of evaluation is measuring and identifying maintenance needs, particularly after implementation. Public Works maintenance and facility staff should conduct routine maintenance checks of installed pedestrian projects to identify general wear and tear and immediate fixes—such as potholes and broken asphalt—that may impede use. The Town should establish a plan and timeline for addressing such issues. This encouragement initiative relies upon crowd-sourcing to report maintenance needs.

EVALUATION RESOURCES

1. National Center for Safe Routes to School – Walkability Checklist.
<http://archive.saferoutesinfo.org/sites/default/files/walkabilitychecklist.pdf>
2. Pedestrian and Bicycle Information Center – Counts.
http://www.pedbikeinfo.org/planning/tools_counts.cfm
3. FHWA – Road Safety Audits.
<https://safety.fhwa.dot.gov/rsa/>

4.4 Policy Recommendations

4.4.1 State Pedestrian Transportation Policy

The NCDOT DBPT web page includes references and links to state and federal policies to support accommodation of pedestrians as part of the transportation system.

See <https://www.ncdot.gov/bikeped/lawspolicies/> along with the summaries below.

COMPLETE STREETS POLICY AND GUIDELINES

This policy requires planners and designers to consider and incorporate multimodal alternatives in the design and improvement of all transportation projects within a growth area of a municipality unless certain circumstances. In July of 2012, NCDOT adopted guidelines to support the policy.

PEDESTRIAN POLICY GUIDELINES

Pursuant to this policy, NCDOT may participate with localities in the construction of sidewalks as incidental features of highway improvement projects.

ADMINISTRATIVE ACTION TO INCLUDE LOCAL ADOPTED GREENWAY PLANS IN THE NCDOT HIGHWAY PLANNING PROCESS AND GUIDELINES

These guidelines require NCDOT to consider greenways and greenway crossings during the highway planning process.

BRIDGE POLICY

NCDOT's Bridge Policy includes information to address sidewalks and bicycle facilities on bridges, including minimum handrail heights and sidewalk widths.

Recommendation: Town staff should be familiar with State pedestrian policies and laws, including best practices and ensure that NCDOT projects include pedestrian accommodations.

Recommendation: Coordinate with NCDOT Division 3 plans to resurface or reconstruct NCDOT-owned and maintained roadways. Ensure that plan recommendations for pedestrian facilities are included on those streets. If a compromise to the original recommendation is needed then contact NCDOT DBPT for guidance on appropriate alternatives.



4.4.2 Town of Carolina Beach, North Carolina Code of Ordinances

The Code of Ordinances are the current legislation adopted by the Town and available from the website <http://www.carolinabeach.org/>. Pedestrian-specific ordinances (Chapter 16, Motor Vehicles and Traffic, Article IV, Section 16-130 through Section 16-134) primarily focus on detailing where pedestrians can and cannot walk as well as safe and legal crossings. Article IV addresses pedestrians.

SIDEWALKS

Chapter 40, Zoning, Article VI Landscaping and Development Specification Standards detail specific requirements associated with sidewalk construction and placement. Section 40-176—Buffer yard landscaping—requires sidewalk and tree plantings for all new construction within the central business district. Section 40-178—Design specification standards—requires sidewalks, curb, and gutter for all new development and redevelopment that exceeds 50 percent of the current tax or appraised value. This ordinance also states the minimum sidewalk width is 4 feet for residential areas and 5 feet within the central business district or state-maintained roads. If the sidewalk cannot fit on the existing right-of-way, the property owners will be required to provide the town with an easement to maintain sidewalks.

Recommendation: The Town should include all relevant local and state ordinances and laws related to pedestrians and sidewalks in education and encouragement materials and programming. Information should be stated an appropriate reading level and should include images and graphics where appropriate so the information is easily accessible to all community members.

Recommendation: The Town should establish a maintenance fund to assist with maintaining and replacing existing and new sidewalks.

Recommendation: The Town should establish street design standards that detail connectivity requirements for new sidewalks, curb, and gutter in all new development and redevelopment. A standard 5-foot minimum sidewalk width should be applied to all new development.

ZONING

Chapter 40, Zoning Article XIV – Nonconforming Situations, Section 40-423: Central Business District will not approve any new drive-in/drive-thru facilities to balance between automobile dependent uses and safety of pedestrians on planned and existing sidewalks.

Recommendation: The Town should explore additional form-based codes and streetscape requirements that encourage pedestrian uses in the Central Business District.



4.4.3 Other Plans and Coordination

There are several local and regional plans that detail pedestrian-related projects and improvements. However, the Town does not have a coordinating body to monitor ongoing or planned projects for coordination opportunities. There is an opportunity to work with surrounding towns and regional representatives and governing bodies to coordinate efforts, share experiences, and learn success stories that may be applicable.



Recommendation: The Town should work with the WMPO to identify opportunities to coordinate efforts for transportation on a regional level.

Recommendation: The Town should work with New Hanover County to coordinate efforts in the Town of Carolina Beach with efforts in the Carolina Beach Parks, Recreation, and Open Space Master Plan Update (2017), Wilmington/New Hanover County Comprehensive Greenway Plan (2013), and the Carolina Beach Bicycle Multi-Use Transportation Plan (2011).

Recommendation: The Town should work with surrounding towns of similar size and the WMPO Bicycle and Pedestrian Advisory Committee to learn more about establishing and maintaining a bicycle and pedestrian committees.

Recommendation: The Town should identify and engage community organizations and leaders to be responsible for monitoring and implementing the Plan.

Table 6. Four E's Recommendation Overview

Strategy	Target Audience	Lead Agency/ Stakeholder	Partnerships for Success	Time Frame	Duration	Costs
 Encouragement						
Active Routes to School Coordinator	Schoolchildren, Parents	Town of Carolina Beach	County Department of Public Health	Immediate	Ongoing	\$
Walking/Bicycling Maps	General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Volunteers	Near Future – Long-Range	Ongoing	\$ - \$\$
Self-Guided/Group Walking Tours	General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Volunteers	Near Future – Long-Range	Periodic	\$
Wayfinding Signs	General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Volunteers	Immediate	Ongoing	\$ - \$\$
Awareness Days/Events	General Public	Town of Carolina Beach	Bicycle Pedestrian Committee, Volunteers	Immediate – Long-Range	Ongoing	\$
Town Designations	General Public	Town of Carolina Beach	Bicycle Pedestrian Committee	Long-Range	Ongoing	\$
 Education						
Project-Related Efforts	General Public	Town of Carolina Beach	NCDOT	Immediate – Long-Range	Ongoing	\$
Driver Education	General Public	Town of Carolina Beach	NCDOT	Near Future – Long-Range	Ongoing	\$ - \$\$\$
Internal Education	Town staff/ Representatives	Town of Carolina Beach	NCDOT, Regional, County staff	Immediate – Long-Range	Periodic	\$
Let's Go NC	General Public, schoolchildren	Town of Carolina Beach	NCDOT, Active Route to School Coordinator	Immediate	Periodic	\$
Eat Smart, Move More NC	General Public	Town of Carolina Beach	NCDPH, ESMM	Immediate	Ongoing	\$

Strategy	Target Audience	Lead Agency/ Stakeholder	Partnerships for Success	Time Frame	Duration	Costs
 Enforcement						
Watch for Me NC	Motorists	Town of Carolina Beach	Law Enforcement, NCDOT	Immediate – Long-Range	Periodic	\$
SeeClickFix	General Public	Town of Carolina Beach	—	Immediate – Long-Range	Ongoing	\$
Speed Feedback Signs	Motorists	Town of Carolina Beach	—	Long-Range	Ongoing	\$\$ - \$\$\$
Motorist Enforcement	Motorists	Town of Carolina Beach	Law Enforcement	Immediate	Periodic	\$\$ - \$\$\$
 Evaluation						
Bicycle and Pedestrian Committee	Town Staff / General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Steering Committee	Near Future – Long-Term	Ongoing	\$
Annual Pedestrian Count Program	General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Steering Committee	Near-Future – Long-Range	Periodic	\$ - \$\$\$
Road Safety Audits	Town Staff	Town of Carolina Beach	Bicycle Pedestrian Committee	Near-Future – Long-Range	Periodic	\$\$ - \$\$\$
Community Surveys	General Public	Bicycle Pedestrian Committee	Town of Carolina Beach, Steering Committee	Near Future – Long-Range	Periodic	\$\$ - \$\$\$
Facility Inspection/ Maintenance	Town Staff	Town of Carolina Beach	Facilities	Near Future – Long-Range	Periodic	\$\$\$

Time Frame: Immediate = initial steps in Plan, short-term; Near Future = implementation phases; Long-Range = post-implementation, evaluation and maintenance phases

Duration: Ongoing = continual updates needed, no clear end; Periodic = occasional, non-specified milestones

Costs: \$ = Minimal costs/free; \$\$ = Moderate costs, may be available through local funds/investments; \$\$\$ = Requires investment, grants, additional funding resources

5 Implementation Plan

Following through on these recommendations will require persistence and leadership from the local community. Although local sources of funding can go a long way in achieving community aims, there are a variety of ways for the residents of Carolina Beach to encourage walking in their community.

5.1 Implementation Overview

This section outlines the organizational structure and steps necessary to successfully achieve the goals set forth by this Plan. The recommendations within this section include:

- › Organizational structure for administering programs.
- › Action items for building a culture of active living.
- › Methods for monitoring progress and continuing encouragement.
- › Potential funding sources.

5.2 Organizational Framework for Implementation

Successful implementation of the Plan will require the cooperation of several agencies and organizations. Many of these partnerships already exist, and this Plan will build on those partnerships. Examples of these partnerships include the relationships between NCDOT, the Town, and WMPO. Still other connections will be formed through the implementation of this Plan. These coalitions will likely be formed within the community itself, as the Town coordinates its efforts with local schools, athletic associations, and other community groups.



WMPO



5.2.1 Role of NCDOT

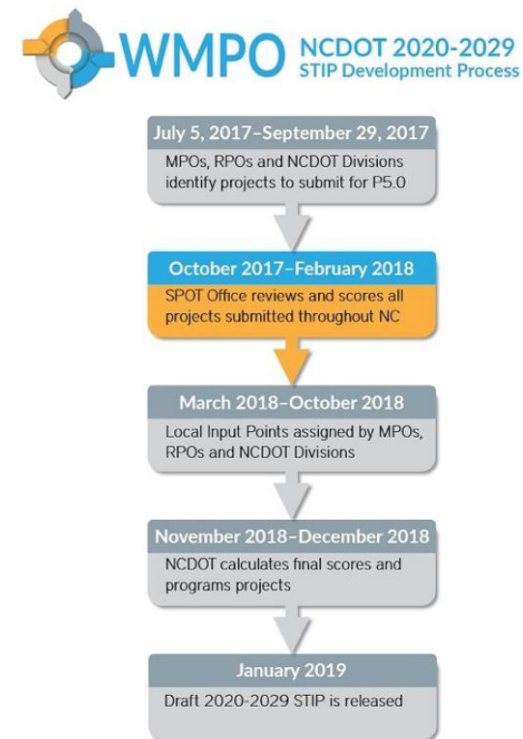
As the administrator of the Bicycle and Pedestrian Planning Grant Initiative and the primary agency concerned with transportation planning, engineering, and construction in the State of North Carolina, NCDOT will be an important partner in the implementation of this Plan. After the adoption of this Plan, NCDOT should continue to provide technical assistance and consulting regarding pedestrian transportation planning in Carolina Beach. NCDOT Division 3 is responsible for construction and maintenance of pedestrian facilities in the Town. It will be the primary partner for the design and construction of recommended projects made in Section 3 of this Plan.

The Strategic Prioritization Office of Transportation (SPOT) process prioritizes most NCDOT division projects, per the state's Strategic Transportation Investment (STI) law. SPOT is a data-driven approach to project prioritization for all transportation mode projects, including bicycle and pedestrian project improvements. STI provides three funding tiers for transportation projects: Statewide Mobility, Regional impact, or Division needs. Standalone pedestrian projects are eligible for funding as part of the Division Needs category. Bicycle and pedestrian projects compete against highway and other transportation projects in this category. Half of the score is based on data-centric methodology determined by NCDOT and the other half of the score is dependent on local input from the NCDOT Division 3 office and the WMPO.

The NCDOT DBPT is the primary resource for guidance on bicycle and pedestrian policies, laws, and safety education (Section 4). It is also the administrator for a wide variety of statewide initiatives aimed at promoting safety and participation in active transportation. As the Town progresses with the implementation of this Plan, it should consult the online resources available through the DBPT for guidance on specific pedestrian treatment issues.

5.2.2 Role of the Wilmington Urban Area MPO

As the MPO responsible for transportation planning within New Hanover County and the Town of Carolina Beach, the WMPO should consider implementing the projects recommended in this Plan. For the infrastructure needs of Carolina Beach to be met, WMPO should continue to consider the multimodal transportation needs of the Town in its CTP, last updated in 2015. Opportunities to improve the pedestrian environment should be taken when roadways are scheduled for maintenance or construction. Many of the projects outlined in this report can be accomplished in unison with maintenance programs initiated by the MPO and funded in combination with state roadway improvement programs such as SPOT.



5.2.3 Role of New Hanover County

Planning by the New Hanover County government has a very tangible effect on the Town of Carolina Beach. The County is the primary organization governing land use planning, transportation planning, and public health initiatives in and around the Town. It is vital that these plans align with common goals that span municipal boundaries. While New Hanover County is responsible for more than just Carolina Beach, there are several crucial ways for the County to support this Plan:

- › Support active transportation through regional trails and networks.
- › Promote active transportation and public health through county-wide programming.
- › Prioritize pedestrian safety when updating the CTP.

