



OCEAN ISLE BEACH

# BICYCLE + PEDESTRIAN PLAN



Prepared for the Town of Ocean Isle Beach & NCDOT  
Prepared by Alta Planning + Design





### ACKNOWLEDGEMENTS

Thanks to the nearly 500 local residents, business leaders, community leaders, and government staff that participated in the development of this plan through meetings, events, comment forms, and plan review. Special thanks to those who participated as steering committee members, listed below.

### PROJECT STEERING COMMITTEE

The Steering Committee is made up of local residents, government staff, and community and business leaders.

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Prepared for the Town of Ocean Isle Beach, North Carolina

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*Sidewalk on W. First St from the traffic circle.*

# 1 INTRODUCTION

## Chapter Contents:

### Project Background

### Planning Process

### Why this Plan is Important

## PROJECT BACKGROUND

The Ocean Isle Beach Bicycle & Pedestrian Plan was made possible by joint funding from the Town of Ocean Isle Beach and the North Carolina Department of Transportation (NCDOT). In 2013, Ocean Isle Beach was awarded a matching grant from the North Carolina Department of Transportation (NCDOT) Bicycle and Pedestrian Planning Grant Initiative. The purpose of the grant is to encourage municipalities to develop comprehensive bicycle plans and pedestrian plans. To date, the initiative has funded planning efforts in more than 130 municipalities across the state. The program is administered through NCDOT's Division of Bicycle and Pedestrian Transportation.

## PLANNING PROCESS

The planning process began with a Kickoff Meeting in early 2014, which was the first of three project Steering Committee meetings. The Steering Committee is made up of a combination of local residents, Town staff and representatives, business owners, health professionals, and regional transportation planners. This Steering Committee guides the plan's development throughout the planning process. Key steps include crafting an overall vision for the plan, communicating existing bicycle and pedestrian conditions to the Town and project consultants, and providing feedback on plan recommendations.

Aside from the Steering Committee input, the planning process includes several other important methods of public outreach and involvement. The project website, public comment form, press releases, and public workshops are all used to gather input for the plan and ask for feedback on the plan draft. The plan and planning process are also promoted through the Town's Facebook page. Key outreach dates in the process included:

- Project Kick-Off Meeting - February 2014
- Public Workshop #1 - April 2014
- Public Workshop #2 - July 2014
- Draft Bicycle and Pedestrian Plan (released online) – August 2014
- Final Plan Public Hearing Presentation - October 2014



## WHY THIS PLAN IS IMPORTANT

Through this plan, the Town of Ocean Isle Beach aims to:

- Improve pedestrian and bicyclist safety;
- Foster better access to community destinations;
- Create opportunities for active and healthy lifestyles; and
- Enhance quality of life.

The following Vision Statement combines input from the Steering Committee, outlining the overall vision for the outcomes of this plan:

## Vision Statement

*“The Town of Ocean Isle Beach is a community where walking and bicycling are **embraced as ways to get around, get fit, see the sights, and have fun.** Residents and visitors alike have access to well-maintained bicycle and pedestrian facilities and programs that enable **safe, convenient, comfortable, and connected walking and bicycling opportunities** throughout town.”*



### Key Benefits of this Plan



*The following sections discuss the many benefits of planning for and creating a walkable community, from traffic safety and health improvements to economic and environmental benefits. Resources to more comprehensive research on each topic area are provided at the end of each section.*



## Safety for Pedestrians and Bicyclists

### Trends and Challenges

According to a survey of 16,000 North Carolina residents for the 2011 North Carolina Bicycle and Pedestrian Safety Summit, the most commonly reported safety issue for walking and bicycling was inadequate infrastructure (75%).<sup>1</sup> A lack of bicycle and pedestrian facilities, such as sidewalks, bike lanes, trails, and safe crossings, lead to unsafe conditions for bicyclists and pedestrians:

- Each year on average (2007-2011), **162 pedestrians and 19 bicyclists are killed** in collisions with motor vehicles on North Carolina roads, while many more are seriously injured.<sup>2</sup>
- North Carolina is ranked as **one of the least safe states** for walking (41st) and bicycling (44th).<sup>3</sup>
- **13% of all traffic fatalities** in North Carolina are bicyclists and pedestrians.
- During the five-year period from 2007 to 2011, a total of **4,700 bicycle-motor vehicle crashes and 12,286 pedestrian-motor vehicle crashes** were reported to North Carolina authorities.<sup>2</sup>
- In Ocean Isle Beach from 2007-2011, there was one crash involving a bicyclist and three involving a pedestrian. **In three of these crashes, a child bicyclist or pedestrian under the age of 12 was involved.**<sup>2</sup>

### Improving Safety

Separate studies conducted by the Federal Highway Administration and the University of North Carolina Highway Safety Research Center demonstrate that installing pedestrian and bicycle facilities directly improves safety by reducing the risk and severity of pedestrian-automobile and bicycle-automobile crashes. For example, installing a sidewalk along a roadway reduces the risk of a pedestrian “walking along roadway” crash by 88 percent. Furthermore, according to the aforementioned survey, 70% of respondents said they would walk or bicycle more if safety issues were addressed, citing a lack of bicycle and pedestrian facilities as the top issues.<sup>1</sup>

#### Pedestrian Crash Countermeasures

#### Pedestrian Crash Reduction Factor

- |  |     |
|--|-----|
| • Install pedestrian overpass/underpass              | 90% |
| • Install sidewalk (to avoid walking along roadway)  | 88% |
| • Provide paved shoulder (of at least 4 feet)        | 71% |
| • Install raised median at unsignalized intersection | 46% |
| • Install pedestrian refuge island                   | 36% |
| • Install pedestrian countdown signal heads          | 25% |

The following web addresses link to more comprehensive research on safety.

- <http://www.ncdot.gov/bikeped/planning/walkbikenc/>
- [http://www.pedbikeinfo.org/data/factsheet\\_crash.cfm](http://www.pedbikeinfo.org/data/factsheet_crash.cfm)



## Health Impacts of Active Transportation

### Trends and Challenges

North Carolina’s transportation system is one of the most important elements of our public environment. Unfortunately, it includes many streets that are unsafe for walking and bicycling, posing barriers to healthy living and active transportation. In 2012, NCDOT’s Board of Transportation revised its mission statement to include “health and well-being” and passed a “Healthy Transportation Policy,” which declares the importance of a transportation system that supports positive health outcomes. Below are some key trends and challenges related to health and transportation in North Carolina (this is the most relevant readily available data within the scope of this planning effort):

- **65% of adults in North Carolina are either overweight or obese.**<sup>5</sup> The state is also ranked **5th worst in the nation** for childhood obesity.<sup>6</sup>
- Recent reports have estimated the **annual direct medical cost of physical inactivity in North Carolina at \$3.67 billion**, plus an additional \$4.71 billion in lost productivity.<sup>7</sup> However, every dollar invested in pedestrian and bicycle trails can result in a savings of nearly \$3 in direct medical expenses.<sup>8</sup>
- Of North Carolinians surveyed, **60% would increase their level of physical activity if they had better access to sidewalks and trails.**<sup>5</sup>
- A Charlotte study found that residents who switched to walking by using light rail for their commute weighed an average of 6.5 pounds less than those who continued to drive to work.<sup>9</sup>

### Better Health through Active Transportation

Using active transportation to and from school, work, parks, restaurants, and other routine destinations is one of the best ways that children and adults can lead measurably healthier lives. Increasing one’s level of physical activity through walking and bicycling reduces the risk and impact of cardiovascular disease, diabetes, chronic disease, and some cancers. It also helps to control weight, improves mood, and reduces the risk of premature death.<sup>10</sup>

### Active Transportation: Pathway to Health



Source: Alta Planning + Design; WalkBikeNC





## Mobility and Accessibility Benefits of Walking and Biking

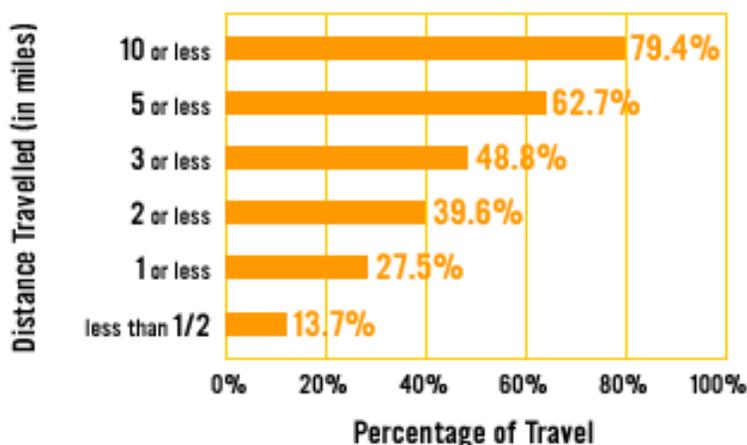
### Opportunity to Increase Walking and Bicycling Rates

According to the 2011 Bicycle and Pedestrian Safety Survey, **at least 70 percent of North Carolinians would walk or bike more for daily trips if walking and bicycling conditions were improved.** With appropriate accommodations, walking and bicycling can provide alternatives to driving for commuting to work, running errands, or making other short trips.

Commute rates for walking and bicycling in North Carolina currently fall below the national average, with just 0.2% of North Carolina commuters bicycling to work and 1.8% walking to work, compared to 0.6% bicycling and 2.9% walking nationwide. This places North Carolina 42nd for walking commute rates and 41st for bicycling commute rates in nationwide state rankings.<sup>3</sup> The charts in Chapter 2 (pages 2-2 to 2-3) show national model communities for walking and biking rates, model communities in North Carolina, and peer beach communities.

An estimated 40% of all trips (commute and non-commute) taken by Americans each day are less than two miles, equivalent to a bike ride of 10 minutes or less; however, just 13% of all trips are made by walking or bicycling nationwide.<sup>3</sup> To put these numbers into perspective, **34% of all trips are made by walking or bicycling in Denmark and Germany, and 51% of all trips in the Netherlands are by foot or by bike.**<sup>17</sup> Germany, Denmark, and the Netherlands are wealthy countries with high rates of automobile ownership, just like the United States. Yet, an emphasis has been placed on providing quality walking and bicycling environments which has alleviated the reliance on motor vehicles for short trips.

*Daily Trip Distances of Americans*



*Most driving trips are for a distance of five miles or less. Chart from the Bicycle and Pedestrian Information Center website, [www.pedbikeinfo.org](http://www.pedbikeinfo.org)*



## Reduced Vehicle Miles Traveled (VMT) & Congestion

Taking short trips by foot or by bike can help to greatly reduce motor vehicle miles driven and traffic congestion. Under the Nonmotorized Transportation Pilot Program, **walking and bicycling investments averted an estimated 32 million driving miles in four pilot communities between 2007 and 2010.**<sup>18</sup> These individual changes in travel behavior can add up to produce significant societal benefits. Traffic on arterials and other streets can be mitigated as people use sidewalks, bike lanes, paths, and other alternatives to get around. Parking lots can also be made less congested by reducing crowding, circling, and waiting for open spots.

The following web addresses link to more comprehensive research on transportation efficiency.

- <http://www.ncdot.gov/bikeped/planning/walkbikenc/>
- [http://www.pedbikeinfo.org/data/factsheet\\_general.cfm](http://www.pedbikeinfo.org/data/factsheet_general.cfm)

## Stewardship Benefits of Active Transportation

Stewardship addresses the impact that transportation decisions (both at the government/policy level and individual level) can have on the land, water and air that Ocean Isle Beach residents and visitors enjoy.

Providing safe accommodations for walking and bicycling can help to reduce automobile dependency, which in turn leads to a reduction in vehicle emissions – a benefit for residents and visitors and the surrounding environment. As of 2003, **27 percent of U.S. greenhouse gas emissions are attributed to the transportation sector, and personal vehicles account for almost two-thirds (62 percent) of all transportation emissions.**<sup>19</sup> Primary emissions that pose potential health and environmental risks are carbon dioxide, carbon monoxide, volatile organic compounds, (VOCs), nitrous oxides (NOx), and benzene. Children and senior citizens are particularly sensitive to the harmful affects of air pollution, as are individuals with heart or other respiratory illnesses. Increased health risks such as asthma and heart problems are associated with vehicle emissions.<sup>20</sup>

Below are some key trends and challenges related to stewardship and transportation in North Carolina:

- Even a modest increase in walking and bicycling trips (in place of motor vehicle trips) can have significant positive impacts. For example, replacing two miles of driving each day with walking or bicycling will, in one year, prevent 730 pounds of carbon dioxide from entering the atmosphere.<sup>21</sup>
- According to the National Association of Realtors and Transportation for America, **89% of Americans believe that transportation investments should support the goal of reducing energy use.**<sup>22</sup>
- North Carolina's 2009-2013 Statewide Comprehensive Outdoor Recreation Plan (SCORP) found **"walking for pleasure" to be the most common outdoor recreational activity, enjoyed by 82% of respondents, and bicycling by 31% of respondents.**<sup>23</sup>



- The natural buffer zones that occur along greenways protect streams, rivers, and lakes, preventing soil erosion and filtering pollution caused by agricultural and roadway runoff.<sup>2</sup>

The following web addresses link to more comprehensive research on active transportation and stewardship.

- <http://www.ncdot.gov/bikeped/planning/walkbikenc/>
- [http://www.pedbikeinfo.org/data/factsheet\\_environmental.cfm](http://www.pedbikeinfo.org/data/factsheet_environmental.cfm)

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WELCOME  
TO  
OCEAN ISLE  
BEACH

EAST SECOND ST

CAUSEWAY DR SW



# CURRENT CONDITIONS

**Chapter Contents:**

**Local Context**

**Current Conditions, Opportunities, and Constraints**

**Existing and Past Programs and Policies**

**Related Plans and Initiatives**

**LOCAL CONTEXT**

The Town of Ocean Isle Beach is located on a coastal barrier island along the Atlantic Ocean on the southern coastline of Brunswick County. The majority of the Town’s jurisdiction is located on the island, with the remaining area covering a one-quarter mile stretch on the mainland along NC Highway 904. The two portions of town are connected by a mid-rise bridge over the Atlantic Intracoastal Waterway and make up a total land area of **3.4 square miles**. As of the 2012 U.S Census estimate, Ocean Isle Beach is home to **567 permanent residents**. During the summer vacation months, the local population increases to 40 times that size, with the peak **summertime population reaching approximately 25,000**. The town is a popular destination for vacationers who come to enjoy the beach, its natural scenic views, and outdoor activities like sunbathing, kayaking, golf on mainland courses, and fishing. Vacationers are normally families who come for a week and rent a cottage, or come for the weekend and stay in short term rentals or in their second homes.

The street pattern of Ocean Isle Beach is mostly a grid, with a few east-west streets running along the length of the **6-mile long island**. NC Highway 904/ Causeway Drive is the main commercial corridor and runs north-south, linking the island to the mainland. A series of residential canal streets, each one-half mile long with an average of 50 homes, run north-south along the island. These **side streets become intensely crowded during the summer months** with pedestrians, bicycles, golf carts, automobiles, and trailers. The Ocean Isle Beach Pier and Arcade, Museum of Coastal Carolina, and many beach accesses, surf and fishing shops, and restaurants are popular local destinations.

Table 2-1 provides a comparison of demographic data for Ocean Isle Beach, Brunswick County, and the State of North Carolina. The **median age of permanent residents of the Town of Ocean Isle Beach is 58.9 years**, far above the state average of 37.4 years. Ocean Isle Beach continues to attract retirees as full-time residents. This **aging population** creates the need for more sidewalks and bikeways that allow residents to safely exercise, stay in good health, visit neighbors, and run errands. With Ocean Isle Beach being a family vacation destination, the town also needs safe sidewalks, bikeways, and crossings to help prevent crashes involving cars and pedestrians or bicyclists.



Table 2-1. Demographic Comparison

	OCEAN ISLE BEACH	BRUNSWICK COUNTY	NORTH CAROLINA
Population <sup>1</sup>	567	112,257	9,752,073
Median Age <sup>2</sup>	58.9	47.4	37.4
Median Household Income <sup>3</sup>	57,411	46,490	46,450
% Households without a Vehicle <sup>3</sup>	1.8%	5.1%	6.5%
% Walk to Work <sup>3</sup>	0.0%	0.9%	1.8%
% Bike to Work <sup>3</sup>	1.0%	<0.1%	0.2%

*During the summer vacation months, the local population increases by 40 times its normal size, with the peak summertime population reaching approximately **25,000**.*

<sup>1</sup> US Census Bureau, 2012 Population Estimates

<sup>2</sup> US Census Bureau, 2010 Demographic Profile Data

<sup>3</sup> US Census Bureau, 2008-2012 American Community Survey 5-Year Estimates

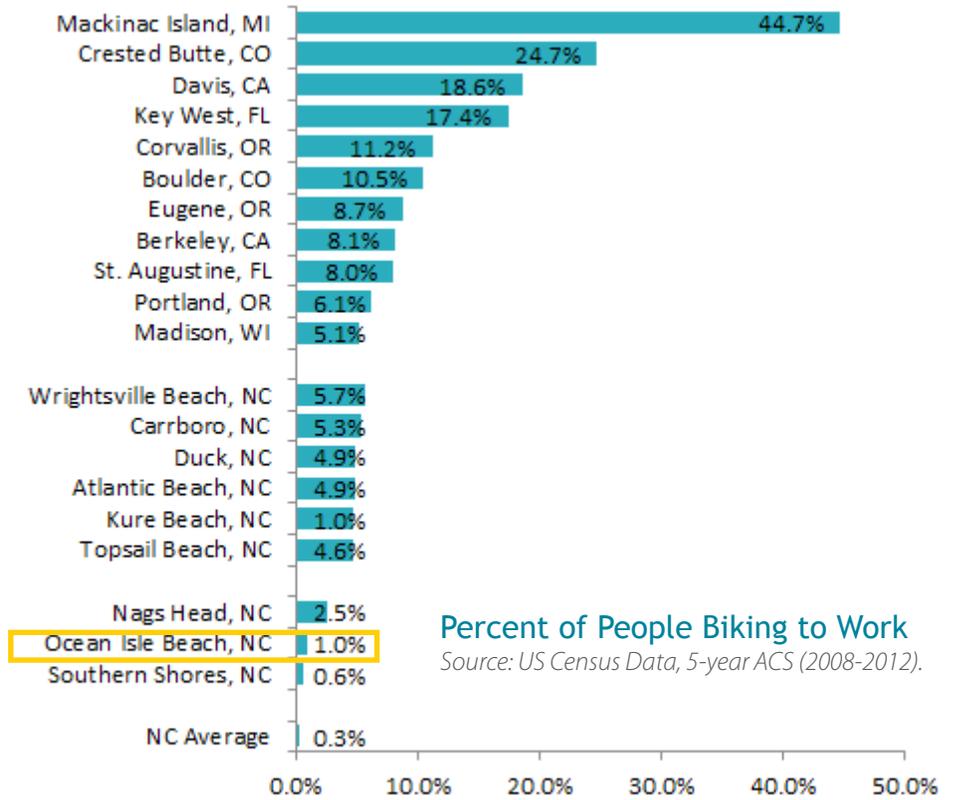
### Bicycling and Walking Rates

In many communities, walking and biking commute rates are used as an indicator of overall walking and biking. Currently, only one percent of Ocean Isle Beach residents bike to work, and zero residents walk to work. Note that these rates (shown on the following page) are for commuting only and do not reflect Ocean Isle Beach’s large seasonal tourist population and their vacation travel behavior. Still, for those who do live and work in Ocean Isle Beach, there is room for improvement as compared to other communities statewide and nationally, especially with homes and businesses being situated close together on the island.

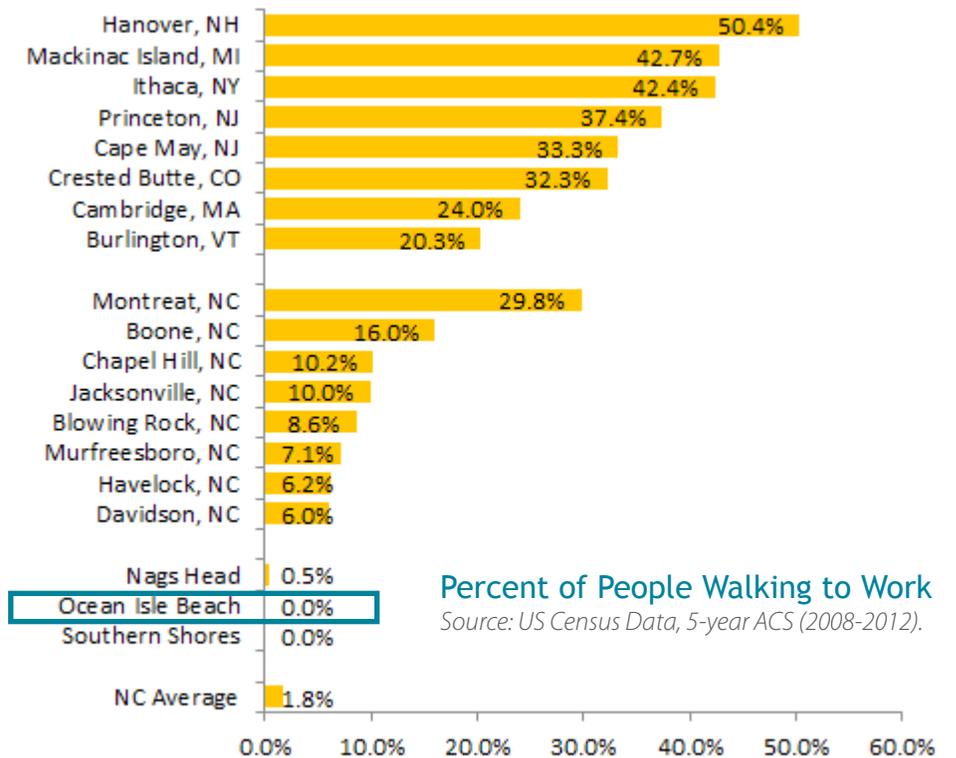
The charts on the following page also provide bicycle- and walk-to-work rates for model communities across the country, model communities in North Carolina, and peer communities for Ocean Isle Beach. These numbers show that, with some effort to improve infrastructure, policies, and programs, high rates of walking and bicycling to work are possible in communities of all sizes. In the short-term, Ocean Isle Beach should strive to match the bike- and walk-to-work rates of the Town of Nags Head, which is a similarly sized beach community both in terms of land area and population. As bicycling and walking become more popular, the Town should work toward even higher rates to match model North Carolina communities like Wrightsville Beach, Carrboro, and Duck, and eventually rates seen in the national peer communities.



“Ocean Isle Beach should strive to match the bike- and walk-to-work rates of the Town of Nags Head, which is a similarly sized beach community both in terms of land area and population.”



Percent of People Biking to Work  
Source: US Census Data, 5-year ACS (2008-2012).



Percent of People Walking to Work  
Source: US Census Data, 5-year ACS (2008-2012).



## CURRENT CONDITIONS, OPPORTUNITIES & CONSTRAINTS

Ocean Isle Beach has **19 miles of streets** within its town limits. Town-owned streets make up 12.5 miles of the street network, with an additional 6.6 miles owned and maintained by the North Carolina Department of Transportation (NCDOT). The pedestrian network consists of **8.9 miles of sidewalks and 0.9 miles of multi-use paths**. The bulk of these sidewalks are located along NCDOT streets, such as First Street, Second Street, and Causeway Drive. Public beach access paths are located roughly every 500 feet along the island, primarily along First Street. Three marked crosswalks on First Street, located at Monroe Street, Beaufort Street, and Private Drive, help to connect pedestrians to the beach accesses. Other walkways, beach accesses, and boardwalks are privately owned and maintained and are currently off-limits to the public. The on-road bicycle network is limited to **0.45 miles of paved shoulders striped on West Third Street**.

### Opportunities

The existing facilities in Ocean Isle Beach provide the beginnings of a bicycle and pedestrian network and are shown on Map 2-1 on the following page. Some strengths of the system include:

- **Existing Sidewalk:** The Town has nearly 9 miles of existing sidewalk along public streets.
- **Frequent Beach Access:** Public beach access points are located every 500 feet along the island.
- **Sidewalk Maintenance:** The Town routinely surveys and maintains existing sidewalks.
- **Bicycling and Walking Activity:** Local residents and thousands of visitors each year walk or ride around town.
- **Speed Limits:** The majority of streets are signed with speed limits of 35 miles per hour or lower.
- **Local Support:** The town has funding support for pedestrian and bicycle facilities from the Board of Commissioners, support from the Ocean Isle Beach Property Owners Association and the Ocean Isle Beach Land Conservancy, and support from this plan's steering committee.



*Frequent beach access points*



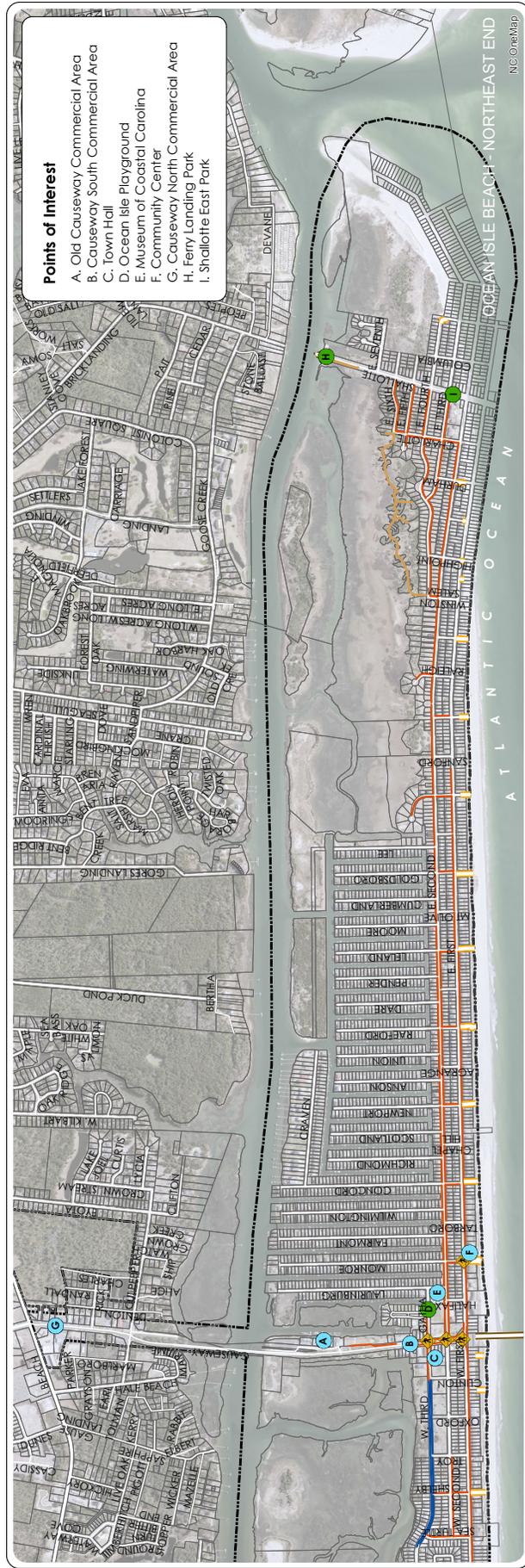
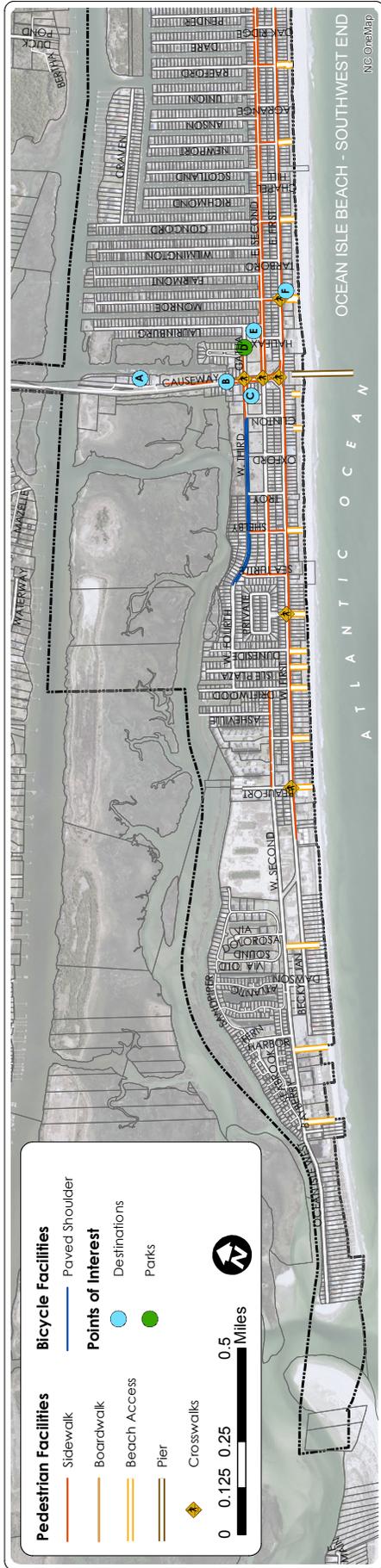
*Low speed limit (20 MPH) on Goldsboro St (typical of many of the north-south streets north of E. Second St.)*



*Left & right above: Bicyclists and pedestrians on W. First St.*



# MAP 2.1: EXISTING CONDITIONS





# TABLE 2.1: CORRIDOR INVENTORY

Road	From	To	Approximate Lane Widths (to edge of pavement)	Existing Road Configuration	Existing Sidewalk (one/both sides)	Curb/Gutter (Y/N)	Shoulder (Y/N)	Speed Limit	Nearby Destinations
E First	Causeway	Leland	10 / 10	2 lane	one side (south)	N	10' gravel (south)	35	Ocean Isle Beach Pier, Community Center, restaurants, shopping
E First	Leland	Sanford	10 / 10	2 lane	one side (north)	N	N	35	Residential, beach access
E First	Sanford	Winston Salem	10 / 10	2 lane	N	N	N	35	Residential, beach access
E First	Winston Salem	High Point (end)	24'	Dirt road	N	N	N	20	Residential, beach access
E Fourth	Winston Salem	Charlotte	20'	No striping	one side (south)	Y	N	20	Residential
E Third	Charlotte	Shallotte	20'	No striping	one side (south)	N	N	20	Residential
E Third	Shallotte	Columbia	18'	No striping	N	N	N	20	Residential
Shallotte	E Seventh	E Third	14   30   14	2 lane w/ grassy median	N	N	N	?	Ferry Landing Park, Shallotte East Park, beach access, residential
E Second	Charlotte	Leland	10 / 10	2 lane	one side (north)	N	N		Residential, beach access
Goldsboro	E Second	end	18'	No striping	N	N	N	20	Residential
E Second	Leland	Halifax	10 / 10	2 lane	both sides	N	N	?	Museum of Coastal Carolina, restaurants, shopping, playground, entertainment
E Second	Halifax	Causeway		2 lane + CTL	both sides			?	Museum of Coastal Carolina, restaurants, shopping, playground, entertainment
Causeway	E Second	Bridge	10.5 / 11 / 10.5	2 lane + CTL	one side (east)	Y	N	35	Restaurants, shopping, entertainment, boat launch
Odell Williamson Bridge	Bridge	Bridge	3   12   12   3	2 lane + shoulders	N	Y	Y	?	Restaurants, shopping, entertainment, boat launch
W Third	Clinton	Sea Turtle	4.5 / 9.5 / 9.5 / 5 (south)	2 lane + shoulders	N	N	Y	20	Town Hall, Police Station, residential
W Third	Causeway	Clinton	11   12   11	2 lane + Left turn lane (eastbound)	both sides	N	N	20	Town Hall, Police Station, restaurants, shopping, entertainment
W First	Causeway	750 ft W of Beaufort	10 / 10	2 lane	one side (south)	N	N	35	Ocean Isle Beach Pier, beach access, shopping, entertainment, residential
W Second	750 ft W of Beaufort	West End Peninsula complex	18-19'	2 lane	N	N	N	?	Residential
W Second	Driftwood	Dead end	17'	No striping	one side (north)	N	N	20	Residential
Isle Plaza	W Fourth	W First	10   20   10	2 lane	N	N	N	20	Residential
Duneside	W Fourth	W First	18'	No striping	N	N	N	20	Residential
Driftwood	end	W First	17-18'	No striping	N	N	N	20	Residential
Sea Turtle	W First	W Third	20'	No striping	one side (east)	N	N	20	Residential
W Second	Sea Turtle	Troy	19'	No striping	one side (south)	N	N	20	Residential
Shelby	W First	W Third	19'	No striping	one side (east)	N	N	20	Residential, beach access
Troy	W First	W Third	18'	No striping	N	N	N	20	Residential, beach access
Clinton	W First	W Third	9 / 9	2 lane	N	N	N	20	Residential, Ocean Isle Beach Pier, beach access
W Second	Clinton	Causeway	9 / 9	2 lane	N	N	N	20	Residential
Causeway	Beach Dr	Odell Williamson Bridge	11   10   11	2 lane + CTL	N	Y	N	35	Restaurants, shopping, entertainment

## Constraints

The following list is an overview of key issues of the existing bicycle and pedestrian network in Ocean Isle Beach. These observations are based on input from the Steering Committee, general public, field review, and available data.

- **Lack of Connectivity:** There is a lack of connectivity between the east-west thoroughfares on the island and the north-south side canal streets. Few side streets currently have sidewalks and the ones that do have few crosswalks. Other key components of connectivity in Ocean Isle Beach that can be improved include:
  - Access to beach access paths
  - Access to commercial areas and attractions
  - Residential circulation
- **Lack of bicycle facilities:** Bike lanes and paths are limited and do not connect to one another. Bicyclists currently have to choose between riding in mixed traffic with large numbers of automobiles and golf carts, or riding on narrow sidewalks with pedestrians.
- **Bridge access:** The Odell Williamson Bridge does not include sidewalks, paths, or bike lanes, has a limited sight distance, and has high automobile traffic volumes and speeds that make it a dangerous crossing for pedestrians and bicyclists. The lack of safe bridge access cuts island walking and bicycling opportunities off from the mainland, and vice versa.
- **High traffic volumes:** During the summer vacation season, the population of Ocean Isle Beach reaches 25,000 people, or more than 40 times its permanent size. This huge increase in population creates intense traffic congestion on the island that can constrain bicycle and pedestrian travel.



*There is a lack of safe crossings for pedestrians and bicyclists.*



- **Mix of traffic types:** Pedestrians, bicyclists, golf carts, and automobiles all occupy the roads during the summer months. The limited sidewalk network, particularly on side streets, forces pedestrians to walk in the street in many places. A lack of designated space and signage for pedestrians and bicyclists contributes to unsafe and unpredictable traffic behavior and confusion between all road users.
- **Lack of safe crossings:** Several side streets and beach access paths are not linked with safe crossings. A lack of marked crosswalks and signage makes it difficult for pedestrians to safely and comfortably cross streets in town.
- **Narrow roads and utilities:** Many roadways in town do not contain enough space within the existing pavement to add shoulders or other facilities for bicycling and walking. Utilities further constrain the available space for new and/or wider pathways.
- **Lack of signage:** There is an overall lack of traffic and wayfinding signage for pedestrians and bicyclists. More signage is needed to make drivers aware of pedestrian and bicycle traffic, direct pedestrians and bicyclists to safe routes and crossings, and provide directions between popular destinations.
- **Lack of programs:** The town does not have any active, recurring programs for pedestrians and bicyclists. Programs that educate all road users on bicycle and pedestrian safety, encourage walking and bicycling in town, and enforce traffic laws and safe traffic behavior could all contribute to a safer and more attractive environment for walking and bicycling.



*Pedestrians, bicyclists, golf carts, and automobiles all occupy the roads during the summer months (W. First St shown above).*



*Utilities such as the drainage system shown above constrain the ability to easily expand the sidewalk on the south side of W. First St to a wider multi-use path.*

### NCDOT-Reported Pedestrian and Bicycle Crashes

Map 2-2 on page 2-10 shows pedestrian and bicycle crashes in Ocean Isle Beach that were reported to the NCDOT between 2007 and 2011. During this period, four crashes involving a bicyclist or pedestrian were recorded. **Three of these crashes involved a child bicyclist or pedestrian under the age of 12**, all of which occurred between June and September during the summer tourist season.

### Roadway Jurisdictions

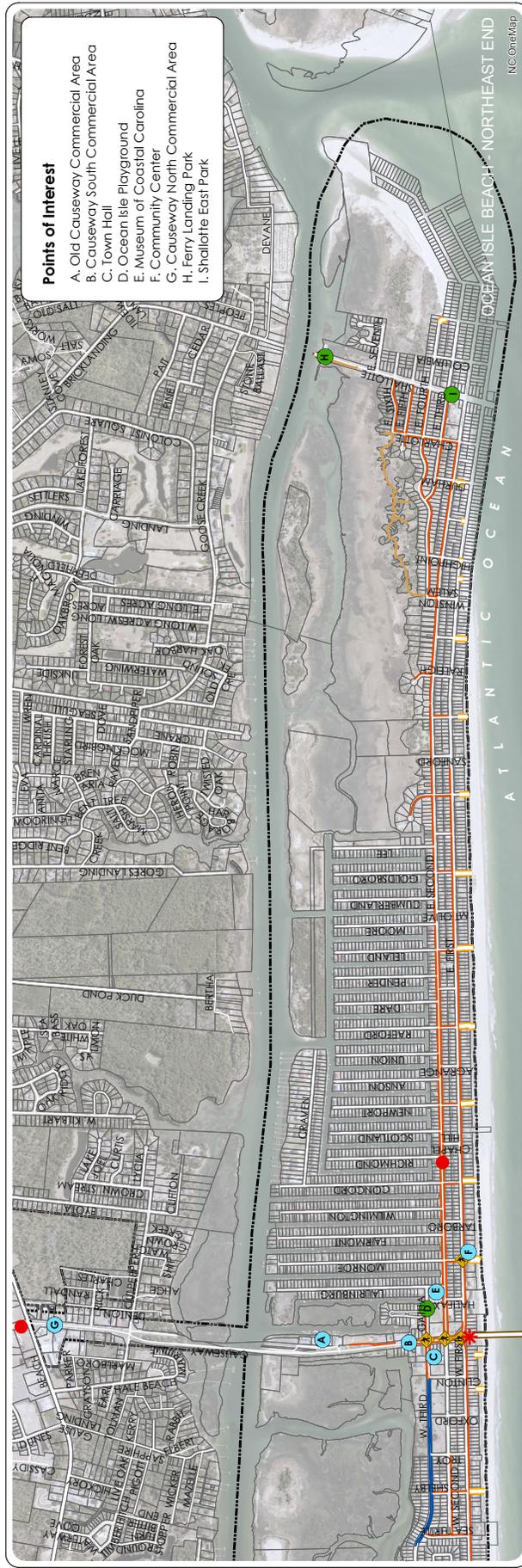
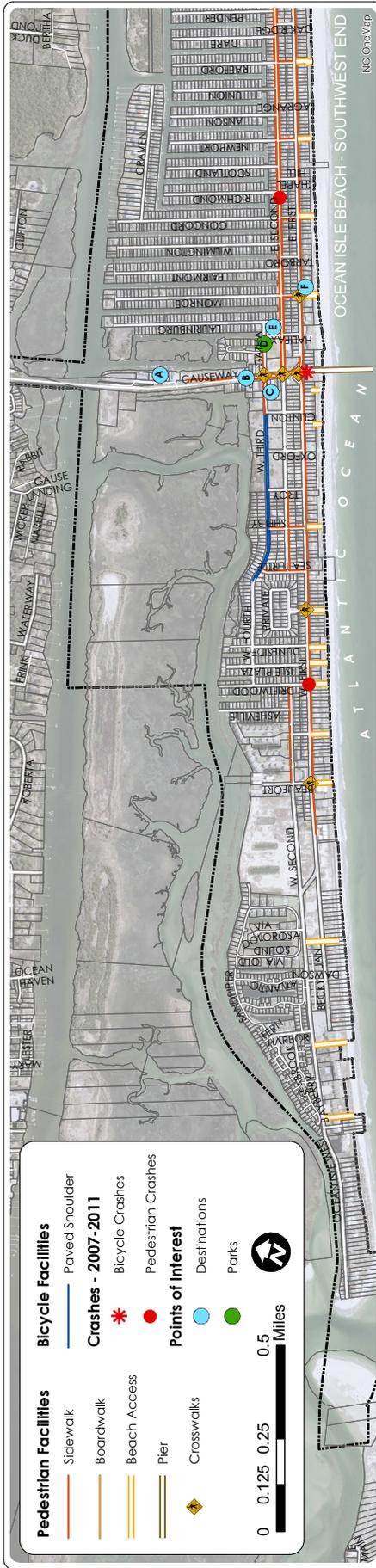
The roadway network in Ocean Isle Beach is a combination of town-owned, state-owned, and privately-owned roads. Knowledge of roadway ownership is important for determining the types of facilities that can be recommended along a roadway, the agency in charge of maintaining the roadway and implementing bicycle and pedestrian recommendations, and how improvements are scheduled, funded, and constructed.

Map 2-3 on page 2-11 shows which roadways in Ocean Isle Beach are state-, local-, or privately-owned. NCDOT-owned roadways make up roughly one-third of all roads in Ocean Isle Beach. These include Causeway Drive and most of First Street and Second Street. The town will need to coordinate with NCDOT Division 3 and the Division of Bicycle and Pedestrian Transportation to implement this plan's recommended improvements along these roadways.



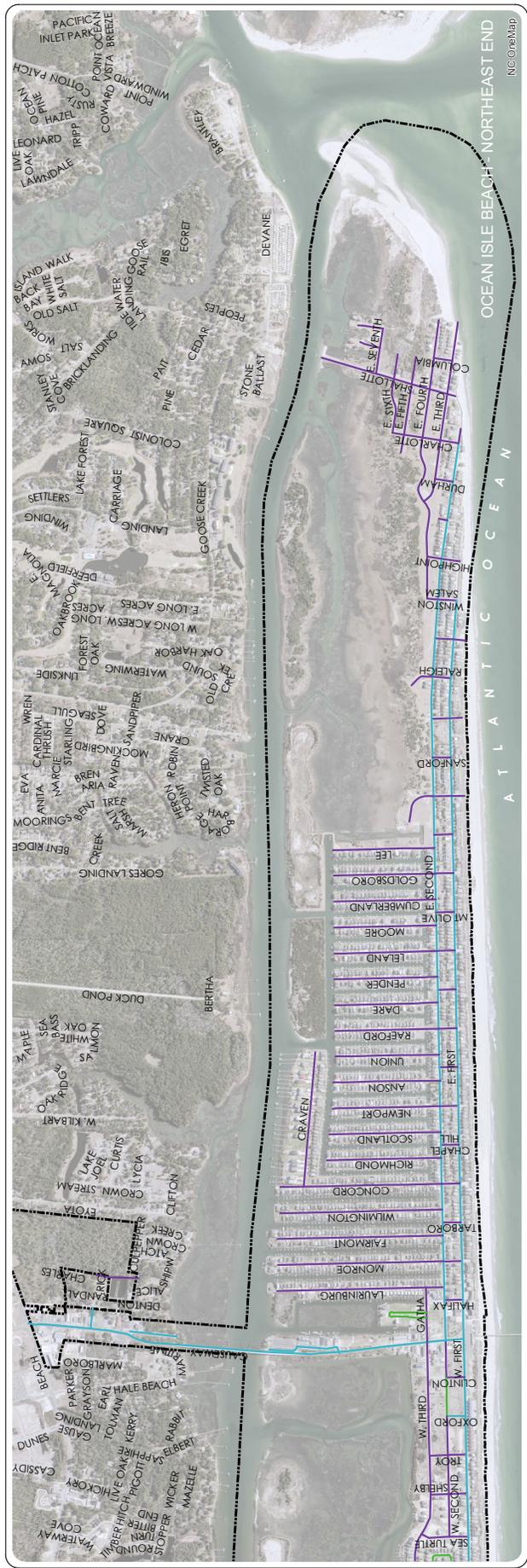
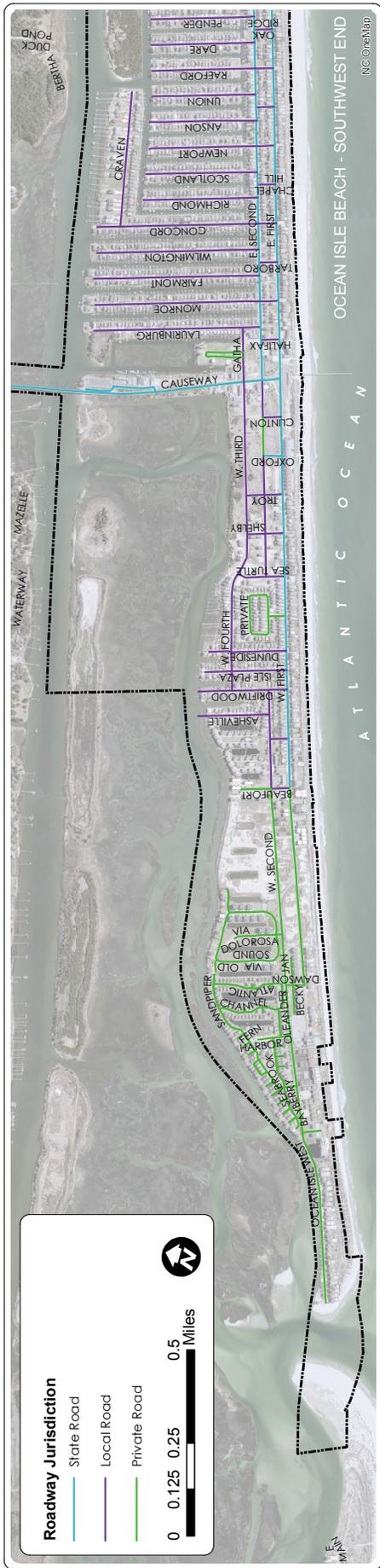
# MAP 2.2: CRASHES INVOLVING PEDESTRIANS AND BICYCLISTS

(As reported by NCDOT, 2007-2011)





# MAP 2.3: ROADWAY OWNERSHIP





## EXISTING AND PAST PROGRAMS AND POLICIES

### Leprechaun 5K Race

In March 2014, Ocean Isle Beach hosted the Brunswick County Lucky Leprechaun 5K Race. This event was open to runners and walkers of all ages, and awards were given to the fastest runners in each age group. Proceeds from the race were used to fund fitness and health programs for underserved Brunswick County residents.

### Town Ordinances

The Town of Ocean Isle Beach does not currently run any recurring bicycle and pedestrian programs, though some town ordinances and activities do benefit bicyclists and pedestrians. The Town ordinance prohibits vehicles from being parked on the sidewalks and blocking pedestrian traffic, which is especially a problem during the crowded summer months. This ordinance is strictly enforced by the Ocean Isle Beach Police Department.

The Town Subdivision Ordinance requires new developments on the island to incorporate sidewalks and/or bike paths and walkways into their development plans. These developments are required to set aside 15 percent of the gross area developed as greenspace to be used for the enjoyment of the residents of the community. Internal walkways and nature walks are incorporated into these developments to improve connectivity and provide recreation opportunities. These requirements make the developments more desirable to potential homeowners.