5.2.4 Role of the Town of Carolina Beach

Carolina Beach is responsible for implementing this Plan. Through its adoption, the Town will be empowered to act as a champion for pedestrian needs. The Town should reconstitute or form pedestrian (and bicycle) advisory committees that will serve as champions for pedestrian planning in Carolina Beach. As champions of active transportation, committee members should encourage the full implementation of this Plan. This includes advocating for the project and programmatic recommendations in this Plan, as well as developing other events and programs as they work in the community. A great example of this is in practice is a wayfinding signage program. This would be functional for pedestrians and would enhance the sense of community and aesthetics in Carolina Beach.

5.3 Implementation Action Steps

This section outlines general steps to fully implement this Plan. Steps are assigned to three categories: policy, programming, and infrastructure. A timeline of these action items is provided in Table 7.

5.3.1 Policy Action Steps

ADOPT THIS PLAN

The first step for the Town of Carolina Beach to build upon the existing regional plans and policies is adopting this Plan. Adoption will improve the Town's eligibility to receive priority funding for projects.

REESTABLISH THE BICYCLE & PEDESTRIAN ADVISORY COMMITTEE

Carolina Beach has a history of citizen involvement in action committees, including former Island Greenway and Wayfinding committees. The Town should re-establish a bicycle and pedestrian advisory committee (BPAC). This committee would be the primary advocate for promoting pedestrian planning and events in Carolina Beach, and oversee event programming and encouragement within the community. Local champions should represent many different interests within the Town, such as the elementary school, Town staff, police, and many others, which share the common goal of making Carolina Beach a safer place to walk. Other coastal North Carolina communities, such as Emerald Isle, have established BPACs that can serve as a model for Carolina Beach.

CONTINUE TO ENFORCE STATE AND LOCAL REGULATIONS

Ensuring that motor vehicles obey the speed limit, pedestrian signals, and other traffic regulations can improve the perception and desirability of walking Carolina Beach. Additionally, ensuring that pedestrians obey traffic laws themselves can ensure that these

travelers stay out of harm's way. This creates an environment that is safe for all roadway users. The NCDOT DBPT offers helpful links to many of these regulations through its website:

<https://www.ncdot.gov/bikeped/lawspolicies>

5.3.2 Program Action Steps

CREATE EDUCATIONAL OUTREACH PROGRAMS

Education provides people of all ages the confidence to walk alongside motor vehicles. Educational outreach should also extend to drivers of motor vehicles as well. Awareness of pedestrians is a skill that is learned and can be improved upon with active engagement.

CREATE ENCOURAGEMENT OUTREACH PROGRAMS

Many of these encouragement programs serve to remind individuals how convenient and attainable an active lifestyle can be. Walk to work and school events can illustrate how easy it is to complete daily activities through active transportation. Open streets events bring people together, build a sense of community, and allow them to engage with the community without needing to drive and find a parking space.

ESTABLISH A MONITORING AND BENCHMARKING PROGRAM

The BPAC should devise ways of monitoring pedestrian activity, as well as preferred routes and destinations. The needs and preferences of the community will evolve over time. To ensure that Town officials and planners can respond effectively, there should be an established methodology for tracking these changes, evaluating current programs, and generating new priorities.



BECOME REGISTERED AS A WALK FRIENDLY COMMUNITY

The Town could choose to apply for a designation as a Walk Friendly Community through the University of North Carolina's Highway Safety Research Center. This designation offers the opportunity for Carolina Beach to assess its current conditions and receive feedback from third party perspectives. By undergoing this process, the Town may be more equipped to apply for future grant funding through organizing its existing conditions and refining its vision as a leading pedestrian friendly community. Other Walk Friendly-recognized communities in North Carolina include Charlotte, Davidson, Asheville, Cary, and Boone. For more information, visit: <http://walkfriendly.org/apply/>

5.3.3 Infrastructure Action Steps

While there are several phases involved in infrastructure project implementation, the steps outlined in this section are fundamental for the Town to take as it implements the new infrastructure projects.

IDENTIFY FUNDING SOURCES

Federal, state, and local funding sources will be necessary to implement this Plan. No one source should be relied upon to complete all of the proposed recommendations. It is essential that local institutions find alternative possibilities for funding to help fill gaps between official sources. Many of these initiatives are related to safety and public health.

PERFORM A ROAD SAFETY AUDIT (RSA)

Lake Park Boulevard (US 421) was repeatedly mentioned by study team members and public workshop attendees as a barrier to pedestrian travel. This entire corridor is an ideal candidate for an RSA, which is a formal examination of mobility safety performance to identify potential road safety issues and identifies opportunities for improvements in safety for all road users. FHWA works with State DOTs and local jurisdictions to encourage RSAs along existing roads and intersections. The goal of an RSA is to identify elements of the road may present a safety concern, and recommend a standard approach to elimination or mitigation.

PRIORITIZE PROJECTS

This Plan includes several recommendations from previous regional and local transportation plans. These foundational plans and projects reflect community needs, such as safety along Lake Park Boulevard and beach access. The highest-scoring projects in Section 3 should be considered for implementation in the near to mid-term.

REVIEW THE APPLICABILITY OF FUTURE PROJECTS

Many of the projects in this Plan, as well as others concerning transportation in Carolina Beach, will need to undergo more detailed site-specific evaluation as future revisions are made. Carolina Beach's priorities will change over time, and projects

should be constantly re-evaluated for future needs. Town staff and the BPAC should work jointly to this end. These priority projects should be the Town's focus as it works with the County and the MPO for funding and implementation through local and regional plans.

5.3.4 Action Item Timeline

Table 7 shows the action item timeline for plan implementation.

5.4 Performance Measures

Performance measures should be developed to evaluate this Plan's action items and programs. Baseline conditions, such as pedestrian counts and event attendance, should be gathered before any of the action items are implemented. This allows the Town and the BPAC to track the progress of successful programs as they grow and mature. Determining which programs are effective and which ones are less effective within the Carolina Beach context will be critical in making future decisions regarding the full implementation of this Plan.



Table 7. Plan Implementation Action Item Timeline

Strategy	Contributing Stakeholders	Lead Agency/ Stakeholder	Time Frame	Duration	Related Section(s)
Policy					
Adopt This Plan	Town Council	Town of Carolina Beach	Immediate	Initial	—
Finalize the Bicycle and Pedestrian Committee	Town Staff, Bicycle Pedestrian Advisory Committee	Town of Carolina Beach	Immediate	Periodic	4.2, 4.3
Continue to Enforce State and Local Regulations	Town Staff, Law Enforcement, Bicycle Pedestrian Advisory Committee	Police	Near Future – Long-Range	Periodic	4.3.3, 4.4
Program					
Create Educational Outreach Programs	Bicycle Pedestrian Advisory Committee	Town of Carolina Beach	Near Future – Long-Range	Ongoing	4.3.2, 4.4
Create Encouragement Outreach Programs	Bicycle Pedestrian Advisory Committee	Town of Carolina Beach	Near Future – Long-Range	Ongoing	4.3.1
Establish a Monitoring and Benchmarking Program	Town Staff, Bicycle Pedestrian Advisory Committee	Town of Carolina Beach	Immediate – Long-Range	Ongoing	4.3.4
Become Registered as a Bike Friendly Community	Town Staff, Bicycle Pedestrian Advisory Committee	Town of Carolina Beach	Near Future – Long-Range	Periodic	4.3
Infrastructure					
Identify Funding Sources	Town Staff, Bicycle Pedestrian Advisory Committee	NCDOT & Town of Carolina Beach	Immediate – Long-Range	Periodic	5.5
Perform a Road Safety Audit	NCDOT Transportation Safety & Mobility Unit, FHWA Division Office, Town Staff	NCDOT & Town of Carolina Beach	Near Future – Immediate	Once	—
Build the Priority Projects Outlined in this Plan	NCDOT, WMPO, New Hanover County, Town Staff	NCDOT	Near Future – Immediate	Ongoing	3.4
Review the Applicability of Future Projects	NCDOT, WMPO, New Hanover County, Town Staff, Bicycle Pedestrian Advisory Committee	NCDOT	Long-Range	Periodic	3.4

Time Frame:

- Immediate = initial steps in Plan, short-term
- Near Future = implementation phases
- Intermediate = final implementation phases
- Long-Range = post-implementation, evaluation and maintenance phases

Duration:

- Initial = preliminary action
- Once = single, stand-alone action
- Ongoing = continual updates needed, no clear end
- Periodic = occasional, non-specified milestones

5.5 Funding Sources

Funding sources to consider moving forward include, but are not limited to, the following. Refer to Appendix B for more funding source options.

- › State Transportation Improvement Program (STIP).¹
- › Congestion Mitigation and Air Quality funding (CMAQ).²
- › Surface Transportation Program-Direct Allocation funding (STP-DA).³
- › State Street-Aid (Powell Bill) Program.⁴
- › NCDOT HSIP Hazard Elimination Program⁵: Safety grant program utilizing federal and state funding to address safety and potential safety issues. Projects are selected based on a cost-benefit ratio with safety benefits being classified in terms of crashes reduced.
- › Governor's Highway Safety Program Grant⁶: Safety grant program specifically related to preventing crashes on North Carolina roads.
- › Eat Smart, Move More NC⁷: Provides a variety of links and resources, including potential funding sources for public health initiatives.
- › Safe Routes to School.⁸
- › HUD State Community Development Block Grant Program⁹: Provides assistance for community projects for smaller communities that benefit low to middle income households.
- › American Hiking Society's National Trails Fund Grant¹⁰: Organization that offers micro-grants (\$500-\$3,000) to active members of the alliance of hiking organizations to improve hiker access or hiker safety. Recipient organization must be a 501(c)(3) non-profit.
- › Private/Institutional sponsorship, potentially through healthcare providers such as the New Hanover Regional Medical Center or the University of North Carolina at Wilmington.

REFERENCES

1. NCDOT Strategic Transportation Investments (STI).
<https://www.ncdot.gov/strategictransportationinvestments/>
2. Congestion Mitigation and Air Quality Improvement (CMAQ).
https://www.fhwa.dot.gov/environment/air_quality/cmaq/
3. Surface Transportation Block Grant Program (STBG).
<https://www.fhwa.dot.gov/specialfunding/stp/>
4. State Street-Aid (Powell Bill) Program.
<https://connect.ncdot.gov/municipalities/state-street-aid/pages/default.aspx>
5. NCDOT Highway Safety Improvement Program (HSIP).
<https://connect.ncdot.gov/resources/safety/pages/nc-highway-safety-program-and-projects.aspx>
6. Governor's Highway Safety Program.
<https://safety.fhwa.dot.gov/hsip/>
7. Eat Smart, Move More NC.
<http://www.eatsmartmovemorenc.com/Funding/Funding.html>
8. Safe Routes to School.
<http://www.saferoutesinfo.org/program-tools/funding>
9. NC Department of Commerce – Community Development Block Grants.
<https://www.nccommerce.com/ruraldevelopment/state-cdbg/grant-categories>
10. American Hiking Society.
<https://americanhiking.org/national-trails-fund/>

A

Appendix A. Guidelines and Facilities

A.1 Types of Pedestrian Facilities

A wide variety of pedestrian-only and shared-use facilities are outlined in this section. These concepts are the foundational elements for project recommendations in this Plan. Not all of these facility types apply to the Carolina Beach context, but this section should serve as a guide for future pedestrian planning.

A.1.1 Shared-Use Paths (Independent Right-of-Way [ROW])

Shared-use paths physically separate users from motor vehicle traffic. Shared-use paths include sidepaths (within the roadway ROW), greenway trails (paved and unpaved nature trails), rail-trails (along an existing or former railroad ROW), and other paved facilities built specifically for bicycle and pedestrian traffic. To adequately accommodate both pedestrians and bicyclists, these pathways should be at least 10 feet wide. Existing shared-use paths less than 10 feet wide are good candidates for widening as those paths are repaved over time. Shared-use paths provide the best protection from motor traffic, except at roadway crossings.

A.1.2 Sidepaths

While path alignments in independent ROW are generally preferred, sometimes existing roads provide the only corridors available. Sidepaths are a specific type of shared-use path that run adjacent to the roadway, where ROW and other physical constraints dictate. The

shared-use path along Cape Fear Boulevard in Carolina Beach is a great example of a sidepath.

The American Association of State Highway and Transportation Officials (AASHTO) guidance discusses the potential conflicts associated with sidepaths, and provides guidelines for their consideration where certain conditions exist. Among other guidelines, AASHTO recommends a minimum distance of 5 feet between paved shoulder and sidepath; along high-speed roadways, AASHTO recommends greater than 5 feet of separation. Sidepaths are most appropriate along roadway sections with relatively few intersections and driveways.

A.1.3 Sidewalks

Sidewalks are pedestrian facilities parallel to the roadway. They should be a minimum of 5 feet wide and should include a landscaped buffer between the sidewalk and roadway. Where a sidewalk is only provided on one side of the road, consideration should be given to a wider facility (8 to 10 feet). All sidewalks should be accessible by curb cuts with ramps to help comply with the Americans with Disabilities Act (ADA) of 1990.

A.1.4 Crosswalks

Crosswalks, whether marked or unmarked, legally exist at all intersections except in prohibited areas. Marked crosswalks delineate the pedestrian right-of-way to motorists and are typically 10 feet wide.

Crosswalk markings can be distinguished by a variety of patterns, including striped and high-visibility. While striped crosswalks consist of two lines perpendicular to the direction of motorist travel, high visibility crosswalks utilize two-foot-wide longitudinal bars parallel to motorist travel, increasing pedestrian visibility to motorists.

PEDESTRIAN REFUGES

Busier downtown locations may employ raised concrete median refuge islands to provide safe spaces for pedestrians to rest or wait for traffic to pass before continuing to cross. Pedestrian refuges not only provide safety and visibility for crossing pedestrians, they may also calm traffic speeds and encourage pedestrians to cross at marked rather than at unmarked locations. Since pedestrian refuges and medians may block the turning movements of vehicles out of driveways, additional consideration should be taken for the effects of raised medians on traffic operations.

RAISED CROSSWALKS

Raised, marked crosswalks can make pedestrians more visible to oncoming traffic and provide traffic calming benefits at sensitive locations. Usually, signage accompanies these crosswalks, indicating to vehicles that a raised pedestrian crossing is ahead. A detectable, textured warning surface at the edge of the raised crosswalk alert visually impaired pedestrians that they are entering the roadway.

CURB RAMPS

To meet ADA requirements, both ends of a crosswalk should have curb cuts with a gently sloping ramp where the crosswalk meets the adjoining sidewalk. This ramp should be covered by a textured warning surface, typically truncated domes, to alert visually impaired pedestrians that they are entering the roadway. The Federal Highway Administration (FHWA) link at the end of this section provides more information on crosswalk design and specifications.

A.1.5 Curb Extensions

Curb extensions are extensions of sidewalks that effectively narrow the roadway and calm traffic. They prioritize pedestrian safety by reducing crossing distance, improving pedestrian visibility, and reducing the speeds of passing vehicles. Curb extensions also serve a secondary purpose of protecting on-street parking. However, curb extensions should not protrude into a bike lane.

A.1.6 Pedestrian Beacons

At signalized intersections, pedestrian countdown signals can facilitate crossings at high volume roads. At unsignalized intersections and mid-block crossings, signage, rectangular rapid flashing beacons (RRFBs), and pedestrian hybrid beacons (PHBs) can alert drivers to the presence of pedestrians. RRFB devices work well at locations with intermittent pedestrian activity, where they will not disrupt traffic with a high volume of crossings. Locations with higher crossing volumes may consider raised pedestrian refuges instead.

For more information, the FHWA provides guides for planning active transportation in small towns and rural areas (Small Town and Rural Multimodal Networks (2016)) as well as design guidelines for sidewalks and trail networks (Designing Sidewalks and Trails for Access (1999 & 2001)).

A.1.7 Pedestrian Facility Examples



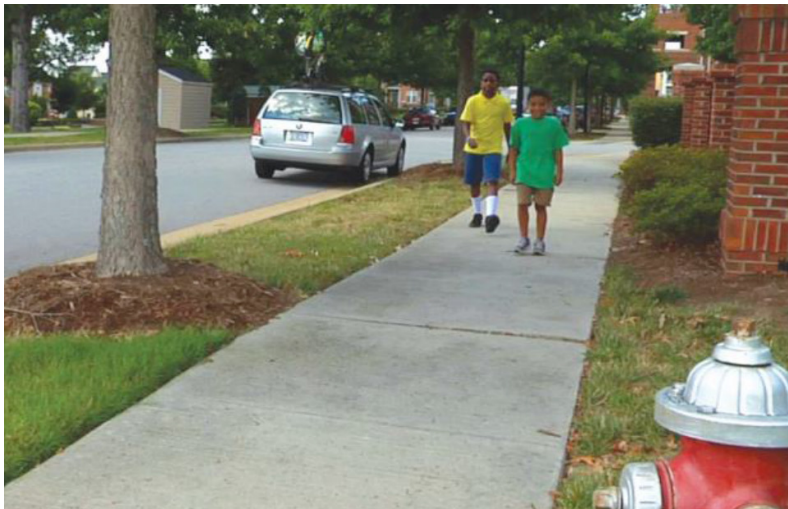
Shared-Use Path

Photo: VHB



Sidepath

Photo: VHB



Sidewalk

Photo: NCDOT



Crosswalk

Photo: VHB



Raised Crosswalk

Photo: VHB



Curb Ramp

Photo: NCDOT



Curb Extensions

Photo: NCDOT



Pedestrian Beacon - RRFB

Photo: VHB

A.2 Design Guidelines for Facilities

This section describes certain general minimum standards, but specific projects should rely on federal and state resources for specific design criteria as part of project implementation. The final section provides a list of useful online guidance by source.

A.2.1 National Guidelines

AASHTO GUIDE FOR THE PLANNING, DESIGN, AND OPERATION OF PEDESTRIAN FACILITIES

AASHTO is a non-profit organization with the goal of supportive multimodal transportation for the entire United States. The AASHTO Pedestrian Guide provides guidance on the planning, design, and application of various types of pedestrian facilities. The project team used this guide to help develop the recommendations in this Plan, and future updates to this Plan should apply the guide.

FHWA GUIDANCE

FHWA provides guidance for accessibility, design, and facility operations. Often, these are in the form of standalone publications that target a specific issue in transportation, such as planning in small towns and facility design. Its resources are especially helpful for state and local governments who wish to implement best practices in transportation planning.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

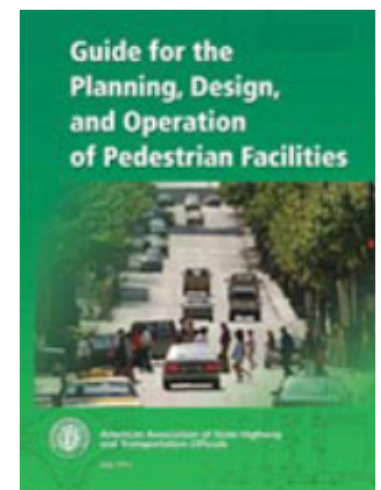
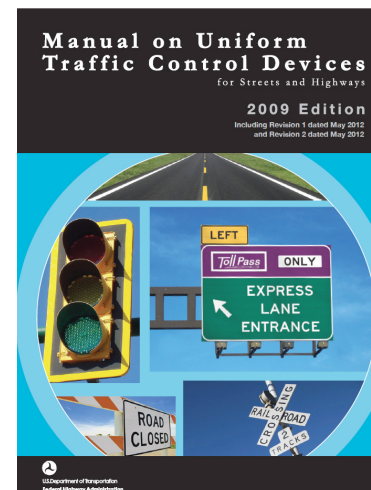
The MUTCD provides guidance on the use, design, and application of control devices such as signs, pavement markings, and signals. This manual defines the compliant design criteria for specific implementation projects. The project team consulted the MUTCD during preparation of this Plan.

MUTCD approved the current standard in 2009, with interim approvals subsequently passed to update portions of the Manual with state-of-the-practice. The next official version of the MUTCD is anticipated to be approved ~2021, however this may shift into future years.

UNITED STATES ACCESS BOARD

The US Access Board provides standards and guidelines for accessibility consistent with ADA. For more information about ADA accessibility requirements, the Town should consult the US Access Board's 1991 ADA Accessibility Guidelines (ADAAG) and the 2010 Standards for Accessible Design as minimum requirements for new construction or alterations.

The Town should also consult the 2011 Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (proposed PROWAG) for additional best practices for accessibility. PROWAG has been published as a Notice of Proposed Rulemaking but is not standard as of 2017.



A.2.2 North Carolina Guidelines

MUTCD

North Carolina has its own supplement to the MUTCD to provide additional guidance on very specific issues, such as the implementation of speed limit signage. For more general instruction on signage and traffic markings, consult the national MUTCD provided by FHWA.

PEDESTRIAN CROSSING GUIDELINES

This guide is designed to help local communities evaluate the existing conditions at pedestrian crossings in North Carolina. It can be used to assess potential improvements based on this evaluation. This guide is not designed to prioritize improvements, or assess the connectivity of a local pedestrian network. Additionally, this guide may not apply in special circumstances such as school crossings.

COMPLETE STREETS PLANNING AND DESIGN GUIDELINES

The North Carolina Department of Transportation (NCDOT) outlines guidelines for pedestrian and bicyclist facilities in its Complete Streets Planning and Design Guidelines publication. This guide is designed to help communities design streets for a variety of transportation modes. Through this multimodal approach, communities can become more active, sustainable, and connected.

TRAFFIC ENGINEERING POLICIES, PRACTICES AND LEGAL AUTHORITY (TEPPL)

This comprehensive resource provides a complete authority on federal and state policies and regulations regarding all transportation issues. This resource should be used as a reference for very intricate details regarding policy issues affecting active transportation.

A.2.3 Useful Web Links by Source

FHWA

MUTCD (2009): <https://mutcd.fhwa.dot.gov/>

Bicycle and Pedestrian Program Publications:
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/

United States Access Board and ADA:
<https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way/guidance-and-research/accessible-public-rights-of-way-planning-and-design-for-alterations/chapter-7%E2%80%9494resources>

NCDOT

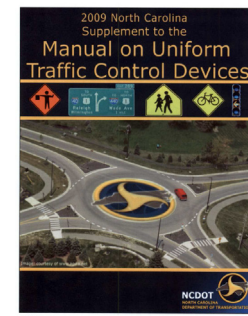
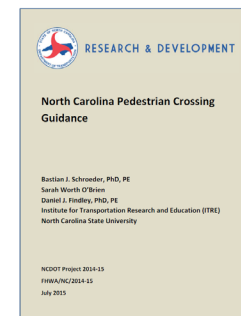
WalkBikeNC: <https://www.ncdot.gov/bikeped/walkbikenc/>

MUTCD-North Carolina Supplement (2009):
<https://connect.ncdot.gov/resources/safety/Documents/>

Pedestrian Crossing Guidance:
https://connect.ncdot.gov/resources/safety/Teppl/TEPPL%20All%20Documents%20Library/Pedestrian_Crossing_Guidance.pdf

Complete Streets Planning and Design Guidelines:
<https://connect.ncdot.gov/projects/BikePed/Pages/Complete-Streets.aspx>

TEPPL: <https://connect.ncdot.gov/resources/safety/Teppl/Pages/tepl.aspx>



B Appendix B. Funding

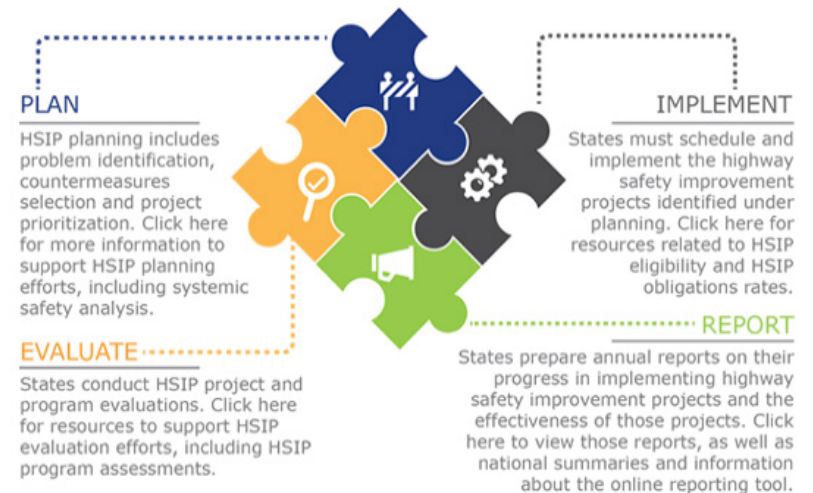
B.1 Federal Funding

In 2015, a five-year transportation funding authorization program was signed called the Fixing America's Surface Transportation (FAST) Act. The FAST Act includes several funding programs that may be used for constructing bicycle and pedestrian transportation improvements. Unless otherwise noted, NCDOT is responsible for selecting which projects will receive these federal funds.

B.1.1 Highway Safety Improvement Program (HSIP)

The HSIP aims to reduce traffic fatalities and serious injuries on all public roads, including non-State-owned public roads. The NCDOT HSIP follows a data-driven approach to select safety projects, select design options (often referred to as "countermeasures"), and evaluate performance. NCDOT traffic engineers work with local agencies to evaluate high-crash locations as possible HSIP projects.

NCDOT reviews the past 10 years of bicycle and pedestrian crash history at potential project sites. Local agencies should contact their respective Division office to discuss bicycle and pedestrian safety concerns along local or State-owned roadways. HSIP-funded bicycle and pedestrian improvement projects often do not require a local funding match. Common HSIP-funded project types include PHBs, road diets, pedestrian refuge medians, and pedestrian signals at marked crosswalks.





Pedestrian Hybrid Beacon (PHB)

Photo: City of Charlotte



Road Diet

Photo: City of Charlotte



Pedestrian Refuge Median

Photo: NCDOT



Pedestrian Signal Heads at Marked Crosswalks

Photo: NCDOT

B.1.2 Surface Transportation Block Grant (STBG) Program

The STBG program is similar to the previously existing Surface Transportation Program, and it is designed to respond to local transportation needs across all modes. Transportation Alternatives Program (TAP) funding is set aside within this program. Bicycle and pedestrian improvements are the most common type of project funded with TAP dollars. Common STBG or TAP projects include sidewalks and greenways.

Within the STBG and TAP set-aside, percentages of the State's allocation are available for areas meeting certain population thresholds. The Town of Carolina Beach should coordinate with the Wilmington Urban Area MPO to discuss opportunities to apply for STBG or TAP funding. TAP and STBG dollars are also programmed through the NC Strategic Transportation Investment (STI) formula discussed in later sections. STBG or TAP funds can be used for all phases of a project, including the preparation of construction design documents, environmental agency review, construction, and inspection.

Per the NC STI law, local agencies must provide a 20% non-federal (local) match to receive STBG or TAP funding for a bicycle or pedestrian project. Town staff should consult with NCDOT staff to develop cost estimates for future construction projects and discuss options for administering federally-funded projects. Local staff should plan to devote significant time to administering federally funded projects. Please consult NCDOT's Local Programs Management Office for more information on the steps involved with locally-administered bicycle and pedestrian construction projects.