### Coordination with NCDOT

NCDOT has installed signage at the beginning of East and West First Streets and along East Second Street that notifies the public of upcoming pedestrian crossings on these streets. At the request of the Town, NCDOT also installed a marked pedestrian crosswalk at one of the Town's most frequented beach access paths. Town staff use maps, census data, and housing data to identify potential crosswalk sites. In conjunction with NCDOT, the Town is in the process of installing mile markers along NCDOT streets to inform pedestrians of their location and how far they have traveled. Ocean Isle Beach is also in the process of reviewing the requirements to become a *North Carolina Fit Community*.

## RELATED PLANS & INITIATIVES

The following local and regional plans are relevant to bicycle and pedestrian planning in Ocean Isle Beach. Links to more information and online versions of these plans are provided below.

### 2009 Ocean Isle Beach Coastal Area Management Act (CAMA) Land Use Plan

The 2009 CAMA Land Use Plan is the town's leading document for maintaining its coastal lands and guiding future growth and development. The town identifies an increased need for greater pedestrian and bicycle access along the island to help alleviate traffic congestion and to improve public access to the shoreline.



In its policies, the plan supports bicycling and walking and calls for bicycle and pedestrian access improvements, including:

- Supporting the use of bicycles as a functional means of reducing automobile traffic and parking demands at the beach
- Constructing additional sidewalks, walkways, and bike lanes at strategic locations on the island
- Widening the existing bridge to accommodate a pedestrian and bicycle path
- Pursuing federal and state grant funding to help construct new sidewalks, walkways, and bike lanes

The plan is available online at: [http://www.oibgov.com/userfiles/File/CAMA\\_Land\\_Use\\_Plan.pdf](http://www.oibgov.com/userfiles/File/CAMA_Land_Use_Plan.pdf)

### **2010 Brunswick County Comprehensive Transportation Plan (CTP)**

The Brunswick County CTP assesses the current and future transportation needs of the region and recommends improvements to meet those needs. While the plan is primarily oriented to addressing automobile travel, it does contain a small bicycle component. The plan recommends that bicycle improvements be made to NC Highway 179/Beach Drive along the northern edge of the Ocean Isle Beach town limits. This corridor is part of the state-designated NC Bicycle Route 3: Ports of Call, which stretches along the North Carolina coast from South Carolina to Virginia. A bicycle facility along Highway 179/Beach Drive would connect Ocean Isle Beach bicyclists to the nearby communities of Shallotte, Sunset Beach, and Calabash. There is no pedestrian element included in this plan.

The plan is available online at:

[https://connect.ncdot.gov/projects/planning/TPBCTP/Brunswick%20County/Brunswick\\_Report\\_online.pdf](https://connect.ncdot.gov/projects/planning/TPBCTP/Brunswick%20County/Brunswick_Report_online.pdf)

### **2009 Brunswick County Comprehensive Parks and Recreation Master Plan**

This plan outlines the projected growth of the Brunswick County population, the anticipated increase in demand for recreation, and a plan for maintaining and expanding the county's collection of parks, recreational facilities, and programs. The plan was reviewed for relevant content, but it does not include any recommendations for the Town of Ocean Isle Beach.

The plan is available online at:

[www.brunswickcountync.gov/portals/0/parksandrec/master%20plan.pdf](http://www.brunswickcountync.gov/portals/0/parksandrec/master%20plan.pdf)



## PUBLIC INPUT ON EXISTING CONDITIONS

Public input for this plan was collected through the project website, public comment form, and public workshops. Generally, the feedback from residents, visitors, and property owners is that they feel the current **walking conditions are fair (58%) to excellent (35%)** and that **improving them is very important (65%)**. Bicycling conditions were rated much lower on average; survey respondents feel the current **bicycling conditions in Ocean Isle Beach are fair (61%) to poor (34%)** and that **improving them is very important (68%)**. Safety, opportunities for recreation and exercise, and connectivity were the main topics identified by the steering committee as being important for this plan to address.

These issues were reflected in the public comments received about connecting the west and east ends of the island to restaurants and shops in the center of town, the desire for continuous bicycling and walking facilities along 1st and 2nd Streets, the lack of a safe connection over the Odell Williamson Bridge to the mainland, and the need for residents to have safer walking access and crossings from canal streets to the beach. Below are some highlights of direct quotes from the public:

*“There are no paths in the western part of Ocean Isle Beach for bikes or pedestrians and **there is no safe lane to ride or walk toward the center of town.**”*

*“Beach access crosswalks - **cars need to stop for pedestrians.**” | “Beach access street crossings - need signs that the law requires that vehicles stop for pedestrians in the crosswalk.”*

*“**Need an east to west trail along the whole island.**”*

*“I would like to be able to **walk or bike across the bridge** like Sunset Beach bridge.” | “Safe bicycle lane over the bridge.”  
“The bridge - would love to have a lane for biking and walking!”*

*“Keeping parked cars off of sidewalks on 1st and 2nd.”*

*“Widened sidewalks throughout the island.”*

*“Crossing Causeway is difficult and dangerous.” | “Need a safer way to cross Causeway at 1st and 2nd Streets.”*

*“Improved crossing conditions at traffic circle.” | “Traffic circle is not safe for bicycling.”*

*“Need a way to slow down traffic on the main streets of the island.”*

*“**Bike lanes along 1st and 2nd Streets.**” | “**Both main streets need a bike lane.**”*

*“All new construction should be required to install sidewalk/bike lanes.”*

*“More parking at the beach for bikes (bigger, cleaner, cleared spaces).”*

*“**Making it easier to walk and bike will get cars off the road!**”*

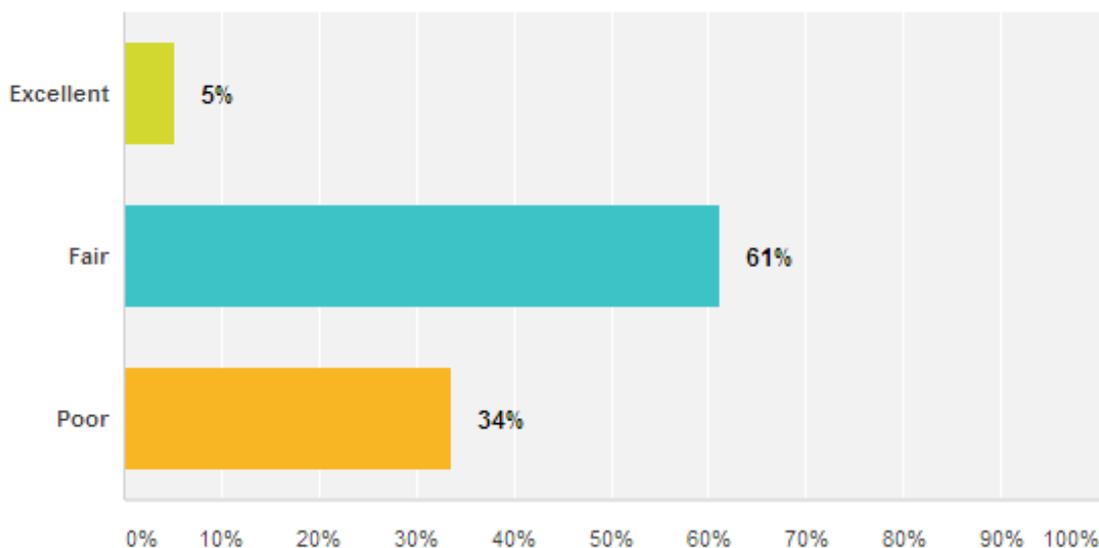


### Public Comment Form Results

The charts below summarize public input collected during this planning process in Spring 2014. Over 450 local residents, property owners, employees, and visitors contributed their input.

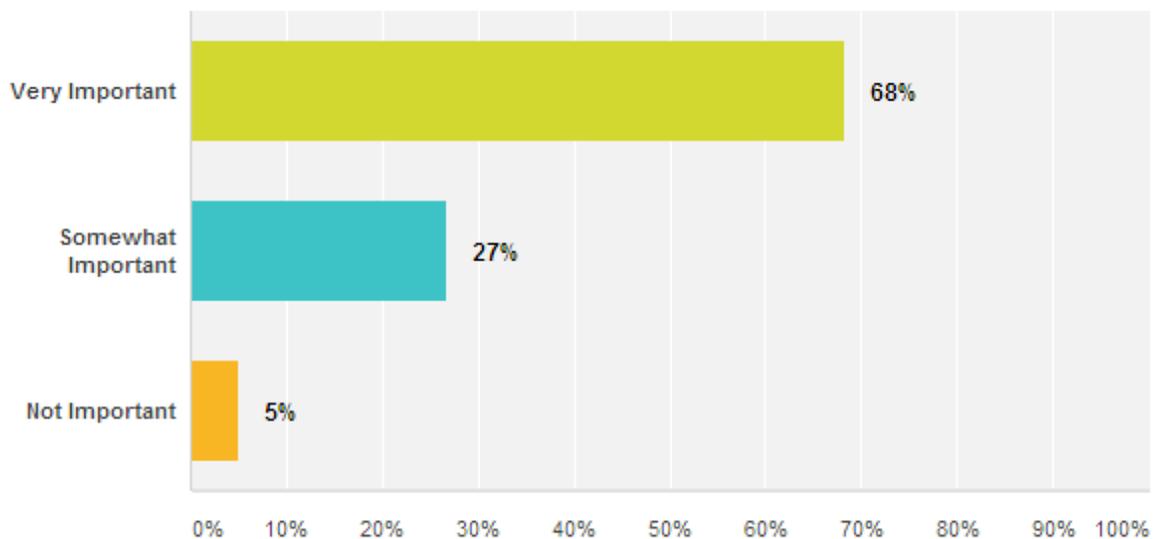
## How do you rate present bicycling conditions in Ocean Isle Beach?

Answered: 449 Skipped: 6



## How important to you is improving bicycling conditions in Ocean Isle Beach?

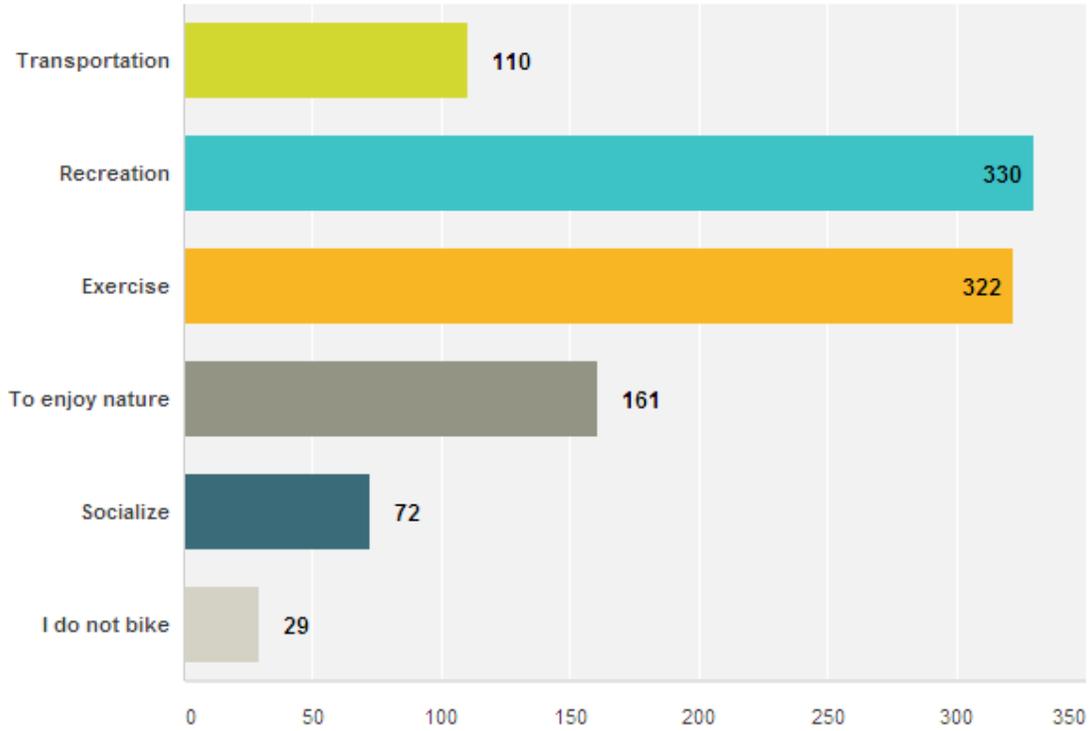
Answered: 450 Skipped: 5





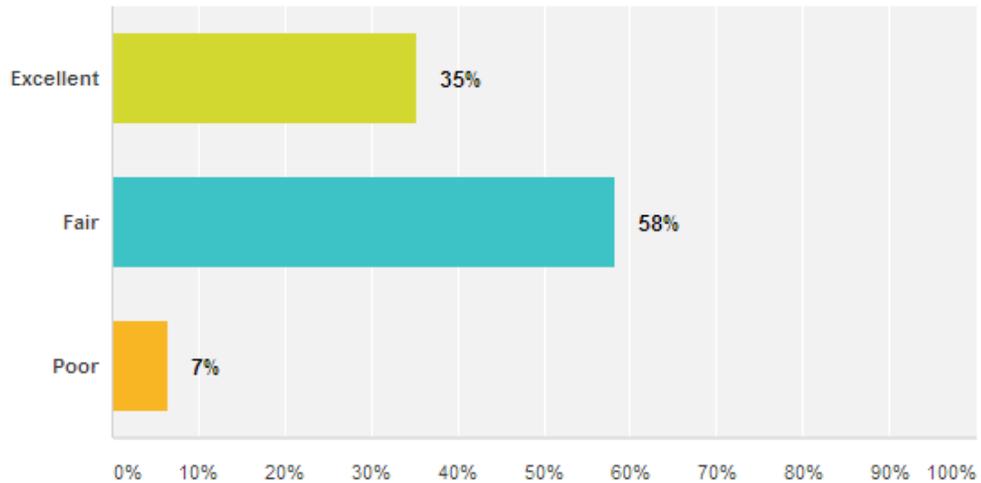
### When you ride your bicycle in Ocean Isle Beach, what is the primary purpose of your trip? (check all that apply)

Answered: 448 Skipped: 7



### How do you rate present walking conditions in Ocean Isle Beach?

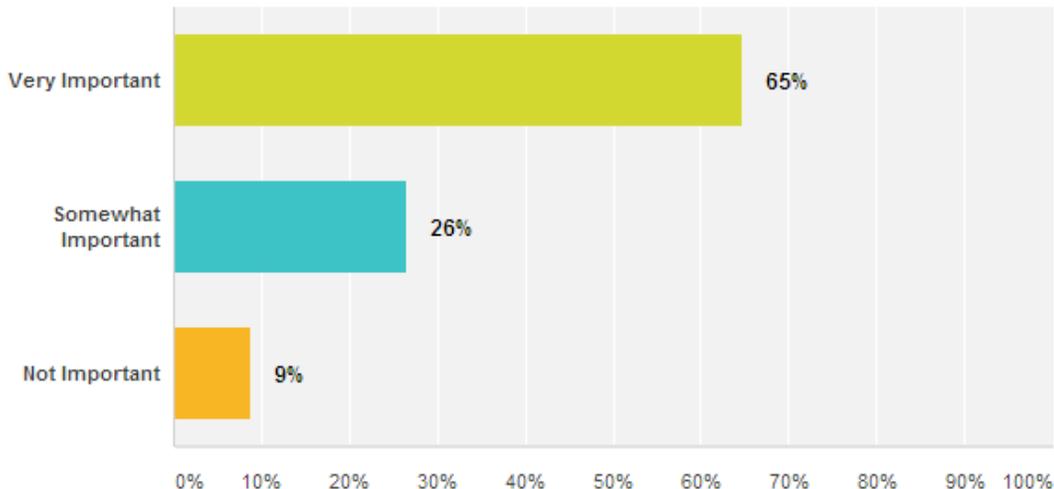
Answered: 443 Skipped: 12





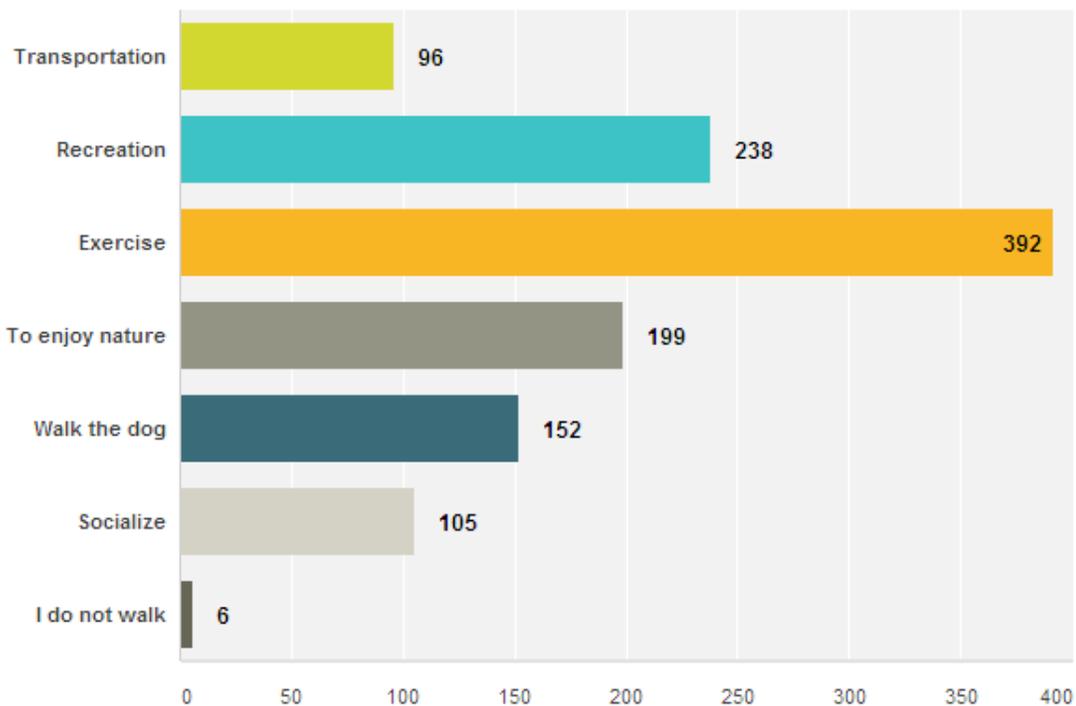
### How important to you is improving walking conditions in Ocean Isle Beach?

Answered: 443 Skipped: 12



### When you walk in Ocean Isle Beach, what is the primary purpose of your trip? (check all that apply)

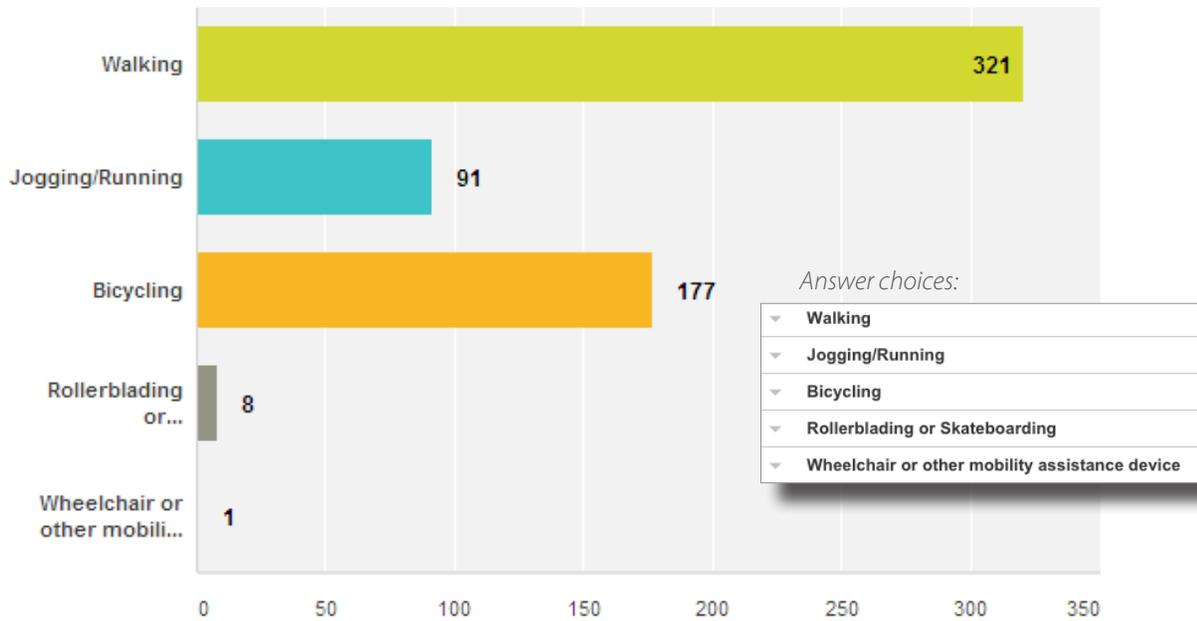
Answered: 446 Skipped: 9





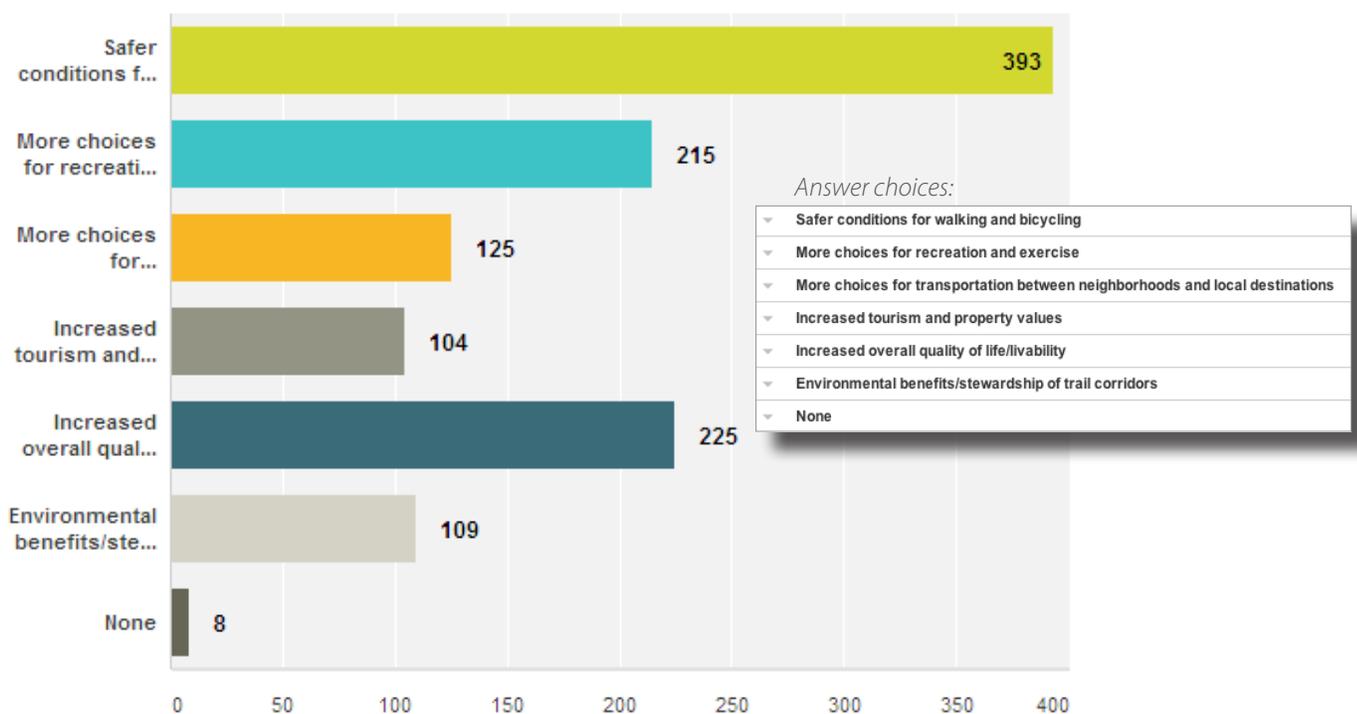
### How do you most often use trails? (check all that apply)

Answered: 371 Skipped: 84



### What should be the most important goals and outcomes of this plan? (check all the apply)

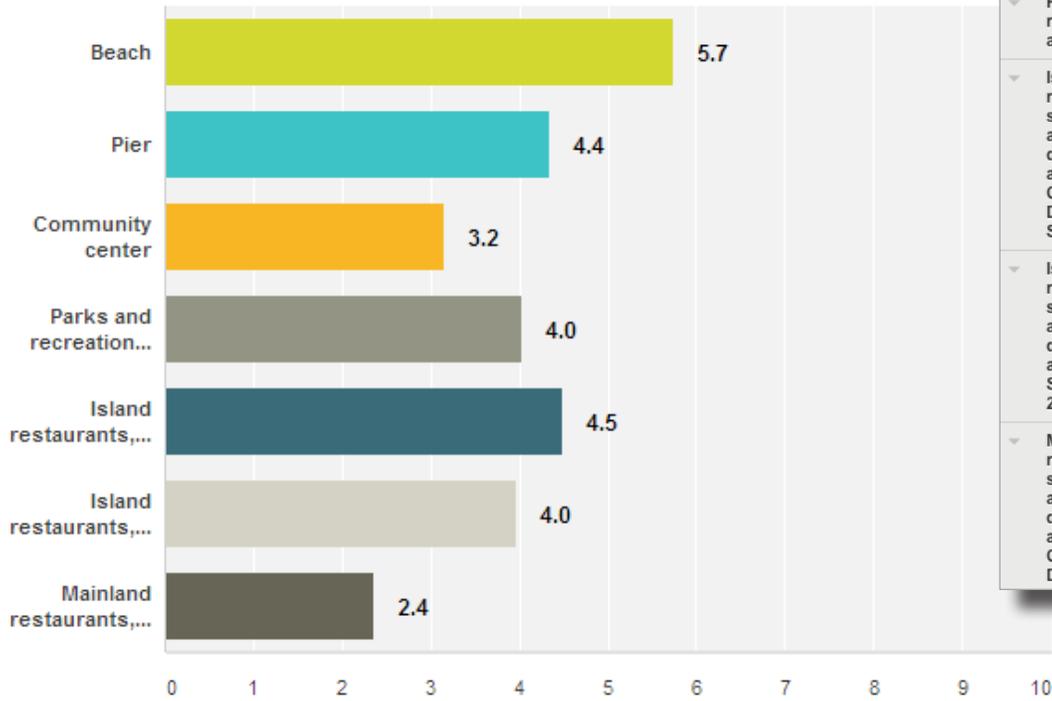
Answered: 436 Skipped: 19





## What destinations would you most like to be able to reach by bicycling or walking? Please rank (1 = most like to reach, 9 = least like to reach)

Answered: 416 Skipped: 39

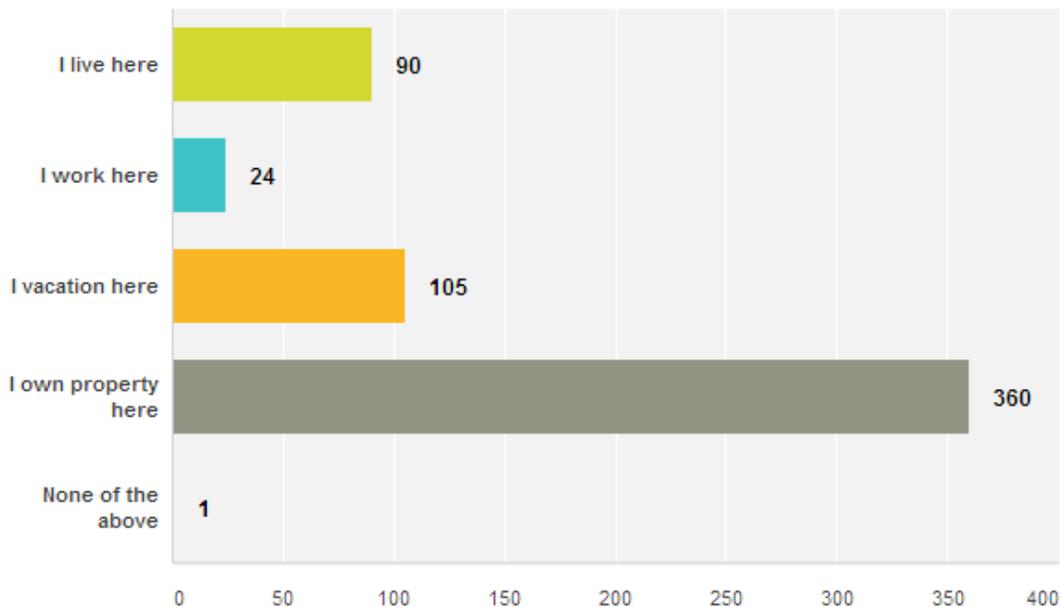


Answer choices:

- ▼ Beach
- ▼ Pier
- ▼ Community center
- ▼ Parks and recreation areas
- ▼ Island restaurants, shopping, and other destinations along Causeway Drive (e.g., Sharky's)
- ▼ Island restaurants, shopping, and other destinations along 1st Street and 2nd Street
- ▼ Mainland restaurants, shopping, and other destinations along Causeway Drive

## What is your relationship to Ocean Isle Beach?

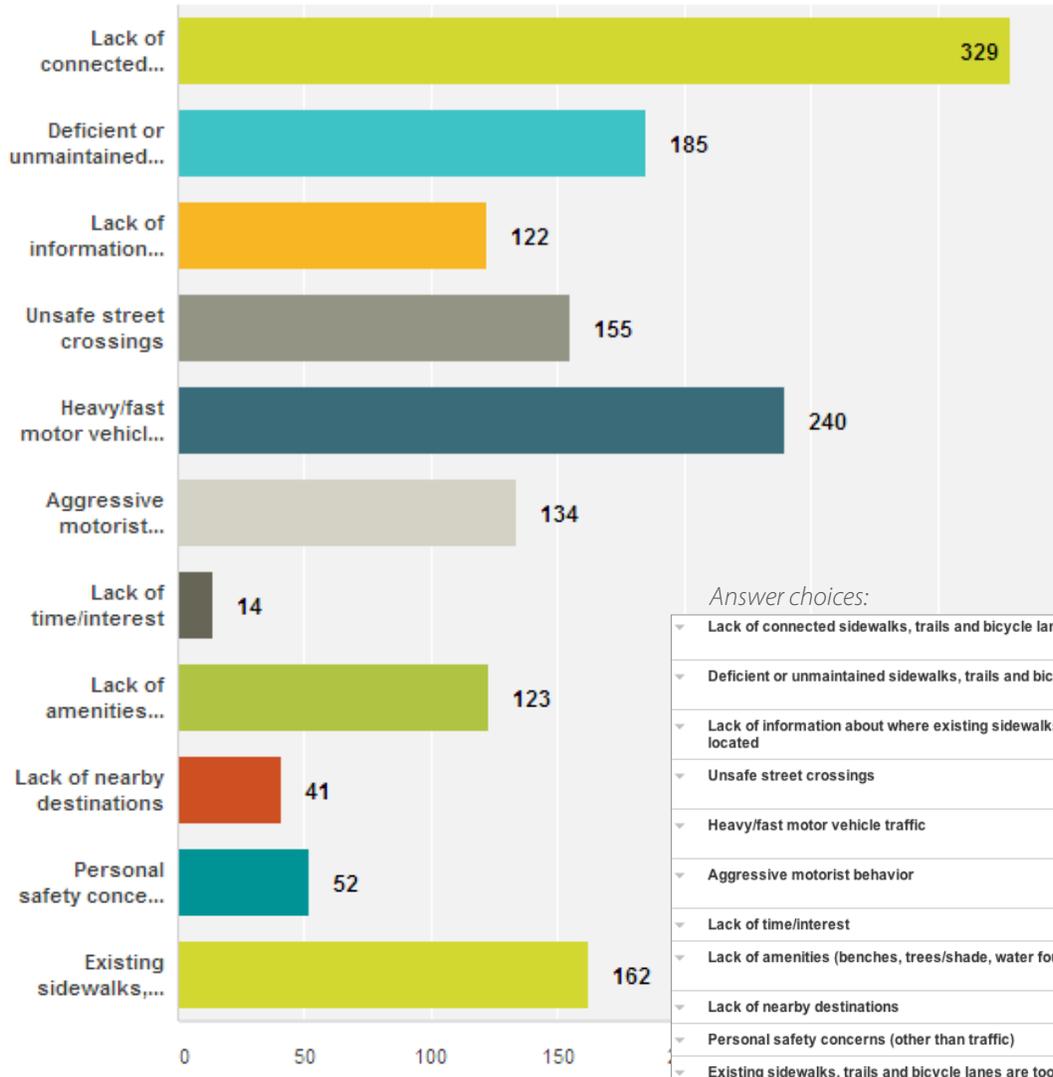
Answered: 425 Skipped: 30





# What do you think are the factors that most DISCOURAGE bicycling or walking in Ocean Isle Beach? Please select up to five factors.

Answered: 424 Skipped: 31





**What are the top three locations for improving conditions for walking and bicycling in Ocean Isle Beach? Examples include locations where we need a new or improved sidewalk, trail, bicycle lane or intersection/street crossing.**

Answered: 319 Skipped: 136

**#1 Top Response:  
First Street (with 123 responses)**

**#2 Top Response:  
Causeway Drive (with 88 responses)\***

**#3 Top Response:  
Second Street (with 86 responses)**

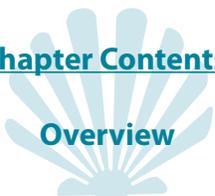
*\*There were an additional 25 responses for "the bridge".*





# 3 NETWORK RECOMMENDATIONS

## Chapter Contents:



Overview

Methodology for Network Design

Pedestrian Facility Types

Types of Cyclists

Bicycle Facility Types

Priority Project Cutsheets

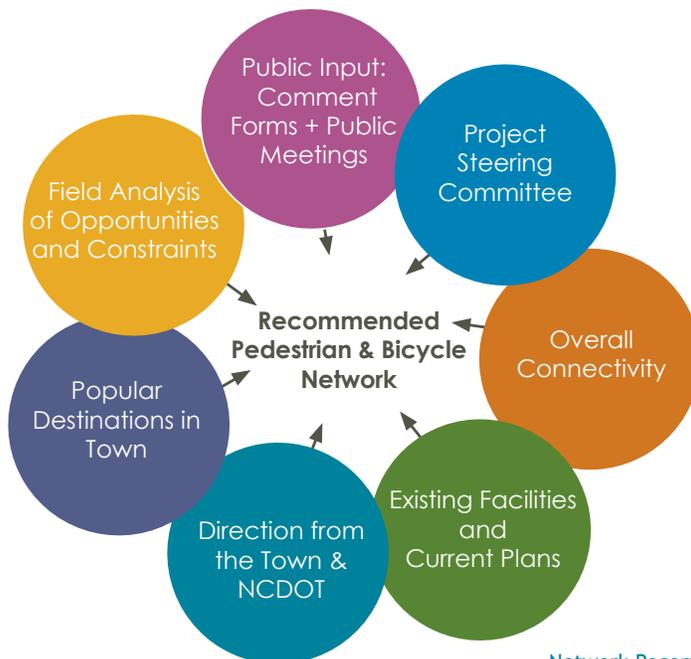
Program Recommendations

## PROJECT BACKGROUND

This chapter details the infrastructure improvements that are recommended to create a safe, accessible, and connected pedestrian and bicycle network in the Town of Ocean Isle Beach. A diverse mix of facilities are recommended to create this comprehensive network, including sidewalks, crossing improvements, on-road bicycle facilities, and multi-use paths. Conceptually, the network recommendations and the destinations they connect can be seen as a network of 'hubs and spokes'. Restaurants, shops, beach access points, parks, neighborhoods, and other places people walk or bike to and from are the 'hubs', whereas the pedestrian and bicycle facilities are the 'spokes' that connect them.

## METHODOLOGY FOR NETWORK DESIGN

Recommendations were developed based on information from several sources: input from the town staff and Steering Committee, public input obtained through public comment forms and in-person workshops, previous plans and studies, review of existing bicycle and pedestrian facilities, noted bicycle and pedestrian destinations, and the consultant's field analysis. Field work examined the potential and need for facilities along key roadway corridors and to make connections between popular destinations in Ocean Isle Beach. Input sources for the plan are summarized by the diagram below.





## PEDESTRIAN FACILITY TYPES

### Sidewalks

The sidewalks recommended for Ocean Isle Beach are shown by the dashed orange lines on Map 3.1 on page 3-9 (with existing sidewalk shown in solid orange lines). These recommendations were chosen to fill in gaps in the existing sidewalk network and to better connect pedestrians to destinations and into neighborhoods.

- » Sidewalks in Ocean Isle Beach should be at least 5' wide, and, where possible, should include a landscaped buffer between the sidewalk and roadway.
- » Areas of higher pedestrian volume may require 7' wide sidewalks, and sidewalks serving as part of the multi-use trail system should be at least 10' in width.



### Boardwalk

Boardwalks are typically required when crossing wetlands or other poorly drained areas. They are usually constructed of wooden planks or recycled material planks that form the top layer of the boardwalk.

- » Boardwalk width should be a minimum of 10 feet when no rail is used. A 12 foot width is preferred in areas with high anticipated use and whenever rails are used.
- » The Town should work with the Ocean Isle Property Owners Association to pursue the possibility of a maintenance agreement on private boardwalks to open them to public use.





### Pedestrian-Friendly Crossings High-Visibility Crosswalk Improvements

Consultant fieldwork, committee input, and previous planning efforts helped to identify important pedestrian crossing points that are in need of minor to significant improvements. High-visibility crosswalk recommendations are shown by the black markers on Map 3.1.

- » High-visibility crosswalks are recommended at both signalized intersections in town and at points along First and Second streets with a high volume of crossing pedestrian and bicycle traffic.
- » High-visibility signage is also recommended to alert approaching drivers.
- » Crossings that link to sidewalk on each side of the road should possess curb cuts with ramps (which helps to satisfy the standards set forth by the American Disability Act of 1991).

### Standard Crosswalk Improvements

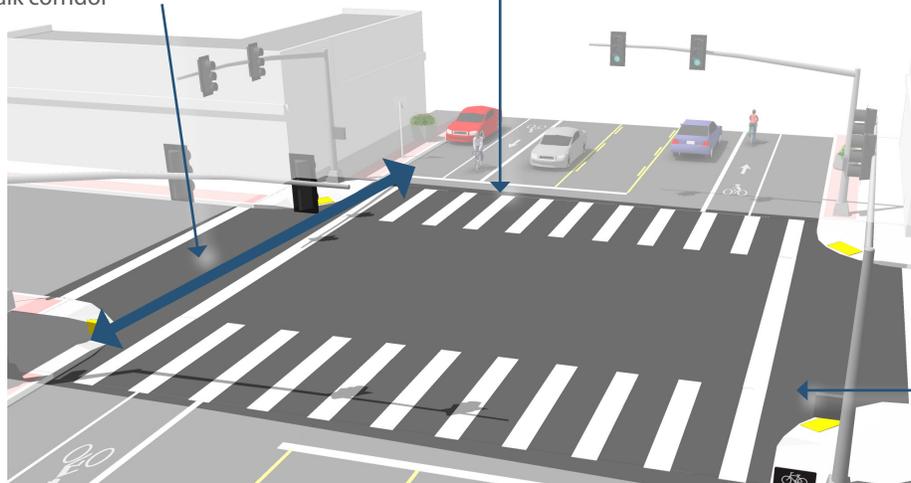
Standard crosswalk markings should be installed along First Street, Second Street, and Causeway Drive at all unsignalized intersections. These are not shown individually on the map due to the map scale and the frequency locations. These marked crosswalks will help to guide pedestrians and bicyclists on sidewalks and sidepaths across the many intersections with side streets.

- » Signage should be included on side streets to alert approaching drivers to look both ways for crossing pedestrian and bicycle traffic before turning (see page A-44 for guidance on this type of sign).
- » Crossings that link to sidewalk on each side of the road should possess curb cuts with ramps (which helps to satisfy the standards set forth by the American Disability Act of 1991).

Some of these treatments have been proven to reduce crashes, as shown in the 2007 FHWA Crash Reduction Factors Study (<http://safety.fhwa.dot.gov>).

The crosswalk should be located to align as closely as possible with the through pedestrian zone of the sidewalk corridor

Continental markings provide additional visibility



Parallel markings are the most basic crosswalk marking type

For more information on designing pedestrian-friendly crossings, see Appendix A: Design Guidelines

## TYPES OF CYCLISTS

Bicyclists can be categorized into four distinct groups based on comfort level and riding skills. Bicyclists' skill levels greatly influence expected speeds and behavior, both in separated bikeways and on shared roadways. Each of these groups has different bicycle facility needs, so it is important to consider how a bicycle network will accommodate each type of cyclist when creating a non-motorized plan or project. The bicycle infrastructure should accommodate as many user types as possible, with decisions for separate or parallel facilities based on providing a comfortable experience for the greatest number of people. In the US population, people are generally categorized into one of four cyclist types. The characteristics, attitudes, and infrastructure preferences of each type are described below.

### Fast and Experienced (Approximately 1% of population)

This cyclist type is characterized by the bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes, and will typically choose roadway connections even if shared with vehicles over separate bicycle facilities such as multi-use paths.



### Enthusied and Confident (5-10% of population)

This user group includes bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or multi-use paths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreational riders, racers, and utilitarian bicyclists.



### Interested but Concerned (Approximately 60% of population)

This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or multi-use trails under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These people may become "Enthusied & Confident" with encouragement, education, and experience.



### No Way, No How (Approximately 30% of population)

Persons in this category are not bicyclists and perceive severe safety issues with riding in traffic. Some people in this group may eventually become more regular cyclists with time and education. A significant portion of these people will never ride a bicycle other than on rare occasions or under special circumstances (e.g., in a park, with a child).





## BICYCLE FACILITY TYPES

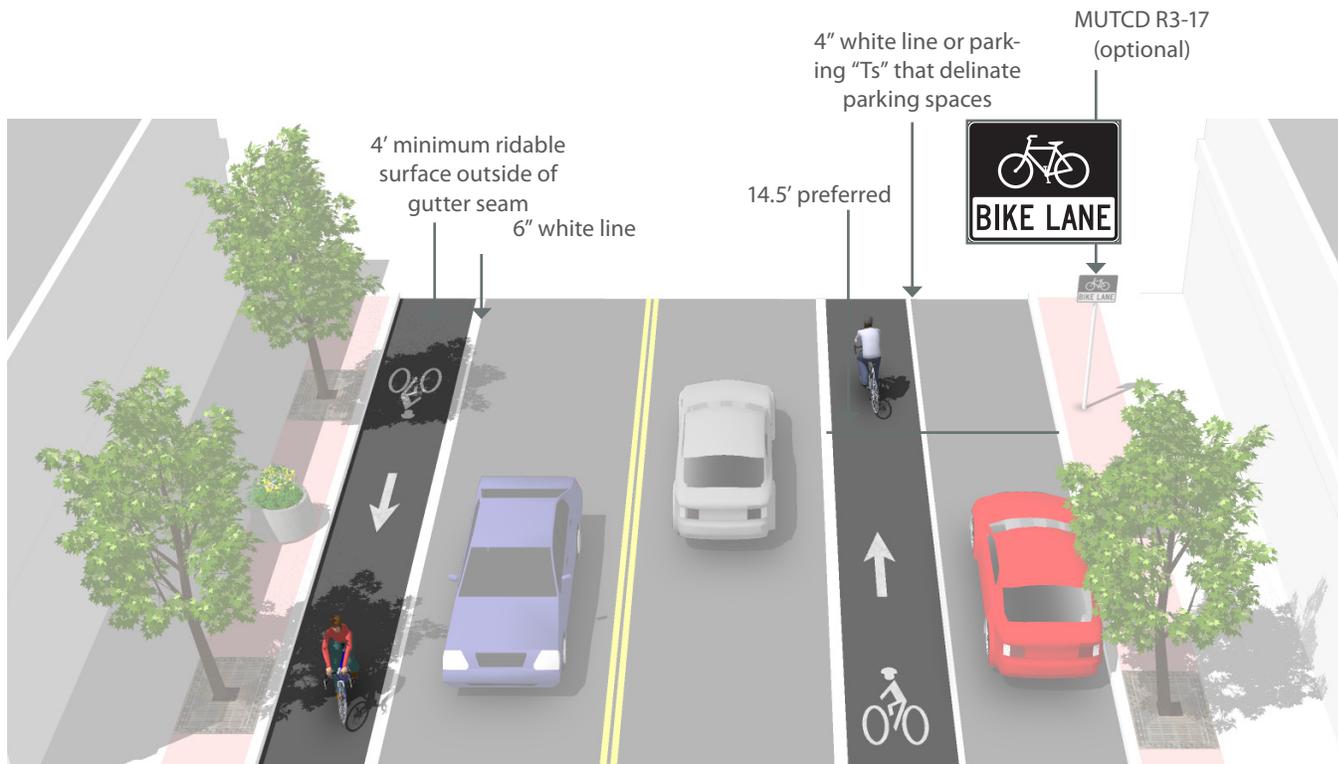
The descriptions on this page offer a brief overview of the primary facility types recommended in this plan. For more information on facility design, please see Appendix A: Design Guidelines.

### Paved Shoulders

A paved shoulder is the part of a roadway that is contiguous to the travel lane, separated by a stripe. There is no minimum width for paved shoulders, although a width of at least four feet is preferred where possible. Paved shoulders are appropriate on rural roadways with low traffic volumes. Ideally, paved shoulders should be included in the construction of new roadways or the upgrade of existing roadways, especially where there is a need to safely accommodate bicycles.

### Bicycle Lanes

Bicycle lanes are described as a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists. Bicycle lanes are always located on both sides of the road (except on one way streets), and carry bicyclists in the same direction as adjacent motor vehicle traffic. The minimum width for a bicycle lane is four feet; five- and six-foot bicycle lanes are typical for collector and arterial roads. As a general practice in the future, any local roadway that is widened or reconstructed with curb and gutter should incorporate bicycle lanes, with consideration for speed limit reductions. For additional design guidance on these methods, see the Appendix A: Design Guidelines section titled 'Retrofitting Existing Streets to Add Bikeways.'