B.1.3 Congestion Mitigation and Air Quality Improvement (CMAQ) Program

CMAQ funds are available to regions of the State that do not meet the National Ambient Air Quality Standards (NAAQS) for ozone, carbon monoxide, or particulate matter. These regions are referred to as non-attainment areas or maintenance areas (former non-attainment areas that are now in compliance). Carolina Beach does not currently fall within a non-attainment area, and is therefore not eligible for these funds.



B.1.4 Recreational Trails Program (RTP)

The FAST Act allows a set aside from TAP to be directed toward the Recreational Trails Program (RTP). In North Carolina, the Department of Natural and Cultural Resources (DNCR) manages RTP. The NC Division of Parks and Recreation (State Trails Program) provides grant funding to local groups to acquire property or build trails. Grants are usually limited to \$100,000 per community or project. RTP-funded trail projects include paved greenways and natural surface hiking trails.



B.1.5 Better Utilizing Investment to Leverage Development (BUILD) Grants

The BUILD Transportation Discretionary Grants program replaced the Transportation Investment Generating Economic Recovery (TIGER) grant program in FY 2018. Like TIGER, the BUILD program uses a competitive, merit-based selection process to award grants to state, local, and tribal agencies for projects with exceptional benefits and significant local or regional impacts. Past grant awards have included multimodal projects that enhanced pedestrian and bicycle networks. BUILD funds are separate from the FAST Act, and may be subject to future federal budgetary adjustments. Local agencies should watch for future announcements for BUILD grants and consult with NCDOT when considering an application.

B.1.6 Federal Transit Administration Funding

Several FTA programs exist that can support “last mile” projects, such as sidewalks connecting to bus stops or bike lanes connecting to transit stations. Local agencies should first consider they are part of a rural area (5311 funding) or urbanized area (5307 funding). Whether the bicycle or pedestrian project connects to a fixed guideway (i.e. light rail) or serves a senior population are other important considerations. Local agencies should consult with the NCDOT Public Transportation Division for more information about funding options.

B.2 State Funding



B.2.1 STI

In 2013, the North Carolina General Assembly passed the STI law. STI defines the overall structure and criteria for distributing NCDOT’s federal and state transportation dollars among new projects. Bicycle and pedestrian projects are eligible within the STI Division Needs funding tier, meaning it will compete for dollars, across all mods and with other communities in the same NCDOT Highway Division.

STI follows a data-driven scoring process for all transportation projects. Each mode has a separate scoring methodology, described by the Strategic Mobility Formula (sometimes referred to as “SPOT”). The SPOT 5.0 version of the formula used to score bicycle and pedestrian projects considers the following criteria:

- › Safety (15%)
- › Access (10%)
- › Demand (10%)
- › Connectivity (10%)
- › Cost Effectiveness (5%)
- › Local Input (50%)

Local input is the most significant part of a project's overall score, so it is most important to coordinate with the MPO and NCDOT Division 3 office. For more information about the SPOT criteria, review online resources provided by NCDOT <https://connect.ncdot.gov/projects/planning/Pages/PrioritizationResources.aspx>

B.2.2 NCDOT Spot Safety Program Funds

The NCDOT Spot Safety Program constructs smaller improvement projects to address safety issues. The maximum Spot Safety funds per project is \$250,000. A NCDOT committee recommends Spot Safety projects to the Board of Transportation (BOT) for approval and funding. The committee considers criteria such as the frequency and severity of crashes, levels of traffic congestion, pedestrians and school access, and local support. Local agencies should contact their NCDOT Division to discuss locations that may have high crash rates and other safety concerns to see if Spot Safety is a possible funding source for their bicycle and pedestrian improvement.

B.2.3 Contingency Funding

Contingency funding is a discretionary funding source appropriated through the annual State budget for small construction projects. Local agencies should contact their NCDOT Division Engineer or state Representative/Senator to discuss smaller scale improvements, such as sidewalks or intersection improvements. Contingency funding is approved by the NCDOT BOT throughout the calendar year.



B.2.4 Complete Streets

Per the 2009 NCDOT Complete Streets Policy and following design guidelines describing how NCDOT will cost-share bicycle and pedestrian improvements, a local agency may request bicycle and pedestrian accommodations as part of a major highway or bridge replacement project. The various policies describing the share of the improvement costs for pedestrian accommodations are described on the website for the NCDOT Bicycle and Pedestrian Division <https://www.ncdot.gov/bikeped/lawspolicies/>. The NCDOT Pedestrian Policy is the most important resource for local agencies to review with regard to cost-share responsibilities.

Sidewalk improvements to a roadway widening or bridge replacement project may be considered if the Town has sidewalks leading to the roadway project extents. Also, NCDOT may ask the Town to pay for part of the cost of constructing the sidewalk and for acquiring additional right of way required for the sidewalk. In-road bicycle lanes, shared lane markings, or shoulders that will be maintained by NCDOT may not require a cost-share from the Town.

The Town should track NCDOT roadway and bridge projects and request bicycle and pedestrian accommodations as specified in this plan. NCDOT may also require that the Town maintain the sidewalks after construction. Ultimately, it is much more affordable

for a Town to build sidewalks and bicycle accommodations as part of the roadway or bridge replacement project than try to add these improvements later.

As with major roadway widening and bridge projects, NCDOT may consider bicycle and pedestrian improvements as part of routing resurfacing projects. NCDOT will consider whether the existing roadway right-of-way will accommodate additional pavement width, if necessary. Oftentimes, NCDOT does not own right-of-way along rural roadways, so adding shoulder width in these areas can be difficult. If the resurfacing project will impact an intersection curb with a sidewalk approach, NCDOT may be required to install ADA-compliant curb ramps. The Town should watch NCDOT's resurfacing schedule and request bicycle and pedestrian accommodations where possible.



B.2.5 North Carolina Parks and Recreation Trust Fund (PARTF)

PARTF provides grants to local governments to assist with public park and recreation projects, including trails and greenways. PARTF is administered by the NC Division of Parks who annually solicits applications from local agencies for funding. Local governments can apply to acquire land for parks and build trails or greenways for public use. A proposed project must be located on a single site. A local agency must provide a local match of at least 50% of the total cost of the project, but the appraised value of land can be donated to the local agency can be used as part of the match.

C **Appendix C. Public Input**

- › Public survey summary
- › Steering Committee Meeting #1 summary
- › Steering Committee Meeting #2 summary
- › Public Workshop #1 summary
- › Steering Committee Meeting #3 summary
- › Public Workshop #2 summary

Place: Carolina Beach Town Hall
1121 North Lake Park Blvd

Date: October 17, 2017

Notes Taken by: VHB

Project #: 38600.02

Re: Carolina Beach Pedestrian Master Plan –
Public Survey Summary

Purpose & Background

The purpose of this memo is to summarize the results of the Carolina Beach Pedestrian Master Plan public survey. The online survey was open from May 25th, 2017, to September 7th, 2017, and 1,006 total responses. The survey asked respondents about their attitudes and perceptions of walking in the Town of Carolina Beach, as well as a set of demographic questions for the project team to better understand survey participants. VHB then summarized the results for inclusion in the preliminary and final recommendations of the plan.

Summary of Key Findings

The following findings are arranged in the order they were presented on the public survey:

Survey Respondent Demographics

- 64% of respondents are year-round Carolina Beach residents. An additional 22% were seasonal residents of Carolina Beach for a total of 86% being resident responders.
- 57% of survey respondents were female, 40% were male, and 3% preferred not to answer.
- The most frequent age range of a survey respondent was between 46 and 55 years old (28%). Seventy-six percent (76%) of respondents were between 36 and 65 years old.
- Both the median household size and the median number of adults (18+) per household of respondents was 2 persons.

Attitudes toward Walking and Infrastructure in Carolina Beach

- Most respondents are avid walkers in Carolina Beach, with 68% indicating that they typically walk at least several times a week around town.
- Generally, respondents have an unfavorable view of pedestrian infrastructure in town. Forty-two percent (42%) rated the network as "Very Poor" or "Poor," with "Neutral/Fair" accounting for 35% and "Good" or "Excellent" representing the remaining 23%.
- Safety concerns tended to be the biggest barriers to walking in Carolina Beach. Unsafe vehicular speed (47%), unsafe pedestrian crosswalk locations (27%), and concern for personal safety and security (23%) were the highest rated impediments to walking after a lack of connected sidewalks (53%).
- The most discouraging driver behaviors to walking are a lack of yielding to pedestrians in the crosswalk (69%) and speeding (60%).

- The most popular destinations for walking in town are the beachfront/boardwalk (83%), shopping/dining (69%), and downtown (56%).
- 84% of resident respondents do not have a sidewalk in front of their residence.
- 51% of respondents indicated that they would be willing to have a sidewalk installed in front of their residence, with 17% being neutral and 32% not being in favor of a sidewalk. The Top 10 Streets identified by respondents were:
 - Carolina Beach Ave (50 votes)
 - Canal Dr (33)
 - St. Joseph St (29)
 - Spencer Farlow Dr (19)
 - Bowfin Lane (18)
 - Carolina Sands Dr (15)
 - Greenville Ave (15)
 - Lake Park Blvd (15)
 - Bonito Ln (13)
 - Mackeral Ln (13)

Survey Diagnostics

- This online survey allowed for more than one response per IP Address to maximize participation. Limiting the survey to only one response per IP Address would mean that only one member of a household could participate; one response from a public library computer lab; one response per business or government agency. This was not ideal, and therefore multiple responses were allowed.
- In an effort to evaluate the potential for repeat survey respondents ("stuffing the ballot box"), the project team examined the number of unique IP Addresses among participants. The results were:
 - 82% of total responses were from a unique IP Address (824 surveys from a unique IP Address).
 - 18% of total responses were from a duplicate IP Address (102 repeat IP Addresses), nearly all of these were two (2) responses from the same IP (70 instances, totaling 140 survey responses [14%]), and these are likely a home computer used by two members of the same household.
 - Five (5) IP Addresses were used to complete three survey responses (15 surveys)
 - Three (3) IP Addresses were used to complete four survey responses (12 surveys)
 - One (1) IP Address was used to complete seven survey responses (7 surveys)
 - One (1) IP Address was used to complete eight survey responses (8 surveys)
 - **Total of 42 surveys (4.2%) were submitted from an IP Address used three or more times.** Many of these are likely from a public library, Town Government, or private business.
- [Redacted] was randomly selected as the winner of a \$50 gift card for participation on the survey. Congratulations [Redacted]!

Town of Carolina Beach – Comprehensive Pedestrian Plan Survey

Thursday, September 07, 2017

25 Responses

1,006

Total Responses

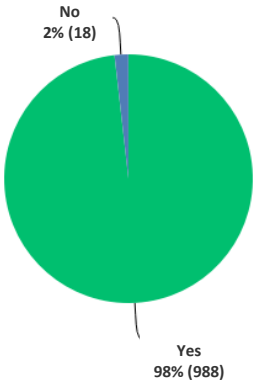
Survey opened: Thursday May 25, 2017

Survey closed: Thursday September 7, 2017

Complete Responses: 855 – 85% completion

Q1: Do you currently walk in/around Carolina Beach?

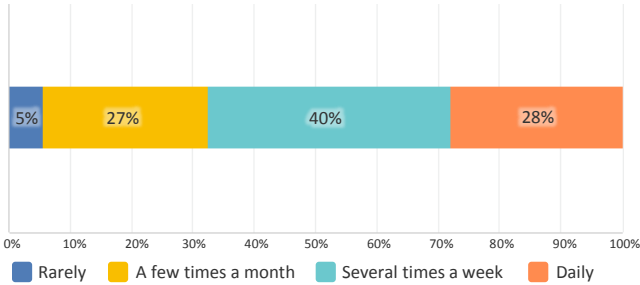
Answered: 1,006 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	98%	988
No	2%	18
TOTAL		1,006

Q2: How often do you walk in/around Carolina Beach?

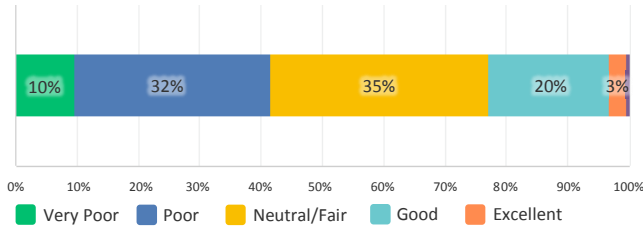
Answered: 1,006 Skipped: 0



ANSWER CHOICES	RESPONSES	
Never	0%	3
Rarely	5%	54
A few times a month	27%	270
Several times a week	40%	398
Daily	28%	281
TOTAL		1,006

Q3: How do you rate the overall network of existing sidewalks and multi-use paths?

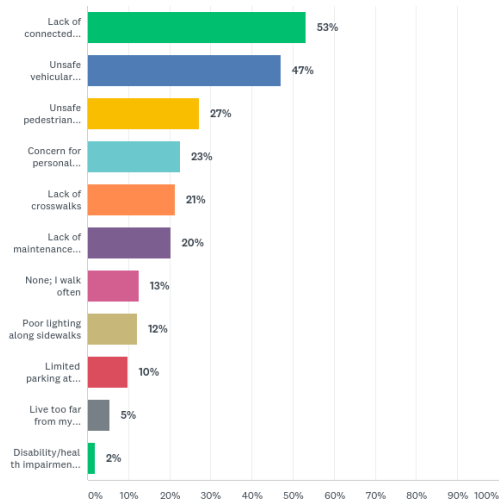
Answered: 1,006 Skipped: 0



	VERY POOR	POOR	NEUTRAL/FAIR	GOOD	EXCELLENT	N/A; CHOOSE NOT TO ANSWER	TOTAL	WEIGHTED AVERAGE
(no label)	10% 97	32% 322	35% 357	20% 197	3% 28	0% 5	1,006	2.74

Q4: In your opinion, which of the following discourage you from walking more frequently? (Select your top three)

Answered: 935 Skipped: 71



ANSWER CHOICES	RESPONSES
Lack of connected sidewalks	53% 497
Unsafe vehicular traffic/speed	47% 440
Unsafe pedestrian crosswalk locations	27% 255
Concern for personal safety/security	23% 211
Lack of crosswalks	21% 199
Lack of maintenance along sidewalks	20% 190
None; I walk often	13% 118
Poor lighting along sidewalks	12% 114
Limited parking at convenient (centralized) location	10% 92
Live too far from my favorite destinations	5% 50
Disability/health impairment (too few accommodations)	2% 17
Total Respondents: 935	

Q5: In your opinion, what location(s) need immediate improvement? (Identify nearest roadway intersection, or adjacent business)

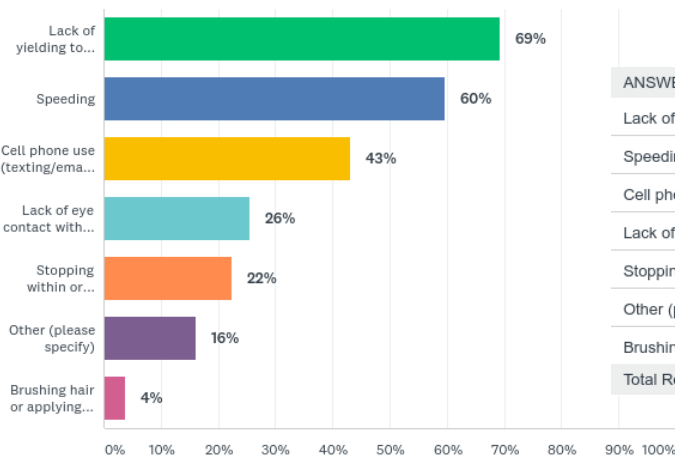
Answered: 736 Skipped: 270

Walkway Better Lighting Downtown Town Hall Beach Access Tiki Bar
 Boardwalk Entire Canal CB Ave Carolina Beach
 Lazy Pirate Side Walks Dow Rd Lake Park
 Spartanburg Ave Cross Walk School Harper Cut Bridge
 Spencer Farlow Sea Joseph Golden Sands Dow Road
 Main Road

Open-Ended Response	RESPONSES
Lake Park	35.60% 262
Side Walks	28.40% 209
Cross Walk	21.20% 156
Carolina Beach	8.83% 65
Harper	8.02% 59
Canal	7.34% 54
Spencer Farlow	6.39% 47
Boardwalk	5.43% 40
Joseph	5.03% 37
Beach Access	4.62% 34

Q6: In your opinion, which of the following driver behaviors, if changed, would encourage you to walk more frequently, rather than drive? (Select your top three)

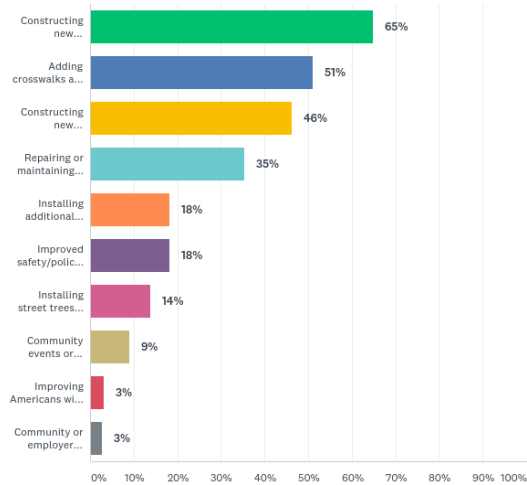
Answered: 897 Skipped: 109



ANSWER CHOICES	RESPONSES
Lack of yielding to pedestrians within crosswalk	69% 622
Speeding	60% 534
Cell phone use (texting/emailing)	43% 387
Lack of eye contact with pedestrians	26% 229
Stopping within or blocking a marked crosswalk	22% 200
Other (please specify)	16% 145
Brushing hair or applying makeup	4% 33
Total Respondents: 897	

Q7: In your opinion, which of the following infrastructure or program improvements would encourage you to walk more frequently, rather than drive? (Select your top three)

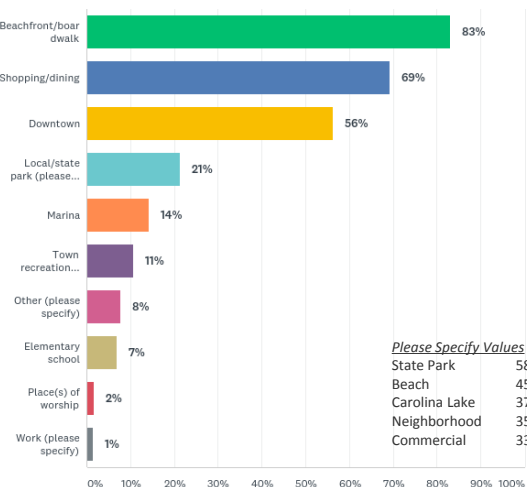
Answered: 897 Skipped: 109



ANSWER CHOICES	RESPONSES	
Constructing new sidewalks/trails	65%	581
Adding crosswalks and pedestrian signals	51%	458
Constructing new recreational greenways and shared use paths	46%	415
Repairing or maintaining existing sidewalks/trails	35%	318
Installing additional lighting along pedestrian routes	18%	163
Improved safety/police presence	18%	163
Installing street trees or furniture (e.g. benches)	14%	123
Community events or festivals	9%	81
Improving Americans with Disabilities Act (ADA) accessibility	3%	29
Community or employer fitness program(s)	3%	24
Total Respondents: 897		

Q8: Which destinations would you most like to walk to? (Select your top three)

Answered: 874 Skipped: 132



ANSWER CHOICES	RESPONSES	
Beachfront/boardwalk	83%	725
Shopping/dining	69%	606
Downtown	56%	492
Local/state park (please specify)	21%	187
Marina	14%	124
Town recreation center	11%	94
Other (please specify)	8%	68
Elementary school	7%	60
Place(s) of worship	2%	14
Work (please specify)	1%	12
Total Respondents: 874		

Q9: Please share your observations or thoughts about walking in Carolina Beach

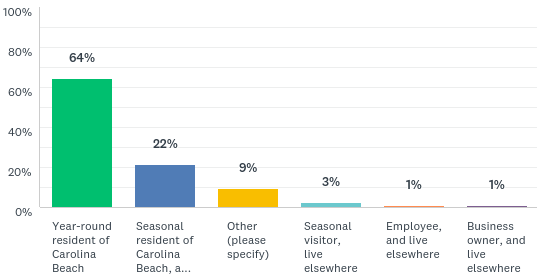
Answered: 634 Skipped: 372

Speed Limit Summer Season Spencer Farlow Close Calls Bike Lanes
Folks Lake Park Blvd Not Bad Drive Year Round Town
Pleasant Cross Walks Golf Carts Side Walks
Concern Street Room Drivers Space Carolina Beach Job
Bike Path Miles Downtown Area Young Children Dogs Enjoy

Open-Ended Response	RESPONSES	
Side Walks	<div><div></div></div>	38.96% 247
Cross Walks	<div><div></div></div>	19.72% 125
Street	<div><div></div></div>	13.72% 87
Town	<div><div></div></div>	11.99% 76
Drivers	<div><div></div></div>	10.57% 67
Drive	<div><div></div></div>	8.83% 56
Carolina Beach	<div><div></div></div>	8.68% 55
Lake Park Blvd	<div><div></div></div>	7.89% 50
Bike Path	<div><div></div></div>	6.78% 43
Bike Lanes	<div><div></div></div>	4.10% 26

Q10: What is your relationship to the Town of Carolina Beach?

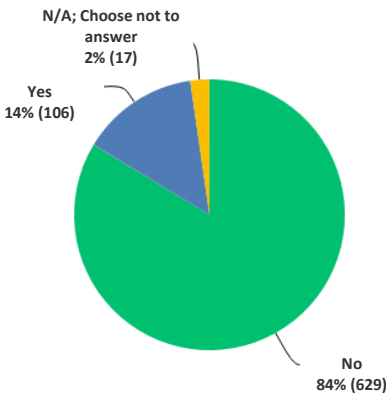
Answered: 875 Skipped: 131



ANSWER CHOICES	RESPONSES	
Year-round resident of Carolina Beach	64%	564
Seasonal resident of Carolina Beach, also live elsewhere	22%	190
Other (please specify)	9%	82
Seasonal visitor, live elsewhere	3%	22
Employee, and live elsewhere	1%	10
Business owner, and live elsewhere	1%	7
TOTAL		875

Q11: As a resident of Carolina Beach, is there currently a sidewalk in front of your residence?

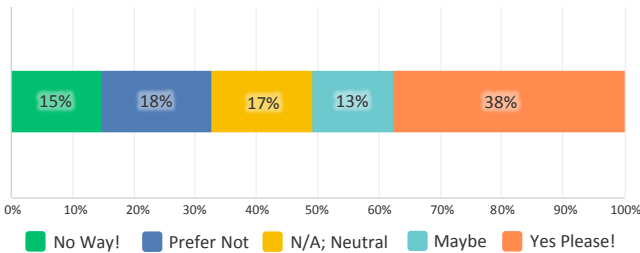
Answered: 752 Skipped: 254



ANSWER CHOICES	RESPONSES	
No	84%	629
Yes	14%	106
N/A; Choose not to answer	2%	17
TOTAL		752

Q12: Please rate your willingness for a sidewalk installation in front of your residence

Answered: 619 Skipped: 387

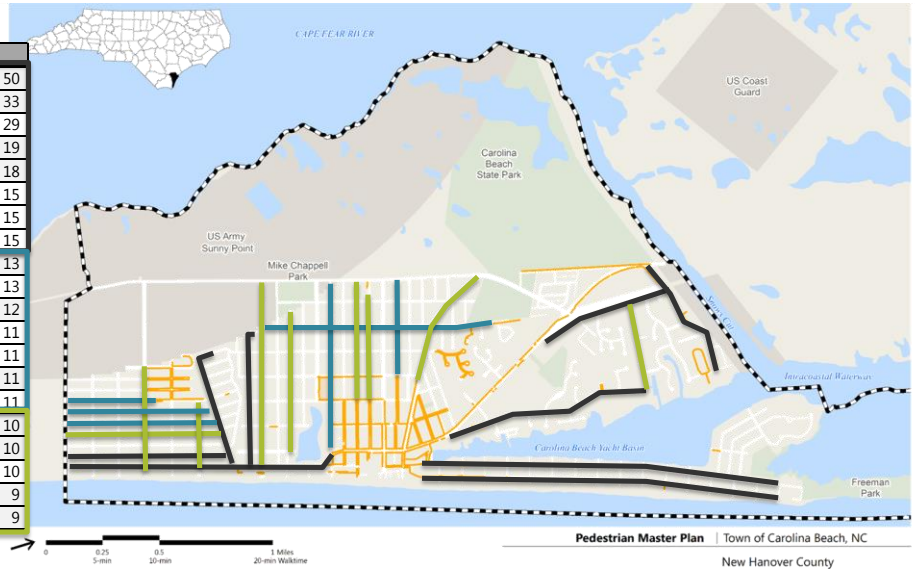


	NO WAY!	PREFER NOT	N/A; NEUTRAL	MAYBE	YES PLEASE!	TOTAL	WEIGHTED AVERAGE
(no label)	15% 92	18% 110	17% 103	13% 81	38% 233	619	3.41

Q13: To gauge resident interested in sidewalk improvement, would you provide the name of your street?

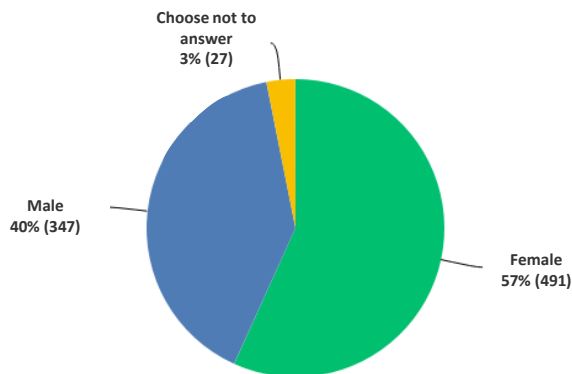
Answered: 340 Skipped: 666

Top 20	Street Name	#
1	Carolina Beach Avenue	50
2	Canal Drive	33
3	St. Joseph Street	29
4	Spencer Farlow Drive	19
5	Bowfin Lane	18
6	Carolina Sands Drive	15
7	Greenville Avenue	15
8	Lake Park Boulevard	15
9	Bonito Lane	13
10	Mackeral Lane	13
11	Raleigh Avenue	12
12	Atlanta Avenue	11
13	Lewis Drive	11
14	Pinfish Lane	11
15	Spartanburg Avenue	11
16	7th Street	10
17	Charlotte Avenue	10
18	Swordfish Lane	10
19	Hamlet Avenue	9
20	Ocean Boulevard	9



Q14: What is your gender?