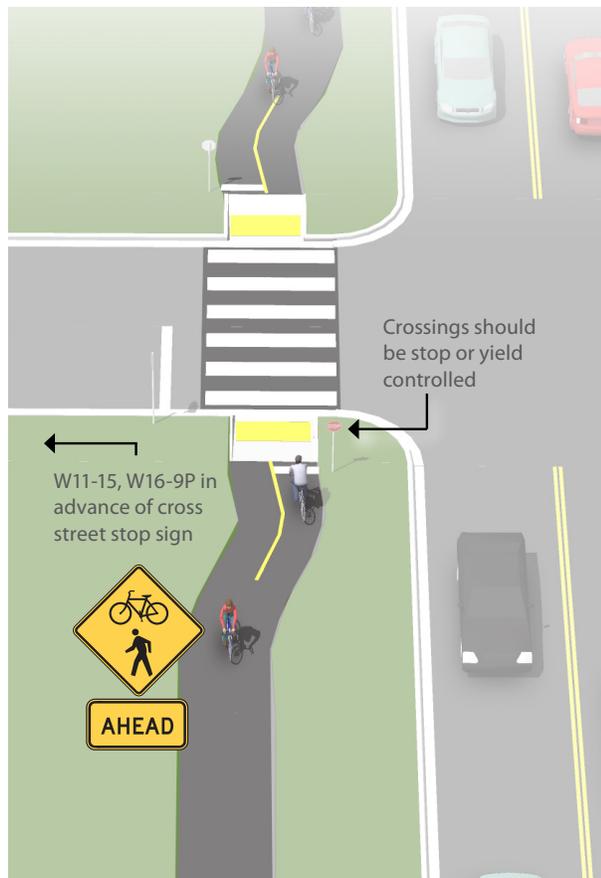
For more information on designing bicycle lanes, see Appendix A: Design Guidelines

## Multi-Use Paths

A multi-use path is a facility that is separated from the roadway and designed for a variety of users, including bicyclists, walkers, hikers, joggers, wheelchair users, and skaters. Multi-use paths may be paved or unpaved and are the preferred facility for novice and average bicyclists. Multi-use paths located within the roadway corridor right-of-way, or adjacent to roads, are called 'side paths.'

Proposed multi-use paths for Ocean Isle Beach are shown as a dashed green line on Map 3.1 on page 3-9.

- » Multi-use paths in Ocean Isle Beach should be a minimum of 10' in width.
- » The key difference between a multi-use side path shown and a typical sidewalk is the extra width. A 10' wide path, for example, allows for safer shared use by bicyclists, pedestrians, and other users, whereas the typical 5'-wide sidewalk does not allow for safe passing.
- » In some areas of town, a multi-use path is recommended where there is existing sidewalk. To meet this recommendation, the town could expand the existing sidewalk to a 10-foot sidepath by adding an additional 5 feet of pavement. This recommendation is marked as "Sidewalk upgrade to sidepath" and is shown with dashed green and gray lines on Map 3.1.
- » To maximize path user safety and comfort, sidepaths should be signed as off-limits to motorized vehicles, including golf carts.
- » Signage should be included along sidepaths to direct users to beach access points with high-visibility crosswalks.



For more information on designing multi-use trails, see Appendix A: Design Guidelines



### Bicycle Bridge Crossing Signal

The Odell Williamson Bridge on Causeway Drive is a significant barrier to pedestrian and bicycle traffic between the island and the mainland. High automobile traffic volumes and speeds and narrow shoulders make the bridge inaccessible to pedestrians and most bicyclists. To improve the safety and comfort of those bicyclists who need or would like to use the bridge until a separate bridge can be built (see below), the town should work with NCDOT to install a bicyclist-activated flashing warning sign on each side of the bridge to alert motorists that bicyclists are crossing the bridge. The flashing signal could be activated using a push-button when the a bicyclist is ready to cross the bridge, would be timed to the average bicycling speed, and would alert motorists and encourage them to slow down. In conjunction with the signal, the town should work with NCDOT to reduce the bridge speed from 35 miles per hour to 25 miles per hour.

### Bicycle/Pedestrian Bridge

Bicycle/pedestrian bridges serve to link facilities across barriers, such as waterways and highways, in order to provide an uninterrupted crossing. These bridges are closed to motorized traffic and can be used to connect trails, on-road bicycle facilities, sidewalks, or some combination of these.

In order to provide a safe and comfortable bicycle and pedestrian connection between the island and mainland, this plan recommends that a bicycle/pedestrian bridge be constructed across the Intracoastal Waterway adjacent to the Odell Williamson Bridge (shown in dashed dark brown on Map 3.1).

- » Greenway trail bridges are most often used to provide user access over natural features such as streams and rivers, where a culvert is not an option or the span length exceeds 20 feet.
- » Bridge options include suspension bridges and prefabricated clear span bridges.
- » When determining a bridge design for greenway trails, it is important to consider emergency and maintenance vehicle access. A greenway trail bridge should support 10 tons for 10 foot wide greenway trails, and 20 tons for wider than 10 feet to accommodate the weight of emergency and maintenance vehicles.

*For more information on designing bicycle and pedestrian bridges, see Appendix A: Design Guidelines*





## PRIORITY PROJECT CUTSHEETS

The cut-sheets on the following pages illustrate and describe the priority pedestrian projects and bicycle projects recommended in this plan. These projects are featured in detail due to their high ranking when compared to other projects in this plan (see the overall project ranking in Table 3.1 on page 3-14).

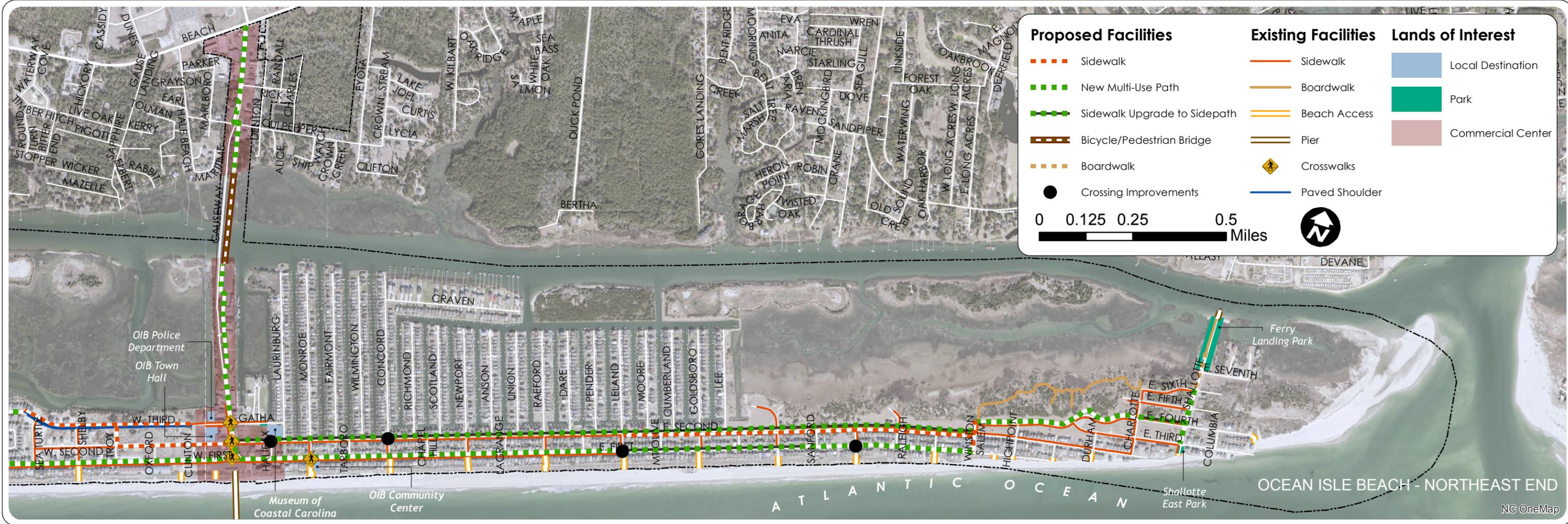
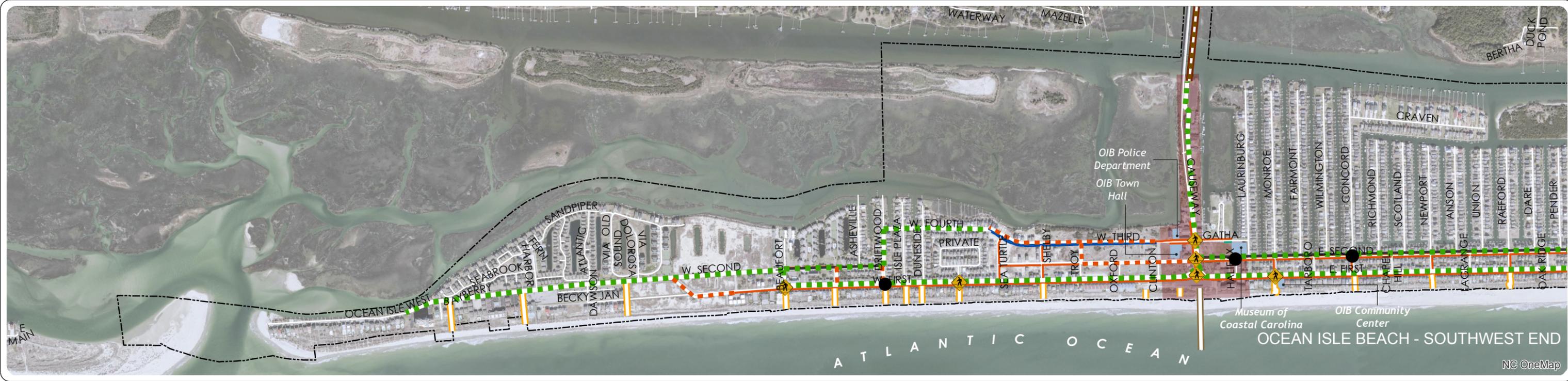
### Project Prioritization Process

Project ranking began with making a list of all of the network recommendations proposed in this plan. The segments were broken down at logical points, such as at major crossings and at connections to existing facilities. The criteria below were then used to rank each segment (see Table 3.1 on page 3-14):

- » Recommendations from the 2014 Pedestrian Plan Public Comment Form
- » Connects to a public building (post office/Town Hall)
- » Connects to a park or pier
- » Connects to a beach access point
- » Connects to a shopping area
- » Connects to existing sidewalk, on-road bicycle facility, or trail on both ends
- » Bicycle or pedestrian crash reported

*These criteria were selected for Ocean Isle Beach based on existing local and regional plans, public input, existing conditions, and available data. The ranking shown in Table 3.1 is for information purposes only and does not constrict the Town or its partners to implementing projects in a particular order.*

# MAP 3.1 BICYCLE AND PEDESTRIAN FACILITY RECOMMENDATIONS



# Trail Cutsheet A: Ocean Isle West/West 2nd Street Multi-Use Path (West End to Beaufort)



Distance: 5,608 ft / 1.06 mi

Right-of-Way: 60 ft

Planning-Level Cost Estimate: \$530,000\*

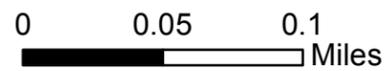
**Why It's Important:**

- » 217 mentions in the 2014 Public Comment Form
- » Connects to beach access points



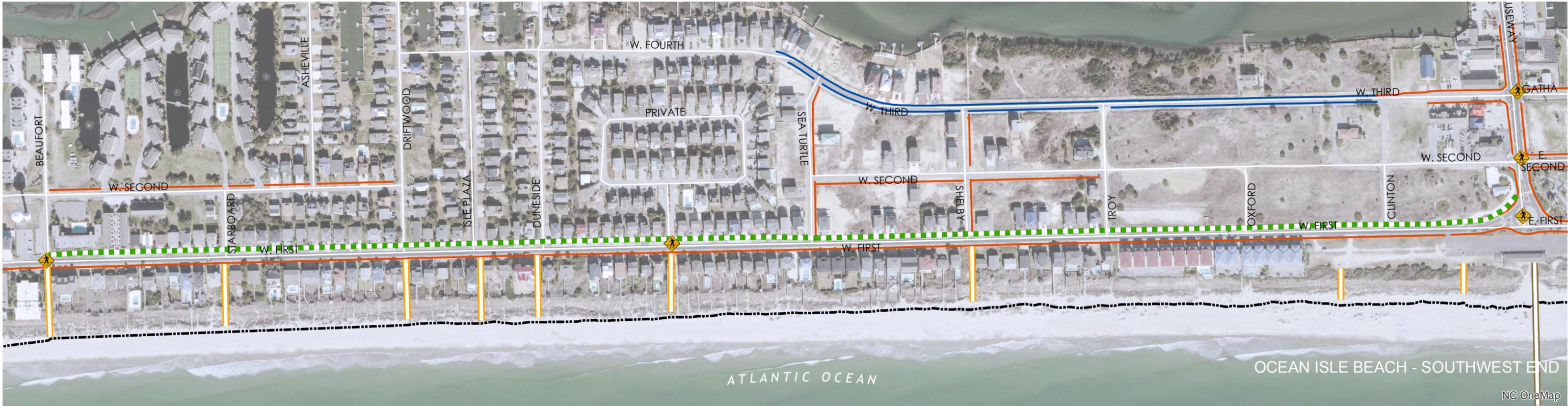
Ocean Isle West Boulevard lacks sidewalks and bicycle facilities and is constrained by bollards, making it difficult for people to walk and bike into town. The Town should work with property owners to have a multi-use path installed on the north side along Ocean Isle West Boulevard and Second Street to fill this gap in the network. This section was the most frequently mentioned location in need of walking and bicycling improvements in the 2014 Public Comment Form.

Recommended	Existing
 New Multi-Use Path	 Boardwalk
	 Beach Access
	 Pier
	 Sidewalk
	 Paved Shoulder
	 Crosswalks



\*Planning-level costs are based on \$500,000/mile for multi-use path construction only.

# Trail Cutsheet B: West 1st Street Multi-Use Path (Beaufort to Causeway)



Distance: 5,815 ft / 1.10 mi

Right-of-Way: 60 ft

Planning-Level Cost Estimate: \$550,000\*

### Why It's Important:

- » 191 mentions in the 2014 Public Comment Form
- » Connects to the Ocean Isle Beach Pier
- » Connects to beach access points
- » Connects to the Causeway commercial center
- » Bicycle or pedestrian crash reported



West 1st Street at Sea Turtle, looking west. A sidepath on the north side of the street would provide a walking and bicycling connection from the west end to the center of town. This section was the 2nd-most frequently mentioned location in need of walking and bicycling improvements in the 2014 Public Comment Form.

Recommended	Existing
 New Multi-Use Path	 Boardwalk
	 Beach Access
	 Pier
	 Sidewalk
	 Paved Shoulder
	 Crosswalks

0 0.05 0.1 Miles 

\*Planning-level costs are based on \$500,000/mile for multi-use path construction only.

# Trail Cutsheet C: East 1st Street Multi-Use Path (Causeway to Leland)



Distance: 5,531 ft / 1.05 mi

Right-of-Way: 60 ft

Planning-Level Cost Estimate: \$525,000\*

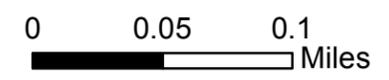
### Why It's Important:

- » 135 mentions in the 2014 Public Comment Form
- » Connects to the Ocean Isle Beach Community Center
- » Connects to the Ocean Isle Beach Pier
- » Connects to beach access points
- » Connects to the Causeway commercial center
- » Bicycle or pedestrian crash reported



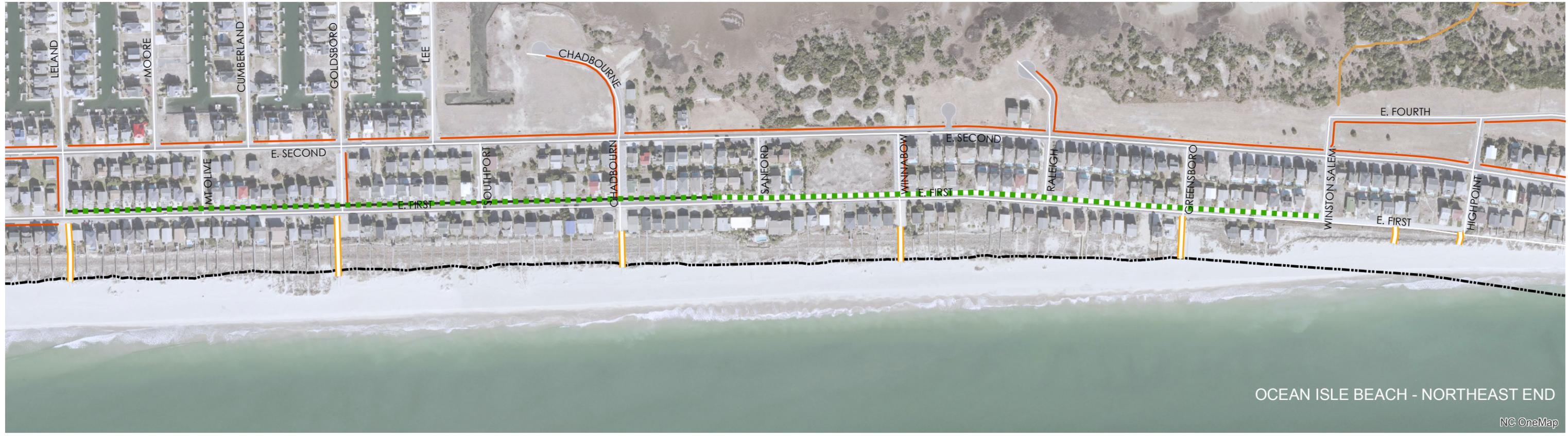
East 1st Street has ample width on the north side for a multi-use path, which would provide bicyclists and pedestrians with a connection from the east end of the island to the center of town.

Recommended	Existing
 New Multi-Use Path	 Boardwalk
	 Beach Access
	 Pier
	 Sidewalk
	 Paved Shoulder
	 Crosswalks



\*Planning-level costs are based on \$500,000/mile for multi-use path construction only.

# Trail Cutsheet D: East 1st Street Multi-Use Path (Leland to Winston-Salem)



OCEAN ISLE BEACH - NORTHEAST END  
NC OneMap

Distance: 4,944 ft / 0.94 mi

Right-of-Way: 60 ft

Planning-Level Cost Estimate: \$470,000\*

**Why It's Important:**

- » 135 mentions in the 2014 Public Comment form
- » Connects to beach access points



The sidewalk on East 1st Street between Leland and Sanford could be widened to create a multi-use path. This would help to reduce space conflicts between pedestrians and bicyclists and also provide bicyclists with dedicated space to ride off of the roadway.

Recommended	Existing
 New Multi-Use Path	 Boardwalk
 Sidewalk Upgrade to Sidepath	 Beach Access
	 Pier
	 Sidewalk
	 Paved Shoulder
	 Crosswalks

0 0.05 0.1 Miles




\*Planning-level costs are based on \$500,000/mile for multi-use path construction only.



**TABLE 3.1 OVERALL PROJECT LIST** (Criteria and ranking for information purposes only)

General Priority Ranking	Street Name	Start/End Point	Facility Type	Crossing Improvements	Length (Feet)	Length (Miles)	Location (recommended)	Recommendations from the 2014 Public Comment Form	Connects to a public building (Town Hall/community center)	Connects to a park or pier	Connects to a beach access point	Connects to a commercial center	Connects to existing sidewalk, shoulder, or trail on both ends	Bike or Ped crash reported
1	West 1st Street	Beaufort to Causeway	Multi-Use Trail/Sidepath	Driftwood	5,816	1.10	North	217	-	✓	✓	✓	-	✓
2	West 2nd Street	West End to Beaufort	Multi-Use Trail/Sidepath	-	5,383	1.02	North	191	-	-	✓	-	-	-
3	East 1st Street	Causeway to Leland	Multi-Use Trail/Sidepath	Leland	5,531	1.05	North	135	✓	✓	✓	✓	-	✓
4	East 1st Street	Leland to Winston-Salem	Multi-Use Trail/Sidepath	Winnabow	4,944	0.94	North	135	-	-	✓	-	-	-
5	West 2nd Street	Beaufort to Driftwood	Multi-Use Trail/Sidepath	-	1,421	0.27	North	120	-	-	-	-	-	-
6	East 2nd Street	Causeway to Winston-Salem	Multi-Use Trail/Sidepath, Sidewalk	Museum of Coastal Carolina, Concord	10,437	1.98	North	117	-	✓	-	✓	✓	✓
7	Causeway Drive	1st Street to Old Causeway Commercial Area (Sharky's)	Multi-Use Trail/Sidepath	-	2,686	0.51	East	88	-	✓	✓	✓	-	✓
8	West 4th Street	Driftwood to West 3rd Street	Multi-Use Trail/Sidepath	-	1,479	0.28	North	84	-	-	-	-	-	-
9	Causeway Drive	Beach Dr to Culpepper	Multi-Use Trail/Sidepath	-	1,418	0.27	West	58	-	-	-	✓	-	-
10	Odell Williamson Bridge	Beach Drive to West 1st Street	Bridge Crossing Signal, Bike/Ped Bridge	-	1,284	0.24	Across Intracoastal Waterway	53	-	✓	-	✓	-	-
11	East 4th Street	Winston-Salem to Shallotte	Multi-Use Trail/Sidepath	-	3,040	0.58	North	25	-	-	-	-	-	-
12	Shallotte Blvd	Existing boardwalk to East 6th Street	Boardwalk	-	552	0.10	West	4	-	✓	-	-	✓	-
13	Shallotte Blvd	East 6th Street to East 3rd Street	Multi-Use Trail/Sidepath	-	787	0.15	West	4	-	-	-	-	✓	-
14	Driftwood	West 4th Street to West 2nd Street	Multi-Use Trail/Sidepath	-	516	0.10	West	3	-	-	-	-	✓	-
15	Beaufort	West 2nd Street to West 1st Street	Multi-Use Trail/Sidepath	-	224	0.04	West	2	-	-	✓	-	-	-
16	Old Causeway Drive	Culpepper to dead end (near Volunteer Fire Dept)	Multi-Use Trail/Sidepath	-	744	0.14	West	0	-	-	-	✓	-	-



## PROGRAM RECOMMENDATIONS

*Purpose: To educate all road users about their rights and responsibilities, to increase awareness and improve traffic safety*

*Partners: Town of Ocean Isle Beach Police Department, Bicycle and Pedestrian Advisory Committee, Town staff*

Below are some key program recommendations that came out of this planning process. See Chapter 4: Implementation for more information on other program ideas related to plan implementation.

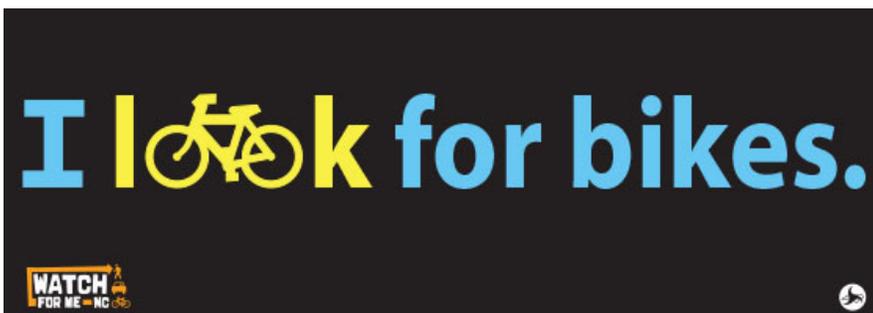
### Media Campaign to Educate Motorists, Bicyclists, and Pedestrians

Watch for Me NC is a comprehensive campaign aimed at reducing the number of pedestrians and bicyclists hit and injured in crashes with vehicles. The campaign consists of educational messages on traffic laws and safety, and an enforcement effort by area police in several Triangle communities. The pilot campaign is programmed to expand statewide; Ocean Isle Beach should contact the NCDOT Division of Bicycle and Pedestrian Transportation to request materials and guidance. **The Town could distribute the educational materials made available by NCDOT at local festivals and other events, at local bike shops and other businesses, and in renters' information packets and property owners' guest information books.** Police officers could hand out bicycle lights along with bicycle and pedestrian safety cards. Program promotions and educational videos could also be broadcast on the local government access channel.

Watch for Me NC website: <http://www.watchformenc.org/>



Images targeting motorists from the 'Watch for Me NC' campaign, including ad space on a bus, messaging at the pump, and bumper stickers.



## Hike & Bike Map

One of the most effective ways of encouraging people to walk and bicycle is through the use of maps and guides to show where you can walk and bike, and to guide people to enjoyable routes and destinations for walking and biking. The Town should create an Ocean Isle Beach Hike and Bike Map to reflect the most current public bicycle and pedestrian infrastructure in town, with a list of bicycle rental locations, suggestions for self-guided bike rides and walks around town, and recommended routes. A portion of the map could be devoted to bicycle and pedestrian safety education, such as informational graphics that demonstrate bicycle hand signals and how to share the road and the trail safely. The map should be made available online and printed as needed to be actively distributed to residents and visitors. It should also be updated on a regular basis as new facilities are implemented.

*Purpose: To encourage walking and bicycling by providing route and facility information and highlighting walking and bicycling destinations.*

*Partners: Town of Ocean Isle Beach, Brunswick County Chamber of Commerce, Ocean Isle Beach GIS staff*

### Sample Maps and Self-Guided Walks:

- » [http://www.durham-nc.com/resources/pdf/dtwt2012\\_printer-friendly.pdf](http://www.durham-nc.com/resources/pdf/dtwt2012_printer-friendly.pdf)
- » <http://www.bikewalktwincities.org/maps-routes/walking-maps>



*More than 19,000 Durham Hike & Bike Maps have been distributed since it was first published in 2010. The map also features safety information and tips for safe riding (at left). Produced by Alta Planning & Design.*



## One-Stop Website

*Purpose: To provide a single, accessible source of all bicycle- and pedestrian-relevant information for Ocean Isle Beach residents and visitors.*

*Partners: Bicycle and Pedestrian Advisory Committee, Ocean Isle Beach Public Utilities Department, Ocean Isle Beach Planning & Inspections Department*

Many current and potential pedestrians and bicyclists do not know where to find information on traffic laws, events, maps, tips, and recreation groups. The Town of Ocean Isle Beach could develop a “one-stop” website that houses all pedestrian- and bicycle-related information and promotions. A website is not difficult to set up, but it will only be successful if the site is easy to use, easy to find, and updated frequently. The site should be reviewed and updated regularly with the most current information. The Bicycle and Pedestrian Advisory Committee can assist in keeping the site up to date. Other recommended programs in this chapter could be housed on the website, such as a hike and bike map, Watch for Me NC materials and links, and a calendar of upcoming events.

Sample pedestrian and bicycle information websites:

- » Portland, OR: <http://www.portlandoregon.gov/transportation/60164>
- » Austin, TX: <http://austintexas.gov/bicycle>
- » Duck, NC: <http://www.townofduck.com/ducktrail/>

*The Town of Duck has a great example website for town trail information. The Duck Trail page presents safety information, route information, and other tips for residents and tourists to enjoy walking and bicycling on the trails in Duck. [www.townofduck.com/ducktrail/](http://www.townofduck.com/ducktrail/)*

The screenshot shows the 'Duck Trail' page on the Town of Duck website. The page has a dark blue header with the town logo and a navigation menu. Below the header, there's a search bar and a 'CONTACT US' section with the town's address and phone number. The main content area is titled 'Duck Trail Usage and Safety' and includes a paragraph about the trail, a list of safety guidelines, and a section for 'While Using The Trail In The Village:'. On the right side, there are sections for 'NEWS CATEGORIES', 'EVENT NEWS', and 'UPCOMING EVENTS'. The 'UPCOMING EVENTS' section lists 'Yoga on the Green' and 'Children's Theater - The Mystery of The Lost Colony'.

### Bike Rodeo

A Bike Rodeo is an event where children can learn and practice bicycling skills in a controlled, supervised environment. Depending on the age of the children involved, a bike rodeo event can include educational components, such as teaching hand signals, proper helmet fitting, and even basic maintenance skills such as changing and inflating a tire. The highlight of any bike rodeo event is a skills course, where children ride through a designed obstacle course to practice turns, braking, and coasting. Some bike rodeo leaders hand out awards to positively reinforce good bicycling habits.

Bike Rodeo resources:

- National Center for Safe Routes to School: <http://www.saferoutesinfo.org/program-tools/organizers-guide-bicycle-rodeos>
- Safe Kids Worldwide: <http://www.safekids.org/sites/default/files/documents/Bike-Rodeo-Station-Guide.pdf>

*Purpose: To celebrate bicycling, teach children and their parents traffic laws and safe riding skills, and improve bicycling confidence and awareness*

*Partners: Town of Ocean Isle Beach Police Department, local bike shops, Bicycle and Pedestrian Advisory Committee, Brunswick County Health Department*



*Photos from the Holly Springs Bike Rodeo, Holly Springs, NC. Volunteers conducted helmet fittings, bicycle education, and a parking lot obstacle course to provide a safe place for children to practice safe riding skills.*



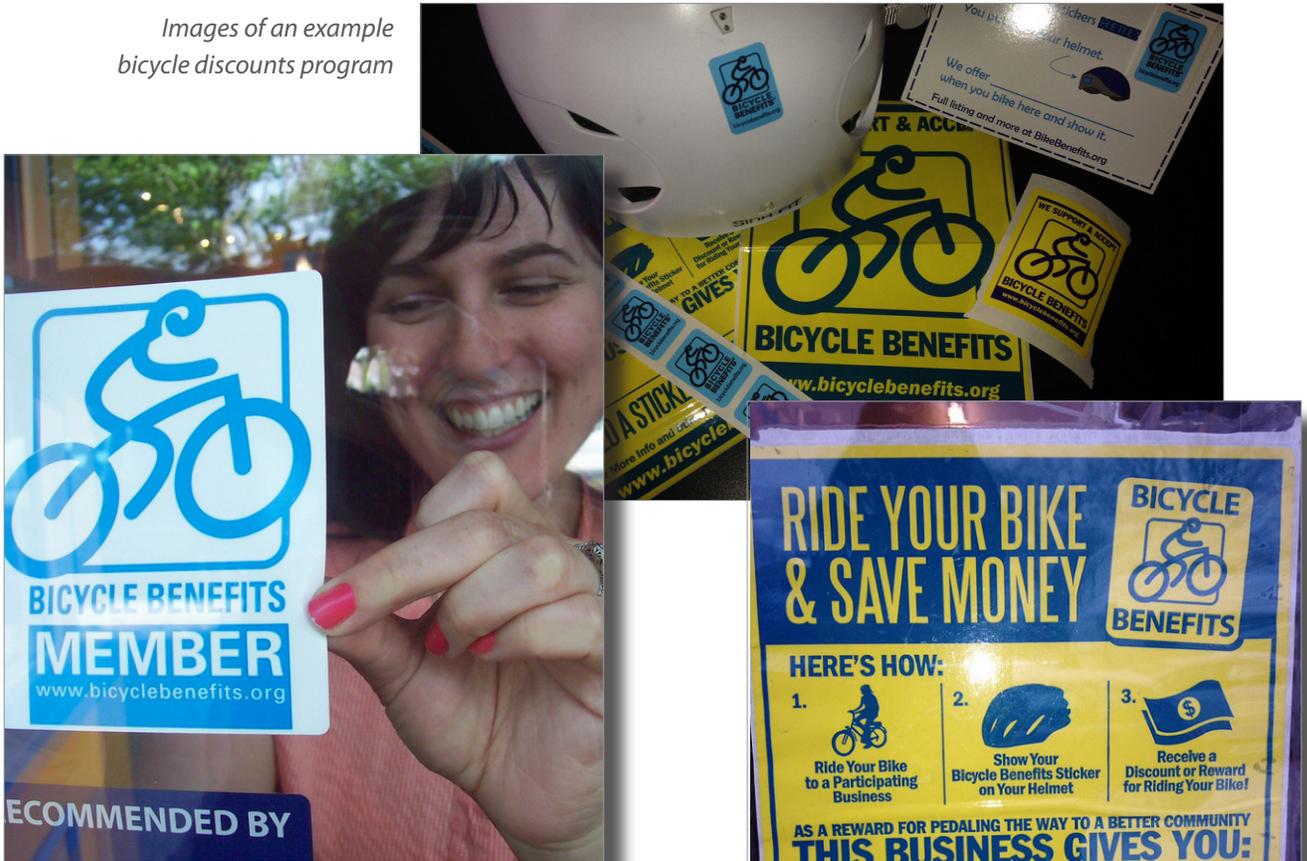
### Local Business Discounts for Bicyclists

*Purpose: To encourage and reward residents and visitors for making short local trips by bike and to promote a bicycle-friendly culture among businesses in Ocean Isle Beach.*

The Bicycle and Pedestrian Advisory Committee and the Town should encourage local businesses to offer discounts to patrons who bicycle to their business. The discount could be a daily or once-weekly promotion that encourages residents and visitors to visit local businesses by bike. This could be especially popular with businesses in areas that have limited motor vehicle parking and overly congested lots. In return for businesses' participation, the Town could develop a list of "Bicycle-Friendly Local Businesses" to feature, along with discount information, on its one-stop website for bicycle and pedestrian information.

*Partners: Local restaurants, shops, and other businesses; Town of Ocean Isle Beach staff; Bicycle and Pedestrian Advisory Committee*

Images of an example bicycle discounts program



**BICYCLE BENEFITS**  
www.bicyclebenefits.org

**BIKE BENEFITS NEAR YOU. WHERE TO GET YOUR STICKER + DISCOUNTS?**

All participating businesses

Discounts for biking throughout the US.

Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA

**HOW THE PROGRAM WORKS?**

GET A STICKER

PUT IT ON YOUR HELMET

BIKE IT AND SAVE!

**Join the revolution!**

Become a business member.

Visit this website for details on how to start this program: <http://bb2.bicyclebenefits.org/>

### Public Bicycle Maintenance Stand

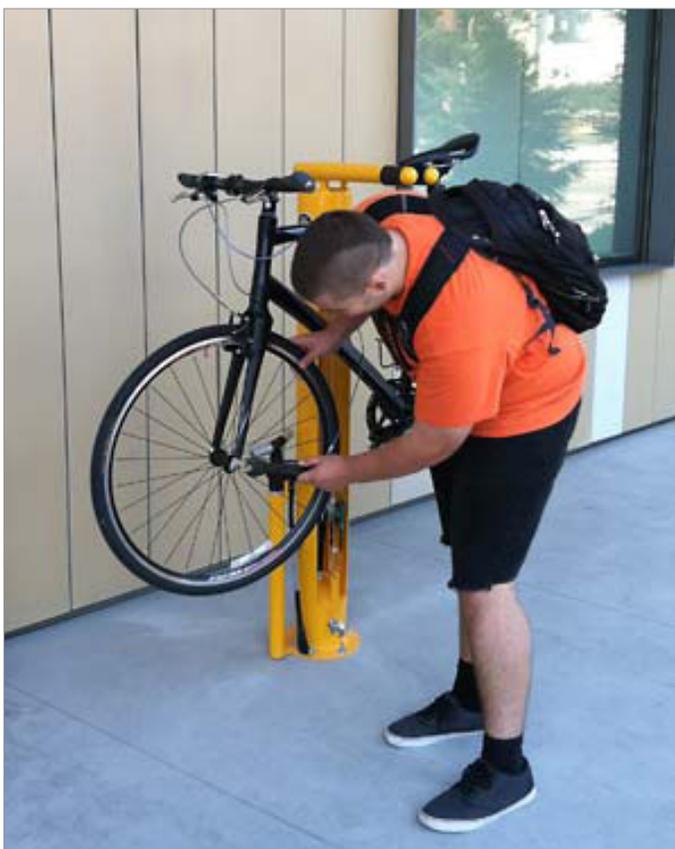
Public maintenance stands have become a popular amenity in bicycle friendly communities because they provide bicyclists with access to tools on-the-go and encourage people to teach and learn bicycle maintenance in an informal setting. They can also help to reduce the number of abandoned or trashed bikes in a community; bikes are often abandoned by their owners when they have a minor mechanical issue that they do not have the tools or knowledge to fix. Public maintenance stands encourage people to learn bicycling skills from one another and send a message to residents and visitors that bicycling is supported in the community. These fixtures can be placed in a park or in another public place and require little upkeep or oversight, since the tools and stand are designed to be self-contained and theft-resistant.

***Purpose:** To provide an easy to use bicycle stand and tool kit that encourages people, particularly youth, to learn bicycle maintenance and fix minor bicycle issues on-the-go, and to make bicycling a visible part of the community*

***Partners:** Local businesses, Town of Ocean Isle Beach*



*Public bicycle maintenance and tool stand examples.*





### Wayfinding Signage Program

*Purpose: To enhance resident and visitor orientation by directing pedestrians, bicyclists, and motorists to popular destinations around town.*

*Partners: Town of Ocean Isle Beach Public Utilities Department, Brunswick County Chamber of Commerce, Town of Ocean Isle Beach Visitor's Center*

Wayfinding signage, as part of a signage program that also includes warning and regulatory signage, enhances resident and visitor orientation. A clear wayfinding system should contribute to economic development by pointing visitors to key destinations around town. The Town of Ocean Isle Beach should develop a customized wayfinding program that includes directional signage to local destinations. Bicycle and pedestrian travel times to popular destinations could also be included on directional signage.

Materials for signage should reflect the character of Ocean Isle Beach and be selected for longevity and ease of maintenance. A wayfinding program could include directional signage, on-road markings, and kiosks with town maps. If funding is not immediately available to develop a complete wayfinding program, a good first step is temporary wayfinding signage that is colorful and informative. The Brunswick County Chamber of Commerce and the Ocean Isle Property Owners Association may be ideal partners based on the nexus with tourism and economic development.

Sample wayfinding signage programs:

- Oakland, CA: <http://www2.oaklandnet.com/oakca/groups/pwa/documents/report/oak025118.pdf>
- 2014 Croatan Regional Bicycle + Trails Plan; Signage Appendix (NCDOT)

*NCDOT and the Eastern Carolina Council recently completed the 2014 Croatan Regional Bicycle + Trails Plan. This plan included guidance for bicycle route and trail signage. Ocean Isle Beach could take a similar approach, using a local logo or symbol in conjunction with the required standards for signage on NCDOT roadways like Causeway Drive, 1st Street, and 2nd Street.*

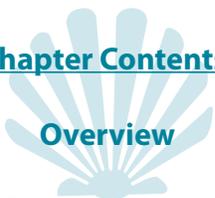






# IMPLEMENTATION

## Chapter Contents:



**Overview**

**Organizational Framework for Implementation**

**Implementation Action Steps Table**

**Key Action Step Descriptions**

**Key Partners in Implementation**

**Performance Measures (Evaluation and Monitoring)**

**Facility Development Methods**

## OVERVIEW

This chapter defines a structure for managing the implementation of the Town of Ocean Isle Beach Bicycle and Pedestrian Plan. Implementing the recommendations within this plan will require leadership and dedication to bicycle and pedestrian facility development on the part of a variety of agencies. Equally critical, and perhaps more challenging, will be meeting the need for a recurring source of revenue. Even small amounts of local funding could be very useful and beneficial when matched with outside sources. Most importantly, the Town need not accomplish the recommendations of this plan by acting alone; success will be realized through collaboration with regional and state agencies, the private sector, and non-profit organizations. Funding resources that may be available to Ocean Isle Beach are presented in Appendix B of this plan.

Given the present day economic challenges faced by local governments (as well as their state, federal, and private sector partners), it is difficult to know what financial resources will be available at different time frames during the implementation of this plan. However, there are still important actions to take in advance of major investments, including key organizational steps, the initiation of education and safety programs, and the development of strategic, lower-cost sidewalks, on-road bicycle facilities, trails, and crossing facilities. Following through on these priorities will allow the key stakeholders to prepare for the development of larger bicycle and pedestrian projects over time, while taking advantage of strategic opportunities as they arise.



## ORGANIZATIONAL FRAMEWORK FOR IMPLEMENTATION

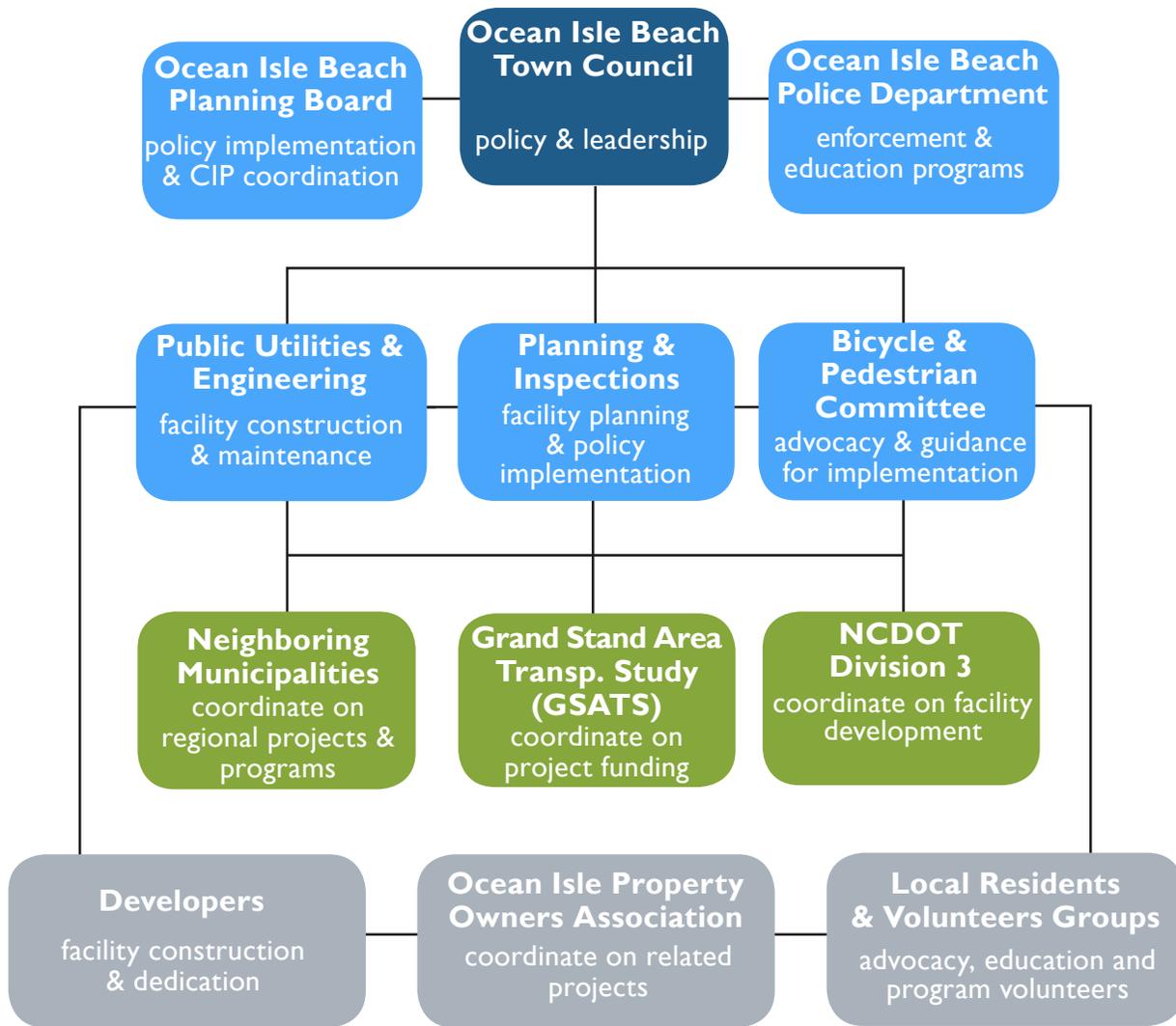




Table 4-1. Implementation Action Steps

TASK	LEAD AGENCY	SUPPORT	DETAILS	PHASE
Present Plan to Town Council	Project Consultants	Planning & Inspections	Presentation to Town Council in Fall 2014.	Short-term (2014)
Approve this plan	NCDOT Bike/Ped Division	Project Consultants	Official letter of approval in Fall 2014.	Short-term (2014)
Adopt this plan	Town Council	Planning & Inspections, Project Consultants	Through adoption, the Plan becomes an official planning document of the Town. Adoption shows that the Town of Ocean Isle Beach has undergone a successful, supported planning process.	Short-term (2014)
Designate Staff	Town Council	Planning & Inspections	Designate staff to oversee the implementation of this plan and the proper maintenance of the facilities that are developed.	Short-term (2014)
Form and confirm the goals of the Bicycle and Pedestrian Advisory Committee	Town Council	Bicycle and Pedestrian Advisory Committee, Planning & Inspections	Form the Bicycle and Pedestrian Advisory Committee and confirm the goals of the BPAC to include the implementation of this plan.	Short-term (2014)
Present this plan to other local and regional bodies and agencies.	Planning & Inspections	Bicycle and Pedestrian Advisory Committee, Public Utilities	This Plan should be presented to other local and regional bodies and agencies. Possible groups to receive a presentation might include: GSATS, regional transportation planners, Brunswick County planners, Brunswick County Health Department, local cycling/walking/running clubs and advocacy groups .	Short-term/Ongoing (Beginning 2015)
Begin Annual Meeting With Key Project Partners	Planning & Inspections	Public Utilities, NCDOT, BPAC, and local & regional stakeholders	Key project partners (see org. chart on page 4-2) should meet on an annual basis to evaluate the implementation of this Plan. Meetings could also occasionally include on-site tours of priority project corridors.	Short-term/Ongoing (Beginning 2015)
Ensure planning efforts are integrated regionally	Bicycle and Pedestrian Advisory Committee, Planning & Inspections	GSATS, Brunswick County, neighboring municipalities, NCDOT	Combining efforts with surrounding municipalities, regional entities, and stakeholders is mutually beneficial, especially with trail development. After adoption by the Town, this document should also be recognized in regional transportation plans, including future updates to the Brunswick County CTP.	Short-term/Ongoing (Beginning 2015)
Policy & Law Orientation	All Stakeholders	NCDOT Bike/Ped Division	Become familiar with State and Federal bicycle and pedestrian policies and laws: <a href="http://www.ncdot.gov/bikeped/lawspolicies/policies/">http://www.ncdot.gov/bikeped/lawspolicies/policies/</a>	Short-term (2015)
Consider reducing speed limits in some areas from 35 MPH to 25 or 30 MPH	Town Council	NCDOT, BPAC	Consider lowering the speed limit on First and Second streets and/or increasing enforcement and awareness. One strategy could be to use temporary signage that displays motorists' speeds as they pass.	Short-term/Ongoing (2015 onward)



TASK	LEAD AGENCY	SUPPORT	DETAILS	PHASE
Develop new policies & approaches for implementation	Planning & Inspections	Town Council	Establish land right-of-way acquisition mechanisms, coordinate development plans, & implement driveway access management. See pages 4-7 and 4-8 for details.	Short-term/Ongoing (2015 onward)
Design Orientation	Public Utilities and NCDOT Division 3	NCDOT Bike/Ped Division	Become familiar with the standards set forth in Appendix A of this Plan, as well as state and national standards for bicycle and pedestrian facility design.	Short-term/Ongoing (2015 onward)
Seek Multiple Funding Sources and Facility Development Options	Planning & Inspections	Town Council, BPAC, Public Utilities, GSATS	Chapter 3 contains project cost estimates and Appendix B contains potential funding opportunities.	Short-term/Ongoing (2015 onward)
Launch New Programs	Bicycle and Pedestrian Advisory Committee	Planning & Inspections, Public Utilities, Ocean Isle Beach Police Department, Brunswick County Health Department	These groups should coordinate to launch new bicycle and pedestrian programs, such as those described in Chapter 3, including a media campaign, hike & bike map, one-stop website, bike rodeo, local business discounts for bicyclists, wayfinding program, and a bicycle maintenance stand.	Short-term/Ongoing (2015 onward)
Maintain Bicycle and Pedestrian Facilities	Public Utilities, NCDOT Division 3	BPAC, General Public (for reporting maintenance needs), Planning & Inspections	Public Utilities and NCDOT should maintain existing sidewalks, crosswalks, and shoulders and address crosswalks that are missing	Short-term/Ongoing (2015 onward)
Notify Planning & Inspections of all upcoming roadway reconstruction or resurfacing/ restriping projects, no later than the design phase.	Public Utilities Director, NCDOT Division 3, GSATS	NCDOT Bike/Ped Division	Provide sufficient time for comments; Incorporate bicycle pedestrian recommendations from this Plan into future updates to the CTP and into future project design plans. If a compromise to the original recommendation is needed, then contact NCDOT Division of Pedestrian and Pedestrian Transportation for guidance on appropriate alternatives.	Short-term/Ongoing (2015 onward)
Design, develop and distribute bicycle and pedestrian safety information in rental check-in packages.	Planning & Inspections	Police Department, BPAC	Info should include safety tips for motorists, bicyclists and pedestrians, with a focus on trail use etiquette and caution at driveway crossings. Other methods of distribution could include web sites, social media, and 'on-the-ground' in trail kiosks.	Short-term/Ongoing (2015 onward)
Establish maintenance program for existing crosswalks	Public Utilities + NCDOT Division 3	Planning & Inspections, BPAC	Establish a program for the regular review and maintenance of existing crosswalks.	Short-term/Ongoing (2015 onward)



TASK	LEAD AGENCY	SUPPORT	DETAILS	PHASE
Install new crosswalks as recommended in Chapter 3	Public Utilities + NCDOT Division 3	Planning & Inspections, BPAC	Standard crosswalk markings should be installed along First Street, Second Street, and Causeway Drive at all unsignalized intersections (see page 3-3). High-Visibility crosswalks and crossing signage should also be added as indicated on Map 3.1 on page 3-9. Consider additional crossings improvements as-needed and coordinate with NCDOT Division 3.	Mid-term (2015-2017)
Install bike racks at destinations throughout town	Public Utilities, BPAC	Planning & Inspections, local businesses	Install bike racks at all beach accesses, parks, public buildings, businesses, and other important destinations in town. Track existing bike racks and include on the Town Hike and Bike Map when it is developed.	Mid-term (2015-2017)
Provide Enforcement and Education Training for Police Officers	Police Department	NCDOT Bike/Ped Division	Provide police officers with training through free online resources available from the National Highway Traffic Safety Administration, and through webinars available through the Association of Pedestrian and Bicycle Professionals. Provide police officers with an informational handout to be used during bicycle and pedestrian-related citations and warnings. Utilize available WatchForMeNC materials, and request that Ocean Isle Beach is included when WatchForMeNC is integrated statewide.	Mid-term (2015-2017)
Complete one of four sections of the First St trail project	Public Utilities + NCDOT Division 3	Planning & Inspections, GSATS, NCDOT Bike/Ped Division	Chapter 3 provides info on the First St trail project segments. Immediate attention to this project will have a large impact on the bicycle and pedestrian environment in Ocean Isle Beach. Aim to complete at least one segment by the end of 2017.	Mid-term (2015-2017)
Develop a long term funding strategy	Planning & Inspections	Town Council, BPAC, Public Utilities, GSATS	To allow continued development of the overall system, capital funds for bicycle and pedestrian facility construction should be set aside every year. Powell Bill funds should be programmed for facility construction. Funding for an ongoing maintenance program should also be included in the Town's operating budget.	Mid-term (2015-2017)



TASK	LEAD AGENCY	SUPPORT	DETAILS	PHASE
Communication & Outreach	BPAC, local bike shops, local advocacy groups	Planning & Inspections, GSATS	The BPAC should establish a communication campaign to celebrate successes as facilities are developed and otherwise raise awareness of the overall bicycle network and its benefits. A key first task of this group is to design and launch a one-stop website. Set up the one-stop website providing information to residents and tourists on bicycling in the region. To begin, the website can include the maps included in this plan.	Mid-term (2015-2017)
Explore options for public maintenance and use of boardwalks	Planning & Inspections	Town Council, Public Utilities	The Town should consider working with the Ocean Isle Property Owners Association to pursue a maintenance agreement on private boardwalks to open them to public use.	Mid-term (2015-2017)
Seek designation as a Walk-Friendly and Bicycle-Friendly Community	Planning & Inspections	Town Council, Public Utilities, BPAC, Recreation Advisory Board	The development and implementation of this plan is an essential first step toward becoming a designated Walk-Friendly or Bicycle-Friendly Community. With ongoing efforts and the short-term work program recommended here, the Town should be in a position to apply for and receive recognition within a few years.	Short- to Mid-term (2015-2020)
Develop Bicycle and Pedestrian Facility Specifications	Public Utilities	Planning & Inspections, NCDOT	Town staff could prepare these in-house to save resources using the design guidelines of this plan and the project cut-sheets as starting points. Specifically, the resources listed in Appendix A will be very useful in drafting such documents.	Mid-term (2017-2020)
Establish a Monitoring Program	Planning & Inspections, BPAC	Public Utilities, local advocates, general public	Planning & Inspections and the BPAC should brainstorm specific benchmarks to track through a monitoring program and honor the completion of projects with public events and media coverage.	Mid-term/Ongoing (2017-2020 onward)
Complete more sections of the First St trail project	Public Utilities + NCDOT Division 3	GSATS, NCDOT Bike/Ped Division	Chapter 3 provides info on the First St trail project segments. Continued attention to this project will have a large impact on the bicycle and pedestrian environment in Ocean Isle Beach. Town should coordinate with GSATS as projects are submitted for statewide prioritization. Aim to complete all four segments by the end of 2022.	Mid- to Long-term (2018-2022)
Identify next set of infrastructure priorities	Town Council & BPAC	Planning & Inspections, Public Utilities	Upon completion of the First St trail project, select the next set of priority improvements for walking and bicycling based on the overall network of recommendations presented in Chapter 3.	Mid- to Long-term (2018-2022)



## KEY ACTION STEP DESCRIPTIONS

### Policy Action Steps

Several policy steps are crucial to the success of future facility development. These steps will legitimize the recommendations found in this plan and enable the right-of-way acquisition necessary to carry out those recommendations.