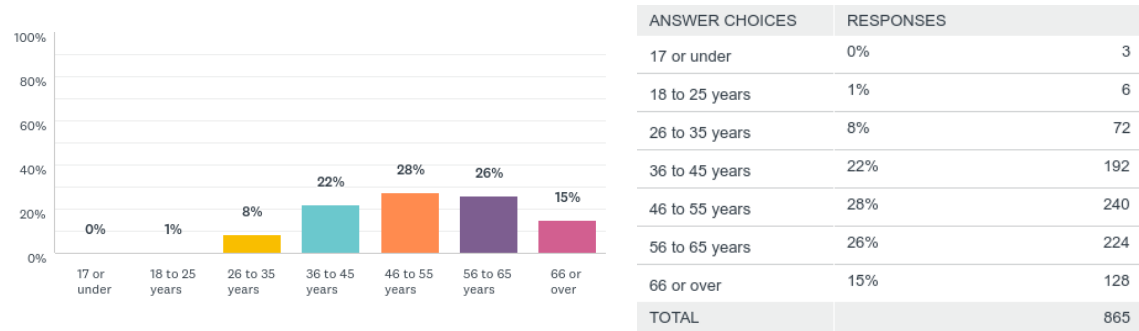
Answered: 865 Skipped: 141



ANSWER CHOICES	RESPONSES	
Female	57%	491
Male	40%	347
Choose not to answer	3%	27
TOTAL		865

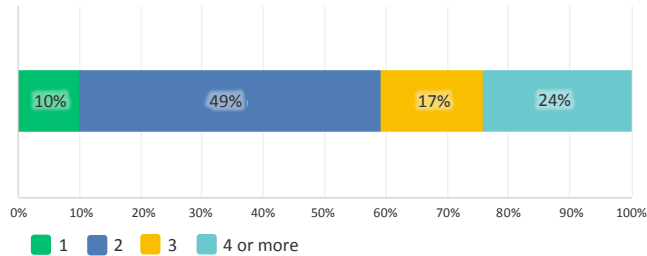
Q15: What is your age category?

Answered: 865 Skipped: 141



Q16: How many total persons live in your household?

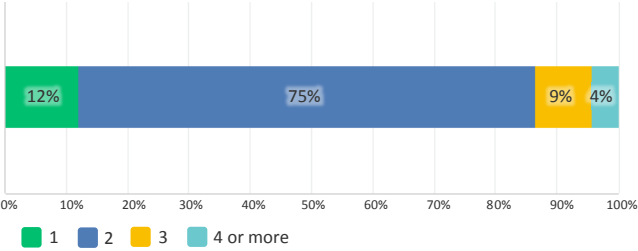
Answered: 865 Skipped: 141



	1	2	3	4 OR MORE	TOTAL	WEIGHTED AVERAGE
(no label)	10%	49%	17%	24%		
	87	426	143	209	865	2.55

Q17: How many adults (18 years or older) live in your household?

Answered: 865 Skipped: 141



	1	2	3	4 OR MORE	TOTAL	WEIGHTED AVERAGE
(no label)	12%	75%	9%	4%		
	104	645	79	37	865	2.06



Meeting Notes

Place: Carolina Beach Town Hall
1121 North Lake Park Blvd

Date: May 23, 2017

Notes Taken by: VHB

Project #: 38600.02

Re: Carolina Beach Ped Master Plan
Steering Committee Meeting #1

ATTENDEES

Abby Lorenzo, Planning & Zoning	Chris Spivey, Police Chief	John Manning, US Army Corps
Ed Parvin, Assistant Town Manager	Beth Doliboa, Wilmington MPO	John Vine-Hodge, NCDOT
Craig Harris, Planning & Zoning	Mike Hoffer, New Hanover County	Timothy Tresohlavy, VHB
Eric Jelinski, Parks & Rec	Duke Hagestrom, Business Owner	
Tim Murphy, Parks & Rec	Kate Eames, Plantation Bldg Corp	

These notes serve as meeting minutes from the project's initial Steering Committee meeting, held on Tuesday May 23, 2017 @ 1 PM, in Carolina Beach, NC.

Steering Committee Members

13 members of the Steering Committee were present for the initial kickoff meeting.

Discussion

Timothy (VHB) serving as the transportation firm consultant opened the meeting with project background. During introductions, each member was asked to provide their response to "**This plan will be successful because...**" some of the key discussion involved:

- We will facilitate community engagement and buy-in to the planning process
- We will directly connect with existing Town parks and recreation facilities
- Stakeholders represent a diversity of backgrounds and interests, and committed to serving resident needs
- There is a need to direct bicyclists and pedestrian safety across roadways to all points of the island
- This process will allow for grant funding opportunities
- NCDOT has demonstrated success on more 180 projects in North Carolina using this process
- Cooperation with US Army at Sunny Point on the steering committee
- Stakeholders have learned through previous projects to involve early and coordinate
- We share a common determination to provide sidewalks
- Community engagement is essential, involving both sides of every topic
- This process will include an implementation and champions moving forward
- Input on needed facilities and planned future facilities will guide this project

Discussion and Markup of Display Board

Timothy (VHB) led a discussion of existing conditions, and asked steering committee members to identify intersections that felt unsafe to cross, as well as potential barriers to walking, and common destinations to be connected via sidewalk or multiuse path. The following locations were identified:

Challenging Intersections/Corridors

- Intersection of Dow Road @ Harper Avenue
- Intersection of Lake Park Blvd @ Dow Road; Lewis Drive; Atlanta Avenue
- Intersection of Carolina Beach Avenue near Courtyard by Marriott Hotel (vicinity)
- Intersection of Canal Drive @ Harper Avenue
- Saint Joseph Street
- Spenser Farlow Drive
- Lake Park Blvd between bridge and marina
- Crossing Carolina Beach Avenue from public parking lots to beach

Destinations

- Beachfront boardwalk
- Restaurant destinations along Lake Park Blvd near Winner Ave & St Joseph Street
- Town Recreation Center on Seventh Street
- Ryder Lewis Park (future)
- Town Farmers Market @ Carolina Lake (moving in Summer)

Barriers

- Carolina Sands Drive – no stub out street connectivity
- Drainage/stream corridor through town (near Mike Chappel Park)

VHB Action Items

1. Coordinate schedules for Steering Committee Meeting #2 and Public Meeting in July
2. Revise project vision statement to include quality of life, safety, and reference to family/community
3. Review previous Town/MPO plans and summarize/synthesize project list (seek integration)
4. Revise existing conditions mapping based on field notes and steering committee markups
5. Prepare summary email and distribute link to steering committee members for online survey

Stakeholder Group Action Items

6. Convey documents for overview of **utility upgrade project – phases B-F**
7. Convey documents/plans for **repaving or redesign of St Joseph Street**
8. Convey Wilmington MPO planned greenway project details (PDF & GIS files)
9. Convey GIS data for drainage/stream corridor through town

10. Connect VHB with school resource officer tasked with Active Routes to School coordination; provide summary of Walk to School Events to date and progress over the years; document for report
11. Coordinate public outreach for Public Meeting tentatively scheduled for July 17-19
12. Actively distribute online survey link to any/all interested public constituents
13. Synthesize major Town of Carolina Beach events/festivals for project report;
 - a. Seeking general overview of how the Town manages vehicles and pedestrians; where the challenging areas are; how they are managed
14. Connect with NCDOT Division 3 Rep:
 - a. Confirm there are no upcoming roadway resurfacing projects
 - b. Relay project information for RRFB installation for intersections along Lake Park Blvd; When was project initiated? What intersections? What was the project budget? How was it funded?

Attachments

Presentation slides

Place: Carolina Beach Town Hall
1121 North Lake Park Blvd

Date: July 18, 2017

Notes Taken by: VHB

Project #: 38600.02

Re: Carolina Beach Ped Master Plan
Steering Committee Meeting #2

ATTENDEES

Abby Lorenzo, Planning & Zoning	Beth Doliboa, Wilmington MPO	Dominique Mitchell, Dept Public Health
Craig Harris, Planning & Zoning	Adrienne Harrington, WMPO	Timothy Tresohlavy, VHB
Jerry Haire, Planning & Zoning	Mike Hoffer, New Hanover Co	Matt Albee, VHB
Chris Spivey, Police Chief	Kate Eames, Plantation Bldg Corp	Meg Bryson, VHB

These notes serve as meeting minutes from the project's second Steering Committee meeting, held on Tuesday July 18, 2017 @ 1 PM, in Carolina Beach, NC.

Steering Committee Members

10 members of the Steering Committee were present for the second meeting.

Discussion

Timothy (VHB) serving as the transportation firm consultant opened the meeting with project background and schedule, reviewed data needs, and reviewed what we learned from the first steering committee meeting.

New steering committee members were asked: "this plan will be successful because..."

- Community participation and need (Jerry)
- More children walking and biking will improve health and reduce obesity (Dominique)
- Walking/biking is a part of the community culture, and what draws people to live at the beach (Adrienne)

Requests for the following information were made to further describe existing initiatives relating to walking:

- Carolina Beach has participated in Walk to School events in the past. **Dominique** offered to research and find a summary of the event dates and some photographs (from Facebook), if available.
 - **Chief Spivey** suggested that the "school resource officer" may also be able to provide summary of past events and photos.
- Timothy inquired whether traffic management staff has been provided for previous Town events, and if this need/program could be summarized as an initiative to promote walking.
- Other Town initiatives to get people out and walking?!?!

Project vision and goals were discussed:

- Local residents will care less about the “health, mobility, environment, and programs” components, and much more about the physical connectivity of sidewalks/paths and boardwalk.
- Project goals should include “enhancing aesthetic quality” of sidewalks, which is a motivating factor. People want to walk along “pretty places”.

Timothy (VHB) led a discussion to review meeting #1 summary materials. Steering committee members added:

Significant destinations or safety concerns

Destinations

- Add Freeman Park (4WD park), “the North end” of the island
- Add Carolina Beach State Park

Challenging Intersections/Corridors

- Add St Joseph Street corridor
- Local residents use Dow Road as a bypass of US-421 (Lake Park Blvd.), however visitors do not; this explains why the annual average daily traffic is much lower than expected (6,700 AADT).
 - Question was raised regarding the week or month that AADTs were collected, and whether it coincides with summer or fall traffic conditions. **VHB to investigate.**

Speed limits and crash data

Roadway Speed Limit corrections

- Lake Park Blvd from Dow Road over the Snows Cut Bridge – 45 MPH
- Lake Park Blvd from Goldsboro Ave to Spartanburg – 25 MPH
- Ocean Blvd from Croaker Lane to Lake Park Blvd – 35 MPH
- Low Speed Vehicles (LSV) are popular in town; must have a license plate
 - Golf carts are not LSVs, and therefore cannot operate on NCDOT streets (US-421; Dow Road)
- Several crashes were coded as “Ped on vehicle”; **VHB to investigate** these crash attributes
- Discussion of previous study that found that new bike/ped facilities may lead to increased crashes due to exposure. Is this still true?
 - Matt: CMF clearinghouse shows before and after crash rates for many different countermeasures. Something like 30% decrease in pedestrian crashes when adding sidewalks. Locations may experience an initial spike with installation, but ultimately decreases crashes over time.

Bike/Ped Improvement Plans

- CB Downtown Master Development Plan (2008) is still relevant regarding bike/ped goals
- CB Bicycle Master Plan (2011) is still relevant; all “Dual MUP” should be “Single MUP” however; this plan emphasized the use of roadways with a 90’ ROW as primary corridors for an improvement
 - Bonito Ln; Ocean Blvd; Tennessee Ave; Second St; Clarendon Ave; Cape Fear Blvd; Harper Ave
- NHC Greenways Plan (2013) is still relevant; four main projects through Carolina Beach;
 - Bicyclists are now prohibited from operating on the boardwalk;
- CB Parks, Recreation & Open Space (2017) is relevant

- WMPO Cape Fear 2040 MTP (2015) contains top 100 projects in region; fiscally-constrained
 - CB includes four (4) bike/ped projects; all recommendations
 - **Adrienne** suggest referring to the Bike/Ped prioritization section for reference, which uses five (5) goals for scoring (Appendix D):
 1. Safety, Education, Awareness, and Enforcement;
 2. Transportation Choice;
 3. Built Environment, Land Use & Connectivity;
 4. Health; and
 5. Economic Development
 - Also recommended using existing "Goat Paths" as indicator for high priority project need
 - **VHB would need a map markup showing these locations** (photos too)
 - CB Ped plan should include Wilmington MPO plan funding mechanisms
 1. Transportation Alternatives Program (TAP)
 2. Surface Transportation Program - Direct Attributable (STP-DA) funding grants
 3. Transportation Alternatives Program – Direct Attributable (TAP-DA)

Survey results – interim

- 975 survey respondents to date
- Demographics
 - 58% of respondents are female;
 1. This matches WMPO Cape Fear Commutes 2040 survey (58.5% female)
 - 69% of respondents are age 46+;
 - 91% of respondents are age 36+
 - 65% respondents are year-round Carolina Beach residents
 - 21% of respondents are seasonal residents of Carolina Beach
- What discourages respondents from walking more frequently?
 - Lack of connected sidewalks (53%) or crosswalks (21%)
 - Unsafe vehicular speed (47%) or unsafe pedestrian crosswalks (27%);
 - Concern for personal safety (23%)
- What infrastructure or program improvements may encourage you to walk more frequently?
 - Construct new sidewalks (65%) or shared use path/greenways (46%)
 - Adding crosswalks and pedestrian signals (51%)
- Residents of Carolina Beach (729 respondents were asked)
 - 84% do not have a sidewalk in front of their residence
 - 51% would like a sidewalk, if possible
 - 33% would not like a sidewalk
 1. Possible reasons include: desire for garden; prefer lawn; prefer parking

Discussion and Markup of Display Board

Timothy asked for a list of the top 5 locations (intersections or corridors) that would benefit from a more detailed visualization of the recommended improvement. These project “cut sheets” will be included as pilot projects within the final report. The locations discussed were:

1. Intersection of Dow Road at Harper Avenue
2. Intersection of Lake Park Blvd (US 421) at Dow Road
3. Intersection of Lake Park Blvd (US 421) at Atlanta Avenue (curve area)
4. Intersection of Lake Park Blvd (US 421) at Lewis Drive and Access Road
5. Spencer Farlow Road corridor (sidewalk) improvements

VHB Action Items

1. Coordinate schedules for Steering Committee Meeting #3 on **Wednesday September 20 @ 3 PM**
2. Coordinate public meeting event in early September – **date/time is tbd**
3. Summarize/synthesize project list from previous studies/plans
4. Revise existing conditions mapping based on field notes and steering committee markups
5. Identify primary versus secondary corridors for pedestrians
6. Preliminary list of projects for review/confirmation by steering committee

Steering Committee Action Items

7. Convey documents for overview of **utility upgrade project – phases B-F**
8. Convey documents/plans for **repaving or redesign of St Joseph Street**
9. Connect VHB with school resource officer tasked with Active Routes to School coordination; provide summary of Walk to School Events to date and progress over the years; document for report.
10. Synthesize major Town of Carolina Beach events/festivals for project report;
 - a. Seeking general overview of how the Town manages vehicles and pedestrians; where the challenging areas are; how they are managed; if there is traffic control or other event management
11. Connect with NCDOT Division 3 Rep:
 - a. Confirm there are no upcoming roadway resurfacing projects
 - b. Relay project information for RRFB installation for intersections along Lake Park Blvd; When was project initiated? What intersections? What was the project budget? How was it funded?

Attachments

Presentation slides

Place: Carolina Beach Town Hall
1121 North Lake Park Blvd

Date: July 18, 2017

Notes Taken by: VHB

Project #: 38600.02

Re: Carolina Beach Ped Master Plan
Public Workshop #1

ATTENDEES

See sign-in sheet

These notes serve as summary notes of public workshop #1 held on Tuesday July 18, 2017 @ 5 PM.

The public workshop began at 5 PM with attendees circling the room and engaging in conversation with staff at each of the four work stations. VHB held a brief presentation at 5:25 PM to provide additional background on the project and the role of attendees in this process. At 5:35 PM the attendees were asked to return to the open house format and resume conversations.

The four work stations included Vision & Goals, Major destinations; Safety issues; and Future opportunities. Attendees were also provided feedback forms to document additional topics that they would like to present to the project team. A summary of comments from each station are provided below:

Vision and Goals – attendees were asked to revise or comment on the vision statement and bulleted list of goals

- "Aging in place" was the only comment received

Major Destinations – attendees were asked where they live (green dot) and where they go/visit (red dot)

- Various beach access points south/west of Ocean Blvd
- Restaurant and retail locations along Lake Park Blvd between Lake Park (Veggie Wagon) and Carolinas Sands neighborhood entrance
- Carolina Beach board walk area, extending westward to the Sea Merchants Grocery Store on Cape Fear Blvd
- Marina/Lazy Pirate vicinity near Lake Park Blvd
- Town Hall and Recreation Center
- Food Lion shopping center and retail destinations (Walgreens and Library)

Safety Issues – attendees were asked to indicate unsafe roadways, intersections, poor pavement conditions, etc.

- Dow Road @ Harper Ave intersection is unsafe due to vehicle speeds and lack of yielding to pedestrians
- Seventh Street - vehicles speeds are unsafe, including Town Police cars
- Fifth Street near Raleigh Ave – poor pavement condition
- **Recent fatal crash** - Lake Park Blvd @ Ocean Blvd; not included in our 2007-14 dataset; **VHB to confirm**
 - **Would Town police have this crash record, or NCDOT?**
- Flooding of Canal Drive
- Lake Park Blvd – US 421 – South of Carolina Lake
 - Do not bike along Lake Park Blvd northbound (east side)

- Too many pedestrians in the bicycle lanes between Tennessee Ave and Carolina Sands (1-block)
 - Tennessee Ave crossing has new Rectangular Rapid Flashing Beacon (RRFB) – peds cross here!
 - Significant “Goat path” along west side of Lake Park Blvd from Lake/Veggie Wagon southward
- Lake Park Blvd – US 421 – between Marina and Carolina Lake
 - Request traffic signal retiming to all bike/ped phase @ Harper Ave signal
 - Thursday night fireworks make it a challenge for drivers to see pedestrians
 - Parallel parking along Lake Park Blvd poses a safety issue
 - Pedestrians do not use crosswalk at Harper Ave (Mexican Restaurant); they cross mid-block
- Lake Park Blvd – US 421 – North of Marina
 - **Sight visibility issue** @ Wilson Ave intersection (501 N. Lake Park; ReMax)
 - Need crosswalk of Lake Park Blvd @ Federal Point Shopping Center (future Harris Teeter) signal
 - Need crosswalk of Lake Park Blvd @ Dow Road / Risley Road intersection
 - How does one access the Food Lion shopping center in a Golf Cart, since these are not allowed on or to cross NCDOT roadways (Lake Park Blvd and Dow Road)

Future Opportunities

Possible connections to make

- Need RRFBs for intersection of Ocean Blvd @ Lake Park Blvd
- Sidewalks along S. Lake Park Blvd needed, connecting to Carolina Lake
- Need pedestrian connection through Carolina Sands neighborhood, possibly along:
 - Pinfish Lane to Riptide Lane
 - **Mackerel Lane to Tidewater Lane to Fourth Street**
 - Bonito Lane to Whitecaps Lane
- Eighth Street is potential greenway/SUP connection; Seventh Street is as well
- Need to finish Cape Fear Blvd SUP, connect to Dow Road
- Request a pedestrian crosswalk needed for intersection of Lake Park Blvd @ Federal Point Shopping Center
- Potential SUP and corridor improvement along St Joseph Street, connecting the marina to Food Lion Shopping Center (Lewis Drive, Access Road, under Snows Cut bridge, Spencer Farlow Dr)
- Flashing beacon needed for intersection of Dow Road @ Harper Avenue

Considerations for longer-term planned improvement

- Kure Beach has voted to not connect with the Island Greenway, south of Alabama Avenue; **is this confirmed?**
- “Beautifying Harbor” initiative is needed, specifically for pedestrian improvements
- Request to complete sidewalks along Canal Drive and Carolina Beach Avenue to fill in the gaps
- Variable Message System sign needed for vehicles crossing Snows Cut (“Watch for Bikes/Peds”)
 - Suggest other programmatic improvements for education and encouragement
- Request for more bike paths on US Army Sunny Point property (adjacent to Carolina Beach State Park)

Feedback Forms –

Unsafe roadways/intersections

- Lake Park during high amounts of foot traffic, better lighting
- Lake Park Blvd. from Tennessee all the way to the bridge
- Lake Park Blvd south of the lake, driveway next to 501 N. Lake Park Blvd is hidden
- Bicyclists do not slow at intersections even when cars are present
- Motorcyclists don't stop for pedestrians
- Most of Lake Park Blvd. is unsafe for bicycling and pedestrian crossing
- Dow and Harper roads are unsafe

Programs or events to promote walking

- Better Connectivity
- Flat, clean surfaces, paths that connect Carolina Beach to Kure Beach
- More craft shows
- smoother biking and walking surfaces
- More paths closer to shopping
- Some type of discount at local restaurants and bars for frequent bikers and walkers

Plan will be successful because...

- It will provide a safe way for visitors and residents to enjoy the town. We will not have to use our cars for transportation.
- DOT, Carolina Beach, and planners are listening to residents and business owners
- More education of bicycle and golf cart users

Attachments

Presentation slides

Markup map scans

Place: Carolina Beach Town Hall
1121 North Lake Park Blvd

Date: October 17, 2017

Notes Taken by: VHB

Project #: 38600.02

Re: Carolina Beach Ped Master Plan
Steering Committee Meeting #3

ATTENDEES

See attendees list

These notes serve as meeting minutes from the project's third Steering Committee meeting, held on Tuesday October 17, 2017 @ 3 PM, in Carolina Beach, NC. Eight (8) members of the Steering Committee were present.

VHB Action Items are included in yellow. **Steering Committee Action Items** are included in green.

Discussion

Timothy (VHB) serving as the transportation firm consultant opened the meeting with project background and schedule, and reviewed what we learned from the last steering committee meeting and public workshop.

Requests for the following information were made to further describe existing initiatives relating to walking:

- **North End Traffic Study** report requested – Carolina Beach Ave & Canal Drive.
- Timothy requested a three to five sentence **summary of local events that promote walking**. Seafood Blues and Jazz festival was mentioned, as well as marathon, and the Beach Music festival as examples. Previous Walk to School events (particularly the dates of previous events) were also mentioned. VHB would appreciate a summary to include in the final report. In our experience, these summaries are best written by attendees.

Online Survey Results were discussed (see full survey summary PDF for more):

- 25% of respondents rated the existing pedestrian network as "Good" or better; 42% rated as "Poor" or worse. This is as expected since survey respondents are choosing to participate largely because they have an opinion to provide or a strong desire to improve their community.
- **Safety** was the top choice for identifying potential barriers to walking more frequently, followed by lack of crosswalks/infrastructure in general. One out of seven (13%) of respondents selected "None; I walk often."
- Top three driver behaviors that respondents would like to change: Yield to pedestrians; Slow down; Discontinue use of cell phone & make eye contact with pedestrians. These are potential topics for a **future safety campaign** (Education & Encouragement).
- Half of CB resident respondents are willing to have a sidewalk installed in front of their residence; 33% are not. Top five streets include: Carolina Beach Ave (55); Canal Dr (33); St Joseph St (29); Bowfin Ln (18); and Carolina Sands Dr (15).

Recent bicycle collision occurred at the intersection of Ocean Blvd and Lake Park Blvd (summer; around 7 pm). Same intersection as the only bike/ped fatal crash since 2007.

Ian (VHB) led a discussion of Preliminary Recommendations beginning with primary corridors.

Preliminary Recommendations

- **Primary Corridors** – Directly connect to significant destinations identified by Steering Committee and Public Workshop attendees. These corridors are for short-term improvements.
 - Carolina Beach Ave should be a primary corridor all the way to Freeman Park. This is preferred over Canal Dr. which supports four-times as many vehicles per day as compared with Carolina Beach Ave.
 - Bonito Lane identified/confirmed because it has a 90' ROW.
 - Any roadway that connects with future Island Greenway (SUP), including Alabama Ave, South Carolina Ave, and North Carolina Ave should be considered.
 - Identified primary corridors were said to resemble the bike plan corridors (as intended).
- **Secondary Corridors** – Connect to primary corridors and offer potential for establishing a loop within Town. These corridors are for medium to longer-term improvements.
 - Most remaining local roads were identified as secondary corridors.

Carolina Sands Neighborhood – Sidewalks are not present, however (15) survey respondents requested sidewalks.

- Community voted against sidewalks 8-9 years ago during previous re-pavement.
- Existing residential roadways are 28 feet in width (unstriped); Residents walk along the shoulder of the roadway of these 25 mph streets.
- Potential for a bike/ped easement that connects Riptide Ln with Pinfish Ln. Town is exploring this potential.
- School bus stop has recently been relocated from LPB @ Tennessee Ave to LPB @ Carolina Sands.

Carolina Beach Ave/Canal Drive – Heading northbound towards Freeman Park

- Approximately 12 years ago a concept to convert these to one-way pairs was presented and discussed by the Town (**North End Traffic Study**). This has been revisited less than two (2) years ago and the Town decided that support for the concept was not substantial enough to move forward.
- Businesses near the southern end (nearest Downtown) were strongly opposed because it may reduce access and visibility. Some residents really liked the concept, however were concerned about the impact to on-street parking and driveway access along Carolina Beach, Canal Drive, and all connecting side streets.
- Canal Drive frequently floods during high tide, and the Town is seeking a re-design to raise the storm drains, roadway, and shoulder.
- New traffic study planned by the MPO – need to confirm the extent of this traffic study.
- Police advisory board involved – need to describe in more detail, if possible.

Dow Road at Harper Avenue intersection – Shared Use Path crossing of 45 mph roadway

- Pedestrians are tentative to cross at this non-signalized intersection.

- There are no reported bike/ped crashes, however, it is possible that rear end vehicle crashes have occurred that were influenced by a crossing pedestrian. VHB to investigate.
- Residents may choose to avoid this intersection to reduce their potential exposure.

Lake Park Blvd crossing locations – Steering Committee was asked to rank their top 5 beach access points, which will likely identify the preferred candidates for crosswalk/intersection improvement priority.

- Tennessee Avenue identified/confirmed because it has an RRFB installed at Lake Park Blvd (90' ROW).
- North Carolina Avenue suggested because of its quality beach access (50' ROW).
- Spartanburg Avenue suggested because of its quality beach access (50' ROW).

Project Recommendations

- 38 Draft project recommendations were presented for discussion.
- Evaluation Criteria (Ranking) – VHB to revise:
 - Based on WMPO's Cape Fear Transportation 2040 scoring system; modified by Steering Committee.
 - Weight (max score) for 3, 5, and 10 points per category.
 - School connectivity dropped to 3 points.
 - Suggestion to merge Places of Interest and Public Health criteria into one (10 points).
 - Cost to Construct was suggested as a new evaluation criteria (5 points).
- Priority Projects
 - Five sample projects were selected as priority projects to be included in the final report with more detailed street cross section and cut sheet information. These project "cut sheets" will be included as pilot projects within the final report. The locations discussed were:
 1. Intersection of Lake Park Blvd (US 421) at Atlanta Avenue (curve area).
 2. Intersection of Dow Road at Harper Avenue.
 3. Spencer Farlow Road corridor (sidewalk) improvements.
 4. St. Joseph Street corridor.
 5. Intersection of Lake Park Blvd (US 421) at Lewis Drive and Access Road.