### Adopt This Plan

Before any other action takes place, the Town of Ocean Isle Beach should adopt this plan. This should be considered the first step in implementation. Through adoption of this plan and its accompanying maps as the Town's official pedestrian and bicycle plan, Ocean Isle Beach will be better able to shape transportation and development decisions so that they fit with the goals of this plan. Most importantly, having an adopted plan is extremely helpful in securing funding from state, federal, and private agencies. Adopting this plan does not commit the Town of Ocean Isle Beach to dedicate or allocate funds, but rather indicates intent to implement this plan over time, starting with these action steps.

The Planning Board should review and recommend the plan to the Town Council, which in turn must consider and officially incorporate the recommended infrastructure improvements of this plan into its land-use plans. The following entities should adopt this plan:

- The Town of Ocean Isle Beach
- Grand Stand Area Transportation Study (GSATS)

Adoption of this plan also signifies that the design guidelines provided in Appendix A are established as pedestrian and bicycle facility standards for each of the adopting agencies. This will establish consistency in design across jurisdictional boundaries, ensuring that future facilities will be developed with consistency and will accommodate a variety of user types.

This plan and its recommended on- and off-road facilities should be approved by the NCDOT and NCDENR, and they should be included in the future planning of each agency. This plan's recommendations should be integrated into an update to the Comprehensive Transportation Plan for Brunswick County. NCDOT should refer to this document when assessing the impact for future projects and plans. Likewise, NCDENR's Division of Parks and Recreation should refer to this plan in any projects for future state parks near Ocean Isle Beach.

### Establish Land Right-of-Way Acquisition Mechanisms

It is recommended that each local zoning and subdivision ordinance be amended to ensure that, as developments are planned and reviewed, the pedestrian and bicycle facilities and greenway corridors identified in this plan are protected. This would entail amending development regulations to have developers set aside land for trails whenever a development proposal overlaps with the proposed routes, as adopted. Town of Ocean Isle Beach staff should ensure that an effective review of all bicycle and pedestrian elements of proposed developments takes place.



In addition, local policies should be revised to appropriately address the needs of bicyclists and pedestrians as outlined in this plan. For example, revising policy language to allow for public access for trail users, as a matter of right, on all new sewer and utility easements, or to mandate the installation of “bicycle-friendly” drainage grates on all roadways during future roadway projects would have a significant impact on the walking and bicycling environment in Ocean Isle Beach.

### Coordinate Development Plans

The Town of Ocean Isle Beach should ensure that adopted bicycle, pedestrian, and multi-use path recommendations from this plan are included in future residential and commercial developments that connect with such proposed facilities.

### Implement Driveway Access Management

The Town of Ocean Isle Beach should consider adding access management language to the town ordinances for both future development and retrofits to existing development, especially along commercial areas on Causeway Drive, 1st Street, and 2nd Street. The NCDOT’s policy on ‘Street and Driveway Access to North Carolina Highways’ provides examples on how to reduce conflict points between motor vehicles and pedestrians and bicyclists. For more information: [www.ncdot.org/doh/preconstruct/altern/value/manuals/pos.pdf](http://www.ncdot.org/doh/preconstruct/altern/value/manuals/pos.pdf)

### Program Action Steps

While policies provide a legal basis for on- and off-road facility development, the program recommendations included in Chapter 3 of this plan will build community support for the creation of new facilities and establish a strong bicycling and walking culture.

### Designate Staff

Designate staff to oversee the implementation of this plan and the proper maintenance of the facilities that are developed. It is recommended that a combination of existing planning staff and public works staff oversee the day-to-day implementation of this plan. In many municipalities, a full-time bicycle and pedestrian coordinator covers this task, but in smaller towns, such as Ocean Isle Beach, it makes more sense to fold these responsibilities into current staff responsibilities.

### Form a Bicycle and Pedestrian Advisory Committee

The Town of Ocean Isle Beach should form a bicycle and pedestrian advisory committee (BPAC) out of the plan’s steering committee to assist in the implementation of this plan. The BPAC should have representation from active pedestrians and commuting and recreational cyclists and should champion the recommendations of this plan. The formation of this group would be a significant step in becoming designated as a Walk- and Bicycle Friendly Community (see information on next page). The committee would provide a communications link between the citizens of the community and local government. They should also continue to meet periodically, and be tasked with assisting the Town of Ocean Isle Beach staff in community outreach, marketing, and educational activities recommended by this plan.



### Become Designated as a Walk-Friendly and Bicycle Friendly Community

A goal for Ocean Isle Beach should be to seek a “Bicycle Friendly Community” (BFC) designation from the League of American Bicyclists. The BFC campaign is an award program that recognizes municipalities that actively support bicycling activities and safety. A Bicycle Friendly Community provides safe accommodation for bicycling and encourages its residents to bicycle for transportation and recreation. Carrboro, Wilmington, and Davidson are examples of North Carolina communities that have become designated as Bicycle Friendly Communities.

Similarly, the Walk Friendly Community (WFC) Campaign is an awards program that recognizes municipalities that actively support pedestrian activity and safety. A Walk Friendly Community provides safe accommodation for walking and encourages its residents to walk for transportation and recreation. The program is maintained by the UNC Highway Safety Research Center’s Pedestrian and Bicycle Information Center, with support from a variety of national partners.

Becoming designated as a Bicycle- and Walk-Friendly Community signals to current residents, potential residents, and visitors that the town is a safe and welcoming place for individuals and families to live and recreate. The development and implementation of this plan is an essential first step toward becoming a Walk- and Bicycle Friendly Community. With ongoing efforts and the short-term work program recommended here, the Town should be in a position to apply for and receive BFC and WFC status within a few years.

### Communication and Outreach

The BPAC should lead the effort to establish a communication campaign to celebrate successes as facilities are developed and otherwise raise awareness of the overall pedestrian and bicycle network and its benefits. A key first task of this group is to design and launch a one-stop website.

Many current and potential pedestrians and bicyclists do not know where to turn to find out about traffic laws, events, maps, tips, and groups. Developing a “Walk and Bike Central” website provides information to a wide audience and encourages people to walk and bicycle. This would be especially useful in attracting visitors who are seeking out a vacation destination where walking and bicycling are safe and enjoyable. A one-stop website is not usually difficult to set up, but it will only be successful if the site is both easy to use and updated frequently. All website content should be reviewed regularly for accuracy. Walking groups, the bicycling community, and volunteer organizations interested in safety and health can assist in keeping the site up to date.

### Establish a Monitoring Program

From the beginning, and continuously through the life of a pedestrian or bicycle facility project, the BPAC should brainstorm specific benchmarks to track through a monitoring program and honor the completion of projects with public events and media coverage. Benchmarks should be revisited and revised periodically as the pedestrian and bicycle facility network evolves.



### **Begin Annual Meeting With Key Project Partners**

Coordination between key project partners will establish a system of checks and balances, provide a level of accountability, and ensure that recommendations are implemented. This meeting should be organized by the designated Town staff, and should include representatives from the Organizational Chart shown on page 4-2. The purpose of the meeting should be to ensure that this plan's recommendations are integrated with other transportation planning efforts in the region, as well as long-range and current land use planning, economic development planning, and environmental planning. Attendees should work together to identify and secure funding necessary to immediately begin the first year's work, and start working on a funding strategy that will allow the Town to incrementally complete each of the suggested physical improvements, policy changes and programs over a 5-10 year period. A brief progress benchmark report should be a product of these meetings, and participants should reconfirm the plan's goals each year. The meetings could also occasionally feature special training sessions on pedestrian, on-road bicycle, and trail issues.

### **Seek Multiple Funding Sources and Facility Development Options**

Multiple approaches should be taken to support bicycle and pedestrian facility development and programming. It is important to secure the funding necessary to undertake priority projects but also to develop a long-term funding strategy to allow continued development of the overall system. Dedicated local funding sources will be important for the implementation of this plan. Capital and local funds for pedestrian facilities and trail construction should be set aside every year, even if only for a small amount. Small amounts of local funding can be matched to outside funding sources or could be used to enhance NCDOT projects with pedestrian features that may otherwise not be budgeted for by the state. A variety of local, state, and federal options and sources exist and should be pursued. These funding options are described in Appendix B.

A priority action is to immediately evaluate the recommendations against transportation projects that are currently programmed in the Transportation Improvement Program (TIP) to see where projects overlap, compliment, or conflict with each other. The Town should also evaluate which of the proposed projects could be added to future TIP updates.

### **Develop Bicycle and Pedestrian Facility Designs and Specifications for Proposed Projects**

Town of Ocean Isle Beach staff could prepare these in-house to save resources, using the design guidelines of this plan and the project cut-sheets as starting points. The public should have an opportunity to comment on the design of new facilities.

### **Launch New Programs**

The program recommendations found in Chapter 3 provide a set of programmatic resources that will support the goals of the Town of Ocean Isle Beach Pedestrian and Bicycle Plan. The Town should reference the recommendations to develop new programs that promote walking and bicycling.



Through cooperation between the Town, the BPAC, and groups such as walking and bicycling clubs, strong education, encouragement, and enforcement campaigns could also occur as new facilities are built. When an improvement has been made, the roadway environment has changed and proper interaction between motorists, bicyclists, and pedestrians is critical for the safety of all users. A campaign through local television, on-site enforcement, education events, and other methods will bring attention to the new facility, and educate, encourage, and enforce proper use and behavior. Chapter 3 provides program ideas to choose from, some of which are included in the action steps table starting on page 4-3.

### Provide Enforcement and Education Training for Police Officers

Law enforcement officers have many important responsibilities, yet pedestrians and bicyclists remain the most vulnerable forms of traffic. The Ocean Isle Beach Police Department has been aware of this planning process, and should be involved in implementation. In many cases, citizens (and even sometimes officers) are not fully aware of state and local laws related to bicyclists and pedestrians. Training on this topic can lead to additional education and enforcement programs that promote safety. Training for Ocean Isle Beach's officers could be done through free online resources available from the National Highway Traffic Safety Administration (NHTSA) (see links at [www.bicyclinginfo.org/enforcement/training.cfm](http://www.bicyclinginfo.org/enforcement/training.cfm)), or through fee-based webinars available through the Association of Pedestrian and Bicycle Professionals (APBP).

### Infrastructure Action Steps

While establishing the policies and programs described, Ocean Isle Beach should move forward with the design and construction of priority projects. They should also work to identify funding for long-term, higher-cost projects.

### Identify Funding

Achieving the vision defined within this plan will require, among other things, a stable and recurring source of funding. Communities across the country that have successfully engaged in pedestrian and bicycle programs have relied on multiple funding sources to achieve their goals. No single source of funding will meet the recommendations identified in this Plan. Instead, stakeholders will need to work cooperatively with municipality, state, and federal partners to generate funds sufficient to implement the program.

A stable and recurring source of revenue is needed that can then be used to leverage grant dollars from state, federal, and private sources. The ability of local agencies to generate a source of funding for pedestrian and bicycle facilities depends on a variety of factors, such as taxing capacity, budgetary resources, voter preferences, and political will. It is very important that these local agencies explore the ability to establish a stable and recurring source of revenue for facilities.

Donations from individuals or companies are another potential source of funding. The BPAC should establish an "Adopt a Trail" program as a mechanism to collect these donations for the development of the trail and sidepath



recommendations discussed in Chapter 3. In addition to a formalized program, a website should be set up as an easy way for individuals to donate smaller amounts.

Federal and state grants should be pursued along with local funds to pay for necessary right-of-way acquisition and project design, construction, and maintenance expenses. “Shovel-ready” designed projects should be prepared in the event that future federal stimulus funds become available. Additional recommended funding sources may be found in Appendix B.

### Complete Short-Term Priority Projects

By quickly moving forward on priority projects, Ocean Isle Beach will demonstrate its commitment to carrying out this plan and will better sustain the enthusiasm generated during the public outreach stages of the planning process. Refer to Chapter 3: Network Recommendations for priority project ranking and the prioritization methodology.

## KEY PARTNERS IN IMPLEMENTATION

### Role of the Ocean Isle Beach Town Council

The Town Council will be responsible for adopting this plan. Through adoption, the Town’s leadership is further recognizing the value of bicycle and pedestrian transportation and is putting forth a well-thought out set of recommendations for improving public safety and overall quality of life (see the ‘Why This Plan is Important’ section in Chapter 1). By adopting this plan, the Town Council is also signifying that they are prepared to support the efforts of other key partners in the plan’s implementation, including the work of Town departments and NCDOT.

Adoption of this plan is in line with public support. Ocean Isle Beach’s online comment form for the planning process yielded over 450 responses and showed strong support for improving walking and bicycling conditions.

### Role of the Ocean Isle Beach Planning Board

The Town of Ocean Isle Beach Planning Board serves as an advisory board to the Town Council on matters of planning and zoning. The Planning Board should be prepared to:

- Become familiar with the recommendations of this plan, and support its implementation.
- Learn about pedestrian- and bicycle-related policies in North Carolina. (see: [www.ncdot.gov/bikeped/lawspolicies/policies/](http://www.ncdot.gov/bikeped/lawspolicies/policies/))

### Role of the Town of Ocean Isle Beach Public Utilities Department

The Public Utilities Department is responsible for the construction and maintenance of pedestrian and bicycle facilities on locally owned and maintained roadways, as well as on NCDOT roadways, where encroachment agreements are secured. Public Works staff of the Public Utilities Department should be prepared to:



- Communicate and coordinate with other town departments and the BPAC on priority bicycle and pedestrian projects.
- Become familiar with the standards set forth in Appendix A of this plan, as well as state and national standards for bicycle and pedestrian facility design.
- Secure encroachment agreements for work on NCDOT-owned and maintained roadways.
- Design, construct, and maintain pedestrian and bicycle facilities.
- Communicate and coordinate with Brunswick County, GSATS, and neighboring municipalities on regional facilities; partner for joint-funding opportunities.
- Communicate and coordinate with NCDOT Division 3 on this plan's recommendations for NCDOT-owned and maintained roadways. Provide comment and reminders about this plan's recommendations no later than the design phase.
- Work with NCDOT Division 3 to ensure that when NCDOT-owned and maintained roadways in Ocean Isle Beach are resurfaced or reconstructed, this plan's adopted recommendations for bicycle and pedestrian facilities are included on those streets. If a compromise to the original recommendation is needed, then contact NCDOT Division of Bicycle and Pedestrian Transportation for guidance on appropriate alternatives.

### Role of the Town of Ocean Isle Beach Planning & Inspections

Planning & Inspections' planning staff will take primary responsibility for the contact with new development to implement the plan (with support from the Public Utilities Department). The staff should be prepared to:

- Communicate and coordinate with local developers on adopted recommendations for bicycle and pedestrian facilities, including paved multi-use trails.
- Assist the Public Utilities Department in communicating with NCDOT and regional partners.
- Become experts on pedestrian-related policies in North Carolina. (see: [www.ncdot.gov/bikeped/lawspolicies/policies/](http://www.ncdot.gov/bikeped/lawspolicies/policies/))

### Role of the Bicycle and Pedestrian Advisory Committee

The Committee should be prepared to:

- Meet with staff from Planning & Inspections and the Public Utilities Department; evaluate progress of the plan's implementation and offer input regarding pedestrian, bicycle, and trail-related issues; assist Town of Ocean Isle Beach staff in applying for grants and organizing bicycle- and pedestrian-related events and educational activities.
- Build upon current levels of local support for pedestrian and bicycle issues and advocate for local project funding.



### Role of the Local NCDOT Division 3

Division 3 of the NCDOT is responsible for the construction and maintenance of pedestrian and bicycle facilities on NCDOT-owned and maintained roadways in the Town of Ocean Isle Beach, OR is expected to allow for the Town to do so with encroachment agreements. Division 3 should be prepared to:

- Recognize this plan as not only as an adopted plan of the Town of Ocean Isle Beach, but also as an approved plan of the NCDOT.
- Become familiar with the bicycle and pedestrian facility recommendations for NCDOT roadways in this plan (Chapter 3); take initiative in incorporating this plan's recommendations into the Division's schedule of improvements whenever possible.
- Become familiar with the standards set forth in Appendix A of this plan, as well as state and national standards for facility design; construct and maintain recommended facilities using the highest standards allowed by the State (including the use of innovative treatments on a trial basis).
- Notify the Town of Ocean Isle Beach Public Utilities Department of all upcoming roadway reconstruction or resurfacing/restriping projects in town, no later than the design phase. Provide sufficient time for comments from the planning staff.
- If needed, seek guidance and direction from the NCDOT Division of Bicycle and Pedestrian Transportation on issues related to this plan and its implementation.

### Role of the Town of Ocean Isle Beach Police Department

The Town of Ocean Isle Beach Police Department is responsible for providing the community the highest quality law enforcement service and protection to ensure the safety of the citizens and visitors. The Police Department should be prepared to:

- Become experts on pedestrian-related laws in North Carolina. (see: [www.ncdot.gov/bikeped/lawspolicies/laws/](http://www.ncdot.gov/bikeped/lawspolicies/laws/))
- Continue to enforce not only bicycle- and pedestrian-related laws, but also motorist laws that affect walking and bicycling, such as speeding, running red lights, aggressive driving, etc.
- Participate in bicycle- and pedestrian-related education programs.
- Review safety considerations with the Public Utilities Department as projects are implemented.

### Role of Developers

Developers in Ocean Isle Beach can play an important role in facility development whenever a project requires the enhancement of transportation facilities or the dedication and development of on-road bicycle facilities, sidewalks, trails or crossing facilities. Developers should be prepared to:

- Become familiar with the benefits, both financial and otherwise, of providing amenities for walking and biking (including trails) in residential and commercial developments.



- Become familiar with the standards set forth in Appendix A of this plan, as well as state and national standards for facility design.
- Be prepared to account for bicycle and pedestrian circulation and connectivity in future developments.

### Role of Local & Regional Stakeholders

Stakeholders for bicycle and pedestrian facility development and related programs, such as Brunswick County, GSATS, and local organizations play important roles in the implementation of this plan. Local and regional stakeholders should be prepared to:

- Become familiar with the recommendations of this plan, and communicate & coordinate with the Town for implementation, specifically in relation to funding opportunities, such as grant writing and developing local matches for facility construction.
- The MPO should work with the Town of Ocean Isle Beach on populating the Strategic Transportation Improvement (STI) list with pedestrian and bicycle infrastructure projects.
- Brunswick County should coordinate with the Town on trail development.
- Business owners and organizations should look for opportunities to partner on specific projects, such as streetscape improvements, or comprehensive signage and wayfinding projects.

### Role of Local Residents, Clubs and Advocacy Groups

Local residents, clubs, and advocacy groups play a critical role in the success of this plan. They should be prepared to:

- Continue offering input regarding pedestrian and bicycling issues in Ocean Isle Beach.
- Assist Town staff and the BPAC by volunteering for bicycle- and pedestrian-related events and educational activities and/or participate in such activities.
- Assist Town of Ocean Isle Beach staff and the BPAC by speaking at Town Council meetings and advocating for local pedestrian and bicycle project and program funding.

### Role of Volunteers

Services from volunteers, student labor, and seniors, or donations of material and equipment may be provided in-kind, to offset construction and maintenance costs. Formalized maintenance agreements, such as adopt-a-trail/greenway or adopt-a-highway can be used to provide a regulated service agreement with volunteers. Other efforts and projects can be coordinated as needed with senior class projects, scout projects, interested organizations, clubs or a neighborhood's community service to provide for many of the program ideas outlined in Chapter 3 of this plan. Advantages of utilizing volunteers include reduced or donated planning and construction costs, community pride and personal connections to the town's greenway, bicycle, and pedestrian networks.



## PERFORMANCE MEASURES (EVALUATION AND MONITORING)

The Town of Ocean Isle Beach should establish performance measures to benchmark progress towards fulfilling the recommendations of this plan. These performance measures should be stated in an official report within two years after the plan is adopted. Performance measures could address the following aspects of pedestrian and bicycle transportation and recreation in Ocean Isle Beach:

- *Safety.* Measures of pedestrian- and bicycle-related crashes and injuries.
- *Facilities.* Measures of how many pedestrian and bicycle facilities have been funded and constructed since the plan's adoption.
- *Maintenance.* Measures of existing sidewalk/crosswalk or bicycle facility deficiency or maintenance needs.
- *Counts.* Measures of pedestrian and/or bicycle traffic at specific locations.
- *Education, Encouragement and Enforcement.* Measures of the number of people who have participated in part of a pedestrian- or bicycle-related program since the plan's adoption.

## FACILITY DEVELOPMENT METHODS

This section describes different construction methods for the proposed pedestrian and bicycle facilities outlined in Chapter 3. Note that many types of transportation facility construction and maintenance projects can be used to create new bicycle and pedestrian facilities. It is much more cost-effective to provide bicycle and pedestrian facilities during roadway construction and re-construction projects than to initiate the improvements later as "retrofit" projects.

To take advantage of upcoming opportunities and to incorporate bicycle and pedestrian facilities into routine transportation and utility projects, the Town of Ocean Isle Beach should keep track of NCDOT's projects and any other local transportation improvements. While doing this, town staff should be aware of the different procedures for state and local roads and interstates.

### NCDOT State Transportation Improvement Program

The NCDOT's State Transportation Improvement Program is based on the Strategic Transportation Investments Bill, signed into law in 2013. The Strategic Transportation Investments (STI) Initiative introduces the Strategic Mobility Formula, a new way to fund and prioritize transportation projects.

The new Strategic Transportation Investments Initiative is scheduled to be fully implemented by July 1, 2015. Projects scheduled for construction before then will proceed as scheduled under the current Equity Formula. Projects slated for construction after that time will be ranked and programmed according to the new formula. The new Strategic mobility formula assigns projects for all modes into one of three categories: 1) Statewide Mobility, 2) Regional Impact, and 3) Division Needs. All independent bicycle and pedestrian projects are placed in the "Division Needs" category, and are ranked using the following criteria:

- Safety
- Access



- Demand or density
- Constructability
- Benefit/cost ratio

These rankings largely determine which projects will be included in NCDOT's State Transportation Improvement Program (STIP). The STIP is a federally mandated transportation planning document that details transportation planning improvements prioritized by the stakeholders for inclusion in NCDOT's Work Program over the next 10 years. The STIP is updated every 2 years. The STIP contains funding information for various transportation divisions of NCDOT, including, highways, rail, bicycle and pedestrian, public transportation and aviation.

These rankings largely determine which projects will be included in NCDOT's State Transportation Improvement Program (STIP). The STIP is a federally mandated transportation planning document that details transportation planning improvements prioritized by the stakeholders for inclusion in NCDOT's Work Program over the next 10 years. The STIP is updated every 2 years. The STIP contains funding information for various transportation divisions of NCDOT, including, highways, rail, bicycle and pedestrian, public transportation and aviation.

For more information on STIP:

[www.ncdot.gov/strategictransportationinvestments/](http://www.ncdot.gov/strategictransportationinvestments/)

To access the STIP: <https://connect.ncdot.gov/projects/planning/Pages/ResourcesMPO-RPO.aspx>

For more about the STIP process: <http://www.ncdot.org/performance/reform/>

### Local Roadway Construction or Reconstruction

Pedestrians and bicyclists should be accommodated any time a new road is constructed or an existing road is reconstructed. In the longer-term, all new roads with moderate to heavy motor vehicle traffic should have sidewalks, bicycle facilities, and safe intersections. However, side paths can be an acceptable solution when a road has few driveways and high-speed, high-volume traffic.

Also, case law surrounding the ADA has found that roadway resurfacing constitutes an alteration, which requires the addition of curb ramps at intersections where they do not yet exist. The Department of Justice and the Federal Highway Administration recently released guidance on the Title II of the Americans with Disabilities Act requirement to provide curb ramps when streets, roads, or highways are altered through resurfacing. More information is available on the following website:

<http://www.ada.gov/doj-fhwa-ta.htm>.

### Residential and Commercial Development

The construction of sidewalks, bicycle facilities, trails, and safe crosswalks should be required during development. Construction of facilities that corresponds with site construction is more cost-effective than retrofitting. In commercial development, emphasis should also be focused on safe pedestrian and bicyclist



access into, within, and through large parking lots. This ensures the future growth of the pedestrian and bicycle networks and the development of safe communities.

### Removing Parking

Some neighborhood collector roadways are wide enough to add pedestrian and bicycle facilities, but they are used by residents for on-street parking, especially in the evening. In locations like this, removing parking is likely to create considerable controversy and is not recommended unless there is no other solution or the parking is rarely used. In the rare case that removing parking is being considered, the parking should not be removed unless there is a great deal of public support for the facilities on that particular roadway and a full public involvement process with adjacent residents and businesses is undertaken prior to removing parking.

If it is not practical to add a bike lane, edgelines and shared lane markings may be considered. On roads where the outside lane and parking area combined are more than 17 feet wide, 10 foot wide travel lanes can be striped with an edgeline, leaving the rest of the space on either side for parking. The stripe would help slow motor vehicles and provide extra comfort for bicyclists, especially during the daytime when fewer cars would be parked along the curb. On roads with outside lane and parking areas that are narrower than 17 feet wide, shared lane markings can be provided every 250 feet on the right side of the motor vehicle travel lane to increase the visibility of the bike route.

### Repaving

Repaving projects provide a clean slate for revising pavement markings. When a road is repaved, the roadway should be restriped to create narrower lanes and provide space for bike lanes and shoulders, where feasible.

In addition, if the spaces on the sides of non-curb and gutter streets have relatively level grades and few obstructions, the total pavement width can be widened to include paved shoulders.

### Installing Shared Lane Markings

The Town of Ocean Isle Beach should adopt the use of shared lane markings, or “sharrows,” as one of its bicycle facility types. Shared lane markings have been newly incorporated into the Manual on Uniform Traffic Control Devices (MUTCD). They take the place of traditional bicycle lanes where travel lanes cannot be narrowed, where speeds do not exceed 35 mph, and/or where there is on-street parking. The intent of the shared lane marking is threefold:

- They draw attention to the fact that the roadway is accommodating bicycle use and traffic;
- They clearly define the direction of travel for both bicyclists and motorists; and
- With proper placement, they remind bicyclists to bike further from parked cars to prevent “dooring” collisions.

While shared-lane markings are not typically recommended or needed on local, residential streets, they are sometimes used along such streets when part of a signed route or bicycle boulevard. It should be noted that sharrows are not a replacement for bicycle lanes in their effectiveness or use.



## Retrofit Roadways with New Bicycle and Pedestrian Facilities

There may be critical locations in the pedestrian and bicycle network that have safety issues or are essential links to destinations. In these locations, it may be justifiable to add new pedestrian and bicycle facilities before scheduling a roadway to be repaved or reconstructed. In some other locations, it may be relatively easy to add sidewalk or to add extra pavement for shoulders, but other segments may require removing trees, relocating landscaping or fences, or re-grading ditches. Retrofitting roadways with side paths creates similar challenges.

## Bridge Construction or Replacement

Provisions should always be made to include a walking and bicycling facility as a part of vehicular bridges. All new or replacement bridges should accommodate two-way travel for all users. Even though bridge construction and replacement does not occur regularly, it is important to consider these policies for long-term bicycle and pedestrian planning. NCDOT bridge policy states that sidewalks shall be included on new NCDOT road bridges with curb and gutter approach roadways. A determination of providing sidewalks on one or both sides is made during the planning process. Facility design standards such as widths of facilities and heights of handrails are presented in Appendix A: Design Guidelines.

## Signage and Wayfinding Projects

A relatively low-cost, short-term action that the Town of Ocean Isle Beach can pursue immediately is to develop and adopt a wayfinding signage style policy and procedure, to be applied throughout the entire community, to make it easier for people to find destinations. Bicycle route signs are one example of these wayfinding signs, and should be installed along routes independently of other signage projects or as a part of a more comprehensive wayfinding improvement project. Posting signage that includes bicycle and walk travel times to major destinations can help to increase awareness of the ease and efficiency of bicycle and pedestrian travel. See Appendix A: Design Guidelines for more detailed guidance on signage and wayfinding improvements.

For a step-by-step guide to help non-professionals participate in the process of developing and designing a signage system, as well as information on the range of signage types, visit the Project for Public Places website: [www.pps.org/reference/signage\\_guide](http://www.pps.org/reference/signage_guide)

## Town Easements

The Town of Ocean Isle Beach should explore opportunities to revise existing easements to accommodate public access greenway trail facilities. Similarly, as new easements are acquired in the future, the possibility of public access should be considered. Sewer easements are very commonly used for this purpose, offering cleared and graded corridors that easily accommodate trails. This approach avoids the difficulties associated with acquiring land, and it better utilizes the Town's resources.



**Economics**  
Investment in transit and high-quality facilities that promote transit use can generate significant economic benefits in the Outer Banks.  
An initial investment of \$2.7M in walking and biking facilities that generate \$4.8M in transit trip revenue.  
Pedestrian and bicycle amenities attract visitors, generate revenue, and encourage local businesses to invest in their areas, creating jobs and increasing tax revenue.  
Walking/Biking  
Pedestrians and Bicyclists





## Chapter Contents:

### Overview

### Design Needs of Pedestrians

#### Sidewalks

### Pedestrians at Intersections

#### Signalization

#### Pedestrian Signs and Wayfinding

### Design Needs of Bicyclists

#### Shared Roadways

#### Separated Bikeways

#### Separated Bikeways at Intersections

#### Signage Programs

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#### Multi-Use Trails

### Multi-Use Trail Crossings

### Traffic Calming Measures

#### Sight Distances

### Standards Compliance

## OVERVIEW

The sections that follow serve as an inventory of pedestrian and bicycle design treatments and provide guidelines for their development. These treatments and design guidelines are important because they represent the tools for creating a pedestrian and bicycle-friendly, safe, accessible community. The guidelines are not, however, a substitute for a more thorough evaluation by a landscape architect or engineer upon implementation of facility improvements. Some improvements may also require cooperation with the NCDOT for specific design solutions. The following standards and guidelines are referred to in this guide:

- The Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) – the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings
- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities – updated in June 2012 provides guidance on dimensions, use, and layout of specific bicycle facilities
- The National Association of City Transportation Officials' (NACTO) 2012 Urban Bikeway Design Guide is the newest publication of nationally recognized bikeway design standards, and offers guidance on the current state of the practice designs (all of the NACTO Urban Bikeway Design Guide treatments are in use internationally and in many cities around the US)
- Meeting the requirements of the Americans with Disabilities Act (ADA) is an important part of any bicycle facility project – the United States Access Board's proposed Public Rights-of-Way Accessibility Guidelines (PROWAG) and the 2010 ADA Standards for Accessible Design (2010 Standards) contain standards and guidance for the construction of accessible facilities
- The North Carolina Department of Transportation (NCDOT) houses a number of design guidelines that are referenced here – the Bicycle Facilities Planning and Design Guidelines (1994), Traditional Neighborhood Development Guidelines (TND) (2000), and the Complete Streets Planning and Design Guidelines (2012).

Should the national standards be revised in the future and result in discrepancies with this chapter, the national standards should prevail for all design decisions. A qualified engineer or landscape architect should be consulted for the most up to date and accurate cost estimates at the time of project implementation.



## DESIGN NEEDS OF PEDESTRIANS

### Types of Pedestrians

Pedestrians have a variety of characteristics and the transportation network should accommodate a variety of needs, abilities, and possible impairments. Age is one major factor that affects pedestrians’ physical characteristics, walking speed, and environmental perception. Children have low eye height and walk at slower speeds than adults. They also perceive the environment differently at various stages of their cognitive development. Older adults walk more slowly and may require assistive devices for walking stability, sight, and hearing. Table A-1 below summarizes common pedestrian characteristics for various age groups.

The MUTCD recommends a normal walking speed of three and a half feet per second when calculating the pedestrian clearance interval at traffic signals. The walking speed can drop to three feet per second for areas with older populations and persons with mobility impairments. While the type and degree of mobility impairment varies greatly across the population, the transportation system should accommodate these users to the greatest reasonable extent.



U.S. Department of Transportation

Federal Highway Administration

Table A-1: Pedestrian Characteristics by Age

Age	Characteristics
0-4	Learning to walk
	Requires constant adult supervision
	Developing peripheral vision and depth perception
5-8	Increasing independence, but still requires supervision
	Poor depth perception
9-13	Susceptible to “dart out” intersection dash
	Poor judgment
	Sense of invulnerability
14-18	Improved awareness of traffic environment
	Poor judgment
19-40	Active, fully aware of traffic environment
41-65	Slowing of reflexes
65+	Difficulty crossing street
	Vision loss
	Difficulty hearing vehicles approaching from behind Could become disoriented or have limited cognitive abilities

## SIDEWALKS

Sidewalks are the most fundamental element of the walking network, as they provide an area for pedestrian travel that is separated from vehicle traffic. Sidewalks are typically constructed out of concrete and are separated from the roadway by a curb or gutter and sometimes a landscaped planting strip area. Sidewalks are a common application in both urban and suburban environments. Attributes of well-designed sidewalks include the following:

- **Accessibility:** A network of sidewalks should be accessible to all users.
- **Adequate width:** Two people should be able to walk side-by-side and pass a third comfortably. Different walking speeds should be possible. In areas of intense pedestrian use, sidewalks should accommodate a high volume of walkers.
- **Safety:** Design features of the sidewalk should allow pedestrians to have a sense of security and predictability. Sidewalk users should not feel they are at risk due to the presence of adjacent traffic.
- **Continuity:** Walking routes should be obvious and should not require pedestrians to travel out of their way unnecessarily.
- **Landscaping:** Plantings and street trees should contribute to the overall psychological and visual comfort of sidewalk users, and be designed in a manner that contributes to the safety of people.
- **Drainage:** Sidewalks should be well graded to minimize standing water.
- **Social space:** There should be places for standing, visiting, and sitting. The sidewalk area should be a place where adults and children can safely participate in public life.
- **Quality of place:** Sidewalks should contribute to the character of neighborhoods and business districts.

This Section Includes:

- Sidewalk Widths
- Sidewalk Obstructions and Driveway Ramps
- Pedestrian Amenities



*Sidewalk widths*



*Sidewalk obstructions and driveway ramps*



*Pedestrian amenities*

## Sidewalk Widths

### Description

The width and design of sidewalks will vary depending on street context, functional classification, and pedestrian demand. Below are preferred widths of each sidewalk zone according to general street type. Standardizing sidewalk guidelines for different areas of the city, dependent on the above listed factors, ensures a minimum level of quality for all sidewalks.

### Discussion

It is important to provide adequate width along a sidewalk corridor. Two people should be able to walk side-by-side and pass a third comfortably. In areas of high demand, sidewalks should contain adequate width to accommodate the high volumes and different walking speeds of pedestrians. The Americans with Disabilities Act requires a 4 foot clear width in the pedestrian zone plus 5 foot passing areas every 200 feet.



STREET CLASSIFICATION	PARKING LANE/ENHANCEMENT ZONE	FURNISHING/ GREEN ZONE	PEDESTRIAN THROUGH ZONE	FRONTAGE ZONE	TOTAL SIDEWALK AREA
<b>Local Streets</b>	7 feet	4 - 8 feet	5 - 6 feet	N/A	9 - 12 feet
<b>Commercial Areas</b>	8 - 10 feet	6 - 8 feet	6 - 12 feet	2 - 8 feet	14- 28 feet
<b>Arterials and Collectors</b>	8 - 10 feet	6 - 8 feet	4 - 12 feet	2 - 4 feet	12 -24 feet

↑  
Six feet enables two pedestrians (including wheelchair users) to walk side-by-side, or to pass each other comfortably

↑  
Total sidewalk area excludes parking dimensions

Recommended dimensions shown here are based on the NCDOT Complete Streets Planning and Design Guidelines. Exact dimensions should be selected in response to local context and expected/desired pedestrian volumes.

### Materials and Maintenance

Sidewalks are typically constructed out of concrete and are separated from the roadway by a curb or gutter and sometimes a landscaped boulevard. Surfaces must be firm, stable, and slip resistant.

### Additional References

USADOT. (2010). *ADA Standards for Accessible Design*.  
United States Access Board. (2007). *Public Rights-of-Way Accessibility Guidelines (PROWAG)*.

NCDOT. (2012). *Complete Streets Planning and Design Guidelines*.



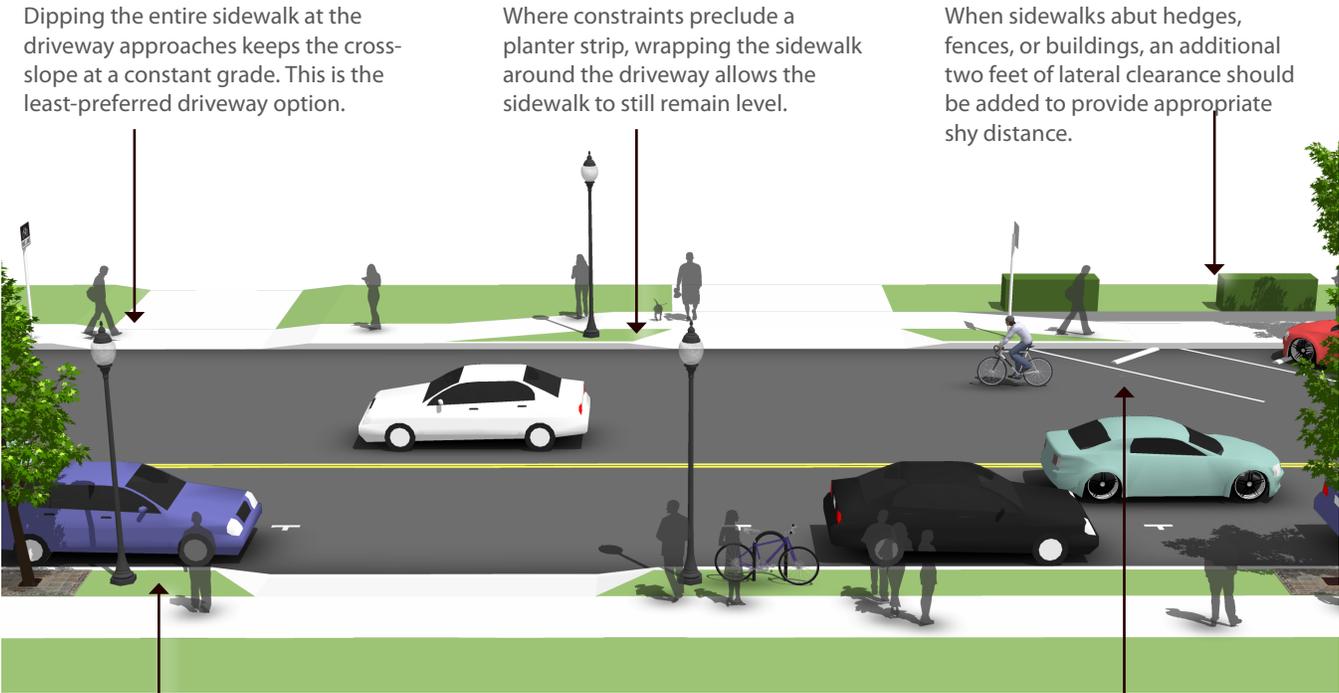
## Sidewalk Obstructions and Driveway Ramps

### Description

Obstructions to pedestrian travel in the sidewalk corridor typically include driveway ramps, curb ramps, sign posts, utility and signal poles, mailboxes, fire hydrants and street furniture.

### Guidance

- Reducing the number of accesses reduces the need for special provisions. This strategy should be pursued first.
- Obstructions should be placed between the sidewalk and the roadway to create a buffer for increased pedestrian comfort.



Dipping the entire sidewalk at the driveway approaches keeps the cross-slope at a constant grade. This is the least-preferred driveway option.

Where constraints preclude a planter strip, wrapping the sidewalk around the driveway allows the sidewalk to still remain level.

When sidewalks abut hedges, fences, or buildings, an additional two feet of lateral clearance should be added to provide appropriate shy distance.

Planter strips allow sidewalks to remain level, with the driveway grade change occurring within the planter strip.

When sidewalks abut angled on-street parking, wheel stops should be used to prevent vehicles from overhanging in the sidewalk.

### Discussion

Driveways are a common sidewalk obstruction, especially for wheelchair users. When constraints only allow curb-tight sidewalks, dipping the entire sidewalk at the driveway approaches keeps the cross-slope at a constant grade. However, this may be uncomfortable for pedestrians and could create drainage problems behind the sidewalk.

### Materials and Maintenance

Excessive cracks, gaps, pits, settling, and lifting of the sidewalk creates a pedestrian tripping hazard and reduces ADA accessibility; damages sidewalks should be repaired.

### Additional References

USDOT. (2010). *ADA Standards for Accessible Design*.  
 United States Access Board. (2007). *Public Rights-of-Way Accessibility Guidelines (PROWAG)*.  
 AASHTO. (2004). *Guide for the Planning, Design, and Operation of Pedestrian Facilities*.

## Pedestrian Amenities

### Description

A variety of streetscape elements can define the pedestrian realm, offer protection from moving vehicles, and enhance the walking experience. Pedestrian amenities should be placed in the furnishing zone on a sidewalk corridor. Signs, meters, and tree wells should go between parking spaces. Key features are presented below.

### Street Trees

In addition to their aesthetic and environmental value, street trees can slow traffic and improve safety for pedestrians. Trees add visual interest to streets and narrow the street's visual corridor, which may cause drivers to slow down. It is important that trees do not block light or the vision triangle.

### Street Furniture

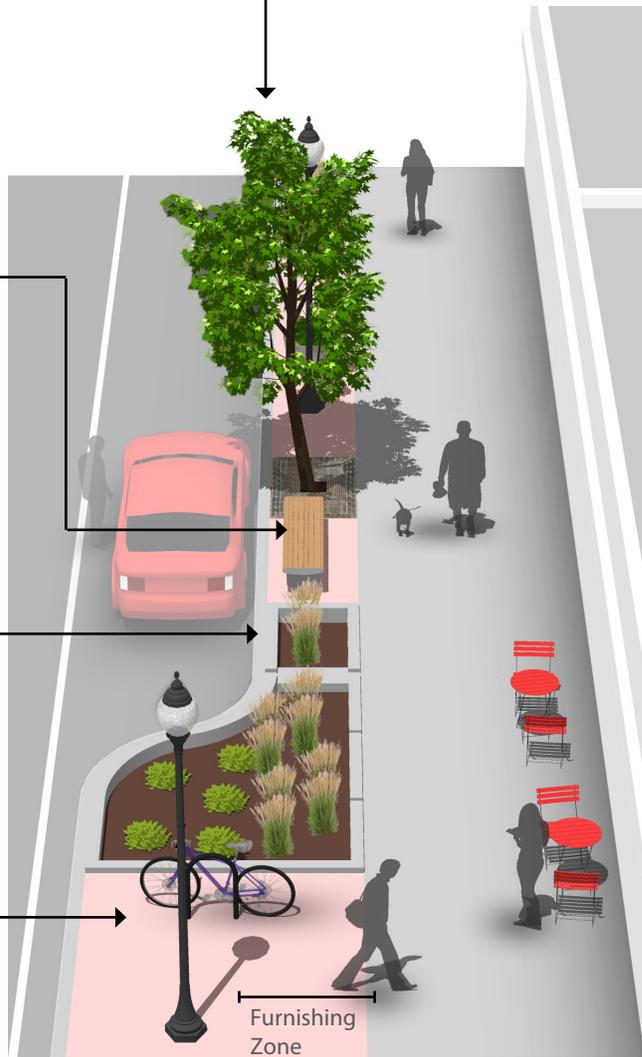
Providing benches at key rest areas and viewpoints encourages people of all ages to use the walkways by ensuring that they have a place to rest along the way. Benches should be 20" tall to accommodate elderly pedestrians comfortably. Benches can be simple (e.g., wood slats) or more ornate (e.g., stone, wrought iron, concrete). If alongside a parking zone, street furniture must be 3 feet from the curbface.

### Green Features

Green stormwater strategies may include bioretention swales, rain gardens, tree box filters, and pervious pavements (pervious concrete, asphalt and pavers). Bioswales are natural landscape elements that manage water runoff from a paved surface. Plants in the swale trap pollutants and silt from entering a river system.

### Lighting

Pedestrian scale lighting improves visibility for both pedestrians and motorists - particularly at intersections. Pedestrian scale lighting can provide a vertical buffer between the sidewalk and the street, defining pedestrian areas.



### Materials and Maintenance

Establishing and caring for your young street trees is essential to their health. Green features may require routine maintenance, including sediment and trash removal, and clearing curb openings and overflow drains.

### Additional References

United States Access Board. (2007). *Public Rights-of-Way Accessibility Guidelines (PROWAG)*.  
 NCDOT. (2012). *Complete Streets Planning and Design Guidelines*.



## PEDESTRIANS AT INTERSECTIONS

Attributes of pedestrian-friendly intersection design include:

- *Clear Space:* Corners should be clear of obstructions. They should also have enough room for curb ramps, for transit stops where appropriate, and for street conversations where pedestrians might congregate.
- *Visibility:* It is critical that pedestrians on the corner have a good view of vehicle travel lanes and that motorists in the travel lanes can easily see waiting pedestrians.
- *Legibility:* Symbols, markings, and signs used at corners should clearly indicate what actions the pedestrian should take.
- *Accessibility:* All corner features, such as curb ramps, landings, call buttons, signs, symbols, markings, and textures, should meet accessibility standards and follow universal design principles.
- *Separation from Traffic:* Corner design and construction should be effective in discouraging turning vehicles from driving over the pedestrian area. Crossing distances should be minimized.
- *Lighting:* Adequate lighting is an important aspect of visibility, legibility, and accessibility.

These attributes will vary with context but should be considered in all design processes. For example, suburban and rural intersections may have limited or no signing. However, legibility regarding appropriate pedestrian movements should still be taken into account during design.

### *This Section Includes:*

- Marked/Raised Crosswalks
- Median Refuge Islands
- At-grade Railroad Crossings
- Minimizing Curb Radii
- Curb Extensions
- ADA Compliant Curb Ramps



*Minimizing curb radii*



*Marked/raised crosswalks*



*Curb extensions*



*Median refuge islands*



*ADA compliant curb ramps*

## Marked Crosswalks

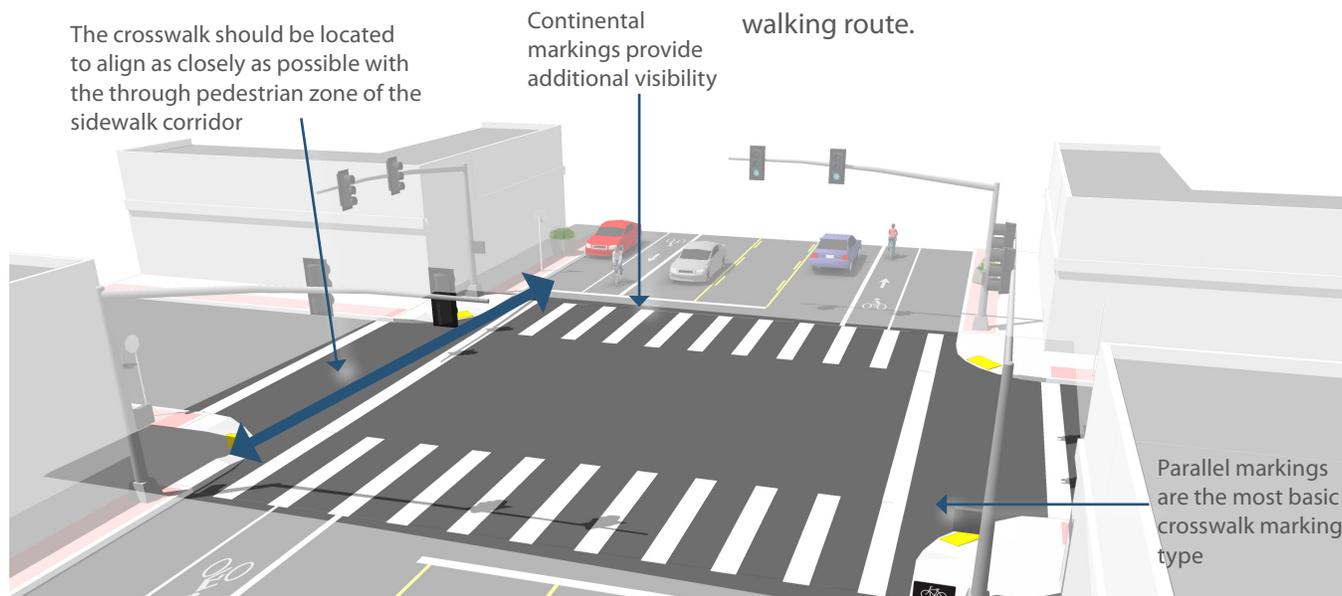
### Description

A marked crosswalk signals to motorists that they must yield for pedestrians and encourages pedestrians to cross at designated locations. Installing crosswalks alone will not necessarily make crossings safer especially on multi-lane roadways.

At mid-block locations, crosswalks can be marked where there is a demand for crossing and there are no nearby marked crosswalks.

### Guidance

- At signalized intersections, all crosswalks should be marked. At unsignalized intersections, crosswalks may be marked under the following conditions:
- At a complex intersection, to orient pedestrians in finding their way across.
- At an offset intersection, to show pedestrians the shortest route across traffic with the least exposure to vehicular traffic and traffic conflicts.
- At an intersection with visibility constraints, to position pedestrians where they can best be seen by oncoming traffic.
- At an intersection within a school zone on a walking route.



### Discussion

Continental crosswalk markings should be used at crossings with high pedestrian use or where vulnerable pedestrians are expected, including: school crossings, across arterial streets for pedestrian-only signals, at mid-block crosswalks, and at intersections where there is expected high pedestrian use and the crossing is not controlled by signals or stop signs.

#### Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority. Thermoplastic markings offer increased durability compared to conventional paint.

#### Additional References

- FHWA. (2009). *Manual on Uniform Traffic Control Devices*. (3B.18)
- FHWA. (2005). *Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations*.
- FHWA. (2010). *Crosswalk Marking Field*

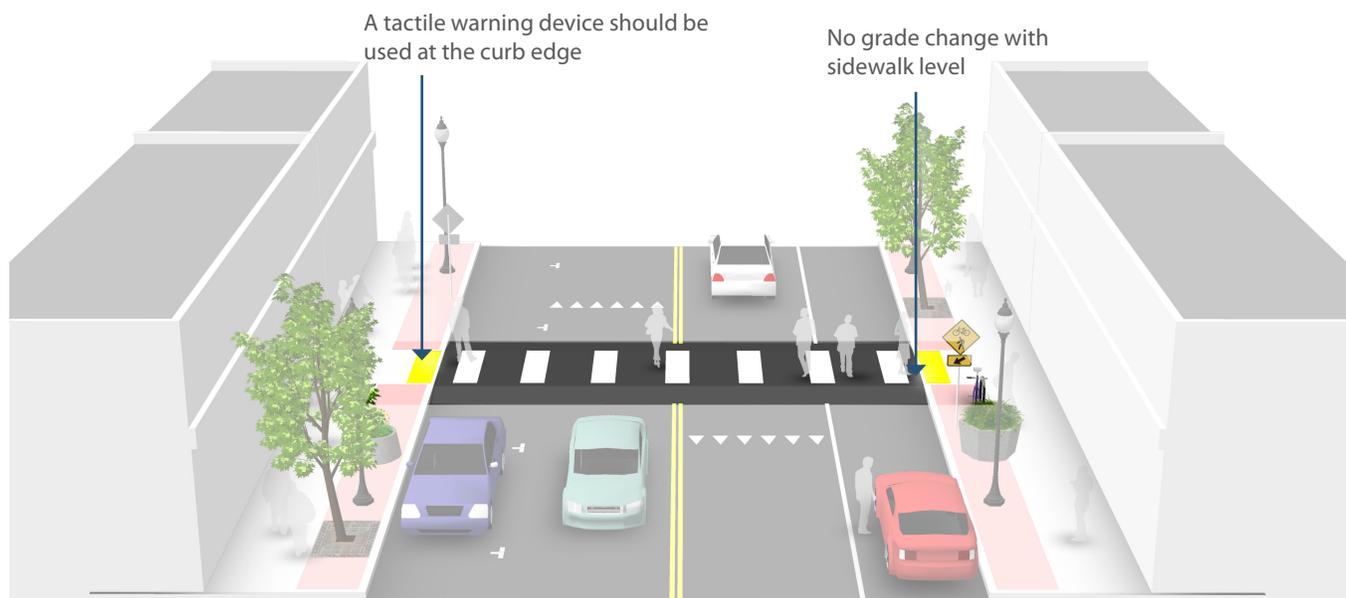
## Raised Crosswalks

### Description

A raised crosswalk or intersection can eliminate grade changes from the pedestrian path and give pedestrians greater prominence as they cross the street. Raised crosswalks should be used only in very limited cases where a special emphasis on pedestrians is desired, and application should be reviewed on case-by-case basis.

### Guidance

- Use detectable warnings at the curb edges to alert vision-impaired pedestrians that they are entering the roadway.
- Approaches to the raised crosswalk may be designed to be similar to speed humps.
- Raised crosswalks can also be used as a traffic calming treatment.



### Discussion

Like a speed hump, raised crosswalks have a traffic slowing effect which may be unsuitable on emergency response routes.

#### Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority.

#### Additional References

- FHWA. (2009). *Manual on Uniform Traffic Control Devices*. (3B.18)
- AASHTO. (2004). *Guide for the Planning, Design, and Operation of Pedestrian Facilities*.
- USDOT. (2010). *ADA Standards for Accessible Design*.
- NCDOT. (2012). *Complete Streets Planning and Design Guidelines*.

## Median Refuge Islands

### Description

Median refuge islands are located at the mid-point of a marked crossing and help improve pedestrian safety by allowing pedestrians to cross one direction of traffic at a time. Refuge islands minimize pedestrian exposure by shortening crossing distance and increasing the number of available gaps for crossing.

### Guidance

- Can be applied on any roadway with a left turn center lane or median that is at least 6' wide.
- Appropriate at signalized or unsignalized crosswalks
- The refuge island must be accessible, preferably with an at-grade passage through the island rather than ramps and landings.
- The island should be at least 6' wide between travel lanes (to accommodate bikes with trailers and wheelchair users) and at least 20' long.
- On streets with speeds higher than 25 mph there should also be double centerline marking, reflectors, and "KEEP RIGHT" signage.

Cut through median islands are preferred over curb ramps, to better accommodate bicyclists.



### Discussion

If a refuge island is landscaped, the landscaping should not compromise the visibility of pedestrians crossing in the crosswalk. Shrubs and ground plantings should be no higher than 1 ft 6 in. On multi-lane roadways, consider configuration with active warning beacons for improved yielding compliance.

### Materials and Maintenance

Refuge islands may collect road debris and may require somewhat frequent maintenance. Refuge islands should be visible to snow plow crews and should be kept free of snow berms that block access.

### Additional References

- FHWA. (2009). *Manual on Uniform Traffic Control Devices*.
- AASHTO. (2004). *Guide for the Planning, Design, and Operation of Pedestrian Facilities*.
- NACTO. (2012). *Urban Bikeway Design Guide*.
- NCDOT. (2012). *Complete Streets Planning and Design Guidelines*.

## ADA Compliant Curb Ramps

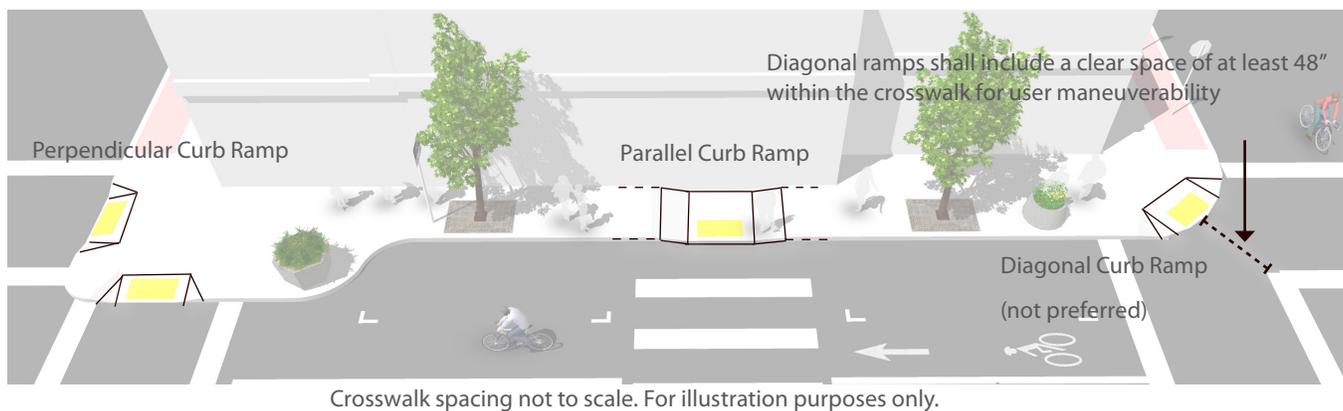
### Description

Curb ramps are the design elements that allow all users to make the transition from the street to the sidewalk. There are a number of factors to be considered in the design and placement of curb ramps at corners. Properly designed curb ramps ensure that the sidewalk is accessible from the roadway. A sidewalk without a curb ramp can be useless to someone in a wheelchair, forcing them back to a driveway and out into the street for access.

Although diagonal curb ramps might save money, they create potential safety and mobility problems for pedestrians, including reduced maneuverability and increased interaction with turning vehicles, particularly in areas with high traffic volumes. Diagonal curb ramp configurations are the least preferred of all options.

### Guidance

- The landing at the top of a ramp shall be at least 4 feet long and at least the same width as the ramp itself.
- The ramp shall slope no more than 1:50 (2.0%) in any direction.
- If the ramp runs directly into a crosswalk, the landing at the bottom will be in the roadway.
- If the ramp lands on a dropped landing within the sidewalk or corner area where someone in a wheelchair may have to change direction, the landing must be a minimum of 5'-0" long and at least as wide as the ramp, although a width of 5'-0" is preferred.



### Discussion

The edge of an ADA compliant curb ramp will be marked with a tactile warning device (also known as truncated domes) to alert people with visual impairments to changes in the pedestrian environment. Contrast between the raised tactile device and the surrounding infrastructure is important so that the change is readily evident. These devices are most effective when adjacent to smooth pavement so the difference is easily detected. The devices must provide color contrast so partially sighted people can see them.

#### Materials and Maintenance

It is critical that the interface between a curb ramp and the street be maintained adequately. Asphalt street sections can develop potholes at the foot of the ramp, which can catch the front wheels of a wheelchair.

#### Additional References

United States Access Board. (2002). *Accessibility Guidelines for Buildings and Facilities*.

United States Access Board. (2007). *Public Rights-of-Way Accessibility Guidelines (PROWAG)*.

USDOT. (2010). *ADA Standards for Accessible Design*.

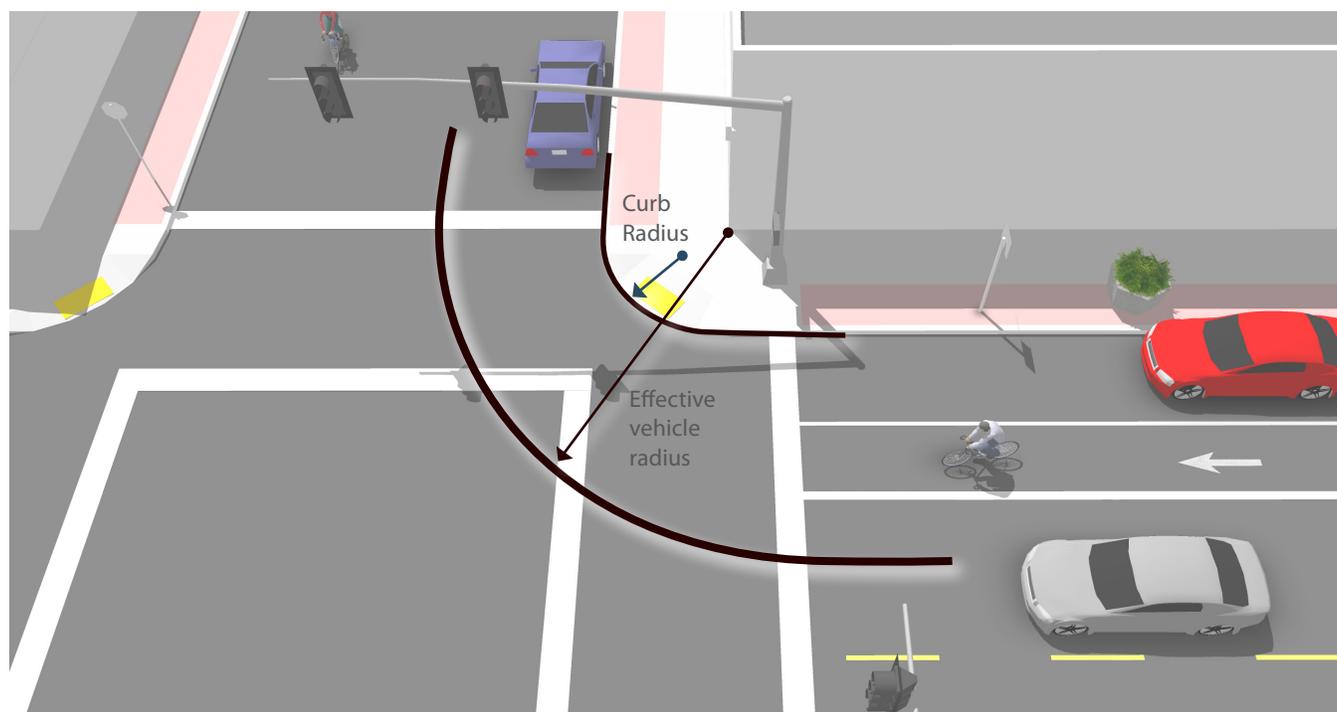
## Minimizing Curb Radii

### Description

The size of a curb’s radius can have a significant impact on pedestrian comfort and safety. A smaller curb radius provides more pedestrian area at the corner, allows more flexibility in the placement of curb ramps, results in a shorter crossing distance and requires vehicles to slow more on the intersection approach. During the design phase, the chosen radius should be the smallest possible for the circumstances.

### Guidance

- The radius may be as small as 3 ft where there are no turning movements, or 5 ft where there are turning movements, adequate street width, and a larger effective curb radius created by parking or bike lanes.



### Discussion

Several factors govern the choice of curb radius in any given location. These include the desired pedestrian area of the corner, traffic turning movements, street classifications, design vehicle turning radius, intersection geometry, and whether there is parking or a bike lane (or both) between the travel lane and the curb.

#### Materials and Maintenance

Improperly designed curb radii at corners may be subject to damage by large trucks.

#### Additional References

AASHTO. (2004). *Guide for the Planning, Design, and Operation of Pedestrian Facilities*.

AASHTO. (2004). *A Policy on Geometric Design of Highways and Streets*.

NC DOT. (2012). *Complete Streets Planning and Design Guidelines*.

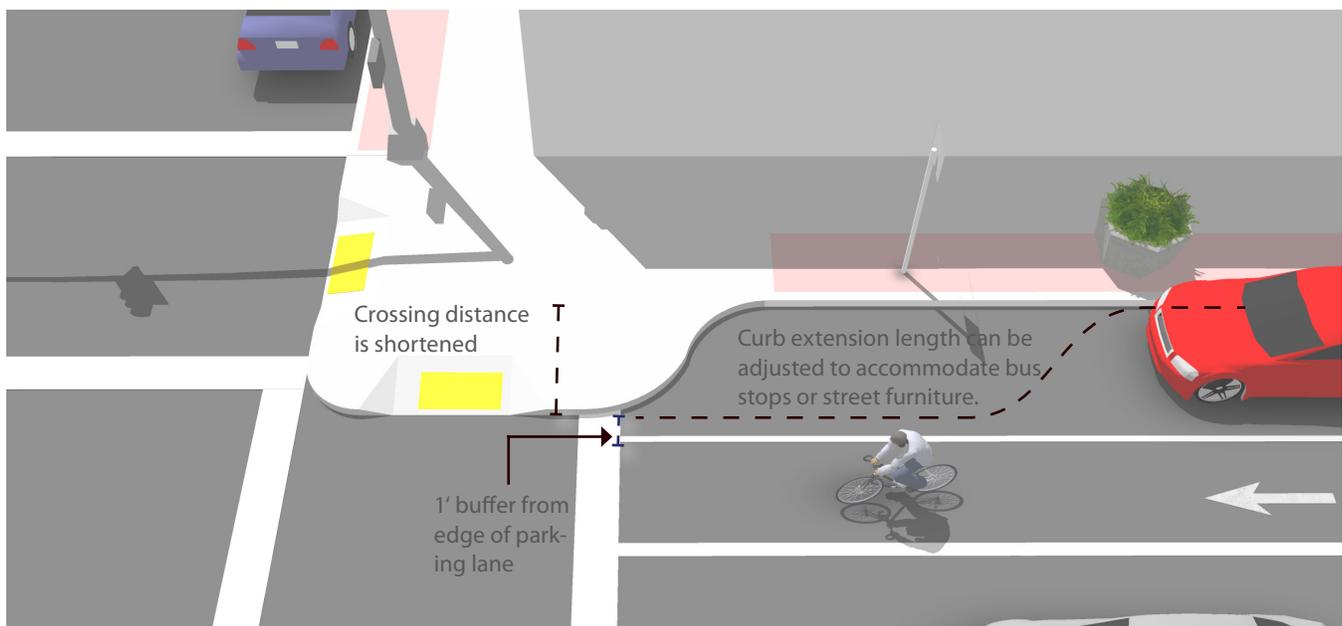
## Curb Extensions

### Description

Curb extensions minimize pedestrian exposure during crossing by shortening crossing distance and giving pedestrians a better chance to see and be seen before committing to crossing. They are appropriate for any crosswalk where it is desirable to shorten the crossing distance and there is a parking lane adjacent to the curb.

### Guidance

- In most cases, the curb extensions should be designed to transition between the extended curb and the running curb in the shortest practicable distance.
- For purposes of efficient street sweeping, the minimum radius for the reverse curves of the transition is 10 ft and the two radii should be balanced to be nearly equal.
- Curb extensions should terminate one foot short of the parking lane to maximize bicyclist safety.



### Discussion

If there is no parking lane, adding curb extensions may be a problem for bicycle travel and truck or bus turning movements.

#### Materials and Maintenance

Planted curb extensions may be designed as a bioswale, a vegetated system for stormwater management.

#### Additional References

AASHTO. (2004). *Guide for the Planning, Design, and Operation of Pedestrian Facilities*.

AASHTO. (2004). *A Policy on Geometric Design of Highways and Streets*.

NCDOT. (2012). *Complete Streets Planning and Design Guidelines*.

## SIGNALIZATION

Crossing beacons and signals facilitate crossings of roadways for pedestrians and bicyclists. Beacons make crossing intersections safer by clarifying when to enter an intersection and by alerting motorists to the presence of pedestrians and bicyclists.

Flashing amber warning beacons can be utilized at unsignalized intersection crossings. Push buttons, signage, and pavement markings may be used to highlight these facilities for pedestrians, bicyclists and motorists.

Determining which type of signal or beacon to use for a particular intersection depends on a variety of factors. These include speed limits, traffic volumes, and the anticipated levels of pedestrian and bicycle crossing traffic.

An intersection with crossing beacons may reduce stress and delays for crossing users, and discourage illegal and unsafe crossing maneuvers.

### *This Section Includes:*

- Pedestrians at Signalized Crossings
- Pedestrian Hybrid Beacon



*Pedestrians at signalized crossings*



*Pedestrian hybrid beacon*

## Pedestrians at Signalized Crossings

### Description

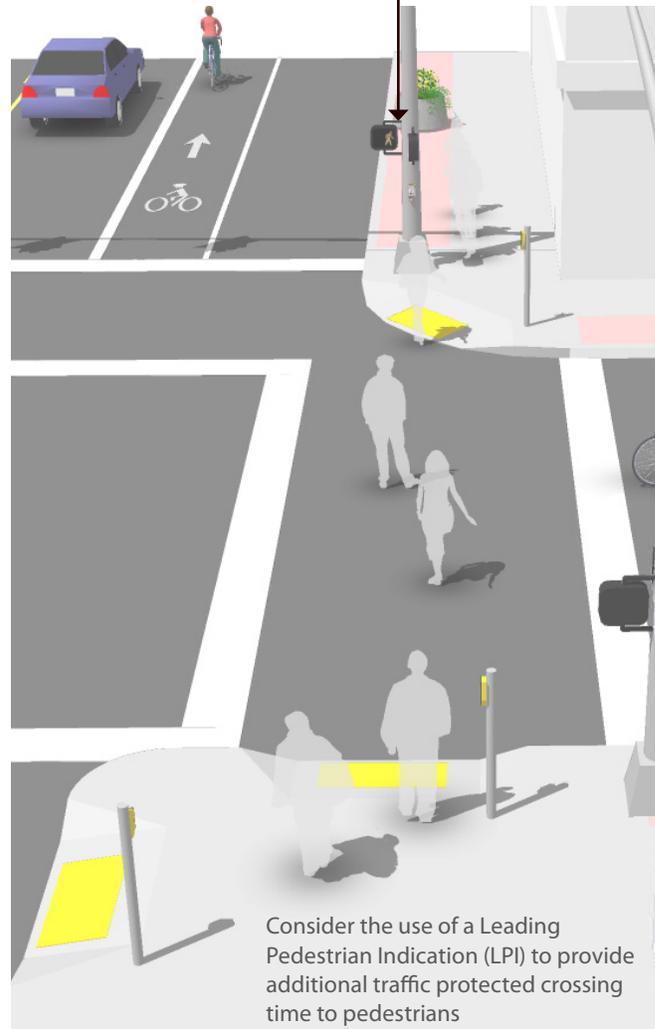
#### Pedestrian Signal Head

- All traffic signals should be equipped with pedestrian signal indications except where pedestrian crossing is prohibited by signage.
- Countdown signals should be used at all signalized intersections to indicate whether a pedestrian has time to cross the street before the signal phase ends.

#### Signal Timing

- Providing adequate pedestrian crossing time is a critical element of the walking environment at signalized intersections. The MUTCD recommends traffic signal timing to assume a pedestrian walking speed of 3.5' per second, meaning that the length of a signal phase with parallel pedestrian movements should provide sufficient time for a pedestrian to safely cross the adjacent street.
- At crossings where older pedestrians or pedestrians with disabilities are expected, crossing speeds as low as 3' per second may be assumed.
- In busy pedestrian areas such as downtowns, the pedestrian signal indication should be built into each signal phase, eliminating the requirement for a pedestrian to actuate the signal by pushing a button.

Audible pedestrian traffic signals provide crossing assistance to pedestrians with vision impairment at signalized intersections



Consider the use of a Leading Pedestrian Indication (LPI) to provide additional traffic protected crossing time to pedestrians

### Discussion

When push buttons are used, they should be located so that someone in a wheelchair can reach the button from a level area of the sidewalk without deviating significantly from the natural line of travel into the crosswalk, and marked (for example, with arrows) so that it is clear which signal is affected. In areas with very heavy pedestrian traffic, consider an all-pedestrian signal phase to give pedestrians free passage in the intersection when all motor vehicle traffic movements are stopped.

#### Materials and Maintenance

It is important to repair or replace traffic control equipment before it fails. Consider semi-annual inspections of controller and signal equipment, intersection hardware, and loop detectors.

#### Additional References

United States Access Board. (2007). *Public Rights-of-Way Accessibility Guidelines (PROWAG)*.

AASHTO. (2004). *Guide for the Planning, Design, and Operation of Pedestrian Facilities*.

NCDOT. (2012). *Complete Streets Planning and Design Guidelines*.

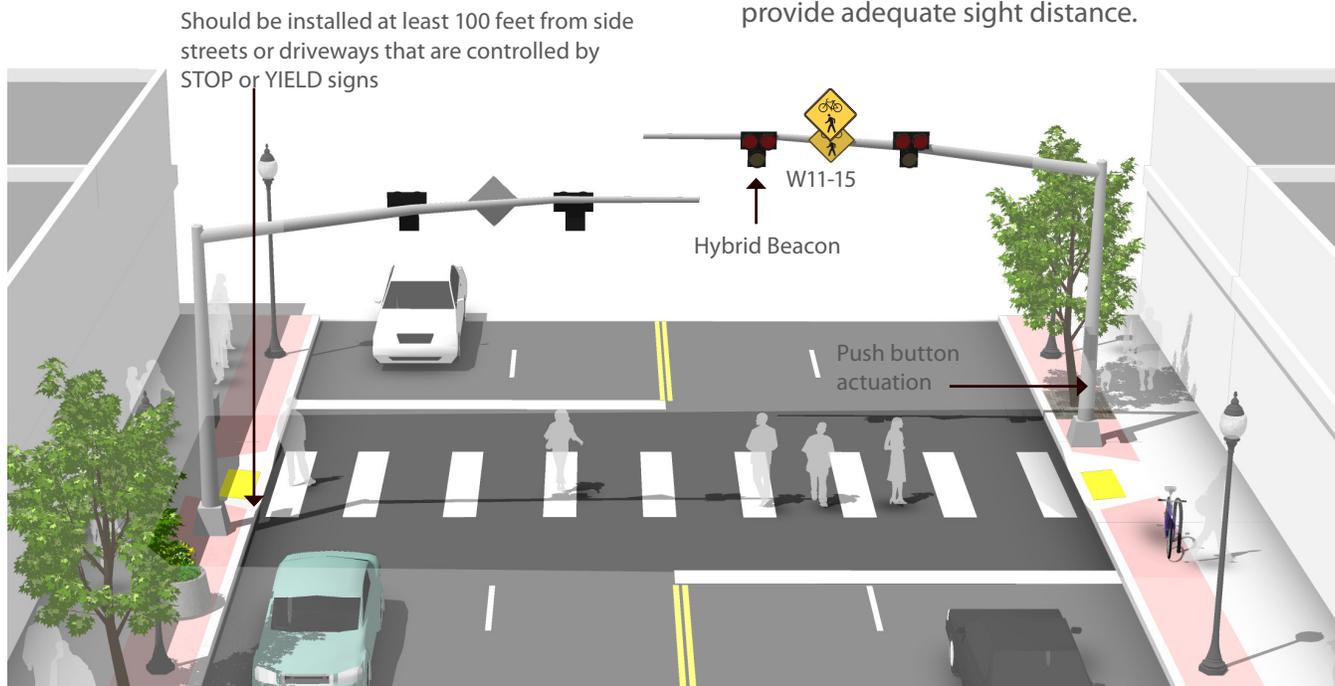
## Pedestrian Hybrid Beacon

### Description

Hybrid beacons are used to improve non-motorized crossings of major streets. A hybrid beacon consists of a signal-head with two red lenses over a single yellow lens on the major street, and a pedestrian signal head for the crosswalk

### Guidance

- Hybrid beacons may be installed without meeting traffic signal control warrants if roadway speed and volumes are excessive for comfortable pedestrian crossings.
- If installed within a signal system, signal engineers should evaluate the need for the hybrid signal to be coordinated with other signals.
- Parking and other sight obstructions should be prohibited for at least 100 feet in advance of and at least 20 feet beyond the marked crosswalk to provide adequate sight distance.



### Discussion

Hybrid beacon signals are normally activated by push buttons, but may also be triggered by infrared, microwave or video detectors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street. Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety.

### Materials and Maintenance

Hybrid beacons are subject to the same maintenance needs and requirements as standard traffic signals. Signing and striping need to be maintained to help users understand any unfamiliar traffic control.

### Additional References and Guidelines

FHWA. (2009). *Manual on Uniform Traffic Control Devices*.

NACTO. (2012). *Urban Bikeway Design Guide*.

NCDOT. (2012). *Complete Streets Planning and Design Guidelines*.



## Active Warning Beacons

### Description

Active warning beacons are user actuated illuminated devices designed to increase motor vehicle yielding compliance at crossings of multi lane or high volume roadways.

Types of active warning beacons include conventional circular yellow flashing beacons, in-roadway warning lights, or rectangular rapid flash beacons (RRFB).

### Guidance

- Warning beacons shall not be used at crosswalks controlled by YIELD signs, STOP signs or traffic signals.
- Warning beacons shall initiate operation based on pedestrian or bicyclist actuation and shall cease operation at a predetermined time after actuation or, with passive detection, after the pedestrian or bicyclist clears the crosswalk.



### Discussion

Rectangular rapid flash beacons have the highest compliance of all the warning beacon enhancement options.

A study of the effectiveness of going from a no-beacon arrangement to a two-beacon RRFB installation increased yielding from 18 percent to 81 percent. A four-beacon arrangement raised compliance to 88 percent. Additional studies over long term installations show little to no decrease in yielding behavior over time.

### Materials and Maintenance

Depending on power supply, maintenance can be minimal. If solar power is used, RRFBs can run for years without issue.

### Additional References

- NACTO. (2012). *Urban Bikeway Design Guide*.
- FHWA. (2009). *Manual on Uniform Traffic Control Devices*.
- FHWA. (2008). *MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11)*.

## PEDESTRIAN SIGNS AND WAYFINDING

Signage provides important safety and wayfinding information to motorist and pedestrian residents and tourists. From a safety standpoint, motorists should be given advance warning of upcoming pedestrian crossings or of traffic calming areas. Signage of any type should be used and regulated judiciously. An inordinate amount of signs creates visual clutter. Under such a condition, important safety or wayfinding information may be ignored resulting in confusion and possible pedestrian vehicle conflict. Regulations should also address the orientation, height, size, and sometimes even style of signage to comply with a desired local aesthetic.

### Regulatory Signage

Regulatory signage is used to inform motorists or pedestrians of a legal requirement and should only be used when a legal requirement is not otherwise apparent (AASHTO, 2004: Guide for the Planning, Design, and Operation of Pedestrian Facilities).

### Warning Signage

Warning signage is used to inform motorists and pedestrians of unexpected or unusual conditions. When used, they should be placed to provide adequate response times. These include school warning signs and pedestrian crossing signs.

### Informational and Wayfinding Signage

Informational and wayfinding signage can provide information providing guidance to a location along a trail or other pedestrian facility. Wayfinding signage should orient and communicate in a clear, concise and functional manner. It should enhance pedestrian circulation and direct visitors and residents to important destinations. A cost-effective signage program can be implemented quickly and easily through the “Walk [Your City]” program (see below). Signs can be customized for bicycling. Visit <http://walkyourcity.org/> for more information.

In doing so, the goal is to increase the comfort of visitors and residents while helping to convey a local identity. Maintenance of signage is as important as walkway maintenance. Clean, graffiti free, and relevant signage enhances guidance, recognition, and safety for pedestrians.



Regulatory signs



Road signage has traditionally been expensive and car-centered, leaving walkers and bikers by the wayside. Walk [Your City] lets anyone from citizens to corporations quickly and affordably promote healthy lifestyles, public safety, and human-centered transit.



S1-1



S3-1



W11-2



W15-1



I-4

SIGN	MUTCD CODE	MUTCD SECTION	CONVENTIONAL ROAD	REGULATORY
Yield here to Peds	R1-5	2B.11	450x450 (18x18)	REGULATORY
Yield here to Peds	R1-5a	2B.11	450x600 (18x24)	
In-Street Ped Crossing	R1-6, R1-6a	2B.12	300x900 (12x36)	
Peds and Bikes Prohibited	R5-10b	2B.36	750x450 (30x18)	
Peds Prohibited	R5-10c	2B.36	600x300 (24x12)	
Walk on Left Facing Traffic	R9-1	2B.43	450x600 (18x24)	
Cross only at Crosswalks	R9-2	2B.44	300x450 (12x18)	
No Ped Crossing	R9-3a	2B.44	450x450 (18x18)	
No Hitch Hiking	R9-4	2B.43	450x600 (18x24)	
No Hitch Hiking (symbol)	R9-4a	2B.43	450x450 (18x18)	
Bikes Yield to Peds	R9-6	9B.10	300x450 (12x18)	
Ped Traffic Symbol	R10-4b	2B.45	225x300 (9x12)	
School Advance Warning	S1-1	7B.08	900x900 (36x36)	SCHOOL, WARNING, INFORMATIONAL
School Bus Stop Ahead	S3-1	7B.10	750x750 (30x30)	
Pedestrian Traffic	W11-2	2C.41	750x750 (30x30)	
Playground	W15-1	2C.42	750x750 (30x30)	
Hiking Trail	I-4	--	600x600 (24x24)	

1. Larger signs may be used when appropriate.
2. Dimensions are shown in millimeters followed by inches in parentheses and are shown as width x height.
3. First dimension in millimeters; dimensions in parentheses are in inches.
4. All information in table taken directly from MUTCD.

For a step-by-step guide to help non-professionals participate in the process of developing and designing a signage system, as well as information on the range of signage types, visit the Project for Public Places website: [http://www.pps.org/reference/signage\\_guide](http://www.pps.org/reference/signage_guide)

## DESIGN NEEDS OF BICYCLISTS

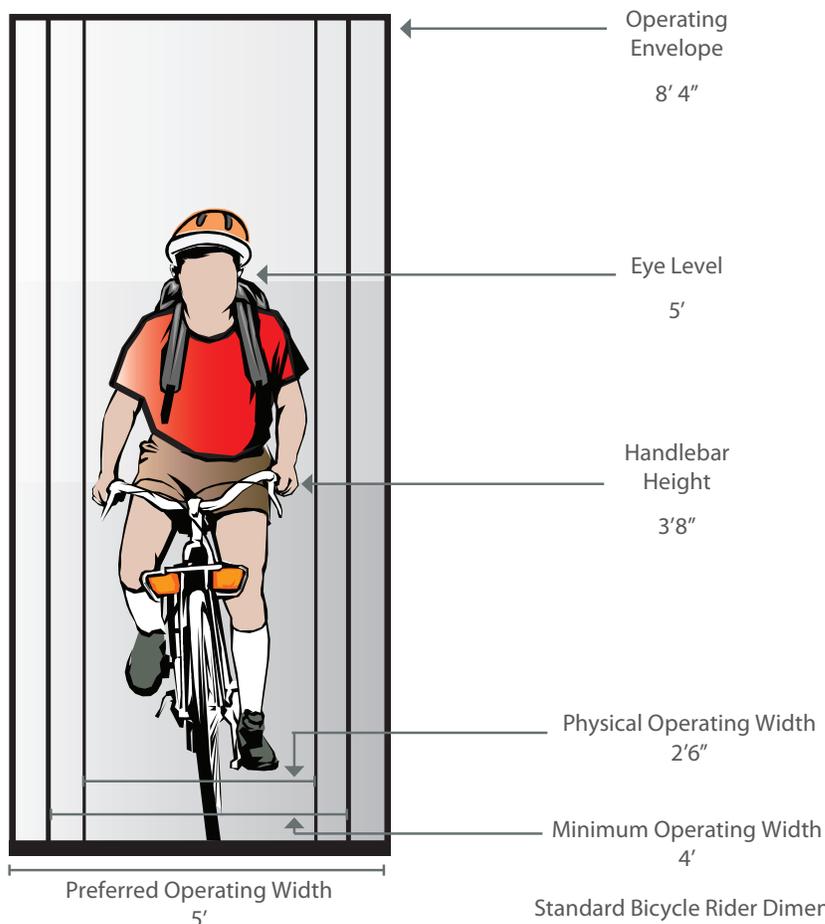
The purpose of this section is to provide the facility designer with an understanding of how bicyclists operate and how their bicycle influences that operation. Bicyclists, by nature, are much more affected by poor facility design, construction, and maintenance practices than motor vehicle drivers. Bicyclists lack the protection from the elements and roadway hazards provided by an automobile’s structure and safety features. By understanding the unique characteristics and needs of bicyclists, a facility designer can provide quality facilities and minimize user risk.

### Bicycle as a Design Vehicle

Similar to motor vehicles, bicyclists and their bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The design of a bikeway should consider reasonably expected bicycle types on the facility and utilize the appropriate dimensions.

The figure below illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility. This is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable.

In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories. The figure and table below summarize the typical dimensions for bicycle types.



Standard Bicycle Rider Dimensions

Source: AASHTO Guide for the Development of Bicycle Facilities, 3rd Edition

## SHARED ROADWAYS

On shared roadways, bicyclists and motor vehicles use the same roadway space. These facilities are typically used on roads with low speeds and traffic volumes, however they can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.

Shared roadways employ a large variety of treatments from simple signage and shared lane markings to more complex treatments including directional signage, traffic diverters, chicanes, chokers, and/or other traffic calming devices to reduce vehicle speeds or volumes.



*Signed Shared Roadway*



*Marked Shared Roadway*

### *This section includes:*

- Signed Shared Roadway
- Marked Shared Roadway

## SIGNED SHARED ROADWAYS

### Description

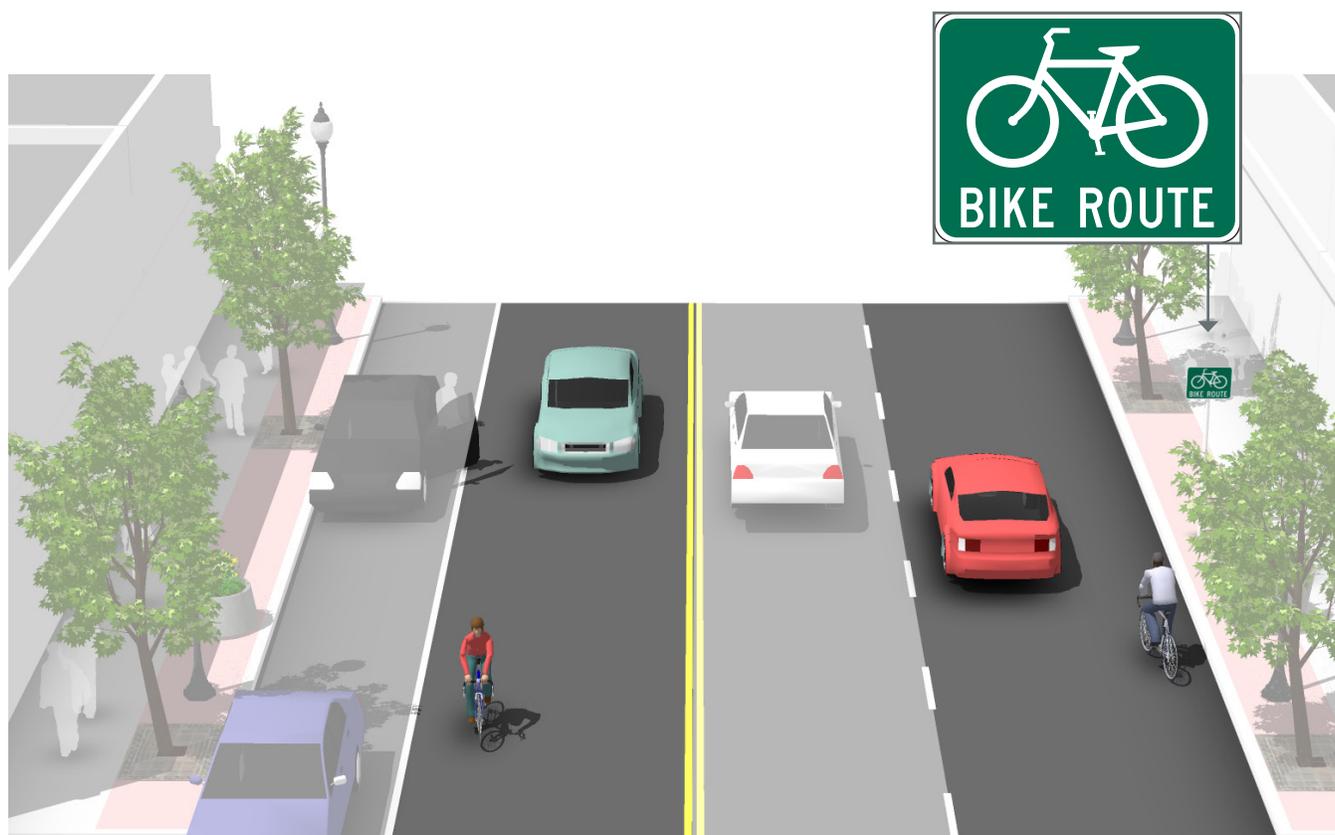
Signed Shared Roadways are facilities shared with motor vehicles. They are typically used on roads with low speeds and traffic volumes, however can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.

### Guidance

Lane width varies depending on roadway configuration.

Bicycle Route signage (D11-1) should be applied at intervals frequent enough to keep bicyclists informed of changes in route direction and to remind motorists of the presence of bicyclists. Commonly, this includes placement at:

- Beginning or end of Bicycle Route.
- At major changes in direction or at intersections with other bicycle routes.
- At intervals along bicycle routes not to exceed ½ mile.



### Discussion

Signed Shared Roadways serve either to provide continuity with other bicycle facilities (usually bike lanes) or to designate preferred routes through high-demand corridors.

### Materials and Maintenance

Maintenance needs for bicycle wayfinding signs are similar to other signs, and will need periodic replacement due to wear.

### Additional References

AASHTO. (2012). Guide for the Development of Bicycle Facilities. FHWA. (2009). Manual on Uniform Traffic Control Devices.

## MARKED SHARED ROADWAY

### Description

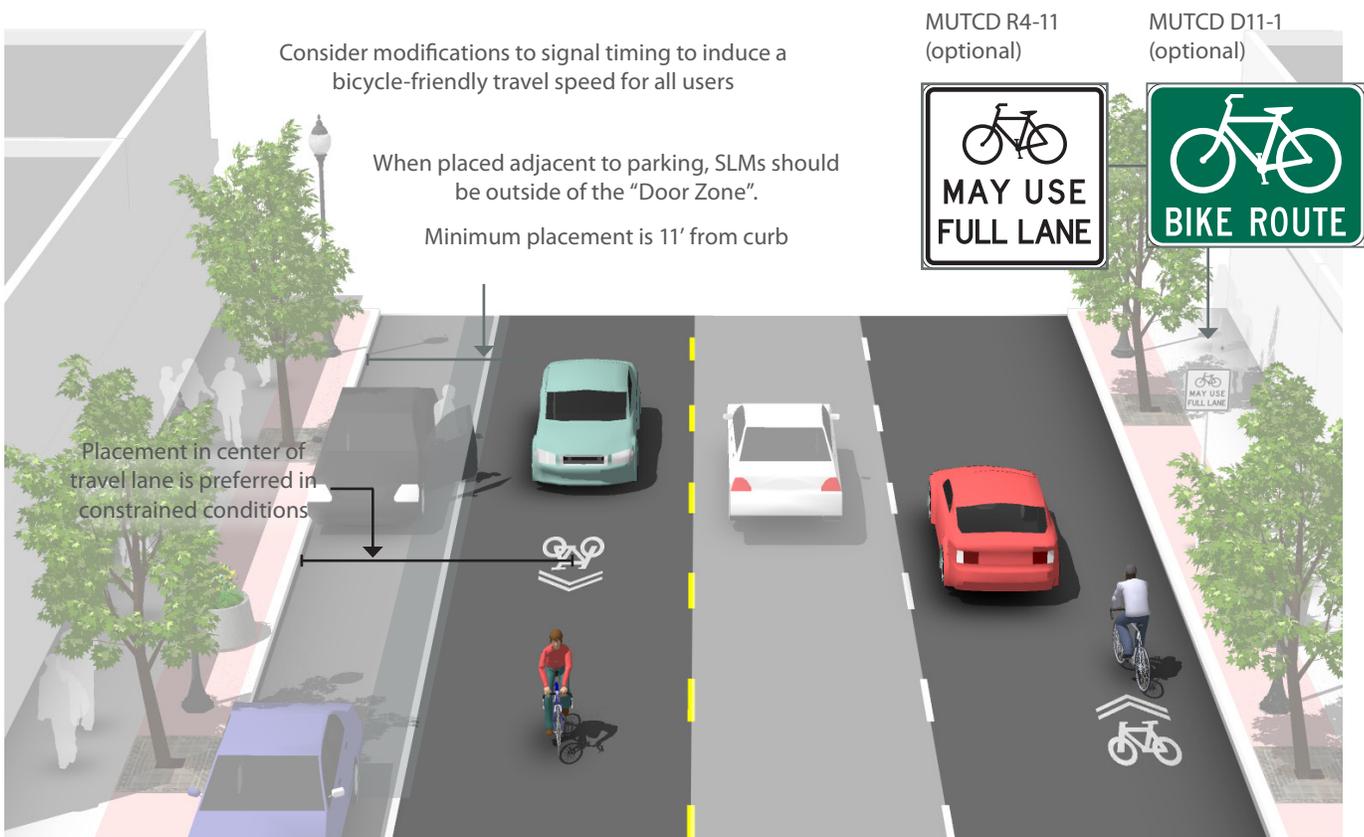
A marked shared roadway is a general purpose travel lane marked with shared lane markings (SLM) used to encourage bicycle travel and proper positioning within the lane.

In constrained conditions, the SLMs are placed in the middle of the lane to discourage unsafe passing by motor vehicles. On a wide outside lane, the SLMs can be used to promote bicycle travel to the right of motor vehicles.

In all conditions, SLMs should be placed outside of the door zone of parked cars.

### Guidance

- In constrained conditions, preferred placement is in the center of the travel lane to minimize wear and promote single file travel.
- Minimum placement of SLM marking centerline is 11 feet from edge of curb where on-street parking is present, 4 feet from edge of curb with no parking. If parking lane is wider than 7.5 feet, the SLM should be moved further out accordingly.



### Discussion

Bike lanes should be considered on roadways with outside travel lanes wider than 15 feet, or where other lane narrowing or removal strategies may provide adequate road space. SLMs shall not be used on shoulders, in designated bike lanes, or to designate bicycle detection at signalized intersections. (MUTCD 9C.07)

### Materials and Maintenance

Placing SLMs between vehicle tire tracks will increase the life of the markings and minimize the long-term cost of the treatment.

### Additional References

AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.  
 FHWA. (2009). *Manual on Uniform Traffic Control Devices*.  
 NACTO. (2012). *Urban Bikeway Design Guide*.

## SEPARATED BIKEWAYS

Designated exclusively for bicycle travel, separated bikeways are segregated from vehicle travel lanes by striping, and can include pavement stencils and other treatments. Separated bikeways are most appropriate on arterial and collector streets where higher traffic volumes and speeds warrant greater separation.

Separated bikeways can increase safety and promote proper riding by:

- Defining road space for bicyclists and motorists, reducing the possibility that motorists will stray into the bicyclists' path.
- Discouraging bicyclists from riding on the sidewalk.
- Reducing the incidence of wrong way riding.
- Reminding motorists that bicyclists have a right to the road.



*Shoulder Bikeways*



*Bicycle Lanes*

### *This section includes:*

- Shoulder Bikeways
- Bicycle Lanes



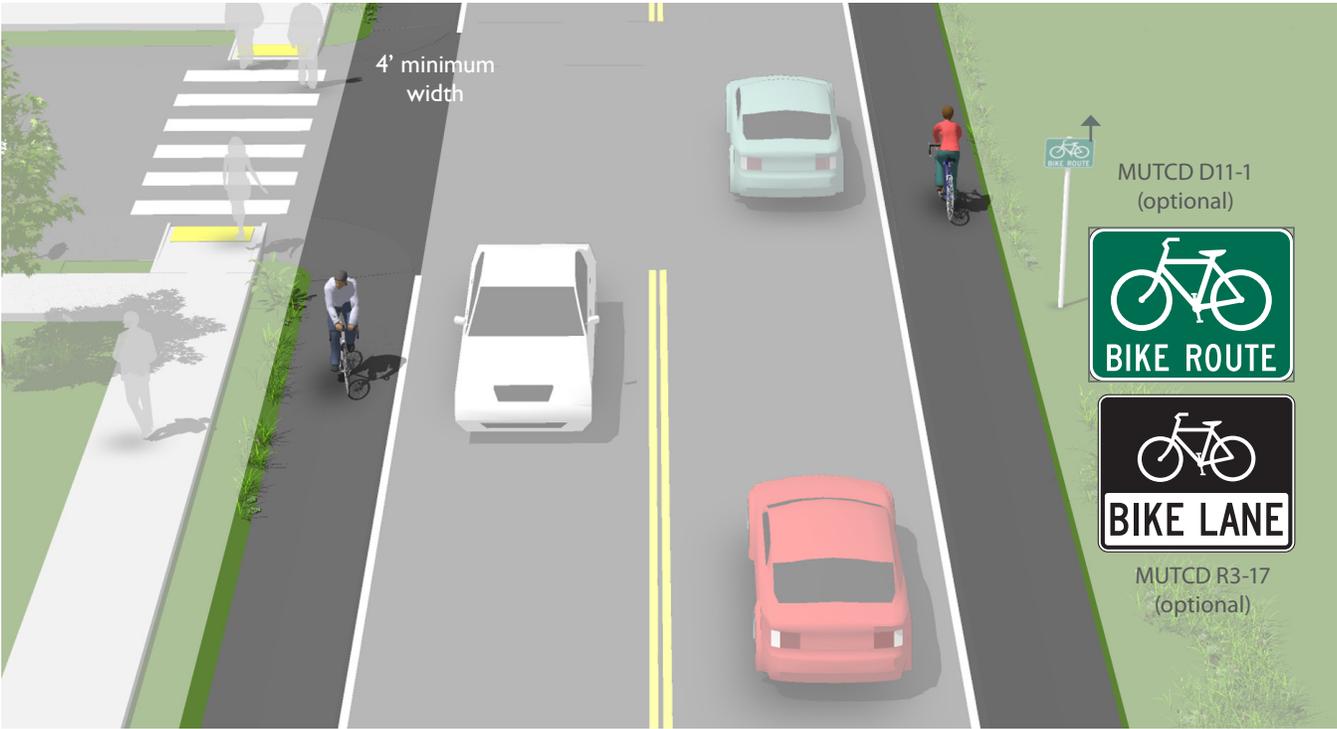
# SHOULDER BIKEWAYS

## Description

Typically found in less-dense areas, shoulder bikeways are paved roadways with striped shoulders (4'+) wide enough for bicycle travel. Shoulder bikeways often, but not always, include signage alerting motorists to expect bicycle travel along the roadway. Shoulder bikeways should be considered a temporary treatment, with full bike lanes planned for construction when the roadway is widened or completed with curb and gutter. This type of treatment is not typical in urban areas and should only be used where constraints exist.

## Guidance

- 4 foot minimum width. Greater widths preferred.
- If it is not possible to meet minimum bicycle lane dimensions, a reduced width paved shoulder can still improve conditions for bicyclists on constrained roadways. In these situations, a minimum of 3 feet of operating space should be provided.



## Discussion

A wide outside lane may be sufficient accommodation for bicyclists on streets with insufficient width for bike lanes but which do have space available to provide a wider (14'-16') outside travel lane. Consider configuring as a marked shared roadway in these locations. Where feasible, roadway widening should be performed with pavement resurfacing jobs.

### Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Shoulder bikeways should be cleared of snow through routine snow removal operations.

### Additional References

AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.  
 FHWA. (2009). *Manual on Uniform Traffic Control Devices*.  
 NCDOT. (1994). *Bicycle Facilities Planning and Design Guidelines*.

## BICYCLE LANES

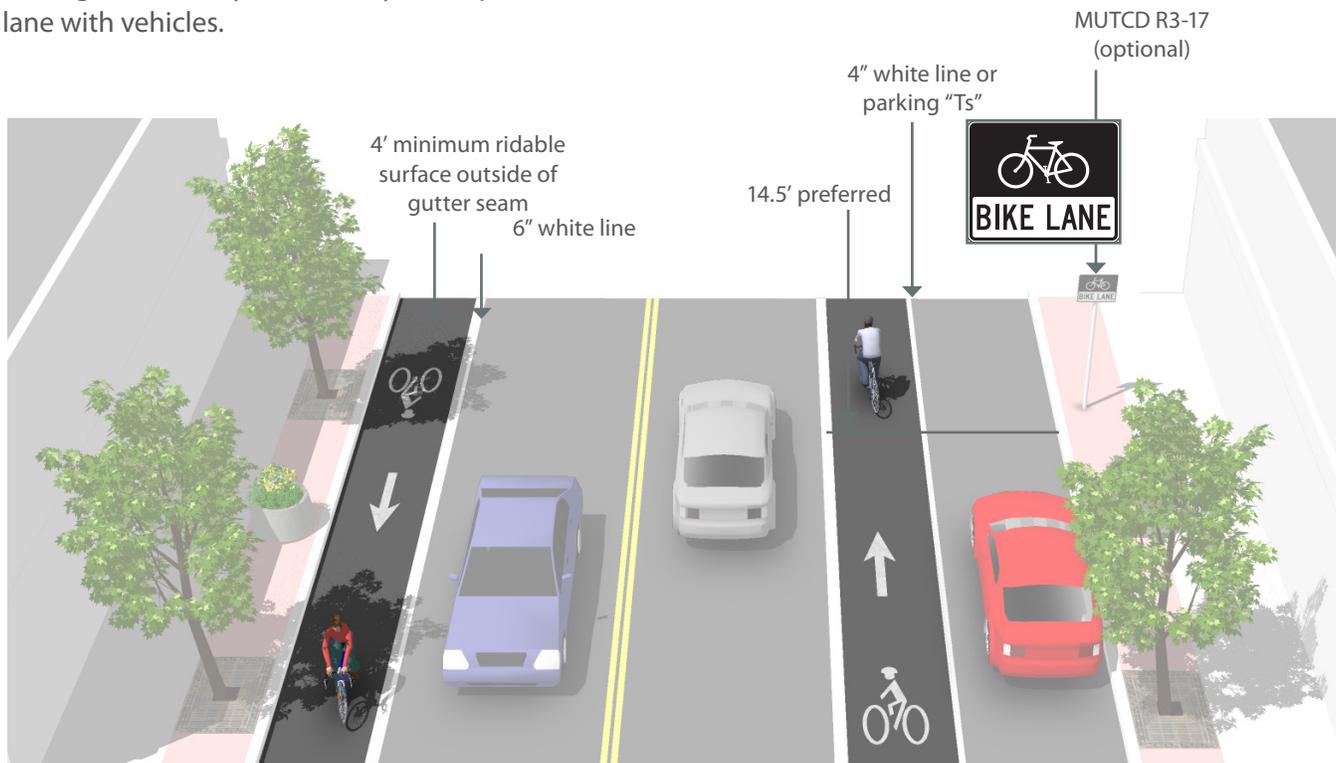
### Description

Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane.

Many bicyclists, particularly less experienced riders, are more comfortable riding on a busy street if it has a striped and signed bikeway than if they are expected to share a lane with vehicles.

### Guidance

- 4 foot minimum when no curb and gutter is present.
- 5 foot minimum when adjacent to curb and gutter or 3 feet more than the gutter pan width if the gutter pan is wider than 2 feet.
- 14.5 foot preferred from curb face to edge of bike lane. (12 foot minimum).
- 7 foot maximum width for use adjacent to arterials with high travel speeds. Greater widths may encourage motor vehicle use of bike lane.



### Discussion

Wider bicycle lanes are desirable in certain situations such as on higher speed arterials (45 mph+) where use of a wider bicycle lane would increase separation between passing vehicles and bicyclists. Appropriate signing and stenciling is important with wide bicycle lanes to ensure motorists do not mistake the lane for a vehicle lane or parking lane.

### Materials and Maintenance

Paint can wear more quickly in high traffic areas or in winter climates. Bicycle lanes should be cleared of snow through routine snow removal operations.

### Additional References

- AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.
- FHWA. (2009). *Manual on Uniform Traffic Control Devices*.
- NACTO. (2012). *Urban Bikeway Design Guide*.
- NCDOT. (2000). *Traditional Neighborhood Development (TND) Guidelines*.
- NCDOT. (1994). *Bicycle Facilities Planning and Design Guidelines*.



## SEPARATED BIKEWAYS AT INTERSECTIONS

Intersections are junctions at which different modes of transportation meet and facilities overlap. An intersection facilitates the interchange between bicyclists, motorists, pedestrians and other modes in order to advance traffic flow in a safe and efficient manner. Designs for intersections with bicycle facilities should reduce conflict between bicyclists (and other vulnerable road users) and vehicles by heightening the level of visibility, denoting clear right-of-way and facilitating eye contact and awareness with other modes. Intersection treatments can improve both queuing and merging maneuvers for bicyclists, and are often coordinated with timed or specialized signals.

The configuration of a safe intersection for bicyclists may include elements such as color, signage, medians, signal detection and pavement markings. Intersection design should take into consideration existing and anticipated bicyclist, pedestrian and motorist movements. In all cases, the degree of mixing or separation between bicyclists and other modes is intended to reduce the risk of crashes and increase bicyclist comfort. The level of treatment required for bicyclists at an intersection will depend on the bicycle facility type used, whether bicycle facilities are intersecting, and the adjacent street function and land use.

***This section includes:***

- Bike Lanes at Right Turn Only Lanes
- Combined Bike Lane/Turn Lane
- Intersection Crossing Markings
- Bicycles at Single Lane Roundabouts



*Bike Lanes at Right Turn Only Lanes*



*Combined Bike Lane/Turn Lane*



*Intersection Crossing Markings*



*Bicyclists at Single Lane Roundabouts*

## BIKE LANES AT RIGHT TURN ONLY LANES

### Description

The appropriate treatment at right-turn lanes is to place the bike lane between the right-turn lane and the right-most through lane or, where right-of-way is insufficient, to use a shared bike lane/turn lane.

The design (right) illustrates a bike lane pocket, with signage indicating that motorists should yield to bicyclists through the conflict area.

### Guidance

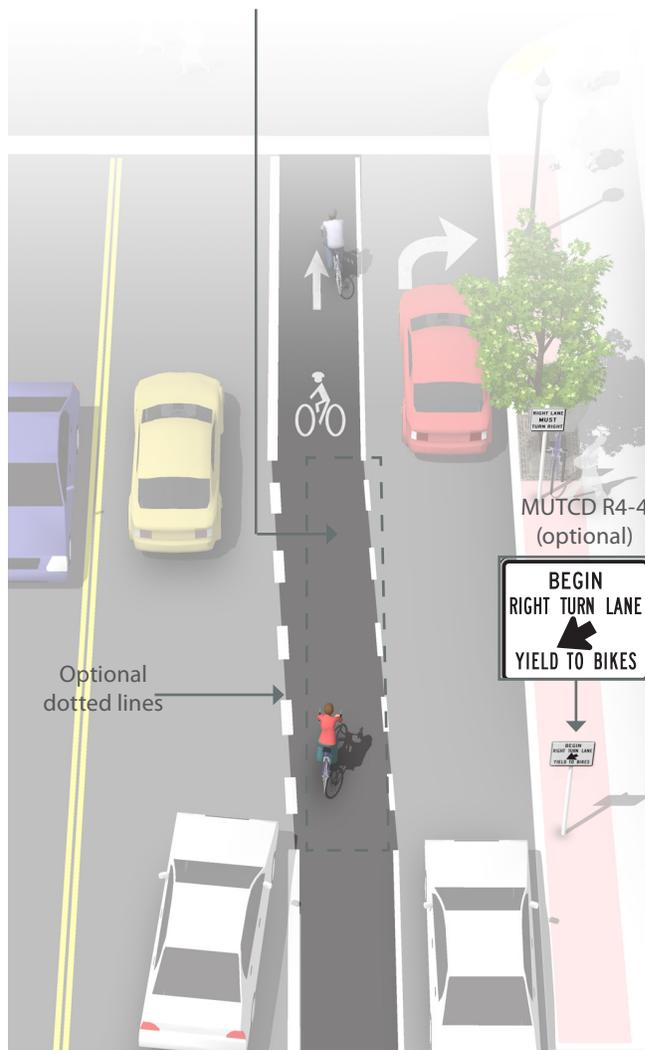
At auxiliary right turn only lanes (add lane):

- Continue existing bike lane width; standard width of 5 to 6 feet or 4 feet in constrained locations.
- Use signage to indicate that motorists should yield to bicyclists through the conflict area.
- Consider using colored conflict areas to promote visibility of the mixing zone.

Where a through lane becomes a right turn only lane:

- Do not define a dotted line merging path for bicyclists.
- Drop the bicycle lane in advance of the merge area.
- Use shared lane markings to indicate shared use of the lane in the merging zone.

Colored pavement may be used in the weaving area to increase visibility and awareness of potential conflict



### Discussion

For other potential approaches to providing accommodations for bicyclists at intersections with turn lanes, please see Combined Bike Lane/Turn Lane on the following page.

### Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

### Additional References

- AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.
- FHWA. (2009). *Manual on Uniform Traffic Control Devices*.
- NACTO. (2012). *Urban Bikeway Design Guide*.

## COMBINED BIKE LANE / TURN LANE

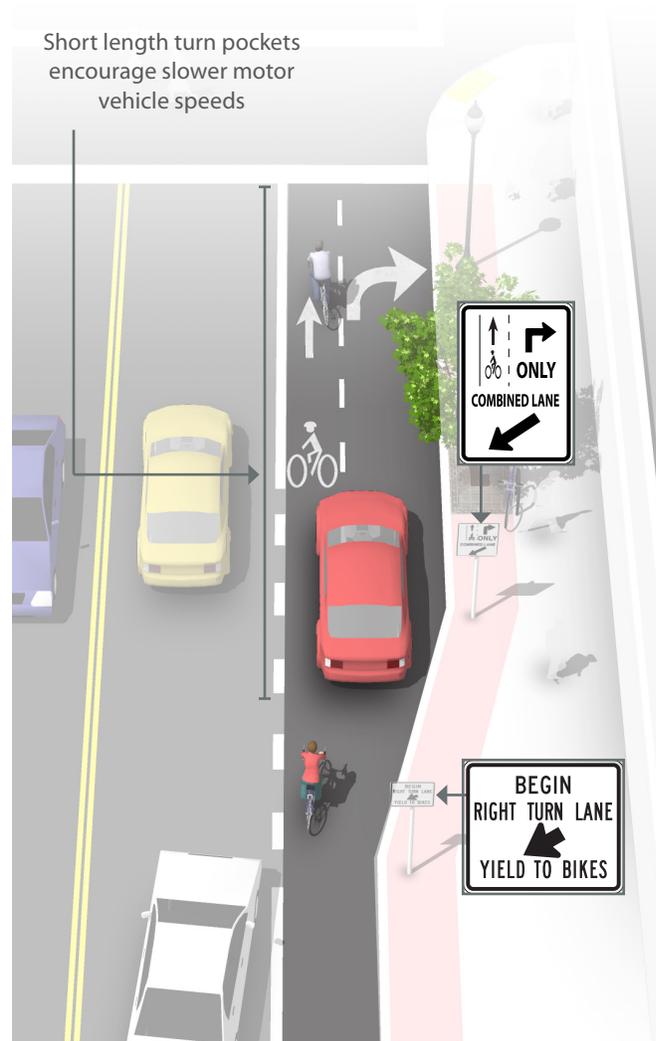
### Description

The combined bicycle/right turn lane places a standard-width bike lane on the left side of a dedicated right turn lane. A dotted line delineates the space for bicyclists and motorists within the shared lane. This treatment includes signage advising motorists and bicyclists of proper positioning within the lane.

This treatment is recommended at intersections lacking sufficient space to accommodate both a standard through bike lane and right turn lane.

### Guidance

- Maximum shared turn lane width is 13 feet; narrower is preferable.
- Bike Lane pocket should have a minimum width of 4 feet with 5 feet preferred.
- A dotted 4 inch line and bicycle lane marking should be used to clarify bicyclist positioning within the combined lane, without excluding cars from the suggested bicycle area.
- A "Right Turn Only" sign with an "Except Bicycles" plaque may be needed to make it legal for through bicyclists to use a right turn lane.



### Discussion

Case studies cited by the Pedestrian and Bicycle Information Center indicate that this treatment works best on streets with lower posted speeds (30 MPH or less) and with lower traffic volumes (10,000 ADT or less). May not be appropriate for high-speed arterials or intersections with long right turn lanes. May not be appropriate for intersections with large percentages of right-turning heavy vehicles.

### Materials and Maintenance

Locate markings out of tire tread to minimize wear. Because the effectiveness of markings depends on their visibility, maintaining markings should be a high priority.

### Additional References

NACTO. (2012). *Urban Bikeway Design Guide*.

*This treatment is currently slated for inclusion in the next edition of the AASHTO Guide for the Development of Bicycle Facilities*

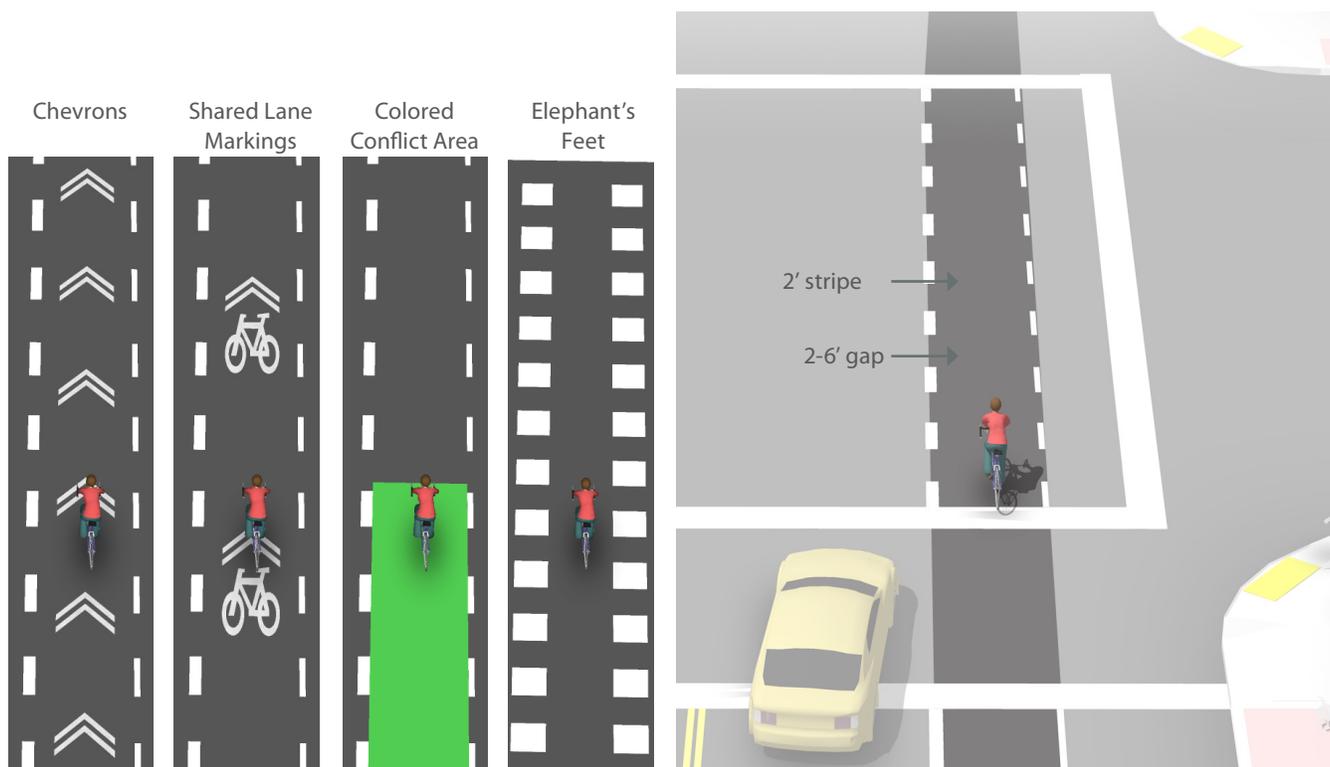
## INTERSECTION CROSSING MARKINGS

### Description

Bicycle pavement markings through intersections indicate the intended path of bicyclists through an intersection or across a driveway or ramp. They guide bicyclists on a safe and direct path through the intersection and provide a clear boundary between the paths of through bicyclists and either through or crossing motor vehicles in the adjacent lane.

### Guidance

- See MUTCD Section 3B.08: “dotted line extensions”
- Crossing striping shall be at least six inches wide when adjacent to motor vehicle travel lanes. Dotted lines should be two-foot lines spaced two to six feet apart.
- Chevrons, shared lane markings, or colored bike lanes may be used to increase visibility within conflict areas or across entire intersections. Elephant’s Feet markings are common in Canada, and in use in Chicago, IL.



### Discussion

Additional markings such as chevrons, shared lane markings, or colored bike lanes in conflict areas are strategies currently in use in the United States and Canada. Cities considering the implementation of markings through intersections should standardize future designs to avoid confusion.

### Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority.

### Additional References

- AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.
- FHWA. (2009). *Manual on Uniform Traffic Control Devices*. (3A.06)
- NACTO. (2012). *Urban Bikeway Design Guide*.

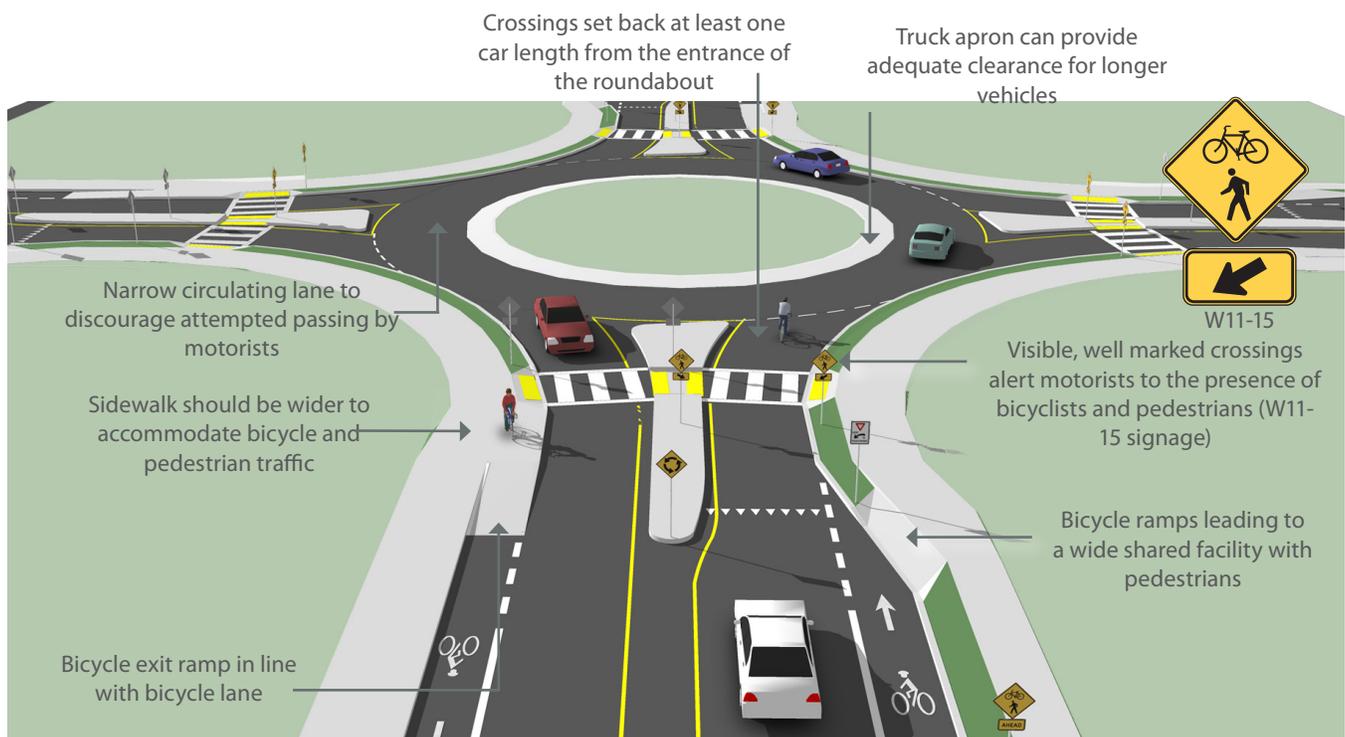
## BICYCLISTS AT SINGLE LANE ROUNDABOUTS

### Description

In single lane roundabouts it is important to indicate to motorists, bicyclists and pedestrians the right-of-way rules and correct way for them to circulate, using appropriately designed signage, pavement markings, and geometric design elements.

### Guidelines

- 25 mph maximum circulating design speed.
- Design approaches/exits to the lowest speeds possible.
- Encourage bicyclists navigating the roundabout like motor vehicles to “take the lane.”
- Maximize yielding rate of motorists to pedestrians and bicyclists at crosswalks.
- Provide separated facilities for bicyclists who prefer not to navigate the roundabout on the roadway.



### Discussion

Research indicates that while single-lane roundabouts may benefit bicyclists and pedestrians by slowing traffic, multi-lane roundabouts may present greater challenges and significantly increase safety problems for these users.

### Materials and Maintenance

Signage and striping require routine maintenance.

### Additional References

AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.  
 FHWA. (2000). *Roundabouts: An Informational Guide*  
 FHWA. (2010). *Roundabouts: An Informational Guide, Second Edition*. NCHRP 672

## SIGNAGE PROGRAMS

A comprehensive system of signage ensures that information is provided regarding the safe and appropriate use of all facilities, both on-road and on multi-use trails. The bicycle network should be signed seamlessly with other alternative transportation routes, such as bicycle routes from neighboring jurisdictions, trails, historic and/or cultural walking tours, and wherever possible, local transit systems.

Signage includes post- or pole-mounted signs and pavement striping. Signage is further divided into information signs, directional/wayfinding signs, regulatory signs and warning signs. Trail signage should conform to the Manual on Uniform Traffic Control Devices and the American Association of State Highway Transportation Official Guide for the Development of Bicycle Facilities. Bicycle signage should also be coordinated with local colleges and universities.

Share the Road signs are intended for use on roadways with high use by bicyclists. This sign reminds motorists that bicyclists have the right to ride on the roadway.



### Directional Signs

Implementing a well-planned and attractive system of signing can greatly enhance bikeway facilities by signaling their presence and location to both motorists and existing or potential bicycle users. Effective signage can encourage more bicycling by leading people to bikeways, and by creating a safe and efficient transportation option for local residents and visitors.

The signage examples on page A-33 show a number of different signs and markings, both on poles and on the roadway. Wayfinding signs such as these improve the clarity of travel direction while illustrating that destinations are only a short ride away. The signs shown are provided only as a point of reference for the purposes of these guidelines.

### Regulatory/Warning Signs

Regulatory and warning bicycle signage like the examples shown on page A-33 should conform to the Manual on Uniform Traffic Control Devices (MUTCD). The signage on page B-25 are examples of regulatory signs for bicycle (their labels are sign reference numbers for the MUTCD).

### Special Purpose Signage

The “Share the Road” sign (to the left), is designed to advise motorists that bicyclists are allowed to share and have the right to cycle on narrow roadways with motor vehicles. For more on the “Share the Road Initiative” go to: <http://ncdot.org/bikeped/safetyeducation/signing>



The “Bikes Allowed Use of Full Lane” sign is currently used on an experimental basis in several cities.

Innovative signage is often developed to increase bicycle awareness and improve visibility (such as ‘Bikes Allowed Use of Full Lane’, bottom left). Special purpose signs to be installed on public roadways in North Carolina must be approved by NCDOT’s Traffic Control Devices Committee and/or the local municipality. New designs can be utilized on an experimental basis with NCDOT approval.



R1-1



R1-2



R3-17



R3-17a



R3-17b



R4-1



R4-2



R4-3



R4-4



R4-7



R5-1b



R9-3c



R5-3



R5-6



R7-9



R7-9a



R9-3a



R9-5



R9-6



R9-7



R10-3



R10-22



R15-1

## BIKEWAY SIGNING

The ability to navigate through a town is informed by landmarks, natural features and other visual cues. Signs throughout the town should indicate to bicyclists:

- Direction of travel
- Location of destinations
- Travel time/distance to those destinations

These signs will increase users' comfort and accessibility to the bicycle systems.

Signage can serve both wayfinding and safety purposes including:

- Helping to familiarize users with the bicycle network
- Helping users identify the best routes to destinations
- Helping to address misperceptions about time and distance
- Helping overcome a "barrier to entry" for people who are not frequent bicyclists (e.g., "interested but concerned" bicyclists)

A community-wide bicycle wayfinding signage plan would identify:

- Sign locations
- Sign type – what information should be included and design features
- Destinations to be highlighted on each sign – key destinations for bicyclists
- Approximate distance and travel time to each destination

Bicycle wayfinding signs also visually cue motorists that they are driving along a bicycle route and should use caution. Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes. Too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists rather than per vehicle signage standards.



*Sign Types*



*Sign Placement*

### *This section includes:*

- Sign Types
- Sign Placement



## SIGN TYPES

### Description

A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes. There are three general types of wayfinding signs:

#### Confirmation Signs

Indicate to bicyclists that they are on a designated bikeway. Make motorists aware of the bicycle route. This signage can include destinations and distance/time, but does not include arrows.

#### Turn Signs

Indicate where a bikeway turns from one street onto another street. This signage can be used with pavement markings, and does include destinations and arrows.

#### Decisions Signs

Mark the junction of two or more bikeways and informs bicyclists of the designated bike route to access key destinations. Destinations and arrows, distances and travel times are optional but recommended.



### Alternative Designs

A customized alternative design may be used to include pedestrian-oriented travel times, local town logos, and sponsorship branding.



### Discussion

There is no standard color for bicycle wayfinding signage. Section 1A.12 of the MUTCD establishes the general meaning for signage colors. Green is the color used for directional guidance and is the most common color of bicycle wayfinding signage in the US, including those in the MUTCD.

### Materials and Maintenance

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

### Additional References

AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.  
 FHWA. (2009). *Manual on Uniform Traffic Control Devices*.  
 NACTO. (2012). *Urban Bikeway Design Guide*.

## SIGN PLACEMENT

### Guidance

Signs are typically placed at decision points along bicycle routes – typically at the intersection of two or more bikeways and at other key locations leading to and along bicycle routes.

### Confirmation Signs

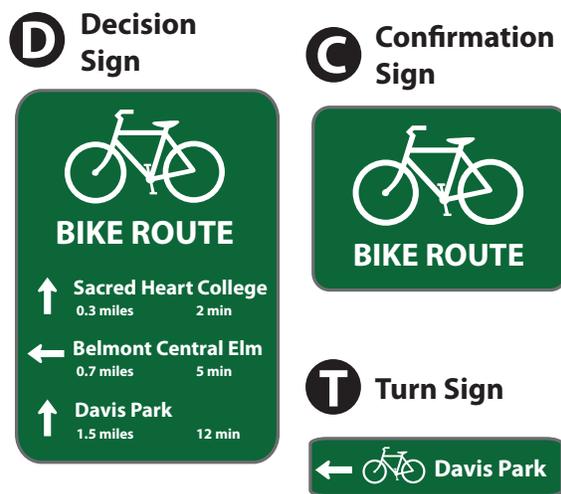
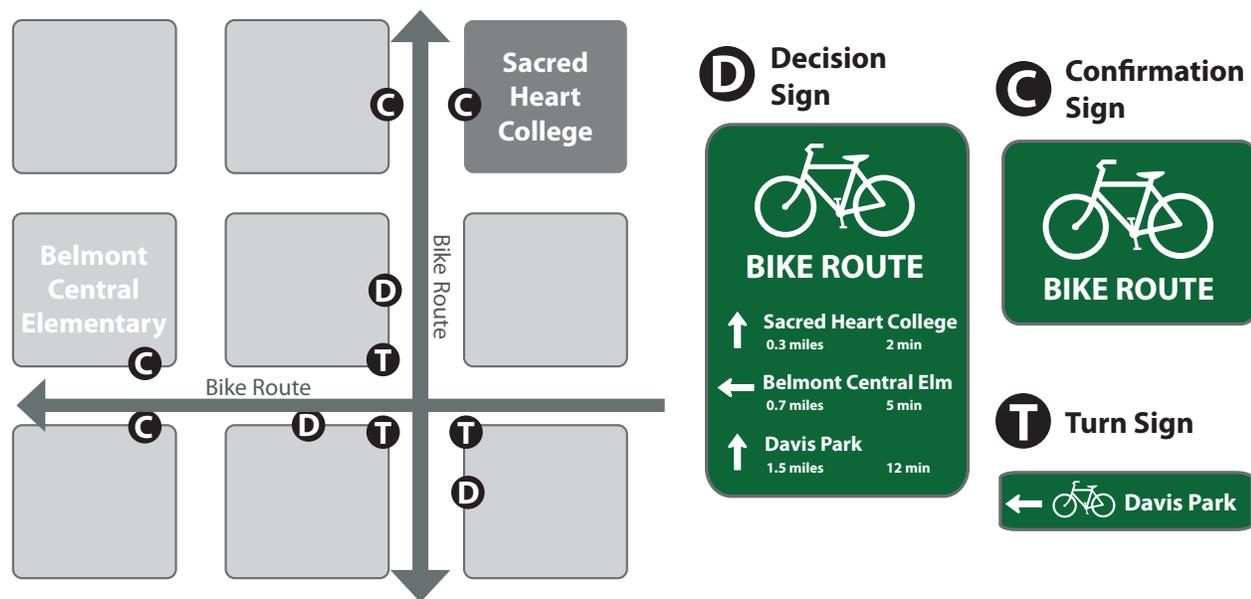
- Every ¼ to ½ mile on off-street facilities and every 2 to 3 blocks along on-street bicycle facilities, unless another type of sign is used (e.g., within 150 ft of a turn or decision sign).
- Should be placed soon after turns to confirm destination(s). Pavement markings can also confirm that a bicyclist is on a preferred route.

### Decision Signs

- Near-side of intersections in advance of a junction with another bicycle route.
- Along a route to indicate a nearby destination.

### Turn Signs

- Near-side of intersections where bike routes turn (e.g., where the street ceases to be a bicycle route or does not go through).
- Pavement markings can also indicate the need to turn to the bicyclist.



### Discussion

It can be useful to classify a list of destinations for inclusion on the signs based on their relative importance to users throughout the area. A particular destination’s ranking in the hierarchy can be used to determine the physical distance from which the locations are signed. For example, primary destinations (such as the downtown area) may be included on signage up to five miles away. Secondary destinations (such as a transit station) may be included on signage up to two miles away. Tertiary destinations (such as a park) may be included on signage up to one mile away.

### Materials and Maintenance

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

### Additional References

AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.  
 FHWA. (2009). *Manual on Uniform Traffic Control Devices*.  
 NACTO. (2012). *Urban Bikeway Design Guide*.

## RETROFITTING EXISTING STREETS TO ADD BIKEWAYS

Most major streets are characterized by conditions (e.g., high vehicle speeds and/or volumes) for which dedicated bike lanes are the most appropriate facility to accommodate safe and comfortable riding. Although opportunities to add bike lanes through roadway widening may exist in some locations, many major streets have physical and other constraints that would require street retrofit measures within existing curb-to-curb widths. As a result, much of the guidance provided in this section focuses on effectively reallocating existing street width through striping modifications to accommodate dedicated bike lanes.

Although largely intended for major streets, these measures may be appropriate for any roadway where bike lanes would be the best accommodation for bicyclists.

### *This section includes:*

- Roadway Widening
- Lane Narrowing



*Roadway Widening*



*Lane Narrowing*

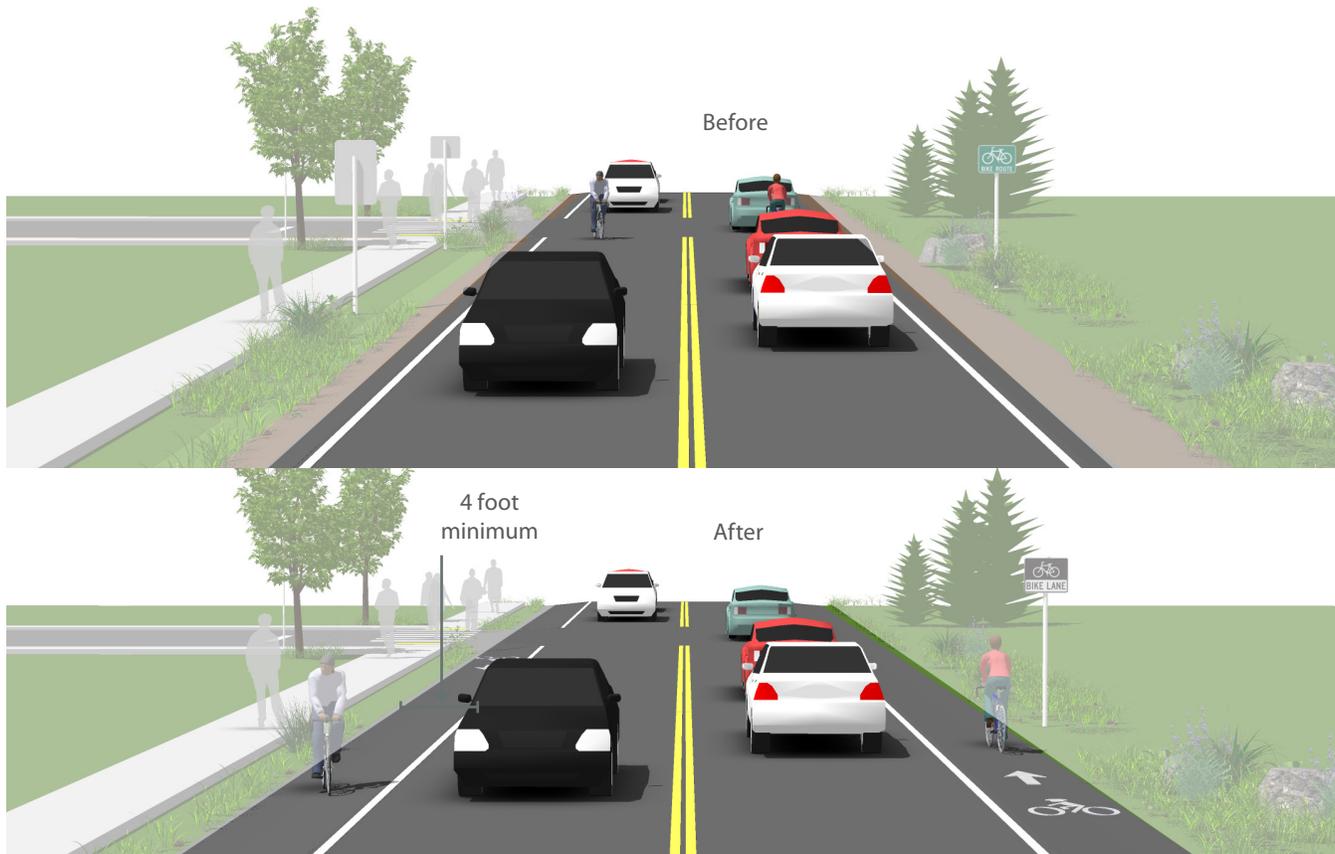
## ROADWAY WIDENING

### Description

Bike lanes can be accommodated on streets with excess right-of-way through shoulder widening. Although roadway widening incurs higher expenses compared with re-striping projects, bike lanes can be added to streets currently lacking curbs, gutters and sidewalks without the high costs of major infrastructure reconstruction.

### Guidance

- Guidance on bicycle lanes applies to this treatment.
- 4 foot minimum width when no curb and gutter is present.
- 6 foot width preferred.



### Discussion

Roadway widening is most appropriate on roads lacking curbs, gutters and sidewalks.

If it is not possible to meet minimum bicycle lane dimensions, a reduced width paved shoulder can still improve conditions for bicyclists on constrained roadways. In these situations, a minimum of 3 feet of operating space should be provided.

### Materials and Maintenance

The extended bicycle area should not contain any rough joints where bicyclists ride. Saw or grind a clean cut at the edge of the travel lane, or feather with a fine mix in a non-ridable area of the roadway.

### Additional References

AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.

## LANE NARROWING

### Description

Lane narrowing utilizes roadway space that exceeds minimum standards to provide the needed space for bike lanes. Many roadways have existing travel lanes that are wider than those prescribed in local and national roadway design standards, or which are not marked. Most standards allow for the use of 11 foot and sometimes 10 foot wide travel lanes to create space for bike lanes.

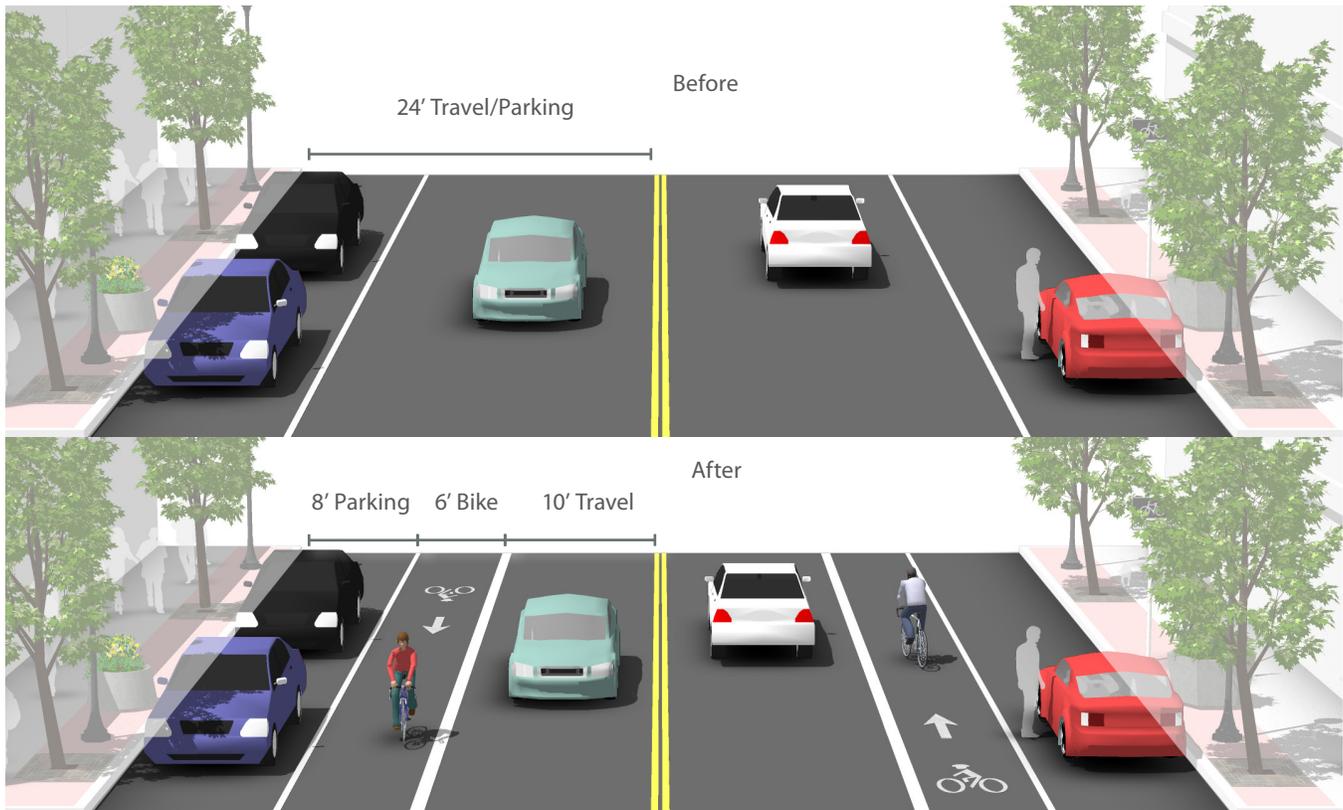
### Guidance

Vehicle lane width:

- Before: 10-15 feet
- After: 10-11 feet

Bicycle lane width:

- Guidance on Bicycle Lanes applies to this treatment.



### Discussion

Special consideration should be given to the amount of heavy vehicle traffic and horizontal curvature before the decision is made to narrow travel lanes. Center turn lanes can also be narrowed in some situations to free up pavement space for bike lanes. AASHTO supports reduced width lanes in A Policy on Geometric Design of Highways and Streets: "On interrupted-flow operation conditions at low speeds (45 mph or less), narrow lane widths are normally adequate and have some advantages."

### Materials and Maintenance

Repair rough or uneven pavement surface. Use bicycle compatible drainage grates. Raise or lower existing grates and utility covers so they are flush with the pavement.

### Additional References

AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.  
 AASHTO. (2004). *A Policy on Geometric Design of Highways and Streets*.

## BIKEWAY SUPPORT AND MAINTENANCE

### Bicycle Parking

Bicyclists expect a safe, convenient place to secure their bicycle when they reach their destination. This may be short-term parking of 2 hours or less, or long-term parking for employees, students, residents, and commuters.

### Maintenance

Regular bicycle facility maintenance includes sweeping, maintaining a smooth roadway, ensuring that the gutter-to-pavement transition remains relatively flat, and installing bicycle-friendly drainage grates. Pavement overlays are a good opportunity to improve bicycle facilities.



Bicycle Racks



Sweeping

### Recommended Bikeway Maintenance Activities

Maintenance Activity	Frequency
Inspections	Seasonal – at beginning and end of Summer
Pavement sweeping/blowing	As needed, with higher frequency in the early Spring and Fall
Pavement sealing	5 - 15 years
Pothole repair	1 week – 1 month after report
Culvert and drainage grate inspection	Before Winter and after major storms
Pavement markings replacement	As needed
Signage replacement	As needed
Shoulder plant trimming (weeds, trees, brambles)	Twice a year; middle of growing season and early Fall
Tree and shrub plantings, trimming	1 – 3 years
Major damage response (washouts, fallen trees, flooding)	As soon as possible

#### This Section Includes:

- Bicycle Racks
- Sweeping



## BICYCLE RACKS

### Description

Short-term bicycle parking is meant to accommodate visitors, customers, and others expected to depart within two hours. It should have an approved standard rack, appropriate location and placement, and weather protection. Racks should:

- Support the bicycle in at least two places, preventing it from falling over.
- Allow locking of the frame and one or both wheels with a U-lock.
- Is securely anchored to ground.
- Resists cutting, rusting and bending or deformation.

### Guidance

- 2' minimum from the curb face to avoid 'dooring.'
- Close to destinations; 50' maximum distance from main building entrance.
- Minimum clear distance of 6' should be provided between the bicycle rack and the property line.
- Locate racks in areas that cyclists are most likely to travel.



## SWEEPING

### Description

Bicyclists often avoid shoulders and bike lanes filled with gravel, broken glass and other debris; they will ride in the roadway to avoid these hazards, potentially causing conflicts with motorists. Debris from the roadway should not be swept onto sidewalks (pedestrians need a clean walking surface), nor should debris be swept from the sidewalk onto the roadway. A regularly scheduled inspection and maintenance program helps ensure that roadway debris is regularly picked up or swept.

### Guidance

- Establish a seasonal sweeping schedule that prioritizes roadways with major bicycle routes.
- Sweep walkways and bikeways whenever there is an accumulation of debris on the facility.
- In curbed sections, sweepers should pick up debris; on open shoulders, debris can be swept onto gravel shoulders.
- Pave gravel driveway approaches to minimize loose gravel on paved roadway shoulders.
- Perform additional sweeping in the Spring to remove debris from the Winter.
- Perform additional sweeping in the Fall in areas where leaves accumulate.



## MULTI-USE TRAILS

A multi-use trail (greenway trail) allows for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles. Path facilities can also include amenities such as lighting, signage, and fencing (where appropriate).

Key features of multi-use trails include:

- Frequent access points from the local road network.
- Directional signs to direct users to and from the path.
- A limited number of at-grade crossings with streets or driveways.
- Terminating the path where it is easily accessible to and from the street system.
- Separate treads for pedestrians and bicyclists when heavy use is expected.

### *This Section Includes:*

- General Design Practices
- Multi-Use Trails along Roadways
- Local Neighborhood Accessways



*General design practices*



*Multi-use trails along roadways*



*Local neighborhood accessways*



## General Design Practices

### Description

Shared use paths can provide a desirable facility, particularly for recreation, and users of all skill levels preferring separation from traffic. Bicycle paths should generally provide directional travel opportunities not provided by existing roadways.

### Guidance

#### Width

- 8 feet is the minimum allowed for a two-way bicycle path and is only recommended for low traffic situations.
- 10 feet is recommended in most situations and will be adequate for moderate to heavy use.
- 12 feet is recommended for heavy use situations with high concentrations of multiple users. A separate track (5' minimum) can be provided for pedestrian use.

#### Clearance

- Lateral Clearance: A 2 foot or greater shoulder on both sides of the path should be provided. An additional foot of lateral clearance (total of 3') is required by the MUTCD for the installation of signage or other furnishings.
- Overhead clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.

#### Striping

- When striping is required, use a 4 inch dashed yellow centerline stripe with 4 inch solid white edge lines.
- Solid centerlines can be provided on tight or blind corners, and on the approaches to roadway crossings.

Terminate the path where it is easily accessible to and from the street system, preferably at a controlled intersection or at the beginning of a dead-end street.



### Discussion

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of shared use paths along roadways. Also known as “sidepaths”, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding when either entering or exiting the path.

### Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

### Additional References

Flink, C. (1993). *Greenways: A Guide to Planning Design and Development*.

## Multi-use Trails Along Roadways

### Description

A multi-use trail or path allows for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles.

Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the path.

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of multi-use paths directly adjacent to roadways.

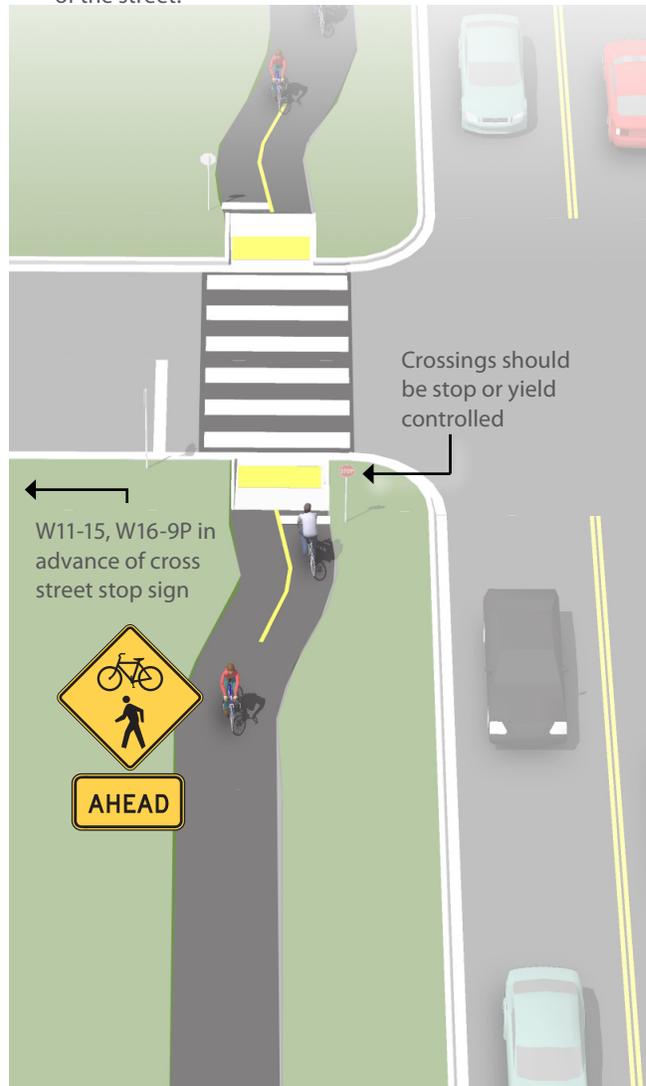
### Guidance

- 8 feet is the minimum allowed for a two-way bicycle path and is only recommended for low traffic situations.
- 10 feet is recommended in most situations and will be adequate for moderate to heavy use.
- 12 feet is recommended for situations with high concentrations of multiple users such as joggers, bicyclists, and rollerbladers. A separate track (5' minimum) can be provided for pedestrian use.
- Bicycle lanes should be provided as an alternate (more transportation-oriented) facility whenever possible.

### Discussion

When designing a bikeway network, the presence of a nearby or parallel path should not be used as a reason to not provide adequate shoulder or bicycle lane width on the roadway, as the on-street bicycle facility will generally be superior to the "sidepath" for experienced bicyclists and those who are cycling for transportation purposes.

Pay special attention to the entrance/exit of the path as bicyclists may continue to travel on the wrong side of the street.



### Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

### Additional References

AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.  
 NACTO. (2012). *Urban Bikeway Design Guide*. See entry on *Raised Cycle Tracks*.

## Local Neighborhood Accessways

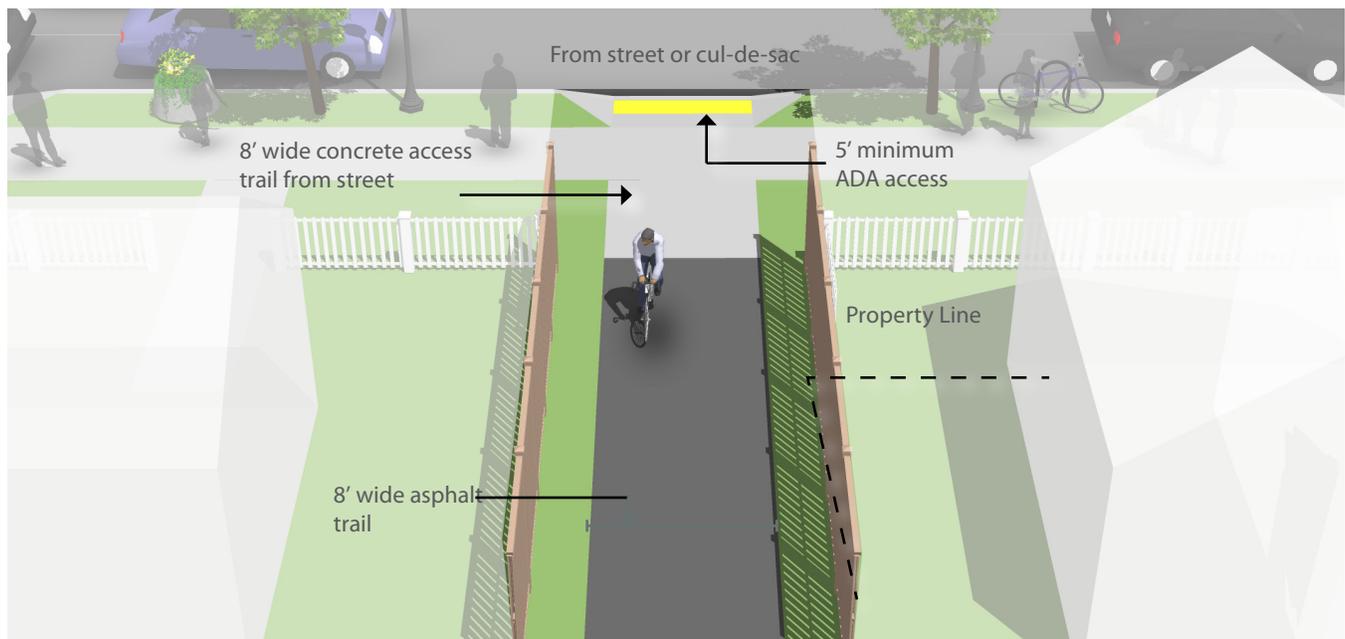
### Description

Neighborhood accessways provide residential areas with direct bicycle and pedestrian access to parks, trails, greenspaces, and other recreational areas. They most often serve as small trail connections to and from the larger trail network, typically having their own rights-of-way and easements.

Additionally, these smaller trails can be used to provide bicycle and pedestrian connections between dead-end streets, cul-de-sacs, and access to nearby destinations not provided by the street network.

### Guidance

- Neighborhood accessways should remain open to the public.
- Trail pavement shall be at least 8' wide to accommodate emergency and maintenance vehicles, meet ADA requirements and be considered suitable for multi-use.
- Trail widths should be designed to be less than 8' wide only when necessary to protect large mature native trees over 18" in caliper, wetlands or other ecologically sensitive areas.
- Access trails should slightly meander whenever possible.



### Discussion

Neighborhood accessways should be designed into new subdivisions at every opportunity and should be required by City/County subdivision regulations. For existing subdivisions, Neighborhood and homeowner association groups are encouraged to identify locations where such connects would be desirable. Nearby residents and adjacent property owners should be invited to provide landscape design input.

### Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

### Additional References

AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.

FHWA. (2009). *Manual on Uniform Traffic Control Devices*.

FHWA. (2006). *Federal Highway Administration University Course on Bicycle and Pedestrian Transportation. Lesson 19: Greenways and Shared Use Paths*.

## MULTI-USE TRAIL CROSSINGS

At-grade roadway crossings can create potential conflicts between path users and motorists. However, well-designed crossings can mitigate many operational issues and provide a higher degree of safety and comfort for path users. This is evidenced by the thousands of successful facilities around the United States with at-grade crossings. In most cases, at-grade path crossings can be properly designed to provide a reasonable degree of safety and can meet existing traffic and safety standards. Path facilities that cater to bicyclists can require additional considerations due to the higher travel speed of bicyclists versus pedestrians.

Consideration must be given to adequate warning distance based on vehicle speeds and line of sight, with the visibility of any signs absolutely critical. Directing the active attention of motorists to roadway signs may require additional alerting devices such as a flashing beacon, roadway striping or changes in pavement texture. Signing for path users may include a standard “STOP” or “YIELD” sign and pavement markings, possibly combined with other features such as bollards or a bend in the pathway to slow bicyclists. Care must be taken not to place too many signs at crossings lest they begin to lose their visual impact.

A number of striping patterns have emerged over the years to delineate path crossings. A median stripe on the path approach will help to organize and warn path users. Crosswalk striping is typically a matter of local and State preference, and may be accompanied by pavement treatments to help warn and slow motorists. In areas where motorists do not typically yield to crosswalk users, additional measures may be required to increase compliance.

### *This Section Includes:*

- Marked/Unsignalized Crossings
- Active Warning Beacons
- Route Users to Existing Signals
- Bridges
- Boardwalks



*Route users to existing signals*



*Marked/unsignalized crossings*



*Bridges*



*Active warning beacons*



*Boardwalks*



## Unsignalized Marked Crossings

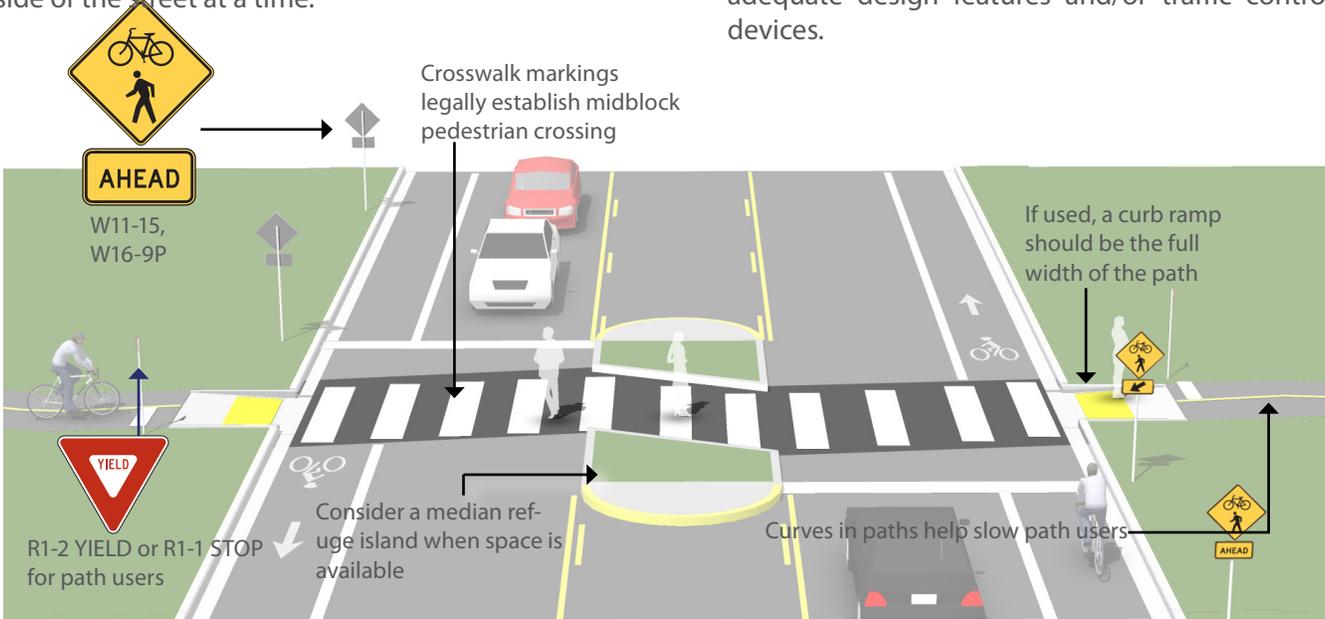
### Description

An unsignalized marked crossing typically consists of a marked crossing area, signage, and other markings to slow or stop traffic. The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, pathway traffic, use patterns, vehicle speed, road type, road width, and other safety issues such as proximity to major attractions.

When space is available, using a median refuge island can improve user safety by providing pedestrians and bicyclists space to perform the safe crossing of one side of the street at a time.

### Guidance

- Refer to the FHWA report, “Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations” for specific volume and speed ranges where a marked crosswalk alone may be sufficient.
- Where the speed limit exceeds 40 miles per hour, marked crosswalks alone should not be used at unsignalized locations.
- Crosswalks should not be installed at locations that could present an increased risk to pedestrians, such as where there is poor sight distance, complex or confusing designs, a substantial volume of heavy trucks, or other dangers, without first providing adequate design features and/or traffic control devices.



### Discussion

Marked crosswalks alone will not make crossings safer, nor will marked crosswalks necessarily result in more vehicles stopping for pedestrians. Whether or not marked crosswalks are installed, it is important to consider other pedestrian facility enhancements (e.g. raised median, traffic signal, roadway narrowing, enhanced overhead lighting, traffic-calming measures, curb extensions, etc.) as needed to improve the safety of the crossing. These are general recommendations; good engineering judgment should be used in individual cases for deciding which treatment to use.

#### Materials and Maintenance

Locate markings out of wheel tread when possible to minimize wear and maintenance costs.

#### Additional References

- AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.
- FHWA. (2009). *Manual on Uniform Traffic Control Devices*.
- NCDOT. (2012). *Complete Streets Planning and Design Guidelines*.

## Active Warning Beacons

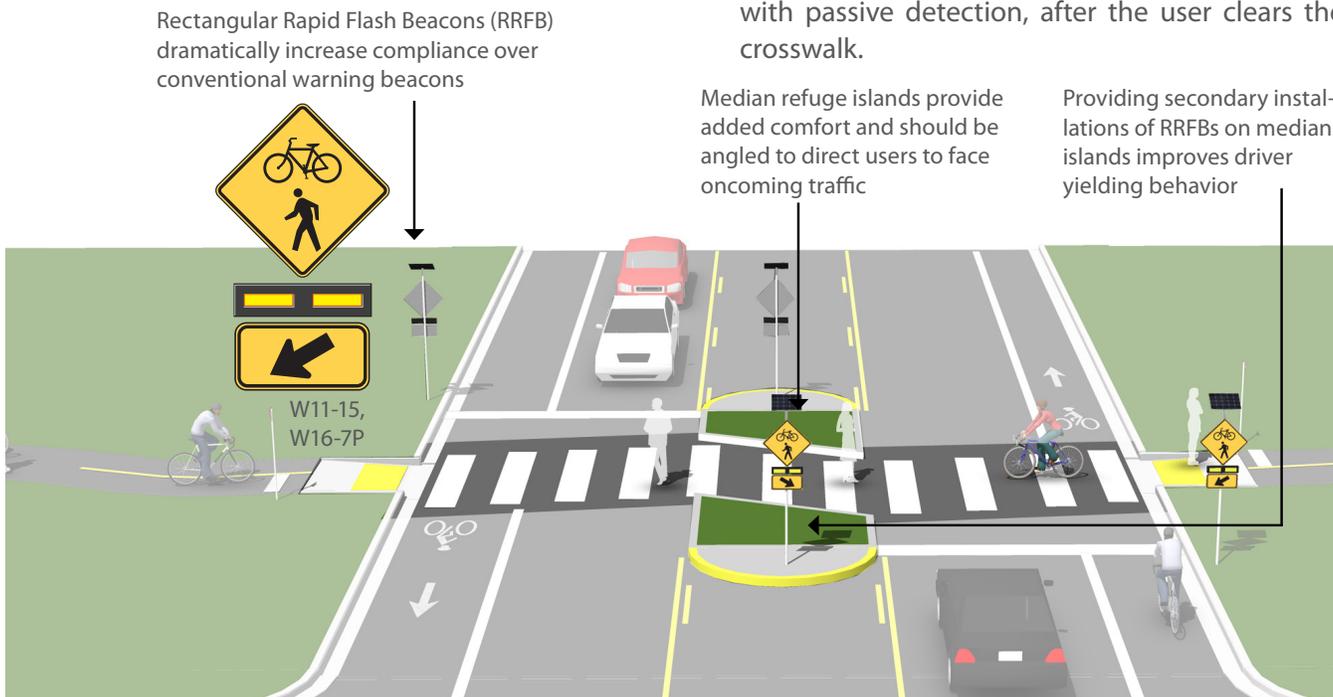
### Description

Enhanced marked crossings are unsignalized crossings with additional treatments designed to increase motor vehicle yielding compliance on multi-lane or high volume roadways.

These enhancements include pathway user or sensor actuated warning beacons, Rectangular Rapid Flash Beacons (RRFB) shown below, or in-roadway warning lights.

### Guidance

- Guidance for Unsignalized Marked Crossings applies.
- Warning beacons shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic control signals.
- Warning beacons shall initiate operation based on user actuation and shall cease operation at a predetermined time after the user actuation or, with passive detection, after the user clears the crosswalk.



Rectangular Rapid Flash Beacons (RRFB) dramatically increase compliance over conventional warning beacons

Median refuge islands provide added comfort and should be angled to direct users to face oncoming traffic

Providing secondary installations of RRFBs on median islands improves driver yielding behavior

### Discussion

Rectangular rapid flash beacons show the most increased compliance of all the warning beacon enhancement options.

A study of the effectiveness of going from a no-beacon arrangement to a two-beacon RRFB installation increased yielding from 18 percent to 81 percent. A four-beacon arrangement raised compliance to 88 percent. Additional studies of long term installations show little to no decrease in yielding behavior over time.

### Materials and Maintenance

Depending on power supply, maintenance of active warning beacons can be minimal. If solar power is used, signals should run for years without issue.

### Additional References

- NACTO. (2012). *Urban Bikeway Design Guide*.
- FHWA. (2009). *Manual on Uniform Traffic Control Devices*.
- FHWA. (2008). *MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11)*
- NCDOT. (2012). *Complete Streets Planning and Design Guidelines*.

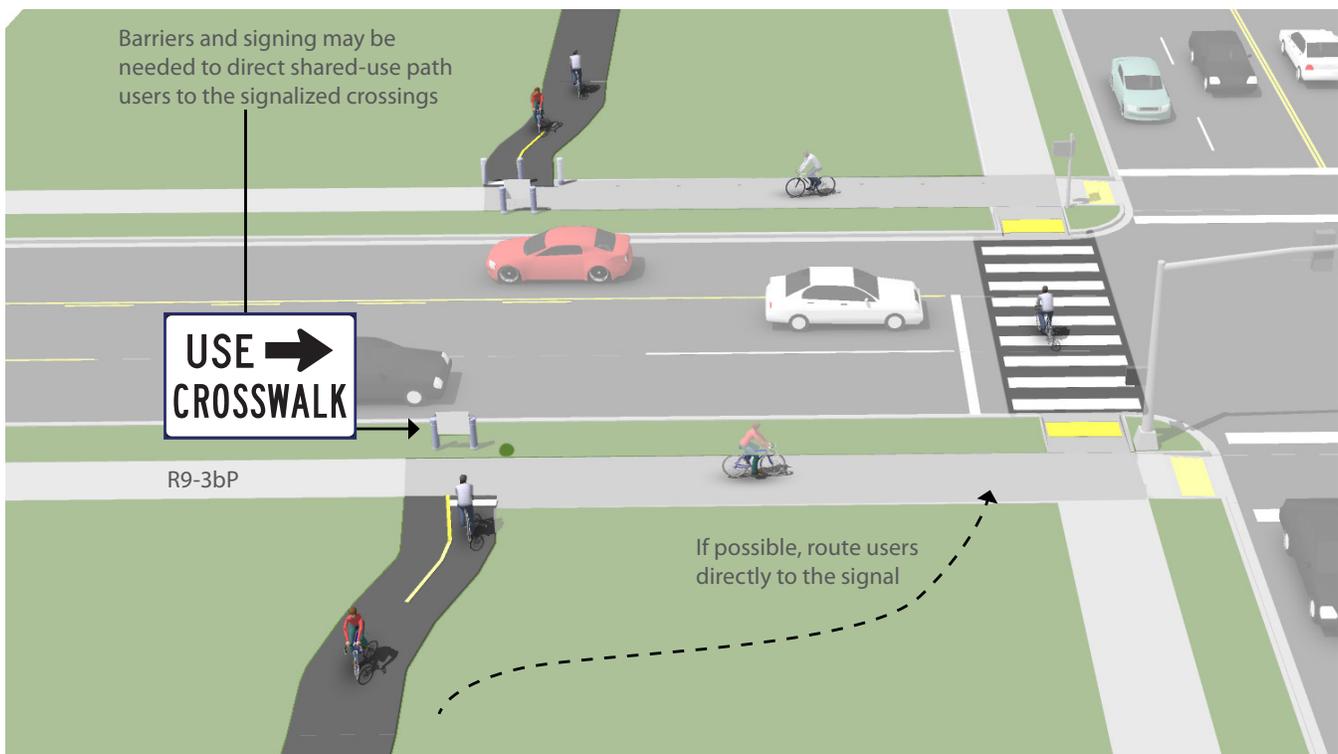
## Route Users to Signalized Crossings

### Description

Path crossings within approximately 400 feet of an existing signalized intersection with pedestrian crosswalks are typically diverted to the signalized intersection to avoid traffic operation problems when located so close to an existing signal. For this restriction to be effective, barriers and signing may be needed to direct path users to the signalized crossing. If no pedestrian crossing exists at the signal, modifications should be made.

### Guidance

- Path crossings should not be provided within approximately 400 feet of an existing signalized intersection. If possible, route path directly to the signal.



### Discussion

In the US, the minimum distance a marked crossing can be from an existing signalized intersection varies from approximately 250 to 660 feet. Engineering judgement and the context of the location should be taken into account when choosing the appropriate allowable setback. Pedestrians are particularly sensitive to out of direction travel and jaywalking may become prevalent if the distance is too great.

#### Materials and Maintenance

Municipalities should maintain comprehensive inventories of the location and age of bicycle wayfinding signs to allow incorporation of bicycle wayfinding signs into any asset management activities.

#### Additional References

AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.

AASHTO. (2004). *Guide for the Planning, Design, and Operation of Pedestrian Facilities*.

## Bridges

### Description

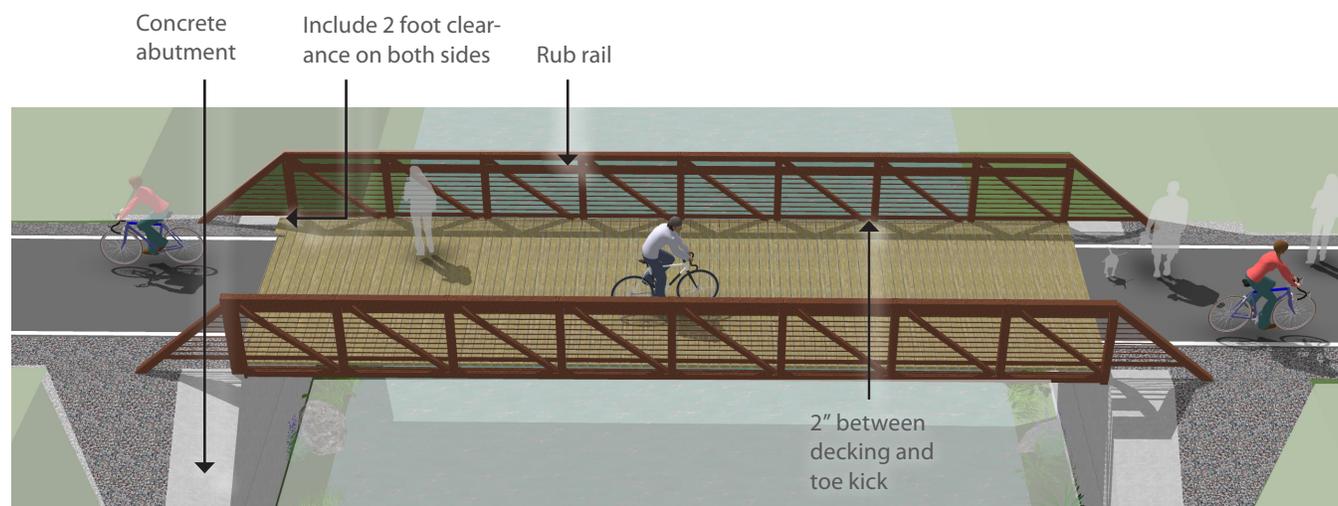
Greenway trail bridges are most often used to provide user access over natural features such as streams and rivers, where a culvert is not an option or the span length exceeds 20 feet. The type and size of bridges can vary widely depending on the greenway trail and specific site requirements. Bridges often used for greenway trails include suspension bridges and prefabricated clear span bridges. When determining a bridge design for greenway trails, it is important to consider emergency and maintenance vehicle access.

Greenway trails that are poorly designed through water features can impact wetlands and streams, and become conduits for delivering sediments, nutrients, and pathogens to the watershed. Greenway trails that cross streams can exhibit bank and streambed erosion if not properly constructed.

### Guidance

- The clear span width of the bridge should include 2 feet of clearance on both ends of the bridge approach for the shoulder.
- Bridge deck grade should be flush with adjacent greenway trail tread elevation to provide a smooth transition.
- Railing heights on bridges should include a 42 inch minimum guard rail, and 48 inches where hazardous conditions exist.

- A minimum overhead clearance of 10 feet is desirable for emergency vehicle access. Maximum opening between railing posts is 4 inches.
- A greenway trail bridge should support 10 tons for 10 foot wide greenway trails, and 20 tons for wider than 10 feet for emergency vehicle access.
- Bridges along greenway trails that allow equestrian use should be designed for mounted unit loadings.
- When crossing small headwater streams, align the crossing as far upstream as possible in the narrowest section of stream channel to minimize impact.
- Greenway trail drainage features should be constructed to manage stormwater before the greenway trail crosses the watercourse (see Drainage and Erosion guideline).
- All abutment and foundation design should be completed and sealed by a professional structural engineer licensed in the State of North Carolina.
- All greenway trail bridges will require local building permits, stormwater and land disturbance permits, floodplain development permits, and FEMA approval. Length and height of the bridge cords are governed by the width of the floodway and impacts to the base flood elevation of streams.





## Boardwalks

### Description

Boardwalks are typically required when crossing wetlands or other poorly drained areas. They are usually constructed of wooden planks or recycled material planks that form the top layer of the boardwalk. The recycled material has gained popularity in recent years since it lasts much longer than wood, especially in wet conditions. A number of low-impact support systems are also available that reduce the disturbance within wetland areas to the greatest extent possible.

### Guidance

- Boardwalk width should be a minimum of 10 feet when no rail is used. A 12 foot width is preferred in areas with average anticipated use and whenever rails are used.
- When the height of a boardwalk exceeds 30", railings are required.
- If access by vehicles is desired, boardwalks should be designed to structurally support the weight of a small truck or a light-weight vehicle.



### Discussion

In general, building in wetlands is subject to regulations and should be avoided.

The foundation normally consists of wooden posts or auger piers (screw anchors). Screw anchors provide greater support and last much longer.

### Materials and Maintenance

Decking should be either non-toxic treated wood or recycled plastic. Cable rails are attractive and more visually transparent but may require maintenance to tighten the cables if the trail has snow storage requirements.

### Additional References

- AASHTO. (2012). *Guide for the Development of Bicycle Facilities*.  
 FHWA. (2001). *Wetland Trail Design and Construction*.

## TRAFFIC CALMING MEASURES

Traffic calming is a design approach that seeks to lower motor vehicle traffic speeds using physical and visual cues. These tools are typically self-enforcing; the roadway’s physical conditions influence drivers directly rather than regulatory devices and enforcement measures. Traffic calming works best on local streets with residential areas and highly trafficked commercial corridors.

Extensive research shows that slower motorist speeds reduce overall crash severity and frequency, and improve comfort of bicyclists and pedestrians along the street. Slower traffic also tends to reduce roadway noise, which contributes to overall neighborhood livability and walking comfort.

Traffic calming measures must include special considerations for bicyclists. Measures such as narrowing the roadway may adversely affect bicyclists’ ability to share the road, while introducing vertical or horizontal deflections to slow traffic may introduce an unexpected hazard to the cyclist. Conversely, carefully designed and applied traffic calming measures can enhance bicyclist safety and access.

### *This Section Includes:*

- Mini Traffic Circles
- Planted Median Islands
- Chicanes



*Mini traffic circles*



*Planted median islands*



*Chicanes*

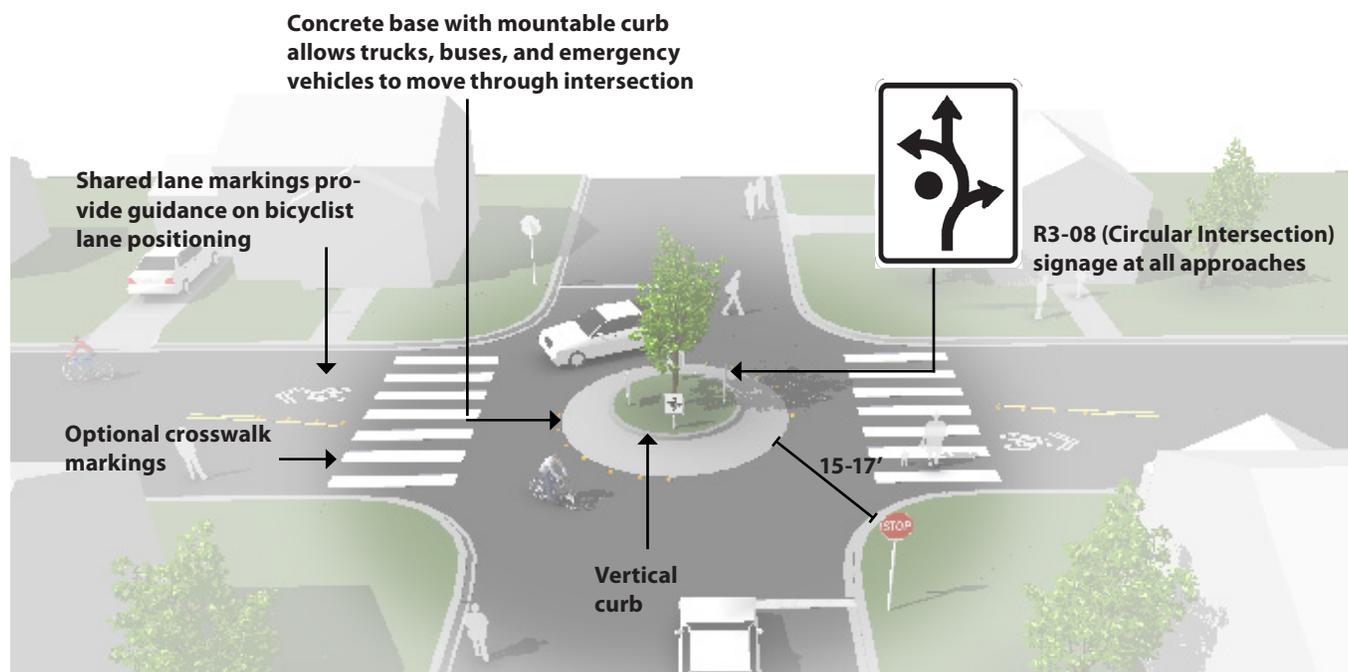
## Mini Traffic Circles

### Description

Mini traffic circles are raised, circular islands placed in the middle of local roadway intersections that control turning movements and help reduce vehicle speeds by forcing slow turns in a predictable manner. Additional benefits include reductions in local air and noise pollution from the removal of stop-and-go traffic, as well as visual and environmental benefits of added landscaping and tree planting opportunities.

### Guidance

- Best suited for low-volume, local streets.
- Design must have low turning radii to reduce vehicular turning speeds, which improves pedestrian and bicyclist safety.
- Install signage and pavement markings to guide motorists, pedestrians, and bicyclists through the allowed turning movements and crossing areas.
- May be Stop- or Yield- controlled.



### Discussion

Work with emergency service providers when considering mini traffic circles. Traffic circles can also include a paved apron to accommodate the turning radii of larger vehicles including fire trucks and school buses where necessary.

#### Materials and Maintenance

Raised concrete planters provide opportunities to integrate landscaping or green stormwater features such as bioswales. Temporary mini traffic circles created with paint and/or removable raised features can be useful in gauging support and finalizing design.

#### Additional References

- Ewing & Brown. (2009) *U.S. Traffic Calming Manual*.  
 NACTO. (2013) *Urban Street Design Guide*.  
 FHWA. (2009). *Manual on Uniform Traffic Control Devices*.

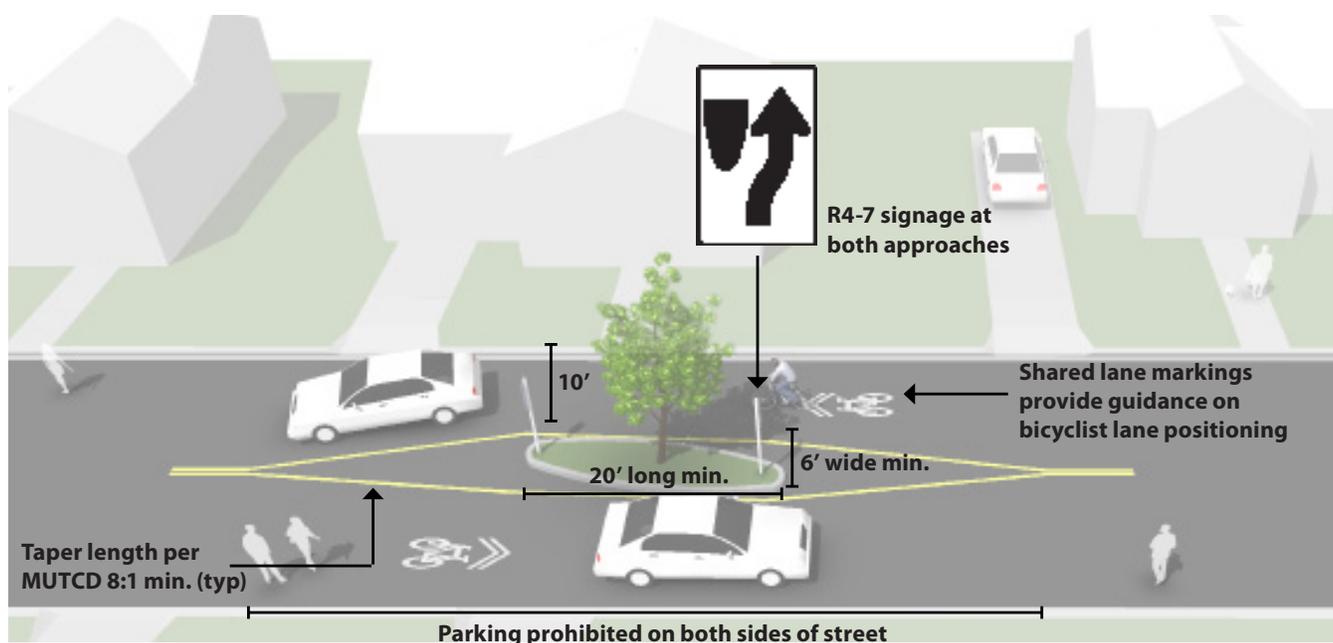
## Planted Median Islands

### Description

Planted median islands are horizontal traffic calming features placed in the center of a street. Planted median islands increase visual interest and narrow the street, encouraging drivers to reduce speeds. They may integrate pedestrian refuge islands and be paired with other traffic calming features such as speed humps or textured paving. Width, length, and the amount of horizontal deflection created will vary based on context.

### Guidance

- Use short median islands on neighborhood streets to slow traffic and indicate that drivers are entering a residential area.
- Long planted medians may be used on multi-lane streets as a visual narrowing technique.
- Median islands can also be configured as diverters at intersections (with pedestrian and bicycle refuges) in situations where volume management is desired.



### Discussion

Consider midblock pedestrian refuges where blocks are long and crossing demand is high.

Local plantings can enhance sense of place. Median islands may also incorporate green stormwater infrastructure such as bioswales and flow-through planters.

### Materials and Maintenance

Hardscaping may be used at narrow points or at pedestrian crossing points. At crossing points, landscaping and tree limbs should be maintained to allow pedestrian and motorist visibility.

### Additional References

- NCDOT. (2012). *Complete Streets Planning and Design Guidelines*.
- NACTO. (2013) *Urban Street Design Guide*.
- Ewing & Brown. (2009) *U.S. Traffic Calming Manual*.



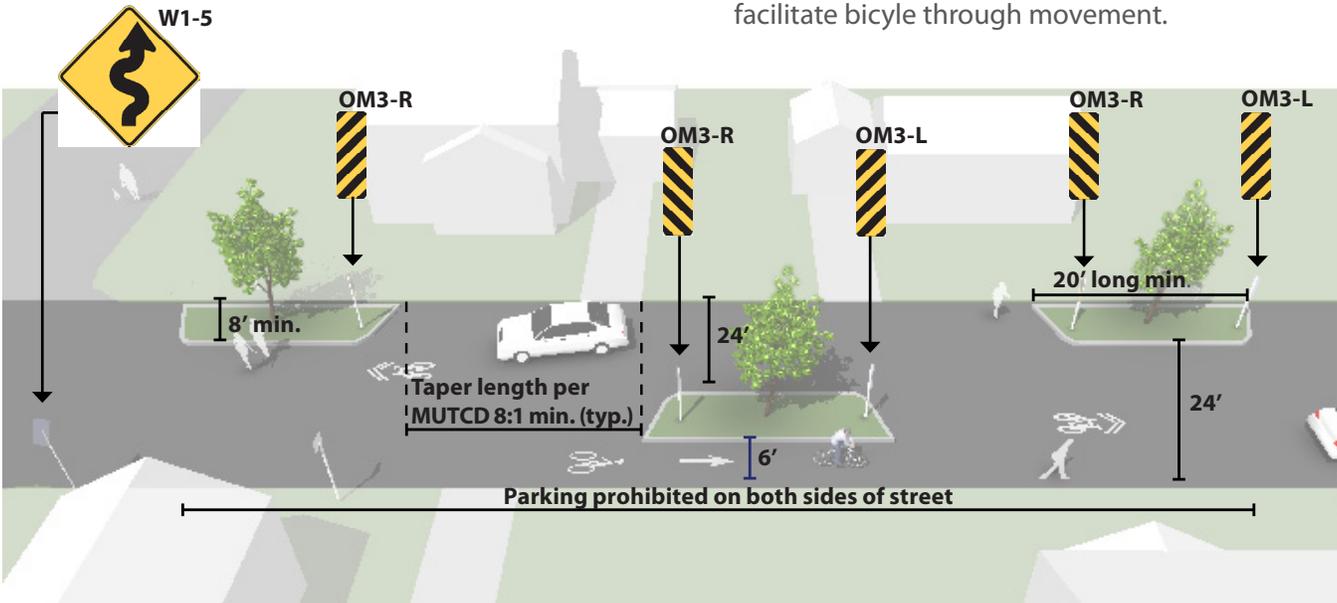
## Chicanes

### Description

Chicanes introduce horizontal deflections in the roadway through the use of alternating curb extensions, edge islands, or parking bays. The intent of chicanes is to slow traffic speeds thereby increasing the comfort of pedestrians and bicyclists. They may also be used to indicate a roadway transition such as from a commercial corridor to a low-speed residential area.

### Guidance

- Use on low traffic residential streets.
- Use a series of at least three curb extensions, islands, or parking bays to effectively slow motorists.
- Narrowing the roadway to one lane with deflection angles of 45 degrees may help prevent “straight line racing.”
- Consider leaving a 5-6 foot gap between the curb and Chicane islands on bicycle boulevards to facilitate bicycle through movement.



### Discussion

Chicane design must prevent motorists from being able to maintain their speed by cutting across the centerline, and must ensure that passing motorists do not squeeze cyclists at conflict points. Signage and pavement markings can reinforce the need for motorists and bicyclists to share the road if no exclusive bicycle pathway is provided near curbs.

Work with emergency service providers when considering traffic calming or street closures/diverters.

### Materials and Maintenance

Raised concrete planters provide opportunities to integrate landscaping or green stormwater features such as bioswales. Temporary chicanes created with paint and/or removable raised features can be useful in gauging support and finalizing design.

### Additional References

- NACTO. (2013) *Urban Street Design Guide*.
- Ewing & Brown. (2009) *U.S. Traffic Calming Manual*.
- FHWA. (2009). *Manual on Uniform Traffic Control Devices*.

## SIGHT DISTANCES

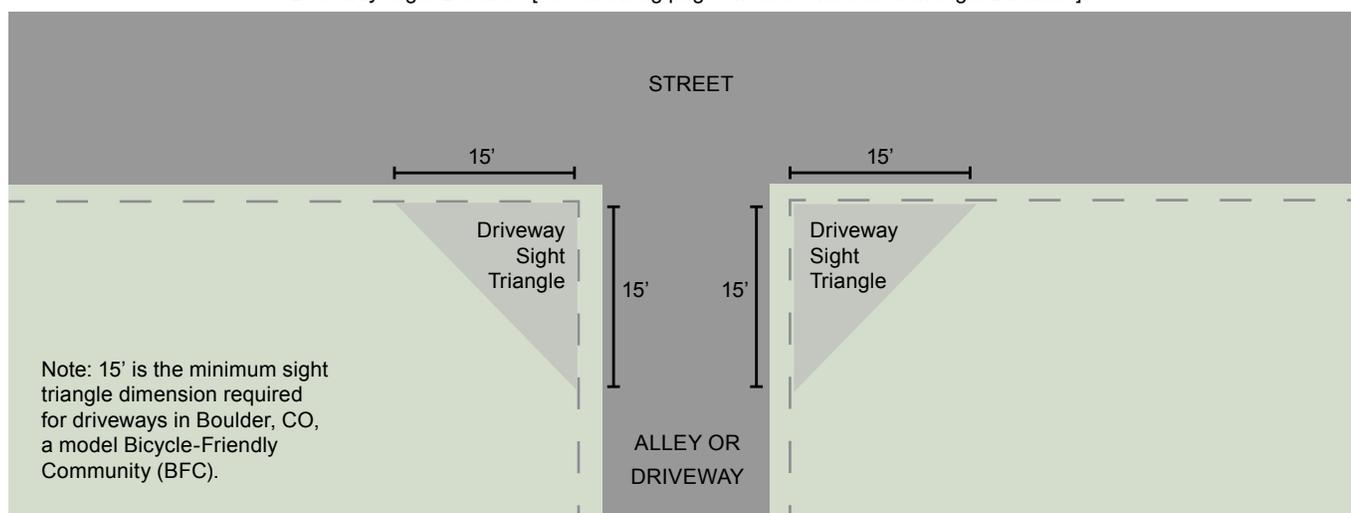
### Description

Specified areas along intersection approaches, called sight triangles, should be free of obstructions that block a driver's view of potentially conflicting vehicles (including bicycles) or pedestrians entering the traveled way. The determination of sight triangles at intersections varies by the target speed of the thoroughfares, type of traffic control at the intersection and type of vehicle movement.

### Guidance

- If the sight triangle is obstructed, every effort should be made to eliminate or move the obstruction or mitigate the obstruction (for example, install curb extensions to improve visibility of crossing pedestrians or trim vegetation).
- Shrubs must be kept low, and trees and large shrubs under-trimmed sufficiently to permit clear sight in the area between 2 feet and 8 feet above roadway elevations.
- Driver's eye level: 3.75'

Driveway Sight Distance [see following page for *Street Intersection* Sight Distance]



### Discussion

Development standards for City of Boulder, CO (Revised City Code) may serve as a model for sight triangle guidance specific to driveways, roadways, and bicycle facilities. See the following page for a case study.

#### Materials and Maintenance

The AASHTO Guide for the Development of Bicycle Facilities (2012), section 7.2.4, recommends the following: "Adopt local ordinances to require adjacent landowners to control vegetation and/or allow road authorities to control vegetation that originates from private property." However, no specific sight triangle dimensions are provided.

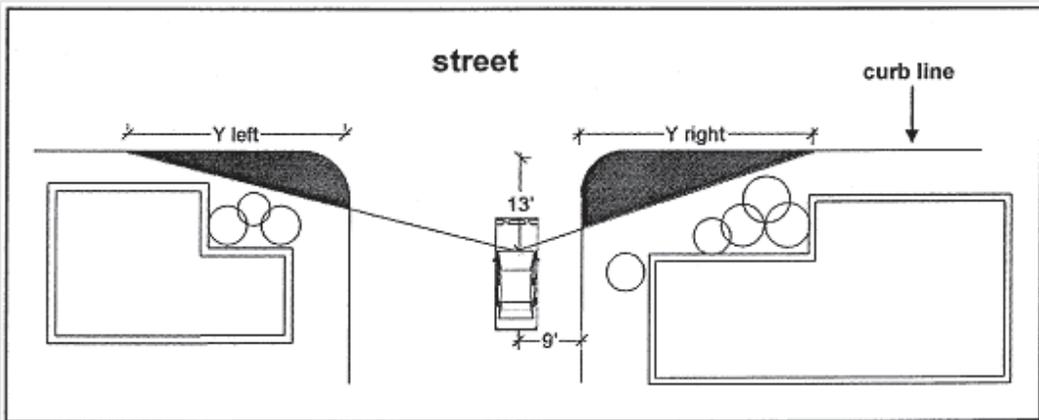
#### Additional References

- Designing Walkable Urban Thoroughfares: A Context Sensitive Approach Institute of Transportation Engineers (ITE)
- Guidelines for Planting within Highway Right-of-Way
- NCDOT Roadside Environmental Unit Landscape Design & Development



### Site Distance Case Study for Street Intersections: City of Boulder, CO

The following development standards for City of Boulder, CO (Revised City Code) may serve as a model for guidance on sight triangles. The shaded area in the diagram below is required to be kept free of all structures, fences, landscaping and other materials. The size of the sight triangle is based on the size of the road and speed limit, as shown in the table below. See full development standards online: <http://www.colocode.com/boulder2/>



Lane Usage	Additional Facilities	Speed Limit	Y Distance (Left)	Y Distance (Right)
2 lanes	None	25 mph	155 feet	105 feet
		30/35 mph	210 feet	145 feet
	Bike lane or on-street parking	25 mph	110 feet	85 feet
		30/35 mph	150 feet	115 feet
	Bike lane and on-street parking	25 mph	90 feet	75 feet
		30/35 mph	125 feet	100 feet
3 or 4 lanes	None	25 mph	155 feet	80 feet
		30/35 mph	210 feet	110 feet
		40/45 mph	265 feet	135 feet
	Bike lane or on-street parking	25 mph	110 feet	65 feet
		30/35 mph	150 feet	90 feet
		40/45 mph	195 feet	115 feet
	Bike lane and on-street parking	25 mph	90 feet	60 feet
		30/35 mph	125 feet	80 feet
		40/45 mph	160 feet	100 feet
5 or more lanes	None	25 mph	155 feet	60 feet
		30/35 mph	210 feet	85 feet
		40/45 mph	265 feet	110 feet
	Bike lane or on-street parking	25 mph	110 feet	55 feet
		30/35 mph	150 feet	75 feet
		40/45 mph	195 feet	95 feet
	Bike lane and on-street parking	25 mph	90 feet	50 feet
		30/35 mph	125 feet	65 feet
		40/45 mph	160 feet	85 feet



## STANDARDS COMPLIANCE

Some of these treatments covered by these guidelines are not directly referenced in the current versions of the AASHTO Guide or the MUTCD, although many of the elements of these treatments are found within these documents. An "X" marking in the following table identifies the inclusion of a particular treatment within the national and state design guides. A "-" marking indicates a treatment may not be specifically mentioned, but is compliant assuming MUTCD compliant signs and markings are used.

In all cases, engineering judgment is recommended to ensure that the application makes sense for the context of each treatment, given the many complexities of urban streets.



	Manual of Uniform Traffic Control Devices (2009)	Guide for the Development of Bicycle Facilities (2012)	Urban Bikeway Design Guide (2012)	NCDOT Bicycle Facilities & Planning Design Guidelines
Signed Shared Roadway	X	X		X
Marked Shared Roadway	X	X	X	
Bicycle Boulevard		X	X	
Shoulder Bikeway	X	X		X
Bicycle Lane	X	X	X	X
Bike Lanes at Right Turn Only Lanes	X	X	X	X
Colored Bike Lanes in Conflict Areas	Interim Approval Granted	X	X	
Combined Bike Lane/Turn Lane	-		X	
Intersection Crossing Markings	X	X	X	
Bicyclists at Single Lane Roundabouts	-	X		
Wayfinding Sign Types	X	X	X	X
Wayfinding Sign Placement	X	X	X	X
Multi-use Trails/Greenways	X	X		X
Multi-use Trails along Roadways	X	Discouraged		Discouraged



**Chapter Contents:**

**Overview**

**Federal Funding Sources**

**State Funding Sources**

**Local Government Funding Sources**

**Private and Non-Profit Funding Sources**

**OVERVIEW**

When considering possible funding sources for bicycle and pedestrian projects in the Town of Ocean Isle Beach, it is important to remember that not all construction activities or programs will be accomplished with a single funding source. It will be necessary to consider several sources of funding that together will support full project completion. Funding sources can be used for a variety of activities, including: programs, planning, design, implementation, and maintenance. This appendix outlines the most likely sources of funding from the federal, state, and local government levels as well as from the private and non-profit sectors. A summary table of funding sources is included on page B-2. Note that this appendix reflects the funding available at the time of writing; Funding amounts, cycles, and the programs themselves may change over time.

**FEDERAL FUNDING SOURCES**

Federal funding is typically directed through state agencies to local governments either in the form of grants or direct appropriations. Federal funding typically requires a local match of five percent to 50 percent, but there are sometimes exceptions. The following is a list of possible Federal funding sources that could be used to support construction of pedestrian and bicycle improvements.

**Moving Ahead for Progress in the Twenty-First Century (MAP-21)**

The largest source of federal funding for pedestrian and bicycle projects is the USDOT’s Federal-Aid Highway Program, which Congress has reauthorized roughly every six years since the passage of the Federal-Aid Road Act of 1916. The latest act, Moving Ahead for Progress in the Twenty-First Century (MAP-21) was enacted in July 2012 as Public Law 112-141. The Act replaces the Safe, Accountable, Flexible, Efficient Transportation Equity Act – a Legacy for Users (SAFETEA-LU), which was valid from August 2005 – June 2012.

MAP-21 authorizes funding for federal surface transportation programs including highways and transit for the 27-month period between July 2012 and September 2014. It is not possible to guarantee the continued availability of any listed MAP-21 programs, or to predict their future funding levels or policy guidance. Nevertheless, many of these programs have been included in some form since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, and thus may continue to provide capital for active transportation projects and programs.



FUNDING SOURCE	PLANNING	PROGRAMMING	DESIGN/CONSTRUCTION
FEDERAL FUNDING			
Transportation Alternatives	x	x	x
Surface Transportation Program			x
Highway Safety Improvement Program		x	x
Congestion Mitigation/Air Quality		x	x
FTA Metropolitan Planning Program	x		
FTA Enhanced Mobility of Seniors and Individuals with Disabilities		x	x
Partnership for Sustainable Communities	x	x	x
Land and Water Conservation Fund	x		x
Rivers, Trails, and Conservation Assistance Program	x		
National Scenic Byways Discretionary Grant Program			x
Federal Lands Transportation Program	x		x
Energy Efficiency and Conservation Block Grants	x		x
STATE FUNDING			
NCDOT State Transportation Improvement Program			x
Incidental Projects			x
Spot Safety Program			x
High Hazard Elimination Program			x
Governor's Highway Safety Program			x
Bicycle and Pedestrian Planning Grant Initiative	x	x	
Eat Smart, Move More North Carolina Community Grants		x	x
The North Carolina Division of Parks and Recreation			x
The North Carolina Parks and Recreation Trust Fund (PARTF)			x
Adopt-a-Trail Program			x
Powell Bill Funds			x
Community Development Block Grant	x	x	x
Clean Water Management Trust Fund	x	x	x
Safe Routes to School Program	x	x	x
Urban and Community Forestry Grant	x		x



FUNDING SOURCE	PLANNING	PROGRAMMING	DESIGN/CONSTRUCTION
LOCAL FUNDING			
Capital Reserve Fund			X
Capital Project Ordinance			X
Local Improvement District			X
Municipal Service District			X
Tax Increment Financing			X
Bonds and Loans			X
Revenue Bonds			X
General Obligation Bonds (cities, counties, and service districts)			X
Special Assessment Bonds			X
State Revolving Fund Loans			X
Sales Tax	X		X
Property Tax	X		X
Excise Tax			X
Occupancy Tax			X
Stormwater Utility Fees			X
Streetscape Utility Fees			X
Impact Fees			X
Exactions			X
Installment Purchase Financing			X
In-Lieu-of Fees			X
PRIVATE/NON-PROFIT FUNDING			
The Robert Wood Johnson Foundation	X	X	
North Carolina Community Foundation	X	X	
Walmart State Giving Program	X	X	X
The Rite Aid Foundation Grant		X	X
Z. Smith Reynolds Foundation			X
Bank of America Charitable Foundation	X	X	
Duke Energy Foundation		X	
American Greenways Eastman Kodak Awards	X	X	X
National Trails Fund		X	X
The Conservation Alliance	X	X	
National Fish and Wildlife Foundation	X	X	X
The Trust for Public Land	X	X	
Blue Cross Blue Shield of North Carolina Foundation		X	X
Alliance for Biking and Walking Advocacy Advance Grants			X
Local Trail Sponsors			X
Corporate Donations	X	X	X
Private Individual Donations	X	X	X
Fundraising/Campaign Drives	X	X	X
Volunteer Work	X	X	X



In North Carolina, federal monies are administered through the North Carolina Department of Transportation (NCDOT) and Metropolitan Planning Organizations (MPOs). Most, but not all, of these programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. Federal funding is intended for capital improvements and safety and education programs, and projects must relate to the surface transportation system.

There are a number of programs identified within MAP-21 that are applicable to pedestrian and bicycle projects. These programs are discussed below.

For more information, visit: <http://www.fhwa.dot.gov/map21/summaryinfo.cfm>

### Transportation Alternatives

Transportation Alternatives (TA) is a new funding source under MAP-21 that consolidates three formerly separate programs under SAFETEA-LU: Transportation Enhancements (TE), Safe Routes to School (SRTS), and the Recreational Trails Program (RTP). These funds may be used for a variety of pedestrian, bicycle, and streetscape projects including sidewalks, bikeways, multi-use paths, and rail-trails. TA funds may also be used for selected education and encouragement programming such as Safe Routes to School, despite the fact that TA does not provide a guaranteed set-aside for this activity as SAFETEA-LU did.

Average annual funds available through TA over the life of MAP-21 equal \$814 million nationally, which is based on a two percent set-aside of total MAP-21 allocations. Note that state DOT's may elect to transfer up to 50 percent of TA funds to other highway programs, so the amount listed on the website represents the maximum potential funding. Remaining TA funds (those monies not re-directed to other highway programs) are disbursed through a separate competitive grant program administered by NCDOT. Local governments, school districts, tribal governments, and public lands agencies are permitted to compete for these funds.

Each state governor is given the opportunity to "opt out" of the Recreational Trails Program. However, as of the writing of this plan, only Florida and Kansas have "opted out" of the RTP. For all other states, dedicated funds for recreational trails continue to be provided as a subset of TA. MAP-21 provides \$85 million nationally for the RTP.

For the complete list of eligible activities, visit:

[http://www.fhwa.dot.gov/environment/transportation\\_enhancements/legislation/map21.cfm](http://www.fhwa.dot.gov/environment/transportation_enhancements/legislation/map21.cfm)

For funding levels, visit: <http://www.fhwa.dot.gov/MAP21/funding.cfm>



U.S. Department  
of Transportation

**Federal Highway  
Administration**



## Surface Transportation Program

The Surface Transportation Program (STP) provides states with flexible funds which may be used for a variety of highway, road, bridge, and transit projects. A wide variety of pedestrian improvements are eligible, including trails, sidewalks, crosswalks, pedestrian signals, and other ancillary facilities. Modification of sidewalks to comply with the requirements of the Americans with Disabilities Act (ADA) is also an eligible activity. Unlike most highway projects, STP-funded pedestrian facilities may be located on local and collector roads which are not part of the Federal-aid Highway System. 50 percent of each state's STP funds are allocated by population to the MPOs; the remaining 50 percent may be spent in any area of the state.

For more information: <http://www.fhwa.dot.gov/map21/stp.cfm>

## Highway Safety Improvement Program

MAP-21 doubles the amount of funding available through the Highway Safety Improvement Program (HSIP) relative to SAFETEA-LU. HSIP provides \$2.4 billion nationally for projects and programs that help communities achieve significant reductions in traffic fatalities and serious injuries on all public roads, bikeways, and walkways. MAP-21 preserves the Railway-Highway Crossings Program within HSIP but discontinues the High-Risk Rural roads set-aside unless safety statistics demonstrate that fatalities are increasing on these roads. Bicycle and pedestrian safety improvements, enforcement activities, traffic calming projects, and crossing treatments for non-motorized users in school zones are eligible for these funds.

For more information: <http://www.fhwa.dot.gov/map21/hsip.cfm>

## Congestion Mitigation/Air Quality Program

The Congestion Mitigation/Air Quality Improvement Program (CMAQ) provides funding for projects and programs in air quality non-attainment and maintenance areas for ozone, carbon monoxide, and particulate matter which reduce transportation related emissions. States with no non-attainment areas may use their CMAQ funds for any CMAQ or STP eligible project. These federal dollars can be used to build bicycle and pedestrian facilities that reduce travel by automobile. Purely recreational facilities generally are not eligible. Communities located in attainment areas who do not receive CMAQ funding apportionments may apply for CMAQ funding to implement projects that will reduce travel by automobile.

For more information: <http://www.fhwa.dot.gov/map21/cmaq.cfm>

## Federal Transit Administration Enhanced Mobility of Seniors and Individuals with Disabilities

This program can be used for capital expenses that support transportation to meet the special needs of older adults and persons with disabilities, including providing access to an eligible public transportation facility when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs.

For more information: [http://www.fta.dot.gov/documents/MAP-21\\_Fact\\_Sheet\\_-\\_Enhanced\\_Mobility\\_of\\_Seniors\\_and\\_Individuals\\_with\\_Disabilities.pdf](http://www.fta.dot.gov/documents/MAP-21_Fact_Sheet_-_Enhanced_Mobility_of_Seniors_and_Individuals_with_Disabilities.pdf)



### Partnership for Sustainable Communities

Founded in 2009, the Partnership for Sustainable Communities is a joint project of the Environmental Protection Agency (EPA), the U.S. Department of Housing and Urban Development (HUD), and the U.S. Department of Transportation (USDOT). The partnership aims to “improve access to affordable housing, more transportation options, and lower transportation costs while protecting the environment in communities nationwide.” The Partnership is based on five Livability Principles, one of which explicitly addresses the need for bicycle and pedestrian infrastructure (“Provide more transportation choices: Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation’s dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health”).

The Partnership is not a formal agency with a regular annual grant program. Nevertheless, it is an important effort that has already led to some new grant opportunities (including both TIGER I and TIGER II grants). North Carolina jurisdictions should track Partnership communications and be prepared to respond proactively to announcements of new grant programs. Initiatives that speak to multiple livability goals are more likely to score well than initiatives that are narrowly limited in scope to pedestrian improvement efforts.

For more information: <http://www.sustainablecommunities.gov/>

<http://www.epa.gov/smartgrowth/partnership/>

Resource for Rural Communities: [http://www.sustainablecommunities.gov/pdf/Supporting\\_Sustainable\\_Rural\\_Communities\\_FINAL.PDF](http://www.sustainablecommunities.gov/pdf/Supporting_Sustainable_Rural_Communities_FINAL.PDF)

### Land and Water Conservation Fund

The Land and Water Conservation Fund (LWCF) provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. Funds can be used for right-of-way acquisition and construction. The program is administered by the Department of Environment and Natural Resources as a grant program for states and local governments. Maximum annual grant awards for county governments, incorporated municipalities, public authorities, and federally recognized Indian tribes are \$250,000. The local match may be provided with in-kind services or cash.

For more information: [http://www.ncparks.gov/About/grants/lwcf\\_main.php](http://www.ncparks.gov/About/grants/lwcf_main.php)

### Rivers, Trails, and Conservation Assistance Program

The Rivers, Trails, and Conservation Assistance Program (RTCA) is a National Parks Service (NPS) program providing technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program provides only for planning assistance—there are no implementation funds available. Projects are prioritized for assistance based on criteria including conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments. This program may benefit trail development in North Carolina locales indirectly through technical assistance, particularly for





community organizations, but is not a capital funding source.

For more information: <http://www.nps.gov/ncrc/programs/rtca/> or contact the Southeast Region RTCA Program Manager Deirdre "Dee" Hewitt at (404) 507-5691



### National Scenic Byways Discretionary Grant Program

The National Scenic Byways Discretionary Grants program provides merit-based funding for byway-related projects each year, utilizing one or more of eight specific activities for roads designated as National Scenic Byways, All-American Roads, State scenic byways, or Indian tribe scenic byways. The activities are described in 23 USC 162(c). This is a discretionary program; all projects are selected by the US Secretary of Transportation.

Eligible projects include construction along a scenic byway of a facility for pedestrians and bicyclists and improvements to a scenic byway that will enhance access to an area for the purpose of recreation. Construction includes the development of the environmental documents, design, engineering, purchase of right-of-way, land, or property, as well as supervising, inspecting, and actual construction.

For more information: <http://www.bywaysonline.org/grants/>

### Federal Lands Transportation Program (FLTP)

The FLTP funds projects that improve access within federal lands (including national forests, national parks, national wildlife refuges, national recreation areas, and other Federal public lands) on federally owned and maintained transportation facilities. \$300 million per fiscal year has been allocated to the program for 2013 and 2014.

For more information: <http://www.fhwa.dot.gov/map21/fltp.cfm>

### Energy Efficiency and Conservation Block Grants

The Department of Energy's Energy Efficiency and Conservation Block Grants (EECBG) may be used to reduce energy consumptions and fossil fuel emissions and for improvements in energy efficiency. Section 7 of the funding announcement states that these grants provide opportunities for the development and implementation of transportation programs to conserve energy used in transportation including development of infrastructure such as bike lanes and pathways and pedestrian walkways. Although the current grant period has passed, more opportunities may arise in the future.

For more information: <http://www1.eere.energy.gov/wip/eeecbg.html>





## STATE FUNDING SOURCES

There are multiple sources for state funding of bicycle and pedestrian transportation projects. However, beginning July 1, 2015, state transportation funds cannot be used to match federally-funded transportation projects, according to a law passed by the North Carolina Legislature.

### North Carolina Department of Transportation (NCDOT) State Transportation Improvement Program

The NCDOT's State Transportation Improvement Program is based on the Strategic Transportation Investments bill, signed into law in 2013. The Strategic Transportation Investments (STI) initiative introduces the Strategic Mobility Formula, a new way to fund and prioritize transportation projects.

The new Strategic Transportation Investments initiative is scheduled to be fully implemented by July 1, 2015. Projects funded for construction before then will proceed as scheduled under the current Equity Formula; projects slated for after that time will be ranked and programmed according to the new formula. The new Strategic Mobility Formula assigns projects for all modes into one of three categories: Statewide Mobility, Regional Impact, and Division Needs. All independent bicycle and pedestrian projects are placed in the "Division Needs" category, and are ranked using the following five criteria:

- » Safety
- » Access
- » Demand or density
- » Constructability
- » Benefit/cost ratio

These rankings largely determines which projects will be included in the department's State Transportation Improvement Program (STIP). The STIP is a federally mandated transportation planning document that details transportation improvements prioritized by stakeholders for inclusion in the Work Program over the next ten years. The STIP is updated every two years. The STIP contains funding information for various transportation divisions of NCDOT including highways, aviation, public transportation, rail, bicycle and pedestrian, and the Governor's Highway Safety Program.

Access to federal funds require that projects be incorporated into the STIP. The STIP is the primary method for allocating state and federal transportation funds. Starting in 2015, state funds will not be available to match federally-funded projects. As a result, local governments should plan to use local or Powell Bill funds to secure federal dollars to fund bicycle and pedestrian projects.

For more information on STI:

- » [www.ncdot.gov/strategictransportationinvestments/](http://www.ncdot.gov/strategictransportationinvestments/)
- » <https://connect.ncdot.gov/projects/planning>





## Incidental Projects

Incidental Projects are often constructed as part of a larger transportation project, when they are justified by local plans that show these improvements as part of a larger, multi-modal system. Bicycle and pedestrian accommodations such as bike lanes, sidewalks, intersection improvements, widened paved shoulders, and bicycle- and pedestrian-safe bridge design are frequently included as incidental features of highway projects. Most bicycle and pedestrian safety accommodations built by NCDOT are funded with a combination of federal and state roadway construction funds or with a local fund match. The local government may be responsible for a portion of the costs to construct the bike or pedestrian project, even for Complete Streets projects.

## SPOT Safety Program

The Spot Safety Program is a state funded public safety investment and improvement program that provides highly effective low cost safety improvements for intersections, and sections of North Carolina's 79,000 miles of state maintained roads in all 100 counties of North Carolina. The Spot Safety Program is used to develop smaller improvement projects to address safety, potential safety, and operational issues. The program is funded with state funds and currently receives approximately \$9 million per state fiscal year. Other monetary sources (such as Small Construction or Contingency funds) can assist in funding Spot Safety projects, however, the maximum allowable contribution of Spot Safety funds per project is \$250,000.

The Spot Safety Program targets hazardous locations for expedited low cost safety improvements such as traffic signals, turn lanes, improved shoulders, intersection upgrades, positive guidance enhancements (rumble strips, improved channelization, raised pavement markers, long life highly visible pavement markings), improved warning and regulatory signing, roadside safety improvements, school safety improvements, and safety appurtenances (like guardrail and crash attenuators).

A Safety Oversight Committee (SOC) reviews and recommends Spot Safety projects to the Board of Transportation (BOT) for approval and funding. Criteria used by the SOC to select projects for recommendation to the BOT include, but are not limited to, the frequency of correctable crashes, severity of crashes, delay, congestion, number of signal warrants met, effect on pedestrians and schools, division and region priorities, and public interest.

For more information: <https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx>



## Powell Bill Funds

Powell Bill Funds are state funding resources that can be used for most bicycle and pedestrian improvements. Each year, State street-aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways. Beginning July 1, 2015 under the Strategic Transportation Investments initiative, Powell Bill funds may no longer be used to provide a match for federal transportation funds such as Transportation Alternatives.

More information: <https://connect.ncdot.gov/municipalities/state-street-aid/Pages/default.aspx>

## Highway Hazard Elimination Program

The Hazard Elimination Program is used to develop larger improvement projects to address safety and potential safety issues. The program is funded with 90 percent federal funds and 10 percent state funds. The cost of Hazard Elimination Program projects typically ranges between \$400,000 and \$1 million. A Safety Oversight Committee (SOC) reviews and recommends Hazard Elimination projects to the Board of Transportation (BOT) for approval and funding. These projects are prioritized for funding according to a safety benefit to cost (B/C) ratio, with the safety benefit being based on crash reduction. Once approved and funded by the BOT, these projects become part of the department's State Transportation Improvement Program (STIP).

For more information: <https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx>

## Governor's Highway Safety Program

The Governor's Highway Safety Program (GHSP) funds safety improvement projects on state highways throughout North Carolina. All funding is performance-based. Substantial progress in reducing crashes, injuries, and fatalities is required as a condition of continued funding. This funding source is considered to be "seed money" to get programs started. The grantee is expected to provide a portion of the project costs and is expected to continue the program after GHSP funding ends. State Highway Applicants must use the web-based grant system to submit applications.

For more information: <http://www.ncdot.org/programs/ghsp/>



### Eat Smart, Move More North Carolina Community Grants

The Eat Smart, Move More (ESMM) NC Community Grants program provides funding to local communities to support their efforts to develop community-based interventions that encourage, promote, and facilitate physical activity. The current focus of the funds is for projects addressing youth physical activity. Funds have been used to construct trails and conduct educational programs.

For more information: <http://www.eatsmartmovemorenc.com/Funding/CommunityGrants.html>



### The North Carolina Division of Parks and Recreation

The North Carolina Division of Parks and Recreation and the State Trails Program offer funds to help citizens, organizations and agencies plan, develop and manage all types of trails ranging from greenways and trails for hiking, biking, and horseback riding to river trails and off-highway vehicle trails.

For more information: <http://www.ncparks.gov/About/grants/main.php>

### NC Parks and Recreation Trust Fund (PARTF)

The Parks and Recreation Trust Fund (PARTF) provide dollar-for-dollar matching grants to local governments for parks and recreational projects to serve the general public. Counties, incorporated municipalities, and public authorities, as defined by G.S. 159-7, are eligible applicants.

A local government can request a maximum of \$500,000 with each application. An applicant must match the grant dollar-for-dollar, 50 percent of the total cost of the project, and may contribute more than 50 percent. The appraised value of land to be donated to the applicant can be used as part of the match. The value of in-kind services, such as volunteer work, cannot be used as part of the match.

For more information: [http://www.ncparks.gov/About/grants/partf\\_main.php](http://www.ncparks.gov/About/grants/partf_main.php)

### NC Department of Environment and Natural Resources - Recreational Trails and Adopt-a-Trail Grants

The State Trails Program is a section of the N.C. Division of Parks and Recreation. The program originated in 1973 with the North Carolina Trails System Act and is dedicated to helping citizens, organizations and agencies plan, develop and manage all types of trails ranging from greenways and trails for hiking, biking and horseback riding to river trails and off-highway vehicle trails. The Recreation Trails Program awards grants up to \$75,000 per project. The Adopt-A-Trail Program awards grants up to \$5,000 per project.



### Community Development Block Grant Funds

Community Development Block Grant (CDBG) funds are available to local municipal or county governments that qualify for projects to enhance the viability of communities by providing decent housing and suitable living environments and by expanding economic opportunities, principally for persons of low and moderate income. State CDBG funds are provided by the U.S. Department of Housing and Urban Development (HUD) to the state of North Carolina. Some urban counties and cities in North Carolina receive CDBG funding directly from HUD. Each year, CDBG provides funding to local governments for hundreds of critically-needed community improvement projects throughout the state. These community improvement projects are administered by the Division of Community Assistance and the Commerce Finance Center under eight grant categories. Two categories might be of support to pedestrian and bicycle projects in 'entitlement communities': Infrastructure and Community Revitalization.

### Clean Water Management Trust Fund (CWMTF)

This fund was established in 1996 and has become one of the largest sources of money in North Carolina for land and water protection, eligible for application by a state agency, local government, or non-profit. At the end of each year, a minimum of \$30 million is placed in the CWMTF. The revenue of this fund is allocated as grants to local governments, state agencies, and conservation non-profits to help finance projects that specifically address water pollution problems. Funds may be used for planning and land acquisition to establish a network of riparian buffers and greenways for environmental, educational, and recreational benefits.

For more information: <http://www.cwmtf.net/#appmain.htm>

### Urban and Community Forestry Grant

The North Carolina Division of Forest Resources Urban and Community Forestry grant can provide funding for a variety of projects that will help toward planning and establishing street trees as well as trees for urban open space. The goal is to improve public understanding of the benefits of preserving existing tree cover in communities and assist local governments with projects which will lead to a more effective and efficient management of urban and community forests. Grant requests should range between \$1,000 and \$15,000 and must be matched equally with non-federal funds. Grant funds may be awarded to any unit of local or state government, public educational institutions, approved non-profit 501(c)(3) organizations, and other tax-exempt organizations. First-time municipal applicant and municipalities seeking Tree City USA status are given priority for funding.

For more about Tree City USA status, including application instructions, visit: [http://ncforestservice.gov/Urban/urban\\_grant\\_overview.htm](http://ncforestservice.gov/Urban/urban_grant_overview.htm)





## LOCAL GOVERNMENT FUNDING SOURCES

Municipalities often plan for the funding of pedestrian and bicycle facilities or improvements through development of Capital Improvement Programs (CIP). In Raleigh, for example, the greenways system has been developed over many years through a dedicated source of annual funding that has ranged from \$100,000 to \$500,000, administered through the Recreation and Parks Department. CIPs should include all types of capital improvements (water, sewer, buildings, streets, etc.) versus programs for single purposes. This allows municipal decision-makers to balance all capital needs. Typical capital funding mechanisms include the capital reserve fund, capital protection ordinances, municipal service district, tax increment financing, taxes, fees, and bonds. Each category is described below. A variety of possible funding options available to North Carolina jurisdictions for implementing pedestrian and bicycle projects are also described below. However, many will require specific local action as a means of establishing a program, if not already in place.

### Capital Reserve Fund

Municipalities have statutory authority to create capital reserve funds for any capital purpose, including pedestrian facilities. The reserve fund must be created through ordinance or resolution that states the purpose of the fund, the duration of the fund, the approximate amount of the fund, and the source of revenue for the fund. Sources of revenue can include general fund allocations, fund balance allocations, grants, and donations for the specified use.

### Capital Project Ordinances

Municipalities can pass Capital Project Ordinances that are project specific. The ordinance identifies and makes appropriations for the project.

### Local Improvement District (LID)

Local Improvement Districts (LIDs) are most often used by cities to construct localized projects such as streets, sidewalks, or bikeways. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as traffic trip generation.

### Municipal Service District

Municipalities have statutory authority to establish municipal service districts, to levy a property tax in the district additional to the town-wide property tax, and to use the proceeds to provide services in the district. Downtown revitalization projects are one of the eligible uses of service districts, and can include projects such as street, sidewalk, or bikeway improvements within the downtown taxing district.

### Tax Increment Financing

Project Development Financing bonds, also known as Tax Increment Financing (TIF) is a relatively new tool in North Carolina, allowing localities to use future gains in taxes to finance the current improvements that will create those gains. When a public project (e.g., sidewalk improvements) is constructed, surrounding property values generally increase and encourage surrounding development or



redevelopment. The increased tax revenues are then dedicated to finance the debt created by the original public improvement project. Streets, streetscapes, and sidewalk improvements are specifically authorized for TIF funding in North Carolina. Tax Increment Financing typically occurs within designated development financing districts that meet certain economic criteria that are approved by a local governing body. TIF funds are generally spent inside the boundaries of the TIF district, but they can also be spent outside the district if necessary to encourage development within it.

### Other Local Funding Options

- Bonds/Loans
- Taxes
- Impact fees
- Exactions
- Installment purchase financing
- In-lieu-of fees
- Partnerships

## PRIVATE AND NON-PROFIT FUNDING SOURCES

Many communities have solicited greenway funding assistance from private foundations and other conservation-minded benefactors. Below are several examples of private funding opportunities available.

### Land for Tomorrow Campaign

Land for Tomorrow is a diverse partnership of businesses, conservationists, farmers, environmental groups, health professionals, and community groups committed to securing support from the public and General Assembly for protecting land, water, and historic places. The campaign was successful in 2013 in asking the North Carolina General Assembly to continue to support conservation efforts in the state. The state budget bill includes about \$50 million in funds for key conservation efforts in North Carolina. Land for Tomorrow works to enable North Carolina to reach a goal of ensuring that working farms and forests, sanctuaries for wildlife, land bordering streams, parks, and greenways, land that helps strengthen communities and promotes job growth, and historic downtowns and neighborhoods will be there to enhance the quality of life for generations to come.

For more information: <http://www.land4tomorrow.org/>

### The Robert Wood Johnson Foundation

The Robert Wood Johnson Foundation was established as a national philanthropy in 1972 and today it is the largest U.S. foundation devoted to improving the health and health care of all Americans. Grant making is concentrated in four areas:

- To ensure that all Americans have access to basic health care at a reasonable cost
- To improve care and support for people with chronic health conditions
- To promote healthy communities and lifestyles
- To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs



For more specific information about what types of projects are funded and how to apply, visit [www.rwjf.org/applications/](http://www.rwjf.org/applications/)

### North Carolina Community Foundation

The North Carolina Community Foundation, established in 1988, is a statewide foundation seeking gifts from individuals, corporations, and other foundations to build endowments and ensure financial security for non-profit organizations and institutions throughout the state. Based in Raleigh, the foundation also manages a number of community affiliates throughout North Carolina, that make grants in the areas of human services, education, health, arts, religion, civic affairs, and the conservation and preservation of historical, cultural, and environmental resources. The foundation also manages various scholarship programs statewide.

For more information: <http://nccommunityfoundation.org/>

### Walmart State Giving Program

The Walmart Foundation financially supports projects that create opportunities for better living. Grants are awarded for projects that support and promote education, workforce development/economic opportunity, health and wellness, and environmental sustainability. Both programmatic and infrastructure projects are eligible for funding. State Giving Program grants start at \$25,000, and there is no maximum award amount. The program accepts grant applications on an annual, state by state basis January 2nd through March 2nd.

Online resource: <http://foundation.walmart.com/apply-for-grants/state-giving>

### Rite Aid Foundation Grants

The Rite Aid Foundation is a foundation that supports projects that promote health and wellness in the communities that Rite Aid serves. Award amounts vary and grants are awarded on a one year basis to communities in which Rite Aid operates. A wide array of activities are eligible for funding, including infrastructural and programmatic projects.

Online resource: <https://www.riteaid.com/about-us/rite-aid-foundation>

### Z. Smith Reynolds Foundation

This Winston-Salem-based Foundation has been assisting the environmental projects of local governments and non-profits in North Carolina for many years. They have two grant cycles per year and generally do not fund land acquisition. However, they may be able to offer support in other areas of open space and greenways development.

For more information: [www.zsr.org](http://www.zsr.org)





### Bank of America Charitable Foundation, Inc.

The Bank of America Charitable Foundation is one of the largest in the nation. The primary grants program is called Neighborhood Excellence, which seeks to identify critical issues in local communities. Another program that applies to greenways is the Community Development Programs, and specifically the Program Related Investments. This program targets low and moderate income communities and serves to encourage entrepreneurial business development.

For more information: [www.bankofamerica.com/foundation](http://www.bankofamerica.com/foundation)

### Duke Energy Foundation

Funded by Duke Energy shareholders, this non-profit organization makes charitable grants to selected non-profits or governmental subdivisions. Each annual grant must have:

- An internal Duke Energy business “sponsor”
- A clear business reason for making the contribution

The grant program has three focus areas: Environment and Energy Efficiency, Economic Development, and Community Vitality. Related to this project, the Foundation would support programs that support conservation, training, and research around environmental and energy efficiency initiatives.

For more information: <http://www.duke-energy.com/community/foundation.asp>

### American Greenways Eastman Kodak Awards

The Conservation Fund’s American Greenways Program has teamed with the Eastman Kodak Corporation and the National Geographic Society to award small grants (\$250 to \$2,000) to stimulate the planning, design, and development of greenways. These grants can be used for activities such as mapping, conducting ecological assessments, surveying land, holding conferences, developing brochures, producing interpretive displays, incorporating land trusts, and building trails. Grants cannot be used for academic research, institutional support, lobbying, or political activities.

For more information: [www.conservationfund.org](http://www.conservationfund.org)

### National Trails Fund

American Hiking Society created the National Trails Fund in 1998, the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. 73 million people enjoy foot trails annually, yet many of our favorite trails need major repairs due to a \$200 million backlog of badly needed maintenance. National Trails Fund grants help give local organizations the resources they need to secure access, volunteers, tools and materials to protect America’s cherished public trails. To date, American Hiking has granted more than \$240,000 to 56 different trail projects across the U.S. for land acquisition,



constituency building campaigns, and traditional trail work projects. Awards range from \$500 to \$10,000 per project.

Projects the American Hiking Society will consider include:

- Securing trail lands, including acquisition of trails and trail corridors, and the costs associated with acquiring conservation easements.
- Building and maintaining trails which will result in visible and substantial ease of access, improved hiker safety, and/or avoidance of environmental damage.
- Constituency building surrounding specific trail projects - including volunteer recruitment and support.

For more information: <http://www.americanhiking.org/national-trails-fund/>



### The Conservation Alliance

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to protect wild and natural areas. Grants are typically about \$35,000 each. Since its inception in 1989, The Conservation Alliance has contributed \$4,775,059 to environmental groups across the nation, saving over 34 million acres of wild lands.

The Conservation Alliance Funding Criteria:

- The Project should be focused primarily on direct citizen action to protect and enhance our natural resources for recreation.
- The Alliance does not look for mainstream education or scientific research projects, but rather for active campaigns.
- All projects should be quantifiable, with specific goals, objectives, and action plans and should include a measure for evaluating success.
- The project should have a good chance for closure or significant measurable results over a fairly short term (one to two years).
- Funding emphasis may not be on general operating expenses or staff payroll.

For more information: <http://www.conservationalliance.com/grants>



### National Fish and Wildlife Foundation (NFWF)

The National Fish and Wildlife Foundation (NFWF) is a private, non-profit, tax-exempt organization chartered by Congress in 1984. The National Fish and Wildlife Foundation sustains, restores, and enhances the Nation's fish, wildlife, plants, and habitats. Through leadership conservation investments with public and private partners, the Foundation is dedicated to achieving maximum conservation impact by developing and applying best practices and innovative methods for measurable outcomes.



The Foundation awards matching grants under its Keystone Initiatives to achieve measurable outcomes in the conservation of fish, wildlife, plants, and the habitats on which they depend. Awards are made on a competitive basis to eligible grant recipients, including federal, tribal, state, and local governments, educational institutions, and non-profit conservation organizations. Project proposals are received on a year-round, revolving basis with two decision cycles per year. Grants generally range from \$50,000-\$300,000 and typically require a minimum 2:1 non-federal match.

Funding priorities include bird, fish, marine/coastal, and wildlife and habitat conservation. Other projects that are considered include controlling invasive species, enhancing delivery of ecosystem services in agricultural systems, minimizing the impact on wildlife of emerging energy sources, and developing future conservation leaders and professionals.

For more information: <http://www.nfwf.org/pages/grants/home.aspx>

### The Trust for Public Land

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the TPL is the only national non-profit working exclusively to protect land for human enjoyment and well-being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities.

For more information: <http://www.tpl.org>

### Blue Cross Blue Shield of North Carolina Foundation (BCBS)

Blue Cross Blue Shield (BCBS) focuses on programs that use an outcome approach to improve the health and well-being of residents. The Health of Vulnerable Populations grants program focuses on improving health outcomes for at-risk populations. The Healthy Active Communities grant concentrates on increased physical activity and healthy eating habits. Eligible grant applicants must be located in North Carolina, be able to provide recent tax forms and, depending on the size of the non-profit, provide an audit.

For more information: <http://www.bcbsncfoundation.org/>

### Alliance for Biking & Walking: Advocacy Advance Grants

Bicycle and pedestrian advocacy organizations play the most important role in improving and increasing biking and walking in local communities. Advocacy Advance Grants enable state and local bicycle and pedestrian advocacy organizations to develop, transform, and provide innovative strategies in their communities. With sponsor support, the Alliance for Biking & Walking has awarded more than \$500,000 in direct grants, technical assistance, and scholarships to advocacy organizations across North America since the Advocacy Advance Grant program's inception. In 2009 and 2010, these one-year grants were awarded twice annually to startup organizations and innovative campaigns to dramatically increase biking and walking. The Advocacy Advance





Partnership with the League of American Bicyclists also provides necessary technical assistance, coaching, and training to supplement the grants.

For more information, visit [www.peoplepoweredmovement.org](http://www.peoplepoweredmovement.org)

### Local Trail Sponsors

A sponsorship program for trail amenities allows smaller donations to be received from both individuals and businesses. Cash donations could be placed into a trust fund to be accessed for certain construction or acquisition projects associated with the greenways and open space system. Some recognition of the donors is appropriate and can be accomplished through the placement of a plaque, the naming of a trail segment, and/or special recognition at an opening ceremony. Types of gifts other than cash could include donations of services, equipment, labor, or reduced costs for supplies.

### Corporate Donations

Corporate donations are often received in the form of liquid investments (i.e. cash, stock, bonds) and in the form of land. Municipalities typically create funds to facilitate and simplify a transaction from a corporation's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented.

### Private Individual Donations

Private individual donations can come in the form of liquid investments (i.e. cash, stock, bonds) or land. Municipalities typically create funds to facilitate and simplify a transaction from an individual's donation to the given municipality. Donations are mainly received when a widely supported capital improvement program is implemented.

### Fundraising/Campaign Drives

Organizations and individuals can participate in a fundraiser or a campaign drive. It is essential to market the purpose of a fundraiser to rally support and financial backing. Often times fundraising satisfies the need for public awareness, public education, and financial support.

### Volunteer Work

It is expected that many citizens will be excited about the development of a greenway corridor. Individual volunteers from the community can be brought together with groups of volunteers from church groups, civic groups, scout troops and environmental groups to work on greenway development on special community workdays. Volunteers can also be used for fund-raising, maintenance, and programming needs.

2014 Bicycle and Pedestrian Plan

WALK BIKE  
OCEAN ISLE  
BEACH



OCEAN ISLE BEACH BICYCLE + PEDESTRIAN PLAN

Prepared for the Town of Ocean Isle Beach & NCDOT  
Prepared by Alta Planning + Design