Discussion of Program and Policy Recommendations – Kara (VHB) facilitated programmatic recommendations section.

- Suggestion was made to form a Bicycle & Pedestrian Advisory Committee (BPAC), and segment the Town into different geographic zones for members to focus their attention on potential bike/ped projects.
 - Island Greenway Committee – previously operated under the guidance of Mr. Tom Kirkbride and Tom Cobble, however dissolved in 2015. This was a volunteer-based committee.
 - Wayfinding Committee – previously formed in relation to active transportation. Received push back from NCDOT for signs along ROW. Committee transitioned into private owner engagement and eventually dissolved.
 - Emerald Isle was mentioned as a possible peer for guidance on formulating an effective BPAC.

- WMPO was also mentioned as a significant partner and resource for the Town.

VHB Action Items

1. Draft plan report sections.
2. Schedule Steering Committee Meeting #4 to be held virtually, using Skype for Business.
3. Revise priority corridors based on SC discussion & public workshop.
 - a. Provide a PDF of priority corridors to Alan Pytcher, NCDOT.
4. Revise evaluation criteria based on SC discussion.

Steering Committee Action Items

5. Provide 3-5 sentence summary of Town events to document existing encouragement initiatives for walking.
6. Rank your top 10 beach access points and provide to Jerry Haire. These lists will be compiled to identify a priority ranking based on the best amenities (e.g. showers, bathrooms, parking).
7. Convey **North End Traffic Study** document.
8. Convey documents/plans for **repaving or redesign of St Joseph Street**, if available.

Attachments

Sign in sheet

Presentation slides



Meeting Agenda

Steering Committee Meeting Sign-in

	Name	Dept/Office	Email
1	Eric Jelinski	Parks & Rec Dept	eric.jelinski@carolinabeach.org
2	ED PARVIN	CB PLANNING	ed.parvin@carolinabeach.org
3	Jerry Haire	Planning	jerry.haire@carolinabeach.org
4	Abigail Lorenzo	WMPO	abigail.lorenzo@wilmingtonnc.gov
5	Mike Hoffer	CFCC	mike@mikehoffer.com
6	Kate Games	Local / Plantation Bldg. Corp	games@plantationbuildingcorp.com
7	Duke Hagestrom	Citizen	dukeh@bellsouth.net
8	Alan Pycher	NC DOT	apycher@ncdot.gov
9	Timothy Tresch	VHB	
10	Kara Peach	VHB	
11	Ian Hamilton	VHB	
12			
13			
14			
15			

Place: Carolina Beach Town Hall
1121 North Lake Park Blvd

Date: October 17, 2017

Notes Taken by: VHB

Project #: 38600.02

Re: Carolina Beach Ped Master Plan
Public Workshop #2

ATTENDEES

See sign-in sheet; Approximately 60 attendees

These notes serve as summary of public workshop #2 held on Tuesday, October 17, 2017 @ 5:30 PM at the Carolina Beach Town Hall.

Attendees were asked to sign in, and circle the room to engage in conversation with staff at designated work stations. VHB held a brief presentation beginning at 5:35 PM to provide additional background on the project and frame the role of attendees in this process. At 5:55 PM, the attendees were asked to return to the open house format and resume conversations. The workshop ended at 7:30 PM.

The four work stations included Survey Results, Priority Corridors, Facility Improvements, and Significant Destinations/Safety Issues. A summary of comments from each station are provided below:

Survey Results – attendees were asked to revise or comment on survey findings.

- Concern over validity of results because multiple surveys could be completed by the same IP address. VHB desired multiple responses to allow both spouses to respond from a single household.
- VHB reviewed duplicate IP Addresses and found that 4.2% of completed surveys were submitted from an IP address that was used three or more times. Many of these are likely from a public library, town government office, or private business.

Priority Corridors – attendees were asked whether the appropriate roadways were identified as primary.

- Carolina Beach Avenue was suggested as a primary corridor; Canal Drive was also suggested.
- 7th Street was suggested to be downgraded to secondary corridor, citing that very few pedestrians currently walk along this street. Some residents were opposed to sidewalks because this would add more concrete, which is bad for environment and general aesthetics of community. Suggestions also included focusing on speed enforcement.
 - Clarendon Blvd (90' ROW) was suggested for downgrade to secondary corridor. The challenge is that these two streets connect town points of interest (Park, School, Recreation Center).
 - Other meeting attendees suggested that 6th St, 7th St, Clarendon Ave, and Atlanta Ave all need paths because a lack of existing pedestrians is likely the result of being afraid of walking in the road.
- Atlanta Avenue @ Lake Park Blvd: Drivers do not stop. This is a very busy intersection, and they may not anticipate the stop due the curve.
- Greenville Avenue/Clarendon Blvd/3rd/4th/5th Streets were all discussed as Primary corridors.

- Focus efforts near Pelican Road, the Boardwalk, and Boat Basin. Highest priority for improvements.
- Any store with a Redbox was cited as a destination and should be improved for pedestrians.
 - Dow Road; Lake Park Blvd; Winner Ave; Spartanburg Ave were specifically mentioned.
- Some residents suggested that neighborhood streets west of the lake should be downgraded from secondary to tertiary because no improvement is needed. People walk in the street because traffic is non-existent.

Facility Improvements – attendees were asked to indicate where they would recommend the following:

- **Signage for pedestrian/bicycle awareness**
 - Snows Cut bridge entering Town
 - Suggested messages include “Bike/Ped Friendly”, “Golf Carts welcome”, “Kids at Play.”
 - Reduce speed limit to 35 on bridge, once you’ve entered Town Limits
 - Reduce to 25 mph past Dow Road
 - Lake Park Blvd @ Lewis Dr intersection (Food Lion shopping center)
- **Crosswalks** (traditional)
 - Lake Park Blvd @ Lewis Dr (Food Lion shopping center)
 - Lake Park Blvd @ Winner Ave (Lazy Pirate)
 - Lake Park Blvd @ ABC store/Wings/Ace Hardware signalized intersection
 - Lake Park Blvd @ Goldsboro Ave
 - Lake Park Blvd @ Spartanburg Ln (Scotchman convenience store)
 - Many locals visit The Scotchman (convenience store) in the morning but drivers to not stop. Suggest moving the 35 MPH sign 700’ south to Uncle Vinny’s Ristorante (Carolina Sands Dr). Add a crosswalk (with a pedestrian refuge) and a sidewalk across from store.
 - Canal Dr @ Pelican Lane
 - Everywhere there is a business with parking
- **Raised crosswalks @ intersections**
 - Lake Park Blvd @ Harper Ave, Raleigh Ave, Cape Fear Blvd, Charlotte Ave, and Hamlet Ave
 - Lake Park Blvd @ South Carolina Ave (Sands)
 - Speed bumps/humps mentioned for residential streets south of Ocean Blvd (mid-block)
 - Along Bowfin Ln, Snapper Ln, Swordfish Ln, Bonito Ln, Mackerel Ln, Pinfish Ln, and Kingfish Ln
- **Rectangular Rapid Flashing Beacons (RRFBs)**
 - Existing six (6) RRFBs along Lake Park Blvd were well received by meeting attendees
 - Enforcement is also needed as some cars do not stop
 - Lake Park Blvd @ Spartanburg Ln (non-signalized)
 - Lake Park Blvd @ Goldsboro Ave (non-signalized)
 - Lake Park Blvd @ St Joseph St (non-signalized)
- **Pedestrian Refuge Islands**
 - Lake Park Blvd @ Lewis Drive (Food Lion shopping center)
 - Lake Park Blvd @ Town Hall (Flaming Amy’s)

- **Sidewalk Enhancements**

- Along east side of St. Joseph Street between Goldsboro Ave and Carl Winner Ave (marina)
- Lake Park Blvd east side from Harper Ave to Dow Rd
- Lake Park Blvd south of the Lake (Lake Drive; Sumter Ave)
- Carolina Beach Ave toward Freeman Park
 - Canal Dr also mentioned because it is less constrained than CB Ave

- **Shared Use Paths/Extensions**

- St Joseph Street (east side)
- Dow Road (east side) extending/connecting to Mike Chapel Park
- Carolina Beach Ave along east side (partial sidewalk, partial bike lane for several blocks)
- Carolina Beach is more of a biking community. It is easier to get around on bicycles than foot. Bicycle lanes are preferred over sidewalks. Residents may not support converting bike lanes to sidewalk (shoulder).

General Discussions with Attendees

Safety

- Several attendees noted they would rather see more strategies to slow drivers than change facilities. Suggestions included:
 - Increased enforcement for speed, stop signs, and RRFB
 - Add four-way stop signs
 - Add speed humps in residential neighborhoods
 - Enlarge 25 MPH speed limit area along Lake Park Blvd (further north and south)
- Pedestrians cross Lake Park Blvd in unsafe manner (midblock; randomly; slowly; unexpectedly)
- Some intersections do not have enough ROW for multiple pedestrians plus bicycles.
 - Need more space to safely stand along roadway, and not on grass/mud
- Lighting along Canal Dr was mentioned as a safety concern
- Speeding along St Joseph St
- All-pedestrian phase needed for Lake Park Blvd traffic signals at Cape Fear Blvd and Harper Ave

Education

- Add awareness signs for visitors entering Town over the Snows Cut bridge
- Use variable message signs to display messages to slow traffic. Reduce to 35 MPH sooner.
- Conduct educational training at day cares and churches relating to the rules of the road

Attachments

Presentation slides

Markup poster scans

Public Workshop #2

	Name	Tell Us About Yourself	Which street/intersection in Carolina Beach should be improved first?
example	John Doe	Carolina Beach Resident	Intersection of Lake Park Blvd @ Hamlet Ave
1	DICK & Shannon Rowe	Carolina Beach	South Carolina & Lake Park
2	Donald Matson	Carolina Beach	C.B. Ave. S.
3	Cathy Casey	CB Resident	Canal Dr.
4	WAYNE ROUSE	CB	CANAL
5	Becky Wood	CB	MAURICE
6	Doble Couple	CB	
7	Mike Repeta	Property owner	Carl Winner & Lake Park
8	DAVID MALACH	CB OWNER	
9	SARAH FAIRBANKS	resident	Canal and/or CBAN
10	JAY HEALY	CB	
11	DARREN WILKINS	CB RESIDENT	HARRIS STREET
12	Daniel Tangredi	CB Resident	Lake Park ^{South} Past Lake
13	JUAN DEW-KIGHT	CB resident	LAKE PARK & DOW
14	Ben Say	CB	sidewalk south of the lake on C.P.B. to town limit.
15	Lori & Jay Walker	CB resident	CANAL & LAKE PARK ped. crosswalk @ Spartanburg/Lake PK



Meeting Agenda

Public Workshop #2 (continued)

	Name	Tell Us About Yourself	"To improve bicycling and walking this plan should..."
16	Jon Bridges	Council	
17	LeAnn Pierce	Council	
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Public Workshop #2

	Name	Tell Us About Yourself	Which street/intersection in Carolina Beach should be improved first?
example	John Doe	Carolina Beach Resident	Intersection of Lake Park Blvd @ Hamlet Ave
1	JoDan Garza	resident C.B.	all of the area all of down rd.
2	Toni Sweetland	CB Property Owner	crosswalks & North of Winner Ave.
3	Mark Turner	CB Resident	sidewalks south of Lake on Lake Park Blvd.
4	Tracy Knox	CB Resident	Canal
5	ALAN HELD	CB Resident	SPARTANBURG MOVE CROSS WALK - speed limit
6	Kate HELD	CB Resident	35 - EAST SIDE WALK 1st Block
7	Mike Hoffer	CB resident	Atlanta & Lake Park
8	Ken Womley	CB Resident	Sumter & 4th
9	Ricky NIEC	resident	7th & CLARENDON
10	ELIZABETH SAMBO	RESIDENT	
11	CHASE SAMBO	RESIDENT	
12	Anna Smith	resident	Harper, Lake Park Augusta 16th
13	DAVID RAY	RESIDENT	Atlanta & Lake Park
14	SHIRLEY CRAIG	RESIDENT	LAKE PARK & DOW RD
15	Amy Hooker KIDD	CB RESIDENT	MAINTAIN EXISTING SIDEWALKS

Public Workshop #2

	Name	Tell Us About Yourself	Which street/intersection in Carolina Beach should be improved first?
example	John Doe	Carolina Beach Resident	Intersection of Lake Park Blvd @ Hamlet Ave
1	JOSEPH HACK	CAROLINA BEACH RESIDENT	// //
2	Caithin Gschwind	CB Resident	Lake Park Blvd from Atlanta to Cape Fear Blvd
3	JOE BRADISH	CB Resident	
4	SRIP SPRUE	BUSINESS OWNER RESIDENT	
5	Tommy Tucker	since 1950	LK PK/HARPER - DANGEROUS
6	Kathy Baturke	CB Resident 10 years	Canal
7	STEVE CASEY	RESIDENT	CANAL
8	CATHY CASEY	Resident	CANAL
9	Amy Craig	Resident	
10	Jerry Bagnell	Resident	
11	Duke Hagestrom	Citizen	Dow Road / Harper cross-walk
12	Dex Shokor	Resident	Lake Park
13	Nancy Hunter	Resident	
14	Kerig Kaslo	Resident	?
15	F W Hardy	Resident	?

Prepared for:



Prepared by:

