

TOWN OF DUCK

Comprehensive Pedestrian Plan



SUBMITTED TO
Town of Duck



**North Carolina
Department of Transportation**



**NCDOT Division of Bicycle and
Pedestrian Transportation**



SUBMITTED BY
Engineering NC, P.C.

SEPTEMBER 2014



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Executive Summary

Project Background

Using a Planning Grant awarded by the North Carolina Department of Transportation (NCDOT), the Town of Duck has developed this Comprehensive Pedestrian Plan to describe recommended improvements to the multi-modal transportation system within the Town. This Plan also identifies project costs, implementation priorities, and action items. The proposed infrastructure, programming measures, and policy actions detailed herein are intended to build upon the significant improvements the Town has made since its incorporation in 2002. Finally, the Plan will help achieve the Town Council's adopted Vision to make Duck a Pedestrian First Community.

Steering Committee

To assist in the development of the Plan, the Town established a Steering Committee composed of residents, business owners, public safety personnel, NCDOT, the Albemarle Rural Planning Organization, and Town staff. The Committee met four times during the planning process, to help establish project goals, collect and analyze data, review draft recommendations, and review the Final Plan.

Public Involvement

Early in the planning process, the Town created and publicized a public survey questionnaire, which was distributed at various locations throughout Town as well as online. The survey asked respondents about the existing pedestrian network in Duck, and also asked what types of improvements respondents would like to see. The Town received over 600 responses to the questionnaire.

In addition, two Public Meetings were held during plan development. The first meeting was to review the project purpose and goals, existing conditions and data review, and solicit input on potential recommendations. The second meeting included review and discussion of draft recommendations. During both meetings, a formal presentation was followed by questions and informal discussions. Also during both meetings, participants used electronic voting to register their opinions.

Data Collection and Analysis

Data collection for the Plan took a variety of forms, including: Geographic Information Systems (GIS) mapping and analysis; review of available pedestrian, bicycle, and vehicular counts and crash data; collection of new pedestrian and bicycle counts; and field reconnaissance and photo-documentation. In addition, drainage plans for NC 12 within the Village Center (provided by NCDOT) were reviewed to help determine available right-of-way, existing utility conflicts, and physical features such as retaining walls and drainage inlets. The results of the analysis were presented at the second Steering Committee meeting and at the first Public Meeting.

Overview of the Pedestrian Environment

Pedestrian transportation in the Town has traditionally relied on the Duck Trail, which is comprised of a shared use path north and south of the Village Center and roadway shoulders shared by pedestrians and bicyclists within the Village. Marked pedestrian crosswalks are present with the Village and at several locations north and south of the Village. During tourist season, the existing facilities are heavily used, and conflicts among pedestrians, bicyclists, and vehicles are common. In several locations throughout the Town, ponding of stormwater runoff creates temporary obstructions to pedestrian, bicycle, and vehicular travel, and the Town is improving these locations in a systematic way over time.

Recently, the Town has constructed a pedestrian boardwalk linking the Town Park with businesses to the north and south within the Village. The boardwalk provides access to the Currituck Sound, enhances access to businesses, and also provides a viable and popular means of north-south pedestrian travel. In addition, the Town has recently made improvements to the number and locations of marked crosswalks, has improved the markings for the shared shoulders in the Village, and has improved regulatory signage. To complement these infrastructure improvements, the Town has used educational outreach in the form of brochures, web site information, and public events to promote pedestrian safety.

Plan Development and Recommendations

The final Comprehensive Pedestrian Plan includes recommendations for infrastructure improvements, public outreach and education, and policy actions. The recommendations will help foster a physical and cultural environment that promotes walking as a form of transportation in Duck. The Plan also suggests steps to realize the Town's goals, along with responsible parties and potential partners. Infrastructure costs are included along with a phasing and implementation plan. Finally, the Plan includes information on technical resources and potential funding sources, as well as federal and state guidelines and references for design criteria, minimum standards, and accessibility.

Sidewalks

The Plan recommends the addition of sidewalks to both sides of NC 12 within the Village Center to provide additional capacity within the corridor, separate pedestrians from vehicular and bicycle lanes, and channelize pedestrians to marked crosswalk locations. The Community Development Department should lead implementation in partnership with NCDOT and the Regional Planning Organization (RPO). The sidewalks will likely need to be implemented in phases, and will require the Town to pursue funding from a variety of sources. The likely total cost of sidewalk construction is \$700,000.

Crosswalks

To capitalize on recent crosswalk improvements by the Town, the Plan recommends for adding, removing, and consolidating marked crosswalks, to help develop a system of crossings that works with the other improvements included herein. Several of the crosswalk locations are recommended to include a median refuge island. As lead agency, the Community Development Department should work with NCDOT to implement the crosswalk improvements. Funding will likely need to come from a variety of sources, and the likely total cost is \$100,000.

Bike Lanes

In conjunction with the installation of sidewalks, the shoulders with the Village Center should be converted to formal bike lanes with standard pavement markings and signs. Implementation should be part of the sidewalk construction projects.

Paved Shoulders

The extension of paved shoulders on roadway sections north and south of the Village Center would provide accommodation for bicyclists in addition to the shared use path along these roadway sections. The Community Development Department should take the lead in coordinating with NCDOT to implement the paved shoulders as part of roadway repaving, at a total cost of \$770,000.

Shared Use Paths

The Plan recommends minor extensions of the existing shared use path north and south of the Village Center, to connect to existing and proposed facilities and improve the transition into the Village. The Plan also recommends consideration of a longer term project to install a new shared use path on the west side of NC 12 south of the Village. As lead agency, the Community Development Department should partner with NCDOT and private landowners to implement the paths. The likely total construction cost is \$880,000 (\$670,000 of that total comes from the potential long-term construction of the new path south of the Village).

Pedestrian Level Lighting

Illumination of marked crosswalks will benefit the high levels of night-time pedestrian, bicycle, and vehicular travel. In addition, over the long-term, pedestrian lighting could be installed throughout the Village Center. Community Development and NCDOT should work together on implementation; lighting at the crosswalk locations will likely cost \$140,000.

Intersection Improvements

As part of new sidewalk construction, pedestrian landings and marked crosswalks of intersecting streets would be incorporated. Additional improvements to corner radii and sight lines should also be made where appropriate. For the shared use path north and south of the Village, pavement markings, signage, and sight lines should be analyzed and improved where necessary. Community Development, NCDOT, and the RPO should collaborate to identify funding for the improvements, which should occur as part of sidewalk construction, where applicable. The likely total cost is \$280,000.

Gateways

To enhance the transitions into the Village Center, the Plan recommends Gateway treatments including raised median islands and warning signs, at a total likely cost of \$50,000.

Drainage

The Town has taken significant actions to remediate stormwater ponding that impedes pedestrian, bicycle, and vehicular traffic; the Plan recommends continuation of these efforts at additional specific locations, with construction details and costs to be determined.

Intelligent Transportation Systems

The use of traffic video cameras, web interface, and/or advance warning message signs could convey benefits to the overall transportation system in the Town. Town Administration should investigate the potential for this along with NCDOT.

Encouragement Programs

The Town has recently taken significant steps to encourage walking as a way to access the Town's many destinations. The Plan recommends that these programs be continued and expanded. Elements such as walking and bicycling maps, walking tours, wayfinding programs, tip sheets, and working with bicycle rental shops to promote use of bicycle lights and helmets could all enhance the culture of walking in the Town. Town Administration should work with business owners and the Steering Committee to implement.

Education Programs

The Town should treat education as an integral part of the overall improvement of the pedestrian system, to be pursued concurrently with infrastructure improvements. The Plan includes recommendations for distribution of information through real estate rental companies, professional development for Town staff, coordination with state education programs, and outreach at Town events. Town Administration should work with business owners and the Steering Committee to implement.

Enforcement Programs

The Town Police Department should continue to enforce speed limits throughout the Town, combined with targeted enforcement of legal crosswalk behavior (both by motorists and pedestrians). In addition, the Plan suggests consideration of a program to cite good behavior.

Evaluation Programs

To help monitor the progress and results of Plan implementation, the Town should conduct annual pedestrian and bicycle counts, and compare the results to similar counts taken in 2009 and 2013. In addition, the Plan recommends an annual report on count and crash data, infrastructure improvements, outreach events, and public feedback. Town Council and Administration should lead implementation.

Complete Streets Policy

To complement recently-adopted NCDOT policy, the Town should consider adopting its own Complete Streets Policy to encourage development that accommodates all roadway users. Town Council would be responsible for adopting the policy.

Development Partners

The Plan recommends ordinance enactment and coordination with private interests to ensure that new development and redevelopment projects help implement the Plan's goals. In particular, opportunities exist to coordinate on sidewalk construction and connection, pedestrian access through parking lots, and neighborhood connections.

Access Management

The Town should continue efforts to improve property access and reduce conflict points between motor vehicles and pedestrians and bicyclists.

CURRITUCK SOUND

ATLANTIC OCEAN

Town Boardwalk

Town Park

Town Hall

- Parcel Boundaries
- Existing Pedestrian Facilities**
- Boardwalk
- Wide Shoulder
- Multi-use Path
- Existing Crosswalk
- Subdivision Access
- Proposed Pedestrian Facilities**
- Boardwalk
- Sidewalk
- Bike Lane
- Shared Use Path
- Paved Shoulder
- Crosswalk
- Pedestrian Island
- Raised Medians
- Intersection Improvements

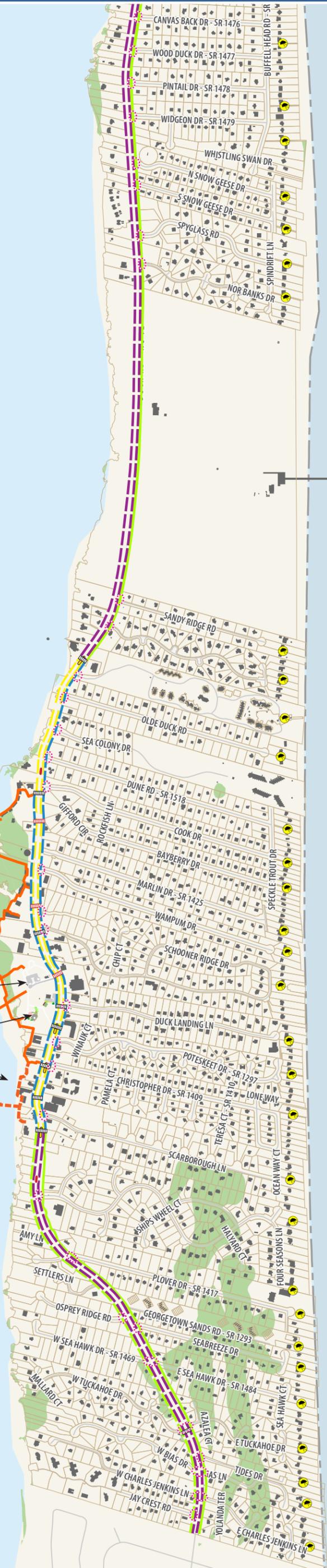




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1: Project Overview and Purpose

Purpose

The Town of Duck Comprehensive Pedestrian Plan (the Plan) will guide the Town, the North Carolina Department of Transportation (NCDOT), and other local and regional partners in developing a pedestrian first community through improved infrastructure, programs, and policies. The Plan is a decision-making tool to assist leaders in prioritizing, funding, and implementing projects. It should be evaluated and updated over time as progress is made and conditions change.

Background

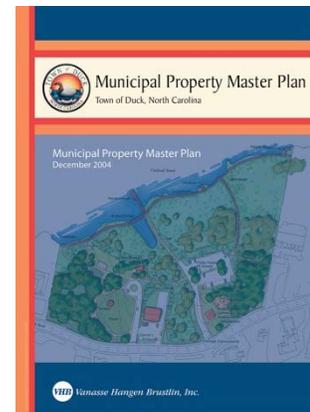
NCDOT Bicycle and Pedestrian Planning Grant Initiative

In 2012, the Town of Duck was awarded a matching grant from the NCDOT Bicycle and Pedestrian Planning Grant Initiative. The purpose of the grant is to encourage municipalities to develop comprehensive bicycle plans and pedestrian plans. The program has assisted more than 100 North Carolina communities and is administered through NCDOT’s Division of Bicycle and Pedestrian Transportation (DBPT).

Past and Current Plans and Initiatives

Since its incorporation in 2002, the Town of Duck has undertaken and/or participated in numerous efforts to enhance the pedestrian environment and encourage walking throughout the Town. These efforts have included adoption of plans, implementation of pedestrian-related programs, and construction of new infrastructure. The Comprehensive Pedestrian Plan builds upon these efforts and related documents, which are listed below and summarized in Chapter 2:

- Municipal Property Master Plan (2004)
- Future Land Use Map (2004)
- CAMA Core Land Use Plan (2005)
- Pedestrian and Bicycle Road Safety Audit (2009)
- Mid-Currituck Bridge Study (2010)
- 2022 Vision (2012)
- Duck Town Council 3-5 Year Goals (2012)
- Land Use Ordinances (updated to 2013)
- NCDOT State Transportation Improvement Program (STIP) (2013)



Project Vision, Goals and Objectives

The Town’s 2022 Vision establishes the Vision for the Comprehensive Pedestrian Plan:

Duck is a pedestrian first community that is safe and easy to navigate by walking and cycling. Our shared use trail, soundside boardwalk and beach trail provide a variety of ways to explore

and discover Duck. Collaboration with various organizations enables us to optimize our traffic flow in our unique seasonal environment.

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

1. Become a Pedestrian First Community and a model Outer Banks town for pedestrian infrastructure and usage.
2. Provide and/or adapt infrastructure which encourages safe pedestrian movement and awareness through a Complete Streets approach, including access for mobility impaired individuals, as well as separation of bicyclists and pedestrians where appropriate.
3. Develop tailored education and awareness programs for various user types and experience levels, accommodating recreation and transportation needs.
4. Provide connectivity between and within neighborhoods and a beach trail to enhance pedestrian mobility, access to the village area, and for emergency access and evacuation.
5. Provide a systematic network of pedestrian crossings.
6. Prepare consistent wayfinding for safety and user guidance through signing and pavement markings.
7. Establish design guidelines for pedestrian lighting, signage, benches and other support amenities.
8. Provide safe, accessible and direct access to businesses in consideration of economic enhancement.
9. Improve environmental conditions in stormwater and air quality by following low impact development practices and encouraging non-motorized transportation.

Plan Components

This Plan is structured to assist the Town in moving from the planning stage into implementation. To do so, it establishes a clear purpose (Chapter 1), assesses existing conditions (Chapter 2), recommends infrastructure improvements (Chapter 3), includes program and policy recommendations (Chapter 4), and outlines a plan for implementation (Chapter 5). Appendices include the results of participant voting during the two public meetings, the 2009 Road Safety Audit, corridor mapping from NCDOT, the public survey questionnaire and responses, and the results of automated pedestrian counts taken during the project.

Planning Process and Public Involvement

Steering Committee

The project Steering Committee included local residents, business owners, Town Council, Town Police and Fire Departments, NCDOT, and the Albemarle Regional Planning Organization. The Steering Committee met four times throughout the planning process to discuss goals and objectives, existing conditions, draft recommendations, and the final plan.

Data Collection, Analysis, and Documentation

Using data collected from previous related projects, available aerial photography and GIS data, crash data, and pedestrian/bicycle counts conducted by the Town as part of this project, the existing conditions were documented and mapped. This assessment also included an all-day field investigation

to confirm physical conditions, photo-document key elements within the project area, and observe pedestrian/cyclist/automobile behavior during morning, daytime, and night-time hours. The existing conditions mapping and preliminary findings and observations were presented to the Steering Committee and at a Public Meeting in July 2013.

Public Involvement

The primary means of public input was a survey questionnaire distributed at Town events, made available at Duck businesses and in Town Hall, publicized on line, and presented at the first Public Meeting. The Town received over 600 responses to the questionnaire. The first Public Meeting for the project was held in July 2013, and attended by approximately 47 people. At the meeting, the existing conditions, goals and objectives were presented, and participants were allowed to vote on a series of question slides that reflected some of the items from the questionnaire. The voting results were saved and documented electronically (see Appendix A).



A second Public Meeting was held in October 2013, and was attended by 62 people. The draft recommendations were presented and feedback was solicited through electronic voting as well as a question/answer/comment period. The voting results were saved and documented electronically (see Appendix A).

Plan Development

Following the assessment of existing conditions, along with public and Steering Committee input, preliminary recommendations for improvements to be included in the Plan were developed. This process included a worksession and field reconnaissance with Town staff, consideration of physical challenges and opportunities to provide new infrastructure, potential phasing of improvements, and suggestions for policy and program implementation. After receiving comments on the Draft Plan from the public, the Steering Committee, Town staff, and NCDOT, the Plan was revised and the final version was presented to NCDOT and Town Council.

Benefits of a Walkable Community

A walkable community provides the infrastructure for people to choose active over motorized transportation. It supports a healthy robust lifestyle for year-round residents as well as the seasonal visitors. Along this same line of thought, a pedestrian first community inspires us all to shift our thinking to emphasize the safety of pedestrians and cyclists throughout the community while accommodating motorized traffic in an efficient manner. This plan seeks to improve the physical setting for walking, while also promoting a culture that supports multimodal transportation.

A more livable community evolves from the framework for walking and cycling and allows a choice in transportation which has many benefits. Modal shift reduces traffic congestion by shifting capacity demand from the roadway to sidewalks and bike lanes which creates a more efficient use of space and resources. In addition to reducing roadway congestion, this shift also reduces parking demand. Sidewalks and bike lanes require less space than vehicle lanes which reduces right-of-way needs and impervious area affecting storm water management. Modal shift improves air quality by having fewer gas powered vehicles on the network and by reducing congestion and delay. A shift to active transportation also has many health benefits from the physical activity, breathing fresh air, and generally being outside. Finally, an improved pedestrian environment (and resulting improved transportation system) contributes to the Town’s economic well-being as access to businesses and tourist destinations is enhanced.

According to the North Carolina Statewide Pedestrian/Bicycle Plan, investments in infrastructure can significantly improve pedestrian safety. The Statewide Plan cites a 2008 Federal Highway Administration publication that suggests that sidewalk installation results in a 65%-89% reduction in pedestrian crashes.

The Centers for Disease Control and Prevention recommend 150 minutes of moderate physical activity per week. Infrastructure and programs to encourage walking and bicycling can directly support this goal, encouraging residents and tourists to be more physically active.

Numerous studies have documented the positive economic benefits of improved walkability. This includes increased property values, job creation, economic development, and tourism. As detailed in the Statewide Ped/Bike Plan, a one-time public investment of \$6.7 million in paths and paved shoulders in the Outer Banks has generated \$60 million in annual tourism revenue.



2: Existing Conditions

Overview

The Town of Duck is an Outer Banks resort town located in northeastern Dare County, North Carolina (see Figure 1). Incorporated in 2002, the Town comprises the historic Village of Duck, surrounding residential areas, the Sanderling Inn resort, and the US Army Corps of Engineers Field Research Facility. The Town is home to approximately 500 permanent residents, but the population swells to nearly 25,000 during the summer tourist season. The main roadway thoroughfare through Duck is NC 12, a 2-lane and 3-lane facility that provides the only means of vehicular access to Duck and points north, including the popular resort destination of Corolla. NC 12 is also a storm evacuation route.

The NC 12 corridor also serves as the primary pedestrian and bicycle route in Duck, and includes the Duck Trail, which consists of a shared use path on the east side of the road north and south of the Village, transitioning to shoulders along the road for use by pedestrians and bicyclists within the Village. Recently, the Town constructed a Soundside Boardwalk spanning most of the Village Center; this provides an attractive and popular alternative for pedestrians. Nevertheless, the multi-modal transportation system receives significant pressure, and conflicts among pedestrians, cyclists, and motorists are frequent. In addition, roadway and trail flooding during rain events represents an accessibility and safety issue for pedestrians, bicyclists, and motorists. East-west pedestrian and bicycle access to the beach, the Sound, and the Village Center is provided by residential streets, which are primarily private streets with low vehicular volumes and low speeds. The shared use path along the east side of NC 12 provides pedestrian and bicycle connection from Duck to the adjacent communities of Southern Shores and Currituck County.

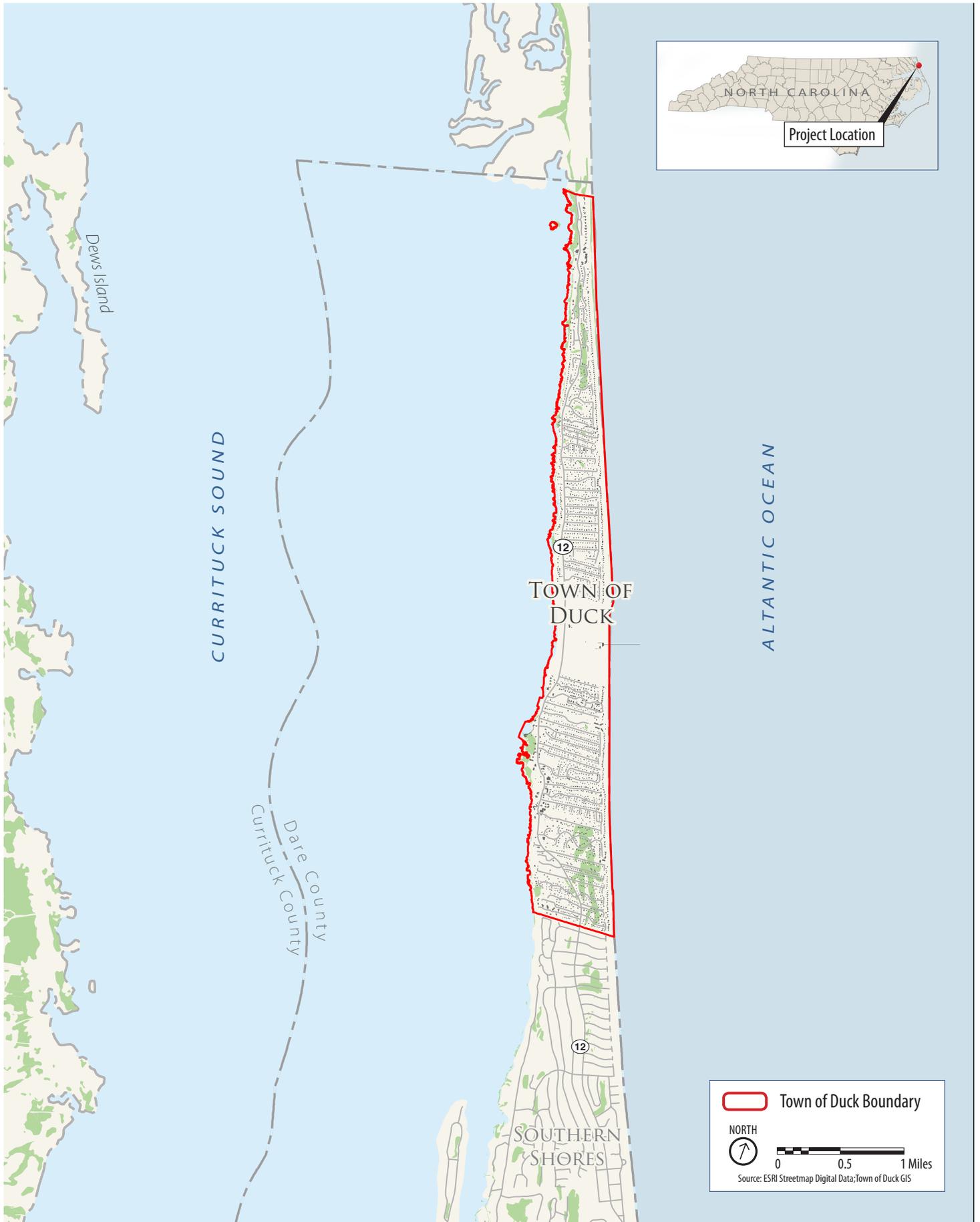
Existing Conditions Mapping

Available aerial mapping and GIS data were collected from the Town and from Dare County to develop the Existing Conditions mapping shown in Figure 2. The maps include property lines, existing land uses, existing pedestrian facilities (shared use path, wide shoulders, boardwalk, crosswalks), and pedestrian and bicycle crashes from 2007-2013. As Figure 2 shows, facilities used by pedestrians in Duck are limited to the shared use path along the east side of NC 12 north and south of the Village Center, the shoulders within the Village





FIGURE 1
VICINITY MAP

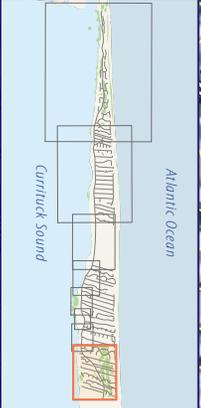


 Town of Duck Boundary



0 0.5 1 Miles

Source: ESRI Streetmap Digital Data; Town of Duck GIS



Parcel Boundaries

Existing Pedestrian Facilities

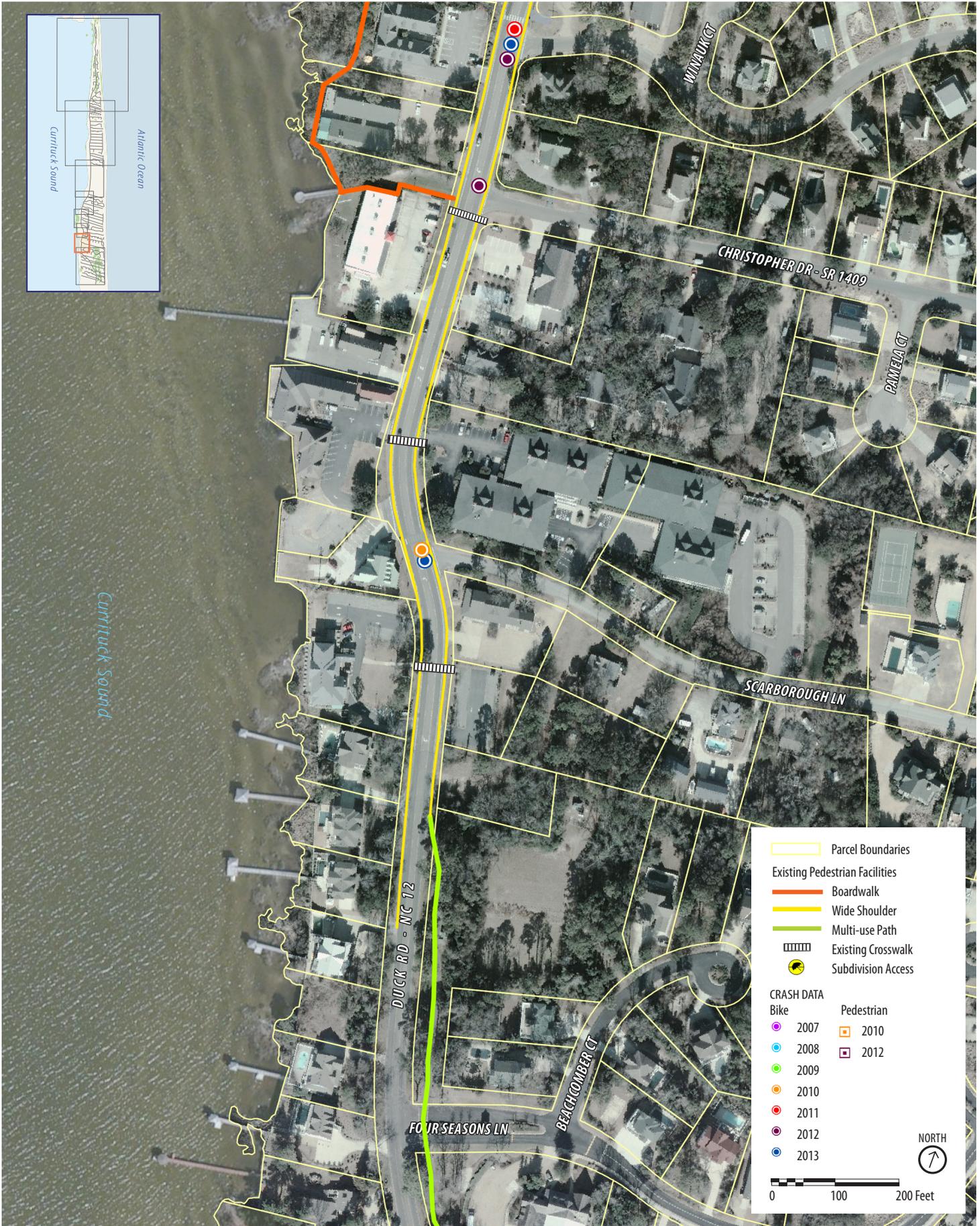
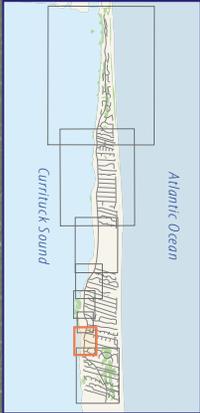
- Boardwalk
- Wide Shoulder
- Multi-use Path
- Existing Crosswalk
- Subdivision Access

CRASH DATA

Bike	Pedestrian
2007	2010
2008	2012
2009	
2010	
2011	
2012	
2013	

NORTH

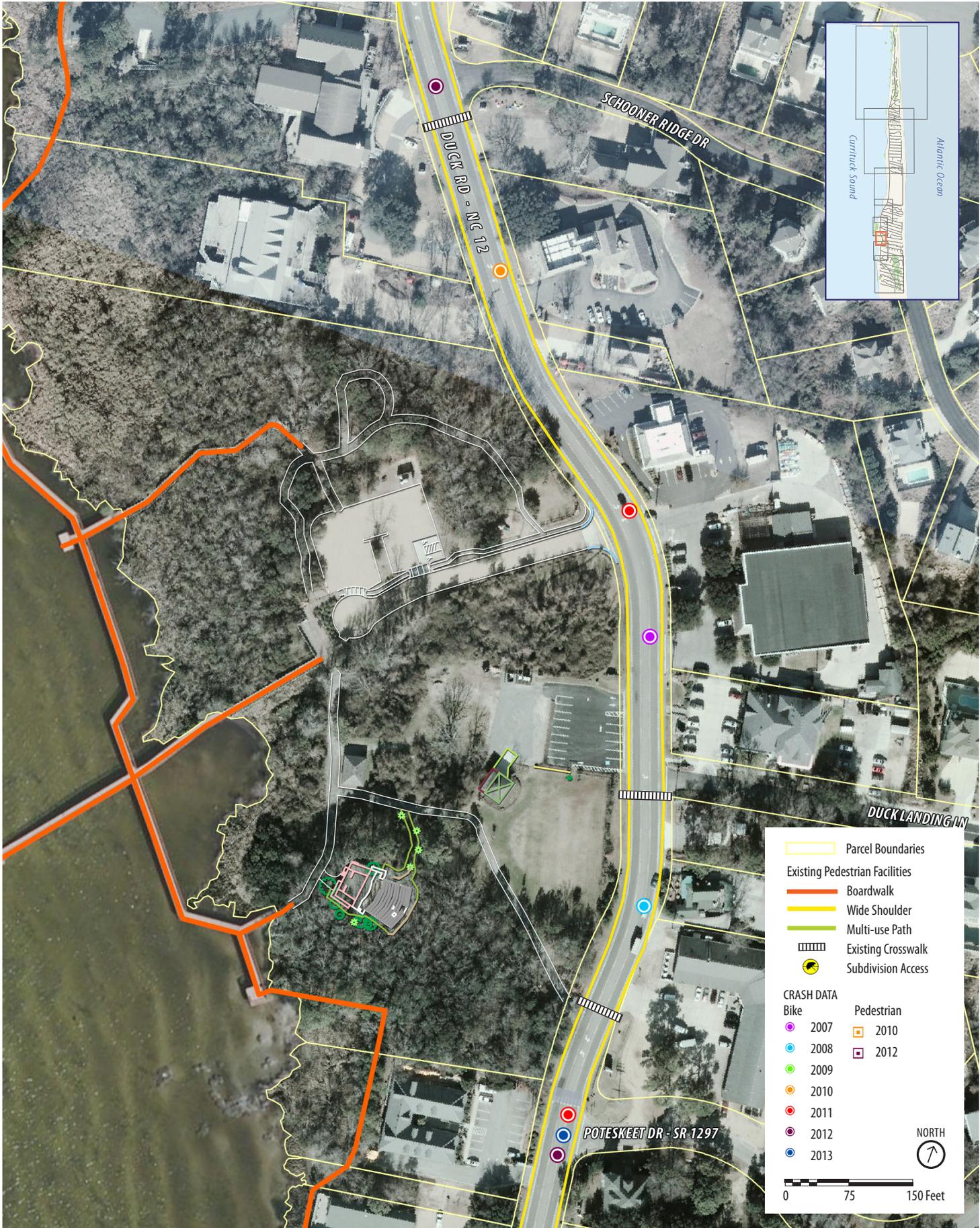
0 200 400 Feet

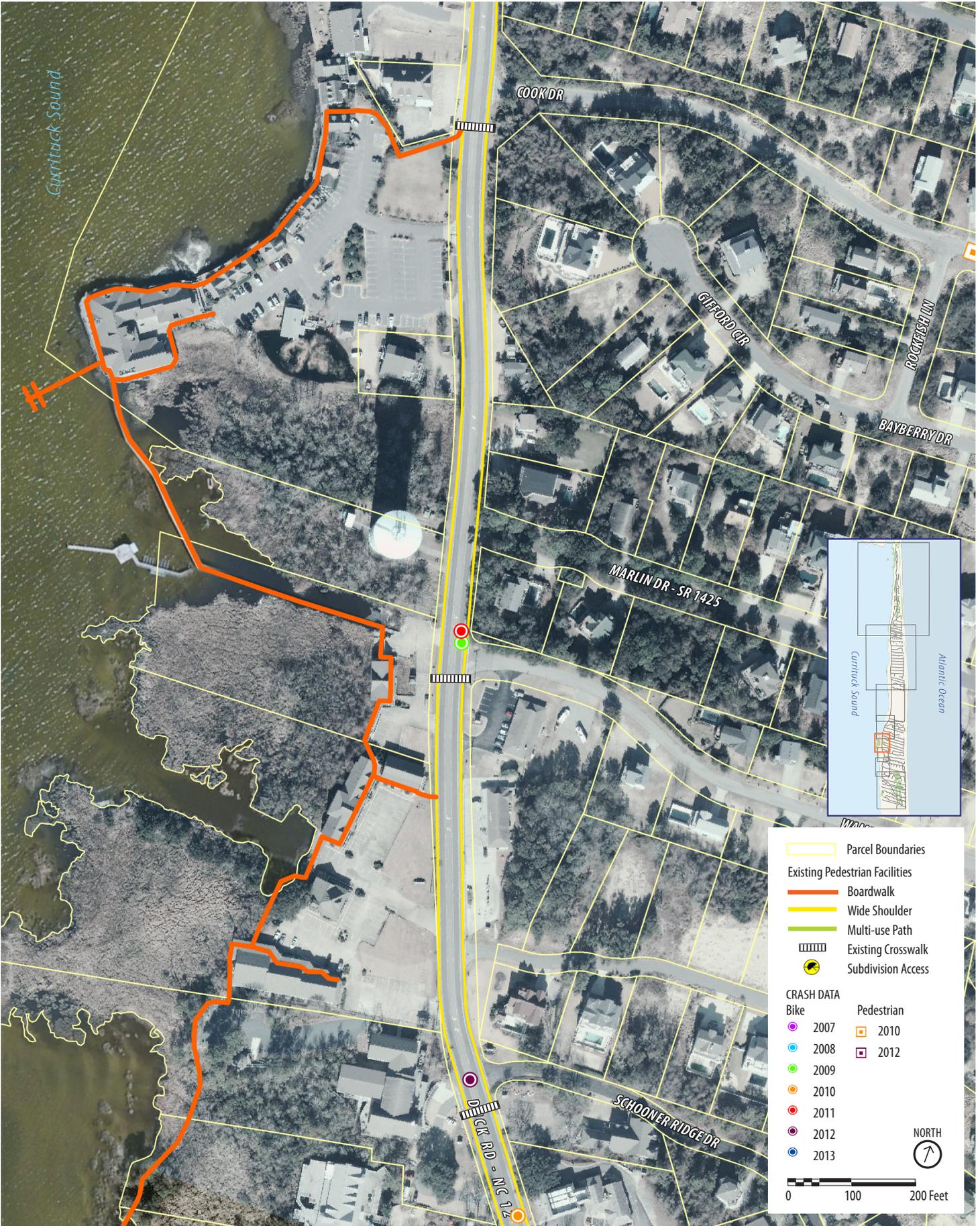


	Parcel Boundaries
Existing Pedestrian Facilities	
	Boardwalk
	Wide Shoulder
	Multi-use Path
	Existing Crosswalk
	Subdivision Access
CRASH DATA	
Bike	Pedestrian

0 100 200 Feet

NORTH

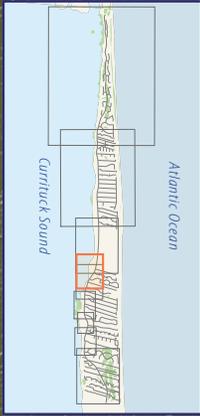




- Parcel Boundaries
- Existing Pedestrian Facilities**
- Boardwalk
- Wide Shoulder
- Multi-use Path
- Existing Crosswalk
- Subdivision Access

- CRASH DATA**
- | | |
|------|------------|
| Bike | Pedestrian |
| 2007 | 2010 |
| 2008 | 2012 |
| 2009 | |
| 2010 | |
| 2011 | |
| 2012 | |
| 2013 | |



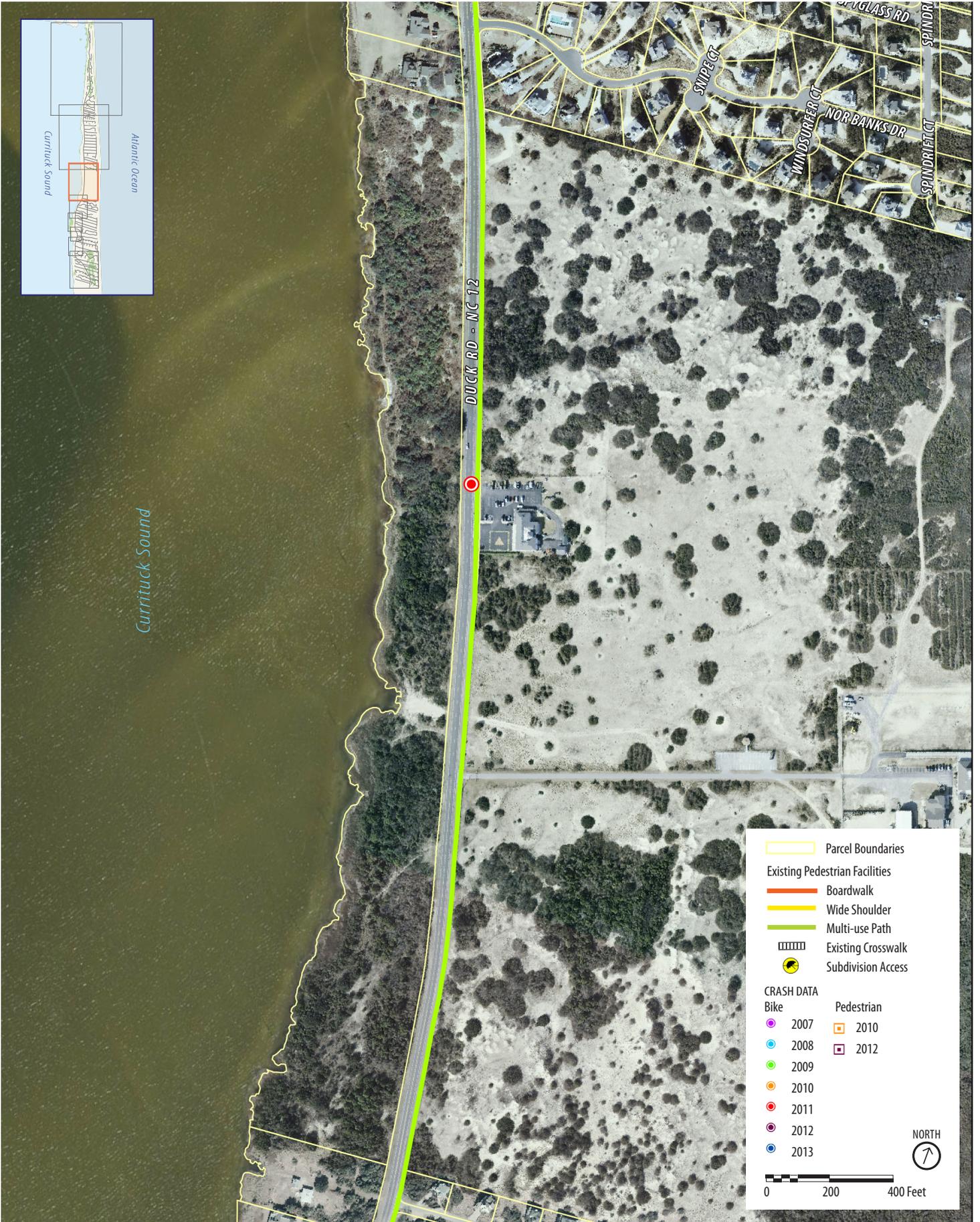
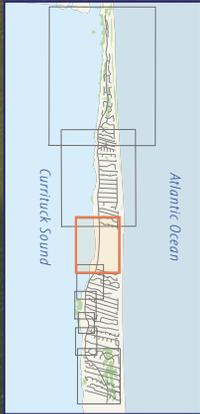


	Parcel Boundaries
Existing Pedestrian Facilities	
	Boardwalk
	Wide Shoulder
	Multi-use Path
	Existing Crosswalk
	Subdivision Access
CRASH DATA	
Bike	
	2007
	2008
	2009
	2010
	2011
	2012
	2013
Pedestrian	
	2010
	2012

0 125 250 Feet

NORTH





Parcel Boundaries

Existing Pedestrian Facilities

- Boardwalk
- Wide Shoulder
- Multi-use Path
- Existing Crosswalk
- Subdivision Access

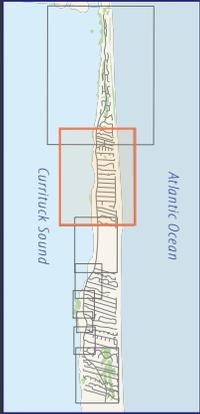
CRASH DATA

Bike	Pedestrian
2007	2010
2008	2012
2009	
2010	
2011	
2012	
2013	

0 200 400 Feet

NORTH





Currituck Sound

Atlantic Ocean

Parcel Boundaries

Existing Pedestrian Facilities

-  Boardwalk
-  Wide Shoulder
-  Multi-use Path
-  Existing Crosswalk
-  Subdivision Access

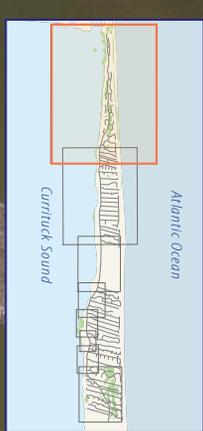
CRASH DATA

Bike	Pedestrian
 2007	 2010
 2008	 2012
 2009	
 2010	
 2011	
 2012	
 2013	

0 350 700 Feet

NORTH



Parcel Boundaries

Existing Pedestrian Facilities

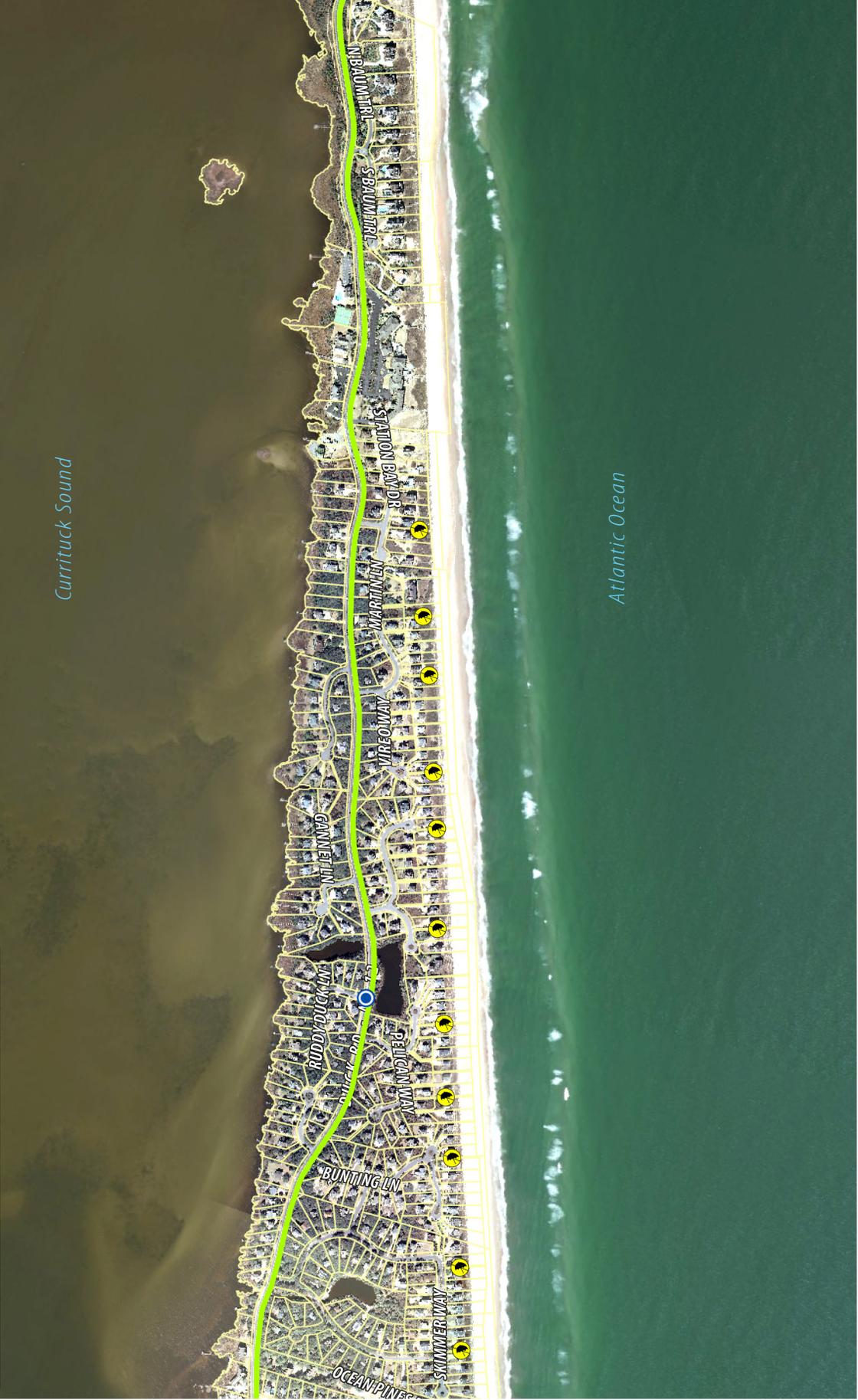
- Boardwalk
- Wide Shoulder
- Multi-use Path
- Existing Crosswalk
- Subdivision Access

CRASH DATA

● 2007	■ 2010
● 2008	■ 2012
● 2009	
● 2010	
● 2011	
● 2012	
● 2013	

0 500 1,000 Feet

NORTH 



Center, the Soundside Boardwalk on the west side of the Village Center, and numerous crosswalks on NC 12. The shared use path and the shoulders are shared by bicyclists and pedestrians.

Pedestrian and Bicycle Crashes

Reported crashes involving pedestrians and bicyclists between 2007 and 2013 were collected from NCDOT and the Town Police Department. Figure 2 identifies crash locations and types (pedestrian/bicycle). Table 1 below summarizes the data. In addition, the 2009 Pedestrian and Bicycle Road Safety Audit (included as Appendix B) provides additional analysis of crash data from 2006-2009.

**Town of Duck Police Department
Accidents Involving Pedestrians or Bicyclists
2007 - 2013 YTD**

YEAR	Incident #	Involvement	Accident Date	Street	Intersection	Units	Total by Year
2007		Bicycle/Motor Vehicle	4/6/2007	NC 12 in front of Kellogg Supply	N from Duck Landing Lane	3	1
2008		Bicycle/Motor Vehicle	8/16/2008	NC 12 in front of Pizzazz Pizza	S from Duck Landing Lane	2	1
2009	090605030	Bicycle/Motor Vehicle	6/6/2009	NC 12 at entrance of 1209 Duck Rd	N From Duck Landing Lane	2	
2009	090620024	Bicycle/Motor Vehicle	6/20/2009	Parking lot at 1194 Duck Road	N From Christopher Drive	2	
2009	090707021	Bicycle/Motor Vehicle	7/4/2009	NC 12 (Duck Road)	E. Charles Jenkins Drive	2	
2009	090710012	Bicycle/Motor Vehicle	7/10/2009	Georgetown Sands Road	N From NC 12	2	
2009	090719026	Bicycle/Motor Vehicle	7/19/2009	NC12	N From Duck Ridge Village Ct	2	5
2010	100602023	Bicycle/Motor Vehicle	6/2/2010	NC 12	N From Scarborough Lane	2	
2010	100811036	Bicycle/Motor Vehicle	8/11/2010	NC12	N From Jay Crest Road	2	
2010	100831012	Pedestrian/Vehicle	8/31/2010	NC12	1209 Duck Road	2	
2010	101013026	Pedestrian/Vehicle	10/13/2010	Cook Dr.	E From Duck Rd.	2	4
2011	110611015	Bicycle/Motor Vehicle	6/11/2011	NC 12	Old Squaw Drive	2	
2011	110705026	Bicycle/Motor Vehicle	7/5/2011	NC 12	Plover Dr.	2	
2011	110712017	Bicycle/Motor Vehicle	7/12/2011	NC12	1259 Duck Road (PVA)	2	
2011	110731018	Bicycle/Motor Vehicle	7/31/2011	Duck Road	Duck Landing Lane	2	
2011	110820018	Bicycle/Motor Vehicle	8/20/2011	NC 12	Wampum Drive	2	
2011	110821021	Bicycle/Motor Vehicle	8/21/2011	Poteskeet Drive	NC 12	2	6
2012	120527024	Bicycle/Motor Vehicle	5/27/2012	Duck Road	S From Christopher Drive	2	
2012	120702015	Pedestrian/Vehicle	7/2/2012	Duck Road	N From Barrier Island Station	2	
2012	120726031	Bicycle/Motor Vehicle	7/26/2012	Duck Road	E From Schooner Ridge Road	2	
2012	120823015	Bicycle/Motor Vehicle	8/23/2012	Duck Road	W From Poteskeet Drive	2	4
2013	130626019	Bicycle/Bicycle	6/26/2013	Duck Multiuse Path	N From 1269 Duck Road	2	
2013	130629015	Bicycle/Motor Vehicle	6/29/2013	Duck Road	Ruddy Duck Lane	2	
2013	130704023	Bicycle/Motor Vehicle	7/4/2012	Duck Road	Scarborough Lane	2	
2013	130719019	Bicycle/Motor Vehicle	7/19/2013	Duck Road	Poteskeet Drive	2	4

The majority of the crashes involve bicycle/motor vehicle conflict, with a smaller number of pedestrian/motor vehicle, and one bicycle/bicycle crash. All of the crashes were within the NC 12 corridor and most appear to involve vehicles turning onto NC 12. This pattern was also noted in the 2009 RSA, and likely involves drivers looking in one direction for oncoming vehicular traffic and crashing with bicyclists coming from the opposite direction.

Pedestrian Desire Lines and Major Destinations

To help identify primary pedestrian routes and desire lines, the Town publicized and encouraged the use of VHB BikeWays, which is a free smart phone application that uses GPS technology to map user trips (both bicycle and pedestrian). During the Existing Conditions phase of the study, BikeWays documented

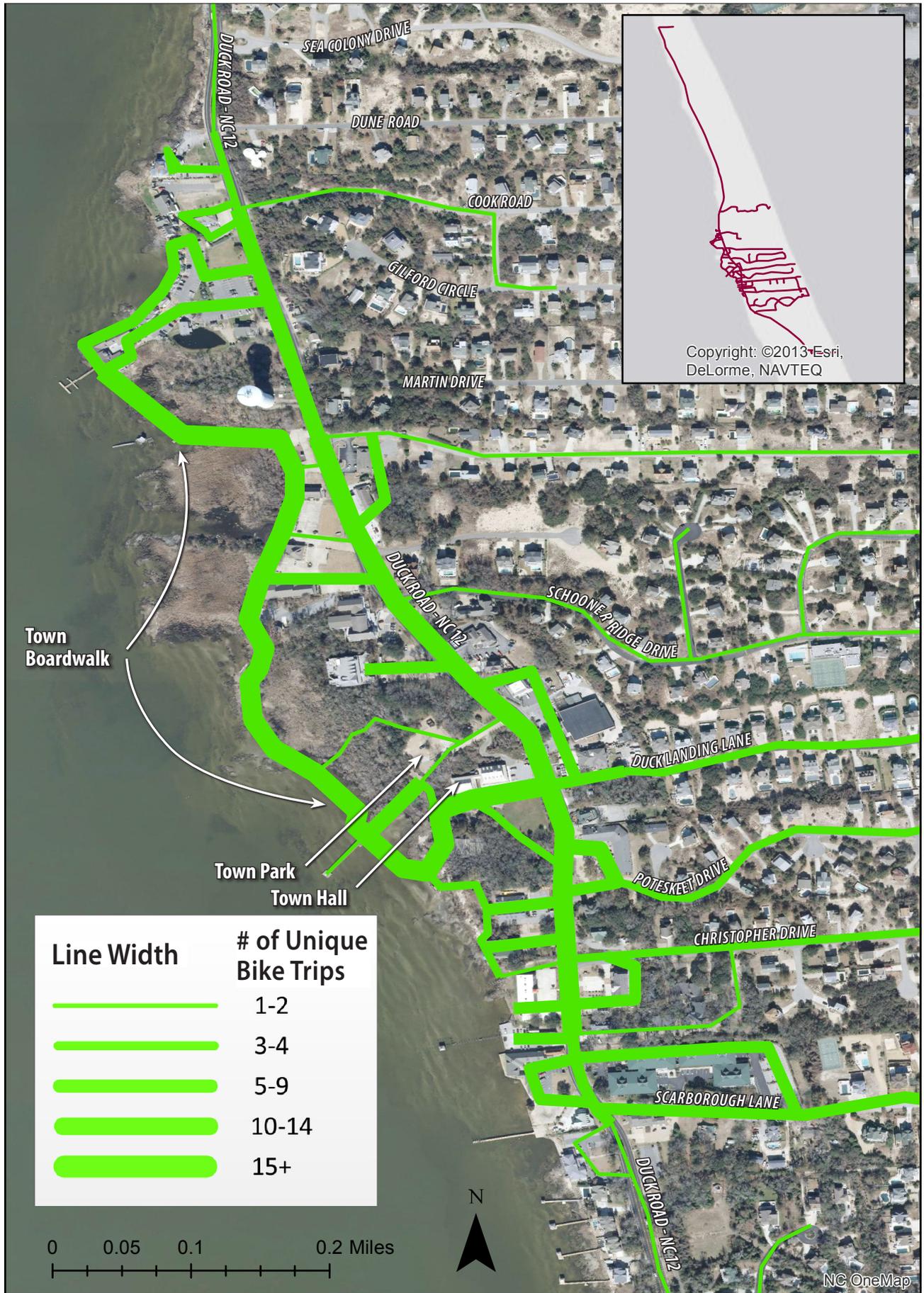
60 trips by 15 individual users, which are shown on Figure 3. As can be seen, the majority of recorded trips occurred within the Village Center along NC 12, the Town Boardwalk, and within the Town Park. The data also indicate the primary neighborhood roads used by pedestrians to access the Village. However, these data represent a very small sample size.

Despite the small sample size, the BikeWays data confirm the major pedestrian destinations identified in the public survey results. Together these indicate where people are walking and the routes they are currently taking. Primary destinations are described below:

1. **Shopping/Dining.** With a few exceptions, shopping and dining opportunities are located in the Village Center, where existing pedestrian facilities are limited to the wide shoulders on NC 12, numerous crosswalks on NC 12, and the Town Boardwalk (discussed further below).
2. **Town Park/Boardwalk.** The Duck Town Park and Boardwalk are located within the Village Center, on the Currituck Sound. They provide active and passive recreational opportunities, public access to the Sound, public parking, and a trail system. The Park also includes the Town Green and Amphitheater where public events are held. The Boardwalk has recently been extended north and south beyond the Park boundaries, and links businesses within the Village.
3. **The Beach.** The beach in Duck is accessed through deeded neighborhood access points, generally at the ends of private streets. In general, these low-volume/low-speed residential streets lack separate pedestrian accommodations, although a few exceptions do exist.
4. **Currituck Sound.** Public access to the Sound is limited to the Town Park and Boardwalk. Several residential neighborhoods within the Town provide Sound access for their communities. In addition, several water sports businesses provide rental access.

Right-of-Way and Physical Constraints

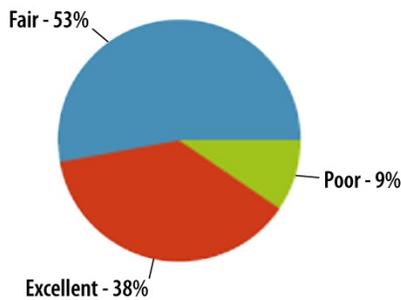
In addition to the GIS analysis described above, and the field assessment detailed below, the available NCDOT drainage plans for the NC 12 corridor within the Village Center were reviewed. These plans are included as Appendix C, and identify the limits of available right-of-way along with physical features such as fire hydrants, utility poles and boxes, landscape beds and retaining walls, and drainage inlets and piping. These plans were used to help assess the planning-level feasibility of potential recommended infrastructure improvements, and also to assign planning-level cost estimates to the improvements.



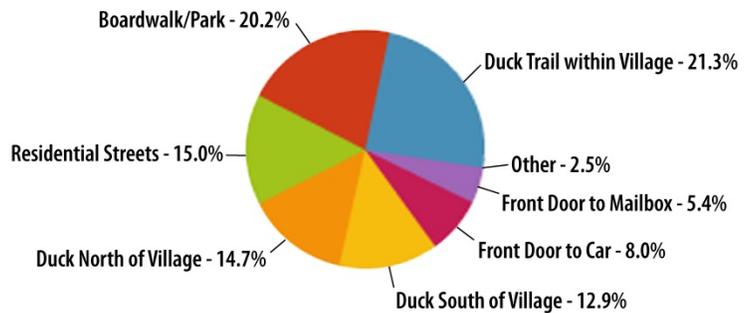
Results from Public Survey Questionnaire

To encourage public input into the planning process, the Town developed, distributed, and publicized a public survey questionnaire, which generated 616 responses. The questionnaire form and graphs of responses are included as Appendix D. Several items on the form dealt with existing conditions, and the results of those questions are shown in the following charts. The majority of survey respondents rated the existing pedestrian network in Duck as fair, with a small percentage ranking it as poor. Pedestrian destinations identified by respondents suggest Town-wide pedestrian activity with high concentration in the Village Center. Automobile traffic and speed was identified as the main factor that discouraged walking in the Town, followed by bicycle/pedestrian conflict. In terms of improvements that would encourage walking, respondents identified crosswalks and pedestrian signals, new sidewalks, and new shared use paths.

HOW WOULD YOU RATE THE PEDESTRIAN NETWORK IN DUCK?



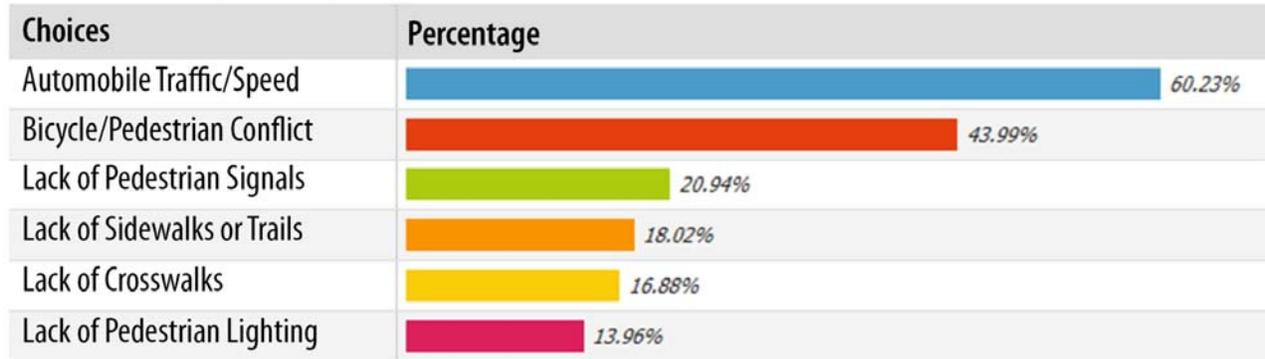
WHERE DO YOU WALK/BIKE/OTHER?



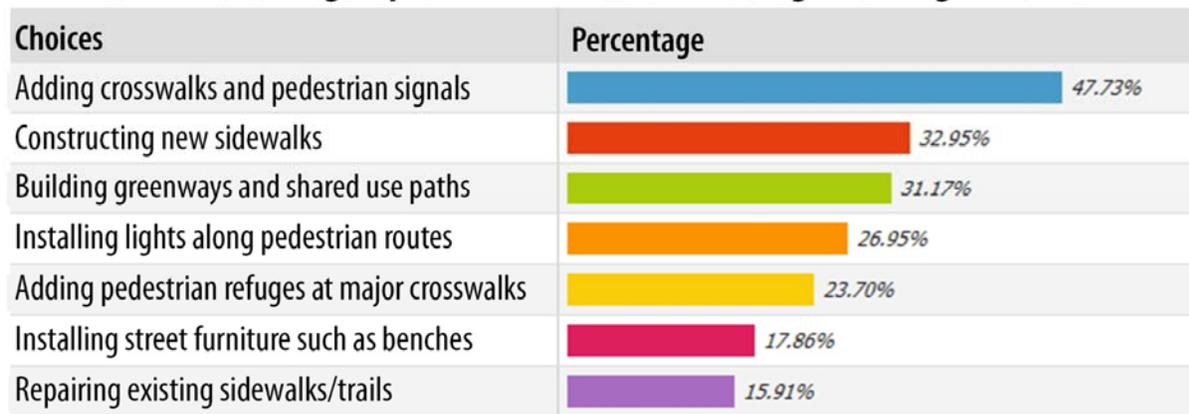
What destinations would you most like to walk to in Duck?

Choices	Percentage
Shopping/Dining	83.28%
Town Park/Boardwalk	72.89%
The Beach	49.35%
Currituck Sound	37.99%
Town Hall	14.94%
Place of Worship	6.66%
Place of Work	3.57%

What discourages Respondents from Walking in Duck?



Which of the following improvements would encourage walking in Duck?



Pedestrian and Bicycle Volumes and Paths

To supplement the existing conditions data and help complete the understanding of current conditions, the Town observed and recorded pedestrian and bicycle volumes and paths in the Village Center on July 24 and 25 (Wednesday and Thursday), 2013. The observations were conducted during morning and evening peak periods for thirteen zones as shown on the following page. For each zone, pedestrians and bicyclists were classified as Adult Pedestrian, Child Pedestrian, Adult Bicyclist, and Child Bicyclist. Pedestrian and bicyclist paths were observed and recorded for all crossings of NC 12 including crosswalk crossings and midblock crossings. A summary chart is included below. The zones are numbered sequentially from south to north. The zones are depicted in Figure 4.

The data confirm several important observations. First, the total volume of pedestrian and bicycle activity within the Village is very high. Second, midblock crossings (instances of pedestrians crossing where no crosswalk exists – all of these crossings are at unmarked locations) are frequent, and in some sections of the corridor more prevalent than crosswalk crossings. Finally, crossing activity appears to be more frequent during the evening peak than the morning peak. The red cells in the chart indicate zones and times in which midblock crossing numbers are higher than crosswalk crossings. The orange cells

show relatively high midblock crossings. The yellow cells for Zone 8 indicate the prevalence of midblock crossings in this area (which does not currently have a crosswalk) during all four observation times. Zone 8 is in the vicinity of Duck Ridge Village Court. Other zones with higher midblock than crosswalk crossings are zone 4 (vicinity of Poteskeet Drive), zone 6 (vicinity of north end of Town Park), zone 10 (south of Cook Drive), and zone 11 (vicinity of Dune Road). Zone 13 (vicinity of the Post Office) has the highest number of crossings per hour, followed by zone 3 (vicinity of Christopher Drive).

Zone	WED. A.M.				WED. P.M.				THURS. A.M.				THURS. P.M.				Total Xing	Avg. Xing/hr
	Ped/bikes along the road		Midblock Crossings	Crosswalk Crossings	Ped/bikes along the road		Midblock Crossings	Crosswalk Crossings	Ped/bikes along the road		Midblock Crossings	Crosswalk Crossings	Ped/bikes along the road		Midblock Crossings	Crosswalk Crossings		
	East	West			East	West			East	West			East	West				
1	564	90	28	42	207	61	30	67	-	-	-	-	258	32	22	75	264	44
2	363	170	7	29	275	168	30	235	362	148	2	29	283	109	11	187	530	66
3	232	173	33	90	250	257	33	172	294	204	17	112	280	229	13	173	643	80
4	440	230	50	12	298	167	106	22	305	152	1	13	488	223	16	167	387	48
5	358	173	2	28	198	106	6	17	312	86	5	20	336	220	10	401	489	61
6	349	130	6	0	197	143	31	0	276	133	0	0	343	310	27	0	64	8
7	330	94	4	16	123	109	29	80	-	-	-	-	192	225	13	36	178	30
8	254	259	4	0	154	193	28	0	297	127	23	0	195	239	40	0	95	12
9	406	183	0	21	-	-	-	-	392	125	27	44	305	-	-	15	107	18
10	322	102	28	7	72	93	21	45	277	108	21	79	149	177	64	47	312	39
11	386	130	4	0	60	96	0	0	326	78	51	0	181	85	0	0	55	7
12	379	116	2	0	-	-	-	-	190	184	0	0	160	61	11	0	13	2
13	351	44	21	39	75	68	84	381	299	31	10	19	153	71	111	465	1130	141
Total	4734	1894	189	284	1909	1461	398	1019	3330	1376	157	316	3323	1981	338	1566		
	71.4%	28.6%	40.0%	60.0%	56.6%	43.4%	28.1%	71.9%	70.8%	29.2%	33.2%	66.8%	62.7%	37.3%	17.8%	82.2%		

-  Midblock crossing numbers higher than crosswalk crossings.
-  Relatively high midblock crossings.
-  Midblock crossings prevalent during all four observation times.



FIGURE 4
PEDESTRIAN
AND BICYCLE
COUNT ZONES



Schedule:

Mid-week Count
(Wednesday and
Thursday)

Two Counts:

AM Peak
(7:30 AM to 9:30 AM)

Afternoon
(6:30 PM to 8:30 PM)

13 Zones

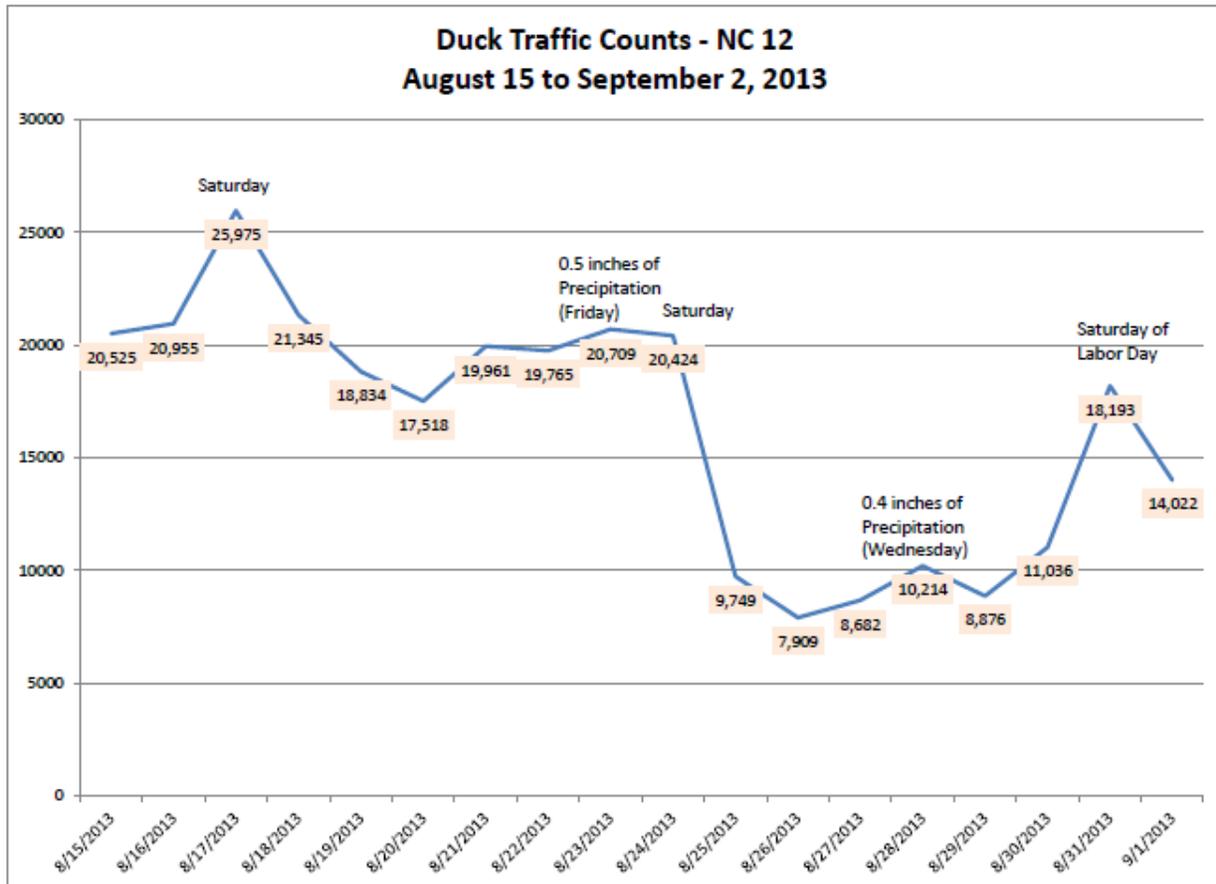
Each zone
completes one
data sheet every
15 minutes.

● High Crossing Locations



Prepared by the Town of Duck
Last Updated July 3, 2013

In addition to the volume and path observations, automated pedestrian counters were deployed at several locations along NC 12 and along the Boardwalk; the results are detailed in Appendix E, and confirm the high volumes of pedestrian traffic throughout the roadway corridor and on the Boardwalk. Also, vehicular traffic was counted on NC 12 for the period from August 15 to September 2, 2013; the results are displayed below:



As the pedestrian and vehicular data indicate, general summer travel behavior in Duck includes heavy volumes of pedestrians, bicycles, and motor vehicles sharing a constrained corridor. Within the Village Center, the high frequency of pedestrian and bicycle crossings of the roadway, along with the close proximity of pedestrians and cyclists to vehicular travel lanes tends to slow traffic as drivers are cautious of unpredictable behavior.

Field Inventory

On July 30, 2013, an extensive field inventory was performed to confirm existing conditions, help identify opportunities, and observe pedestrian behavior throughout the Town at various times of day. This included on-foot touring and photo-documentation of the Village Center during morning, mid-day, afternoon, and night-time hours, as well as windshield surveys of NC 12 north and south of the Village, and residential neighborhoods throughout the Town.

Review of Existing Plans and Policies

Municipal Property Master Plan (2004)

This Master Plan has resulted in the development of the Town Park within the Village Center of Duck. The Plan established priorities for pedestrian facilities on the 10-acre site including a system of paths, connection to the Duck Trail, and construction of the Sound-side boardwalk at the Park. All of the recommendations in the Plan have been implemented, and the Town Park is now a major pedestrian attractor.

Future Land Use Map (2004)

The Town's Land Use Map provides several instructive items for the development of the Pedestrian Plan, including the location of future pedestrian attractors, the prominence of the US Army Corps of Engineers Research Facility, and the prevalence of private roads throughout the Town. While NC 12 and several neighborhood streets are state roads, the majority of roads within the Town's residential subdivisions are owned and maintained by homeowners associations.

CAMA Core Land Use Plan (2005)

The Land Use Plan identifies the transportation issues facing Duck. The primary issues relate to NC 12 as the only north-south route, combined with increasing development north of the Town along with heavy usage of the roadway by pedestrians and cyclists. The Plan cites construction of the Mid-Currituck Bridge connecting the Currituck County mainland to the Outer Banks as one potential measure to improve this situation by providing alternate access to Corolla, and emphasizes the need to preserve the character of Duck as any future improvements are made. The Plan suggests education and regulatory measures, but also notes likely public resistance to new rules.

Pedestrian and Bicycle Road Safety Audit (2009)

The Road Safety Audit (RSA) conducted by VHB focuses on the core of the Village Center, and assesses existing conditions, analyzes traffic and crash data, and identifies eleven safety issues along with suggestions for improvements. Recommendations are categorized as short-term, intermediate, and long-term. The Town has implemented many of the recommendations, including new and relocated crosswalks, improved signage and pavement markings, and educational outreach. The RSA recommends an improved roadway cross section with separated sidewalks as a potential long-term measure.

Mid-Currituck Bridge Study (2010)

The Final Environmental Impact Statement (EIS) for this project includes a Preferred Alternative (which is strongly preferred by the Town of Duck) to construct a bridge between the mainland and the Currituck County Outer Banks. The Preferred Alternative includes no improvements to the roadway or pedestrian system in Duck. The Existing Roads Alternative (analyzed but not selected as preferred) includes widening NC 12 to 3-lanes throughout the Town (the existing 3-lane section within the Village would remain unchanged).

2022 Vision and Town Council 3-5 Year Goals (2012)

The Town's long-term vision and short-term goals include numerous and consistent references to becoming a pedestrian-first community. In fact, one of the statements from the 2022 Vision serves as the

Vision Statement for this Pedestrian Plan. Completion and adoption of this Plan represents one of the Council’s goals in support of the Vision.

Land Use Ordinances (updated to 2013)

The Town’s land use ordinances have recently been updated, and include provisions to promote pedestrian accommodation. The Subdivision Chapter references NCDOT and AASHTO standards for pedestrian access and facility standards, and the Zoning Chapter includes development standards for pedestrian access and shared vehicular access (access management).

NCDOT STIP (2013)

As a part of NCDOT's Transportation Reform, NCDOT has established a new strategic planning process to aid in prioritizing projects. This data-driven approach will put projects in priority order, based on various criteria including how the project meets NCDOT's goals. The strategic prioritization process serves as the primary input source for the STIP. Metropolitan Planning Organizations, (MPOs), Rural Planning Organizations (RPOs), NCDOT Divisions, and the DBPT as well as other units at NCDOT use the Prioritization Project Submittal Tool to submit project information needed for this new prioritization process.

Past and Current Pedestrian-Related Projects

The Town has undertaken significant efforts to improve pedestrian access throughout Duck.

Boardwalk

The Boardwalk began as a facility associated with Duck Town Park, but has since been extended north and south of the Park to connect businesses and provide pedestrian access along the Sound. The Boardwalk now extends from 1240 Duck Road (the Waterfront Shops) south to 1174 Duck Road (Aqua Restaurant). Some of the NC 12 crosswalk improvements described below have been located to coordinate with Boardwalk access points.



Road Safety Audit

In 2009, the Town conducted a Pedestrian and Bicycle Road Safety Audit for a portion of NC 12 within the Village Center. The RSA identified numerous issues and recommended specific measures for improvement. Since completion of the RSA, the Town has implemented the recommendations, including: relocating/removing/adding crosswalks (coordinated with entrances to the Boardwalk); removing inappropriate pavement markings; replacing and adding regulatory signage; improving driveway access; improving intersection sight distances; and educating the public about correct use of existing pedestrian facilities.

Roadway Drainage

In 2006, the Town completed a drainage improvement study that recommended measures to alleviate flooding at several key locations along the NC 12 corridor. In most cases, the drainage issues represented obstacles and/or safety problems for pedestrians and bicyclists as well as automobiles. Over the ensuing years, the Town has undertaken the recommended improvements in a systematic way. Projects completed to-date have included roadway and shared use path reconstruction, installation of storm chambers along the roadway shoulder, use of pervious concrete for shared use path reconstruction, and the use of infiltration swales to divert runoff from the roadway corridor. Additional projects are in the planning stage.

Officer Training

The Town has coordinated with the NCDOT Bicycle and Pedestrian Division to host training sessions for law enforcement officials in support of bicycle/pedestrian safety.

Findings, Challenges, and Opportunities

Since incorporating in 2002, the Town of Duck has undertaken significant measures to enhance its pedestrian network while preserving its unique character. Recent improvements to the crosswalk system, signage, public outreach, the Boardwalk, and the roadway drainage system have helped move the Town in a pedestrian-friendly direction. However, additional infrastructure improvements along with enhanced education and outreach efforts will be necessary to help make the Town a pedestrian-first community.

Existing facilities within Town are limited, and the seasonal pressure on the shoulders along NC 12 within the Village Center results in significant conflicts among pedestrians, bicyclists, and motorists. NC 12 not only functions as Duck’s main street, it is also the only north-south access through the Town and to Currituck County and Corolla, as well as a storm evacuation route. While the possible construction of a Mid-Currituck Bridge would help alleviate some of the



through traffic volume, conflicts will remain as pedestrians, bicyclists, and vehicles all navigate the same space to reach the primary destinations in Duck. During peak times of the day and night, pedestrian and bicycle volumes overwhelm the shoulders in the Village Center, spilling out into the travel lanes. During rain events, flooding exacerbates this problem. Finally, night-time conditions and visibility are especially problematic.

The shared use path on the east side of NC 12 north and south of the Village Center provides a viable option for pedestrians and cyclists in these areas. However, the shared use path crosses numerous intersecting roadways, with varying conditions for sight distance and visibility. The narrow roadway shoulders and higher posted and actual vehicle speeds in these areas limits the ability of cyclists to use the shoulder as an option to the shared use path, and increases pedestrian-bicycle conflict during peak periods.

Opportunities exist for the Town to capitalize on recent successes and make system-wide improvements to the pedestrian transportation network. Most notably, there appears to be adequate right-of-way width within the Village Center (with some exceptions) to modify the roadway cross section to include sidewalks on both sides of the roadway, separated from the shoulders (which would become formal bike lanes). According to NCDOT roadway drainage plans, the roadway right-of-way throughout the Village Center is 60', which would accommodate a center turn lane along with a directional travel lane, bike lane, buffer strip, and sidewalk on each side of the road. For the most part, the drainage plans indicate that the existing roadway is in the center of the right-of-way, though there are some exceptions to this).

Along with this improvement, additional crosswalks and pedestrian refuge islands at key locations could dramatically enhance multi-modal transportation safety and efficiency. Not only would the sidewalks separate pedestrians from bicyclists and vehicular travel lanes, they would help channelize pedestrians to marked crossings and help minimize illegal crossings that disrupt traffic flow. This modal separation would also result in more predictable pedestrian and bicyclist behavior, which would also improve traffic flow, because pedestrians and bicyclists will be less likely to enter the travel lanes to pass one another.

North and south of the Village Center, there are opportunities for enhanced warning signage, as well as gateway and traffic calming treatments. On the west side of NC 12 south of the Village, the potential exists for a new shared use path, although right-of-way, drainage, grading, and driveway crossings constrain this option. For the existing shared use path north and south of the Village, roadway intersections offer the potential for improved sight distance, signage, and pavement markings. Finally, as part of maintenance and repaving of NC 12, the potential exists to widen the existing shoulders to provide an option for bicyclists (especially as a continuation of the formalized bike lanes within the Village).

Outside the NC 12 corridor, the opportunity might exist to extend the boardwalk further north, pending additional feasibility analysis. In addition, there is an opportunity to develop pedestrian

connections between existing east-west subdivision streets, to provide a north-south alternative for pedestrians not wishing to use NC 12, although the lack of existing rights-of-way along with public sentiment may constrain this opportunity.



3: Design Guidelines and Facility Treatment Types

The following types of facilities are recommended for enhancing pedestrian safety and the overall multimodal traveling experience in Duck. They are intended to promote the development of a logical system of improvements resulting in a comprehensive pedestrian network. The recommendations are the result of public input, Steering Committee deliberations, data analysis, field observation, and technical review. Specific project recommendations are included in Chapter 4, while prioritization of the recommendations is included in Chapter 5.

Design Guidelines

Certain general minimum standards are described below, but specific projects should rely on federal and state resources to establish specific design criteria as part of project implementation. Those resources are listed (with links) on the Connect NCDOT web page, and include the following:

National Guidelines

AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities

This publication by the American Association of State Highway and Transportation Officials (AASHTO) provides guidance on the planning, design, and application of various types of pedestrian facilities. It has been used to help develop the recommendations in this Plan, and it should be consulted during updates to the Plan. It will also provide specific guidance for design criteria of individual projects during the implementation phase.

AASHTO Guide for the Development of Bicycle Facilities

The AASHTO Bicycle Guide provides similar types of guidance as the AASHTO Pedestrian Guide, and should be consulted in a similar manner as priority projects are advanced into design and construction.

FHWA Guidance

The Federal Highway Administration provides guidance for accessibility, design, and facility operations.

Manual on Uniform Traffic Control Devices

The MUTCD provides guidance on the use, design, and application of control devices such as signs, pavement markings, and signals. It represents another valuable resource to help establish design criteria for specific implementation projects. The MUTCD was consulted during preparation of this Plan, and also helped form the basis of recommendations in the Town's 2009 Road Safety Audit and subsequent improvements.

United States Access Board

The US Access Board provides standards and guidelines for accessibility consistent with the Americans with Disabilities Act.

North Carolina Guidelines

MUTCD

North Carolina has its own Supplement to the MUTCD, to provide additional guidance on specific issues.

North Carolina Department of Transportation

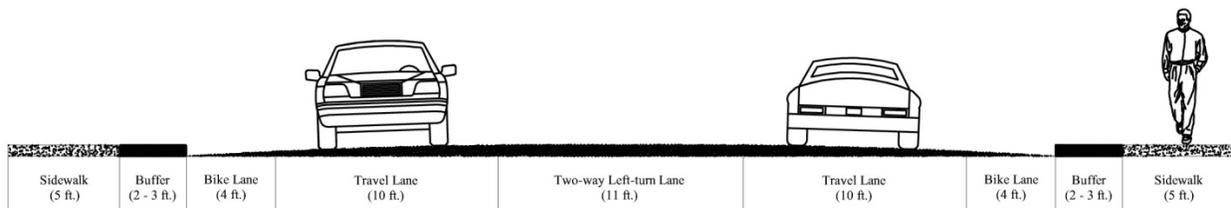
NCDOT has guidelines for Complete Streets, Temporary Accommodations for Pedestrians, Local Programs, and Traditional Neighborhood Development.

http://www.completestreetsnc.org/wp-content/themes/CompleteStreets_Custom/pdfs/NCDOT-Complete-Streets-Planning-Design-Guidelines.pdf

Sidewalks

Sidewalks are pedestrian facilities that should be a minimum of 5’ wide, and where possible should include a landscaped strip between the sidewalk and roadway (see typical cross section below). Where sidewalk is provided on one side of the road only, consideration should be given to a wider facility (8’-10’). There is no curb and gutter existing or proposed in the Town (with the exception of the pedestrian refuge islands discussed below, which would have flush-to-the-road crosswalks). However, intersections, driveway crossings, crosswalk access, and detectable warnings should be installed consistent with AASHTO and ADAAG.

The addition of sidewalks to the roadway cross section with the Village Center could have significant benefits to the pedestrian, bicycle, and vehicular transportation system. First, it would provide additional capacity within the corridor, eliminating the need for pedestrians to share shoulder space with bicyclists. Second, the separation of pedestrians and cyclists would help minimize conflicts associated with differing speeds and travel directions. Third, it would move pedestrians away from vehicular travel lanes, thus improving pedestrian safety and also enhancing vehicular traffic flow. Finally, the landscape strip between the bike lane and the sidewalk will help channelize pedestrians to marked crosswalks and minimize random crossings at unmarked or unexpected locations.

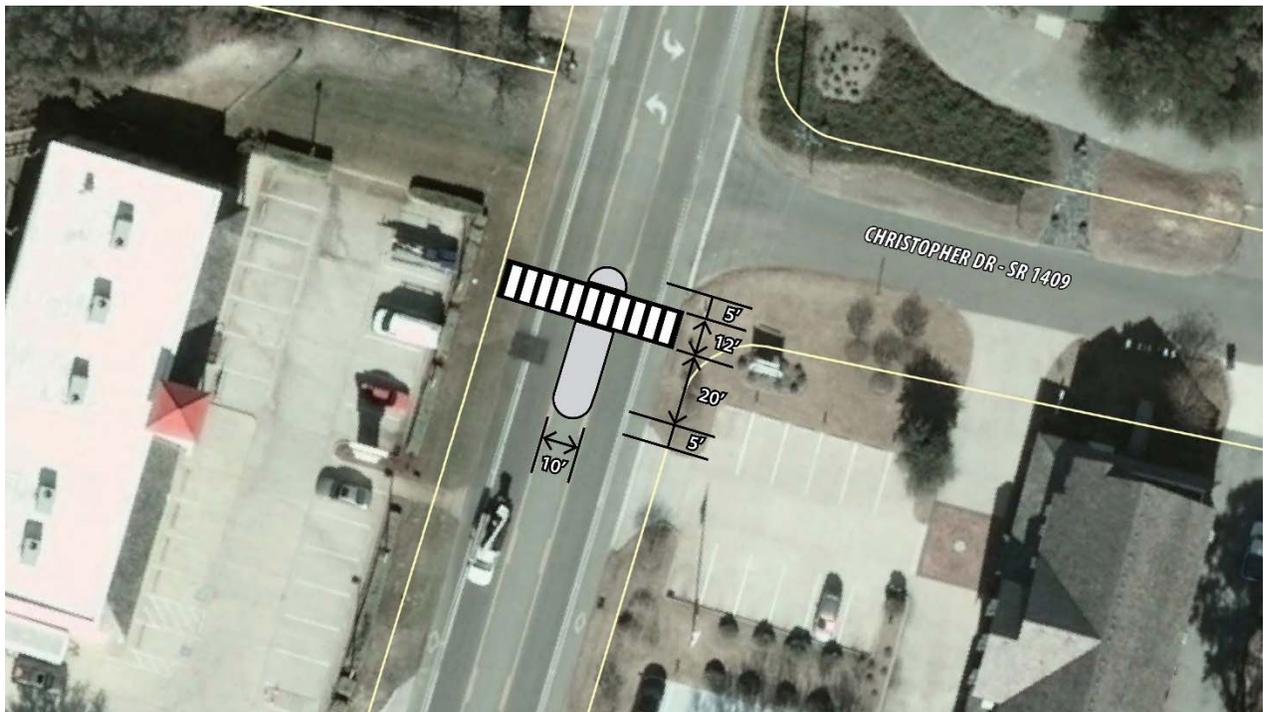


Crosswalks

The plan recommends a two-tiered system of crosswalk treatments (all of which include MUTCD-compliant crosswalk marking and signing), related to the volume of pedestrian crossings at various locations:

- 1) More intense: create a median refuge;
- 2) Less intense: maintain or install standard crosswalk.

Crosswalks should be 10' wide and should include 2' wide longitudinal lines marked with clear, consistent, white markings. This type of crosswalk (which has been used in recent applications in the Town) provides accessibility and high visibility. Median refuge islands allow pedestrians to cross one direction of traffic at a time, provide physical space for pedestrians to wait in the median, improve visibility for drivers and pedestrians, and help calm traffic. Typical dimensioning for the refuges is shown below:



In recommending the number, location, and size of the proposed median refuge islands, consideration was given to potential impacts to traffic operations. Specifically, while providing pedestrian refuge at some of the high pedestrian crossing locations, the proposed islands are placed to limit effects on driveway access, and in each case circulation on private property and intersecting roads was reviewed. In some cases the islands would prevent vehicles from making a two-stage left turn by turning onto NC 12 into the two-way-left-turn lane as an acceleration lane (which is a prohibited traffic movement by law). As part of the overall system of improvements, and especially in conjunction with the proposed sidewalks, the refuge islands would help maintain through traffic flow on NC 12 by encouraging pedestrians to cross at these locations and helping to prevent non-crosswalk crossings that tend to cause more disruption to traffic flow. As part of the implementation process for the proposed median refuge islands (which would

include detailed engineering design of curb locations), additional traffic operations evaluation could be conducted to assess potential impacts to vehicular turning movements from intersecting streets onto NC 12.

Consideration was also given to the use of rectangular rapid flashing beacons (RRFB) at crossings. Whereas the majority of crosswalks in Duck are either within or very close to roadway intersections, there are several that could be considered midblock crossings and therefore potential candidates for use of RRFB. Most notably, the crossings at the south and north ends of the Village, at 1174 Duck Road (Aqua Restaurant) and 1264 Duck Road (1264 Duck Road (Sunset Grille)), warrant consideration for this control device. However, the high volumes of pedestrian crossings at these locations raise concern that the RRFB would be activated almost on a continuous basis, to the extent that vehicular traffic flow could be unacceptably disrupted. Therefore, raised pedestrian refuge islands are recommended at both of these locations, but no RRFB.

NCDOT also provides additional guidance on the placement and design of midblock crossings. The link below contains the NCDOT Standard Practice for Crosswalks – Mid-Block (Unsignalized) Signing:

https://connect.ncdot.gov/resources/safety/Teppl/TEPPL%20All%20Documents%20Library/C-36_pr.pdf

During deliberations, the Steering Committee asked about the potential for flashing warning signs in advance of the crosswalks. However, current guidance on the use of these devices suggests that they be used at crossings, not in advance of crossings, to avoid driver and pedestrian confusion. Furthermore, the proposed regular spacing of crosswalks in the Village would make the placement of advance flashing warning signs especially difficult and confusing, and would add to existing sign clutter.

Consideration was also given to the use of pedestrian signals such as a HAWK (High-intensity Activated crossWalk) device (see photo and operational diagram below). Based on pedestrian crossing and vehicle count data, the crossing at 1264 Duck Road (1264 Duck Road (Sunset Grille)) is the only location that would warrant such a device. A preliminary option for installation of a HAWK at this location was presented during the second public meeting, and was received very negatively by both the general public and the Steering Committee. Pending implementation and evaluation of the improvements in this Plan, HAWK signals could warrant further consideration and analysis for implementation at 1264 Duck Road (1264 Duck Road (Sunset Grille)) and at 1174 Duck Road (Aqua Restaurant).

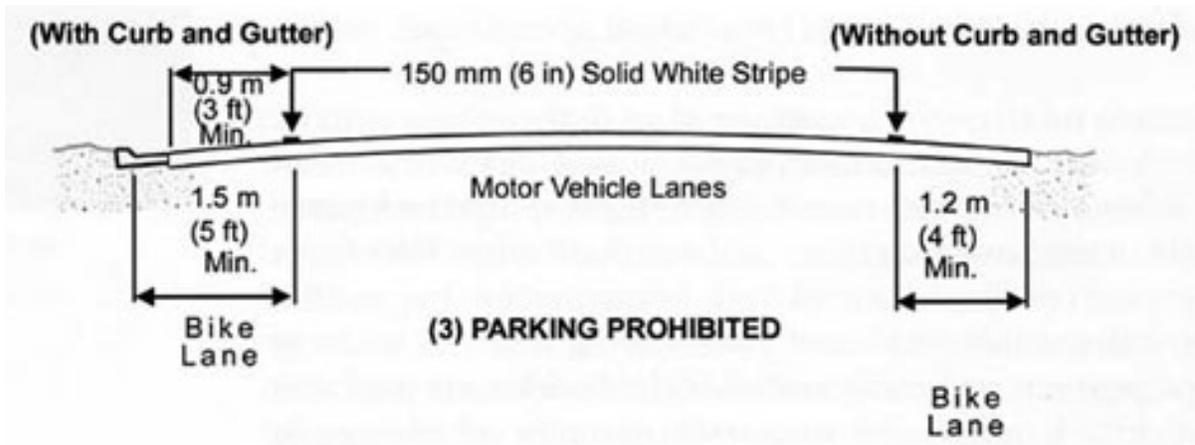


2009 MUTCD
Section 4F.3

Finally, consideration was given to adding new crosswalks at locations along NC 12 north and south of the Village Center. However, based on the traffic volumes and speeds along these sections of the roadway, additional standard marked crosswalks are not recommended. AASHTO and FHWA guidance indicate that at these speeds and volumes, standard marked crosswalks can lead to an increase in pedestrian crashes, perhaps because of the perception of security the markings give to pedestrians which leads to reckless crossing decisions. Alternative crosswalk treatments are also limited in these areas; the 2-lane cross section constrains the potential for refuge islands, and the volume of crossings does not warrant signal installation.

Bike Lanes

Bike lanes should be a minimum of 4' wide of consistent surface (based on no curb and gutter and no on-street parking) and include standard pavement markings and signs. In conjunction with the proposed sidewalks, conversion of the existing wide shoulders in the Village to formal bike lanes would help create a Complete Streets cross section accommodating all roadway users. See cross section and photo-simulation below.



Paved Shoulders

Paved shoulders should be a minimum of 4' wide (based on no curb and gutter and vehicle speeds under 50MPH). On the rural roadway sections outside of the Village Center, where there are no right-turn lanes, paved shoulders should be considered as part of roadway repaving projects, to provide accommodation for bicyclists in addition to the shared use path along these roadway sections.

Shared Use Paths

Shared use paths accommodate both pedestrians and bicyclists, and should be a minimum of 10' wide. In some cases, existing shared use paths are less than 10' wide; as these sections are repaved over time, evaluation should consider the potential for widening.

While it is generally preferable to select path alignments in independent rights-of-way, there are situations where existing roads provide the only corridors available. Sidepaths are a specific type of shared use path that run adjacent to the roadway, where right-of-way and other physical constraints dictate. North and south of the Village Center, the Duck Trail functions as a sidepath. AASTHO guidance discusses the potential conflicts associated with sidepaths, and also provides guidelines for their consideration where certain conditions exist. Among other guidelines, AASTHO recommends a minimum distance of 5' between paved shoulder and sidepath; along high-speed roadways, AASTHO recommends greater than 5' separation. Sidepaths are most appropriate along roadway sections with relatively few intersections and driveways.

Neighborhood Connections

As a potential long-term measure, connections between neighborhoods could be considered to provide pedestrian and/or bicycle access. At this time, no specific projects or alignments have been identified, but the potential exists for these connections to provide north-south alternatives to using the NC 12 corridor. As these connections are considered, specific needs and design criteria (sidewalk, shared use path, or recreational trail) would need to be applied.

Pedestrian Level Lighting

Crosswalks should be illuminated based on the high levels of night-time pedestrian and vehicular travel. Lighting will need to comply with the Town's Dark Sky requirements. In addition, pedestrian lighting throughout the Village Center could be considered as a potential long-term improvement.

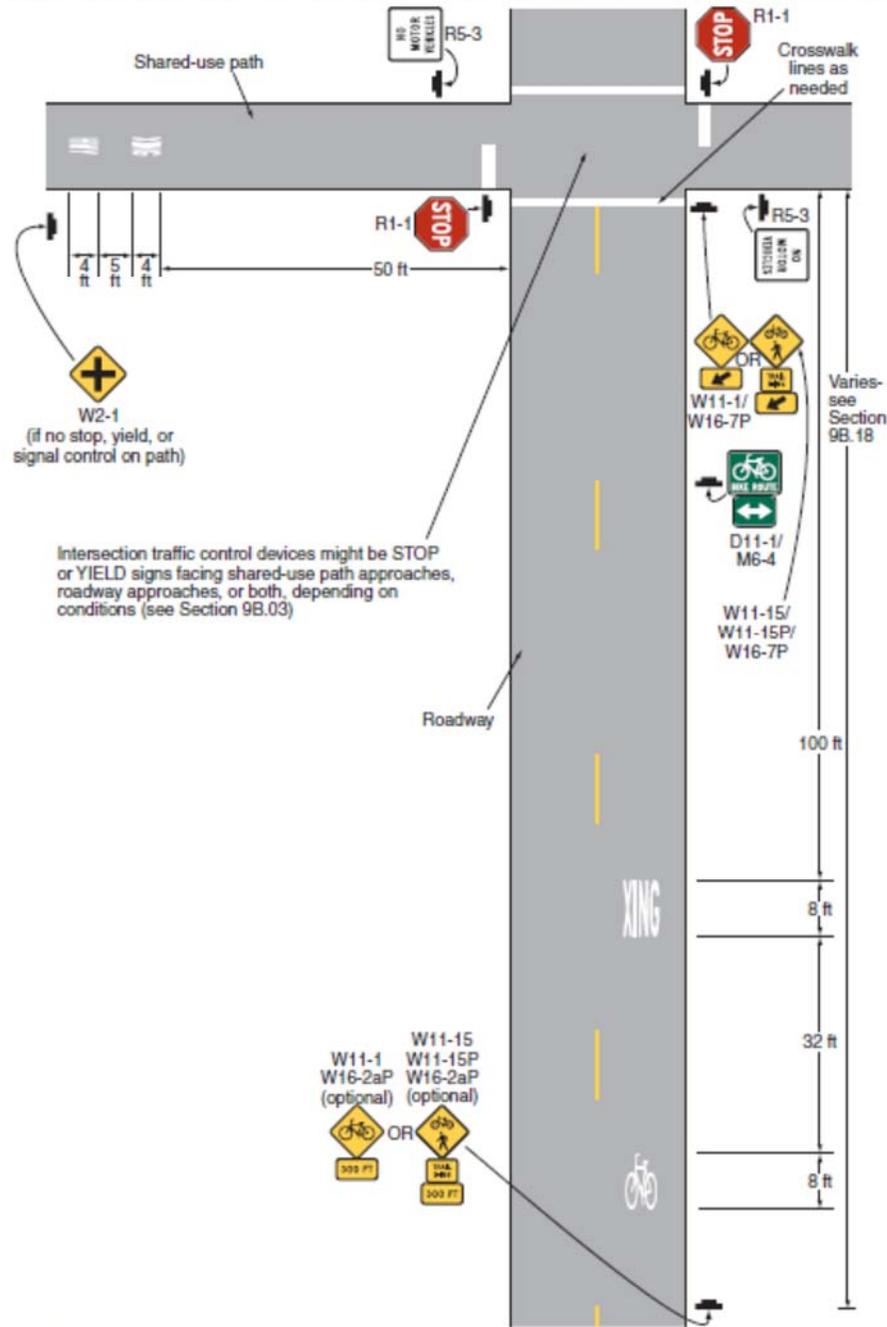
Intersection Improvements

As part of sidewalk construction, corner radii at intersecting streets should be analyzed and tightened where appropriate, and pedestrian landings should be incorporated as needed; crosswalks should be marked across intersecting streets. Intersection sight lines should also be evaluated and cleared where necessary. Two examples of blocked sight lines are 1245 Duck Road (Post Office) where a large utility cabinet obstructs visibility and 1207 Duck Road (Duck Village Outfitters) where a large tree obstructs visibility. Also, as recommended in the 2009 Road Safety Audit, existing stop sign placement should also be evaluated and stop signs moved closer to stop bars where appropriate.

North and south of the Village, where the shared use path intersects neighborhood streets, pavement markings, signage, and sight lines should be analyzed and improved where necessary. The photo below shows an example of the path intersecting a neighborhood street, and the diagram below includes example markings and signage from MUTCD.



Figure 9B-7. Examples of Signing and Markings for a Shared-Use Path Crossing



December 2009

Sect. 9B.1

The shared use path functions as a side path (very close to the parallel roadway) in these locations, and the 2012 AASHTO Guide for the Development of Bicycle Facilities concludes that signage (beyond appropriate placement of stop signs on intersecting streets) is not an effective treatment for modifying driver or trail user behavior. The shared use path approaches and crosswalks (which have right-of-way over the intersecting streets) could potentially include pavement markings and/or colored crosswalk treatments (see photos

below). While these might have limited effectiveness, they are relatively affordable and highly visible enhancements that may convey benefits. Such treatments would require coordination and approval by NCDOT. The roadway approaches should include stop signs and stop bars placed appropriately in advance of the shared use path.



Gateways

Raised median islands should be installed at specified non-crosswalk locations to provide gateway traffic calming. In addition, warning signs should be placed along NC 12 north and south of the Village to alert drivers to expect pedestrians crossing the roadway.



Signage

Regulatory, warning, and wayfinding signs should comply with MUTCD guidance. The MUTCD recommends conservative use of signs that fulfill a need based on engineering study or engineering judgment. The Town has recently installed compliant signs and removed or replaced non-compliant signs throughout the NC 12 corridor. Given the prevalence of private signs throughout the Village Center, the need for and placement of regulatory, warning, and wayfinding signs warrants careful consideration and engineering judgment to deliver clear messages to motorists, bicyclists, and pedestrians, while avoiding confusion and visual clutter.



Drainage

In several locations along the NC 12 corridor, ponding from rainfall runoff frequently covers designated pedestrian and bicycle facilities, as well as vehicular travel lanes. This occurs on the shoulders in the Village Center as well as on the shared use path. The Town has taken significant actions to improve drainage conditions in several locations, and is pursuing improvements to other areas. Additional improvements are included in this Plan.

Intelligent Transportation Systems (ITS)

To alert drivers in advance of congested conditions, the Town could consider possibilities for implementing some form of ITS. This might involve traffic video cameras in the Village, with video streamed to a web interface, or advance warning message signs north and south of the Village. This idea is conceptual at this time, and would require additional investigation and coordination with NCDOT, but if motorists planning an optional trip could be alerted to heavy congestion and thus cancel or postpone their trip, an ITS could convey significant benefits.

4: Infrastructure Recommendations

For clarity, the recommended improvements are presented below as project corridors, with each corridor cut sheet (Figures 5-13) including all of the recommended improvements for that particular segment of roadway or pedestrian corridor. In terms of implementation, individual project elements from various cut sheets will likely be combined to form complete project links. This is explained in additional detail in Chapter 6.

NC 12 - Lane

From: Southern Town Limit

To: Four Seasons Lane

Distance: 4,600 Feet/0.87 Miles

Characteristics:

- Residential neighborhoods on both sides of NC 12 with pedestrian crossings to access beach
- Existing shared use path on east side of NC 12
- One existing crosswalk
- Narrow shoulders on both sides of NC 12
- Speed limit 35 MPH
- Three reported bicycle crashes

Recommended Pedestrian Facilities (see Figure 5)

Signage improvement

- At entry to the section (both directions) install a general pedestrian warning sign to remind drivers to expect pedestrians crossing the roadway.

Shared Use Path

- Provide 10' wide paved shared use path on west side of NC 12.

Paved Shoulder

- As part of roadway repaving and maintenance, consider providing 4' paved shoulder on both sides of NC 12.

Intersection Improvements

- Evaluate and clear sight lines at the stop approaches to NC 12 to increase visibility of approaching pedestrians and cyclists on the shared use path.
- Install enhanced markings for pedestrians and cyclists on the shared use path as reminders to look before entering intersections.
- Develop and install uniform signing for drivers to look both ways for pedestrians and cyclists crossing the intersection.



NC 12

From: Four Seasons Lane

To: Poteskeet Drive

Distance: 1,721 Feet/0.33 Mile

Characteristics:

- Land use transitions from residential to Village commercial along NC 12, with residential neighborhoods east of NC 12
- NC 12 transitions from 2 lanes with narrow shoulders to 3 lanes with wider shoulders (shoulders are currently used by bicyclists and pedestrians)
- Shared use path on east side of NC 12 ends north of Four Seasons Lane
- Three existing crosswalks
- Speed limit 25 MPH
- Six reported bicycle crashes
- Includes pedestrian and bicycle count zones 1-3 and a portion of zone 4; these zones include relatively high midblock crossing locations and high average crossings per hour (zone 3 had an average of 80 crossings per hour)

Recommended Pedestrian Facilities (see Figure 6)

Village Gateway

- North of Four Seasons Lane, install landscaped median (no crosswalk) to alert drivers they are entering a changed condition with higher pedestrian and bicycle activity.

Shared Use Path

- Provide 10' wide paved shared use path on west side of NC 12 from Four Seasons Lane north to existing crosswalk at 1174 Duck Road (Aqua Restaurant).
- On east side of NC 12, extend existing shared use path north to crosswalk at 1174 Duck Road (Aqua Restaurant).

Crosswalk

- At existing crosswalks at 1174 Duck Road (Aqua Restaurant) and Christopher Drive, install median refuge incorporating pedestrian storage capacity to provide two-step crossing.
- Provide pedestrian crosswalk illumination at all existing crosswalks.

Sidewalk and Bike Lane

- North of the 1174 Duck Road (Aqua Restaurant) crosswalk, install sidewalks on both sides of NC 12 and convert existing wide shoulder to marked bike lane; use preferred typical section (bike lanes, landscape strip, sidewalk) shown in Design Guidelines section. Based on NCDOT drainage

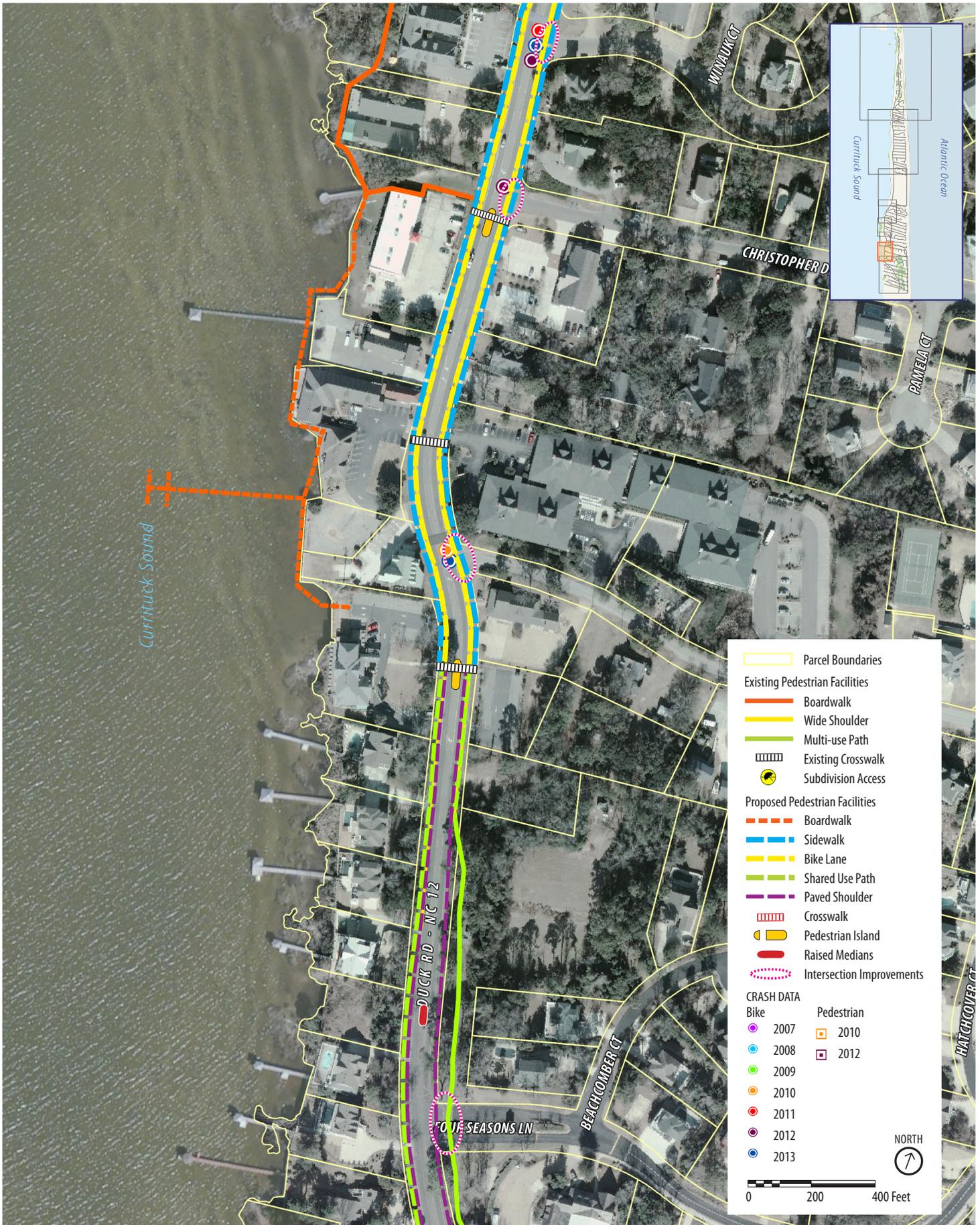
plans, there appears to be adequate right-of-way to accommodate these improvements, with minor exceptions. Right-of-way survey would be required as a first step in engineering design.

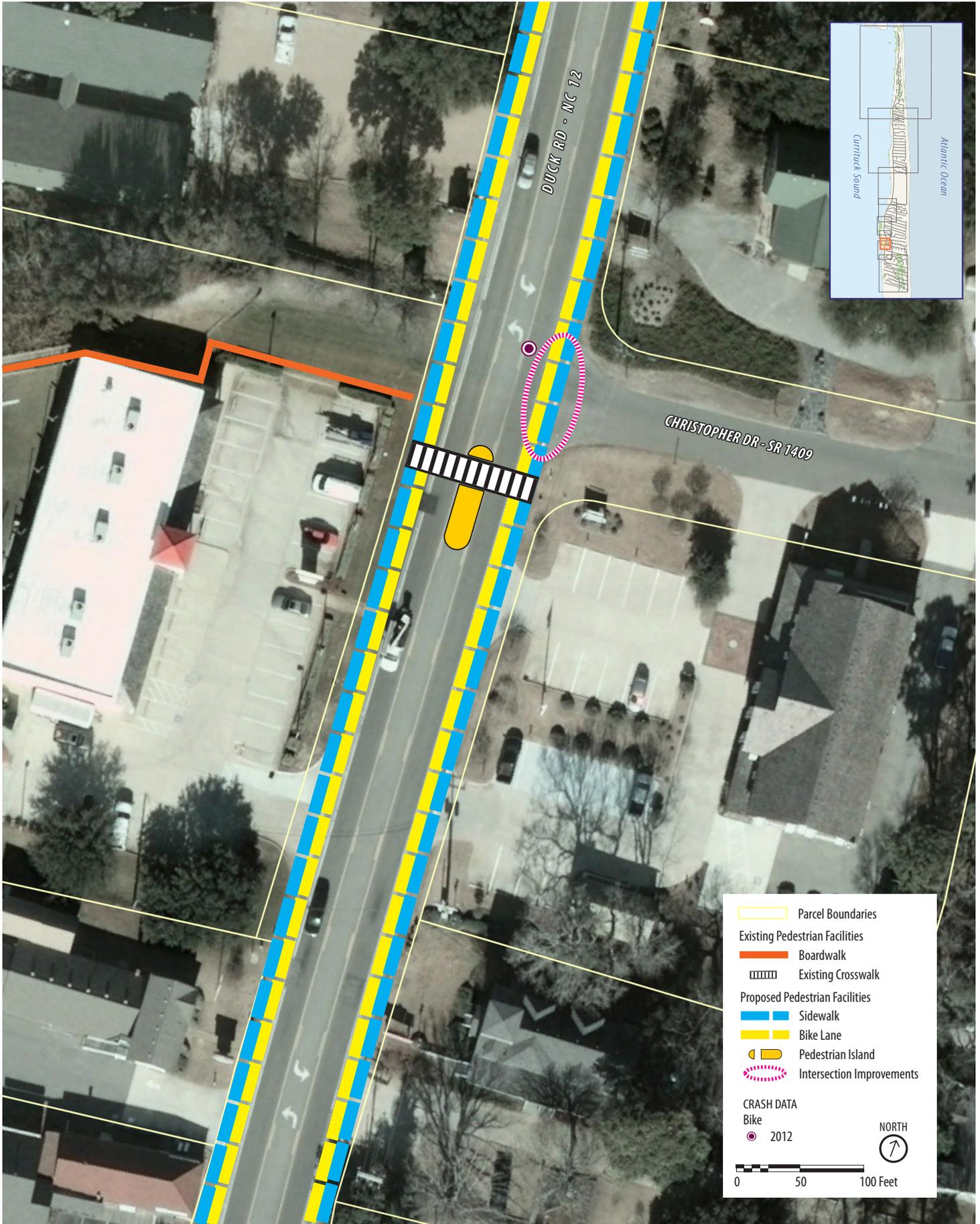
Intersection Improvements

- At intersecting streets, clear sight lines and/or tighten curve radii where needed, and add crosswalk markings.

Paved Shoulder

- South of the crosswalk at 1174 Duck Road (Aqua Restaurant), as part of roadway repaving and maintenance, consider providing a 4' paved shoulder on both sides of NC 12.







EXISTING CONDITIONS



PROPOSED CONDITIONS



EXISTING CONDITIONS



PROPOSED CONDITIONS

NC 12

From: Poteskeet Drive

To: Schooner Ridge Drive

Distance: 1,300 Feet/0.25 Mile

Characteristics:

- Land use includes Village commercial and Town Park along NC 12, with residential neighborhoods east of NC 12
- NC 12 is 3 lanes with shoulders (shoulders are currently used by bicyclists and pedestrians)
- Three existing crosswalks
- Speed limit 25 MPH
- Five reported bicycle crashes
- Includes a portion of pedestrian and bicycle count zone 4 and zones 5-7; zones 4 and 6 have high rates of midblock crossings, while zone 5 has a high average number of crossings per hour (61)

Recommended Pedestrian Facilities (see Figure 7)

Crosswalk

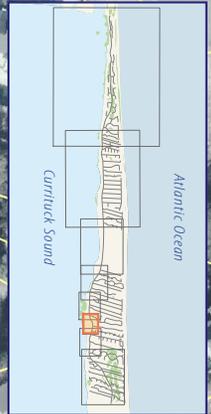
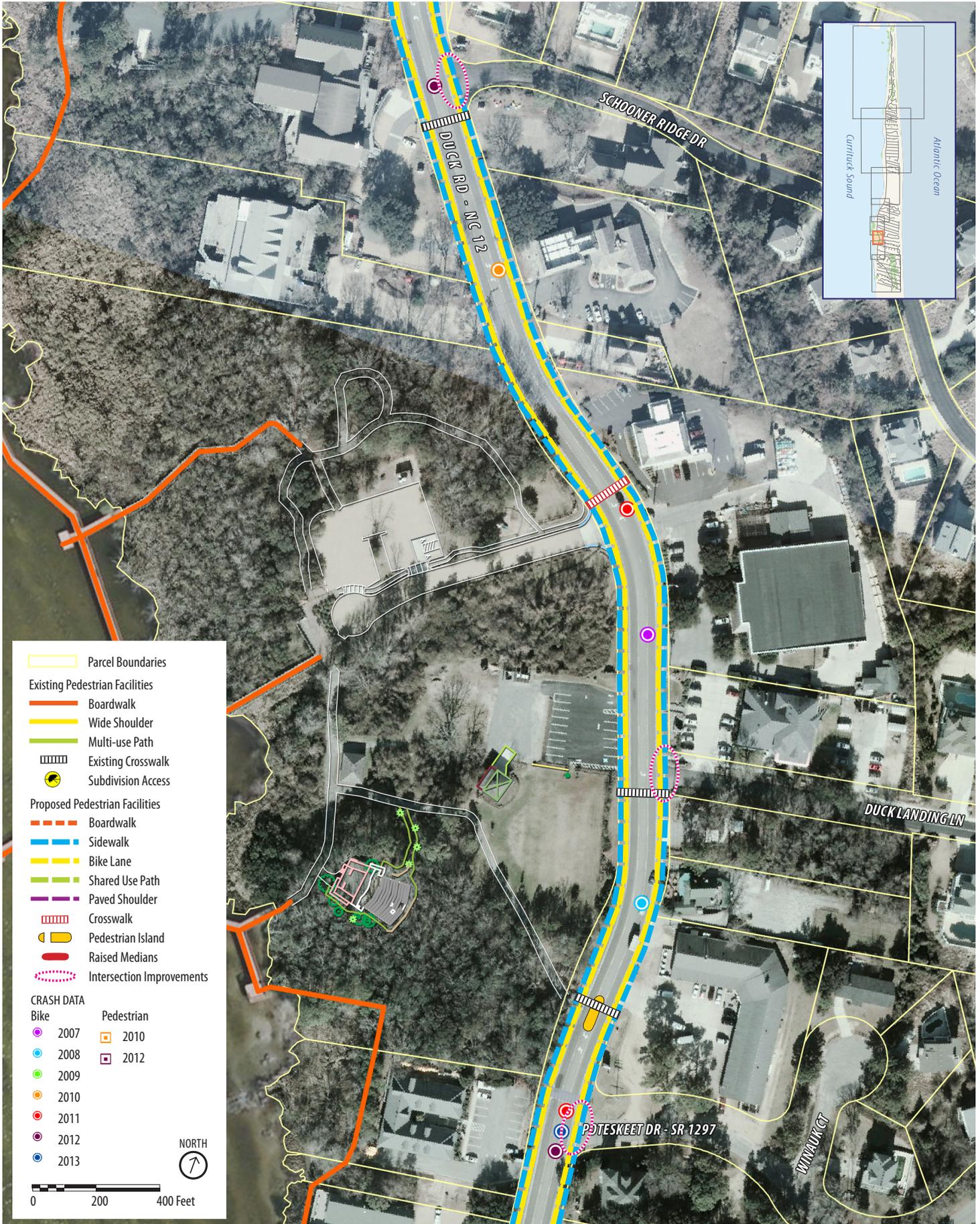
- At existing crosswalk north of Poteskeet Drive, install median refuge incorporating pedestrian storage capacity to provide two-step crossing.
- Install a new crosswalk at the northern entrance to Town Park.
- Provide pedestrian crosswalk illumination at all existing crosswalks.

Sidewalk and Bike Lane

- Install sidewalks on both sides of NC 12 and convert existing wide shoulder to marked bike lane; use preferred typical section (bike lanes, landscape strip, sidewalk) shown in Design Guidelines section. Based on NCDOT drainage plans, there appears to be adequate right-of-way to accommodate these improvements, with minor exceptions. Right-of-way survey would be required as a first step in engineering design.

Intersection Improvements

- At intersecting streets, clear sight line and/or reduce curve radii where needed, and add crosswalk markings.



NC 12

From: Schooner Ridge Drive

To: Cook Drive

Distance: 1,600 Feet/0.30 Mile

Characteristics:

- Land use includes Village commercial, with residential neighborhoods east of NC 12
- NC 12 is 3 lanes with shoulders (shoulders are currently used by bicyclists and pedestrians)
- Two existing crosswalks
- Speed limit 25 MPH
- Two reported bicycle crashes
- Includes pedestrian and bicycle count zones 8-10; zones 8 and 9 have relatively low average crossings per hour, but zones 8 and 10 have high rates of midblock crossings

Recommended Pedestrian Facilities (see Figure 8)

Crosswalk

- Install new crosswalk in vicinity of 1213 Duck Road (Wee Winks).
- Remove existing crosswalk in vicinity of Wampum Drive.
- Install new crosswalk in vicinity of 1240 Duck Road (Waterfront Shops). (NOTE: crosswalk and sidewalk improvements at this location should be coordinated with access management improvements on east side of NC 12 to minimize conflicts with pedestrians walking along the road)
- Provide pedestrian crosswalk illumination at all existing and proposed crosswalks.

Sidewalk and Bike Lane

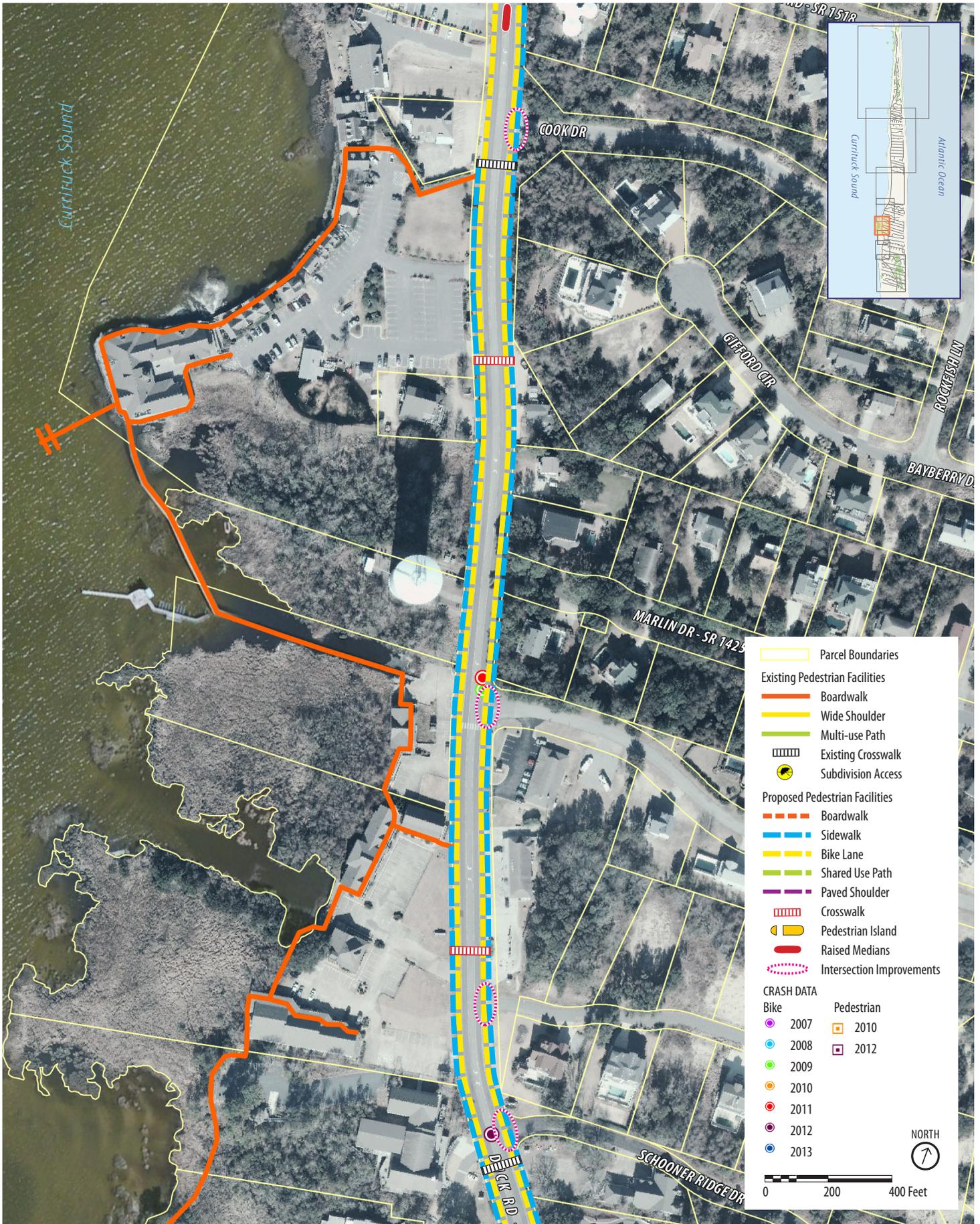
- Install sidewalks on both sides of NC 12 and convert existing wide shoulder to marked bike lane; use preferred typical section (bike lanes, landscape strip, sidewalk) shown in Design Guidelines section. Based on NCDOT drainage plans, there appears to be adequate right-of-way to accommodate these improvements, with minor exceptions. Right-of-way survey would be required as a first step in engineering design.

Intersection Improvements

- At intersecting streets, clear sight lines and/or reduce curve radii where needed, and add crosswalk markings.

Drainage Improvement

- Implement planned improvements to correct drainage problem at 1232 Duck Road (Stan White Realty) Realty.



NC 12

From: Cook Drive

To: Sandy Ridge Road

Distance: 2,250 Feet/0.43 Mile

Characteristics:

- Land use includes Village commercial, with residential neighborhoods east of NC 12, road abuts Sound on west for most of this section
- NC 12 narrows from 3 lanes to 2 lanes at Dune Road, there is also a short 3-lane section in vicinity of 1245 Duck Road (post office); NC 12 has wide shoulders (shoulders are currently used by bicyclists and pedestrians)
- Section of shared use path on east side of NC 12 north of post office
- One existing crosswalk
- Speed limit 25 MPH
- One reported pedestrian crash
- One reported bicycle crash
- Includes pedestrian and bicycle count zones 11-13; zones 11 and 12 abut the Sound to the west and have very low average crossings per hour; zone 13 has the highest average crossings per hour at 141

Recommended Pedestrian Facilities (see Figure 9)

Village Gateway

- South of Dune Road, install landscaped median (no crosswalk) to alert drivers they are entering a changed condition with higher pedestrian and bicycle activity.

Shared Use Path

- On east side of NC 12, extend existing shared use path south to crosswalk at 1264 Duck Road (1264 Duck Road (Sunset Grille)).

Crosswalk

- At existing crosswalk at 1264 Duck Road (1264 Duck Road (Sunset Grille)), install median refuge incorporating pedestrian storage capacity to provide two-step crossing.
- Provide pedestrian crosswalk illumination at all existing crosswalks.

Sidewalk and Bike Lane

- North of Cook Drive, install sidewalk on east side of NC 12 and convert existing shoulder (both sides) to marked bike lane; use preferred typical section (bike lanes, landscape strip, sidewalk) shown in Design Guidelines section, with sidewalk on east side only; consider wider sidewalk in this section (8' to 10'). Based on NCDOT drainage plans, there appears to be adequate right-of-

way to accommodate these improvements, with minor exceptions. Right-of-way survey would be required as a first step in engineering design.

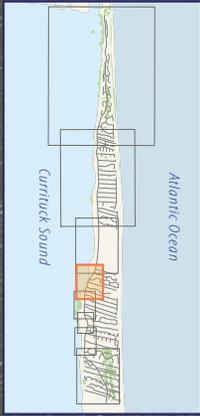
- End marked bike lanes at crossing in front of 1264 Duck Road (1264 Duck Road (Sunset Grille)) and transition cyclists to/from shared use path at this location. Cyclists will also still be able to share the road from this point north.

Intersection Improvements

- At intersecting streets, clear sight lines and/or reduce curve radii where needed, and add crosswalk markings.
- Evaluate and clear sight lines at the stop approaches to NC 12 to increase visibility of approaching pedestrians and cyclists on the shared use path.
- Install enhanced markings for pedestrians and cyclists on the shared use path as reminders to look before entering intersections.
- Develop and install uniform signing as reminders for drivers to look both ways for pedestrians and cyclists crossing the intersection.

Paved Shoulder

- North of the crosswalk at 1264 Duck Road (1264 Duck Road (Sunset Grille)), as part of roadway repaving and maintenance, consider providing a 4' paved shoulder on both sides of NC 12.



	Parcel Boundaries		
Existing Pedestrian Facilities			
	Boardwalk		
	Wide Shoulder		
	Multi-use Path		
	Existing Crosswalk		
	Subdivision Access		
Proposed Pedestrian Facilities			
	Boardwalk		
	Sidewalk		
	Bike Lane		
	Shared Use Path		
	Paved Shoulder		
	Crosswalk		
	Pedestrian Island		
	Raised Medians		
	Intersection Improvements		
CRASH DATA			
	Bike 2007		Pedestrian 2010
	2008		2012
	2009		
	2010		
	2011		
	2012		
	2013		

NORTH


0 200 400 Feet



EXISTING CONDITIONS



PROPOSED CONDITIONS

NC 12

From: Sandy Ridge Road

To: Nor Banks Drive

Distance: 3,700 Feet/0.70 Mile

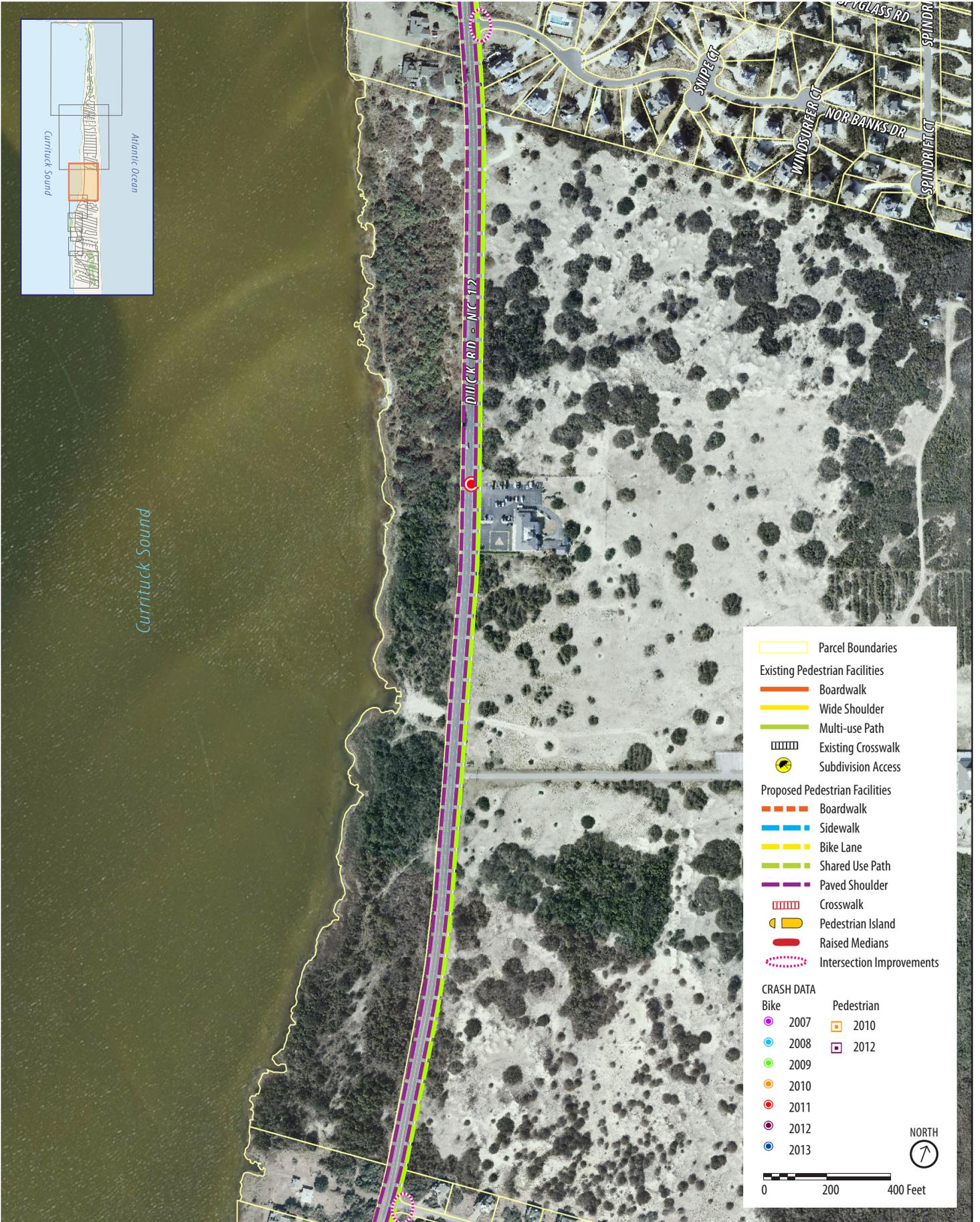
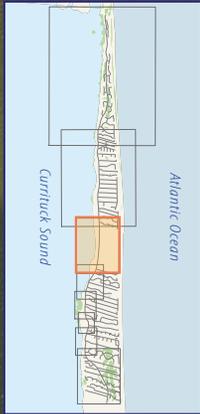
Characteristics:

- Land use includes the open space associated with the United States Army Corps of Engineers Research Facility, in addition to the Duck Fire Station.
- Aside from the Research Facility entrance and the Fire Station entrance, there are no intersecting roadways or driveways in this section.
- NC 12 is 2 lanes with narrow shoulders
- Shared use path on east side of NC 12
- Speed limit 45MPH Labor Day to Memorial Day; 35MPH in summer
- One reported bicycle crash

Recommended Pedestrian Facilities (see Figure 10)

Paved Shoulder

- As part of roadway repaving and maintenance, consider providing a 4' paved shoulder on both sides of NC 12.



	Parcel Boundaries		
Existing Pedestrian Facilities			
	Boardwalk		
	Wide Shoulder		
	Multi-use Path		
	Existing Crosswalk		
	Subdivision Access		
Proposed Pedestrian Facilities			
	Boardwalk		
	Sidewalk		
	Bike Lane		
	Shared Use Path		
	Paved Shoulder		
	Crosswalk		
	Pedestrian Island		
	Raised Medians		
	Intersection Improvements		
CRASH DATA			
	Bike 2007		Pedestrian 2010
	2008		2012
	2009		
	2010		
	2011		
	2012		
	2013		

0 200 400 Feet

NORTH



NC 12

From: Nor Banks Drive

To: Ocean Pines Drive

Distance: 7,000 Feet/1.32 Mile

Characteristics:

- Land use includes residential neighborhoods east of NC 12, with individual residences fronting directly on the west side of NC 12
- NC 12 is 2 lanes with narrow shoulders
- Shared use path on east side of NC 12
- Speed limit 45MPH from Labor Day to Memorial Day; 35MPH in summer
- One reported bicycle crash

Recommended Pedestrian Facilities (see Figure 11)

Intersection Improvements

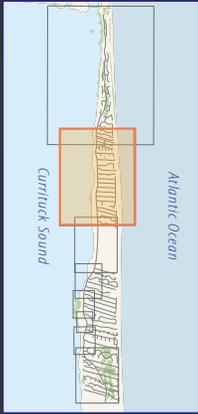
- Evaluate and clear sight lines at the stop approaches to NC 12 to increase visibility of approaching pedestrians and cyclists on the shared use path.
- Install enhanced markings for pedestrians and cyclists on the shared use path as reminders to look before entering intersections.
- Develop and install uniform signing as reminders for drivers to look both ways for pedestrians and cyclists crossing the intersection.

Paved Shoulder

- As part of roadway repaving and maintenance, consider providing a 4' paved shoulder on both sides of NC 12.

Drainage Improvement

- Make improvements to correct drainage problems at Ocean Bay Boulevard/North Duck Watersports.
- Make improvements to correct drainage problems at Snow Geese Drive (this project is currently being put out to bid).



Currituck Sound

Atlantic Ocean

-  Parcel Boundaries
- Existing Pedestrian Facilities**
-  Boardwalk
-  Wide Shoulder
-  Multi-use Path
-  Existing Crosswalk
-  Subdivision Access
- Proposed Pedestrian Facilities**
-  Boardwalk
-  Sidewalk
-  Bike Lane
-  Shared Use Path
-  Paved Shoulder
-  Crosswalk
-  Pedestrian Island
-  Raised Medians
-  Intersection Improvements

- CRASH DATA**
- | | |
|--|--|
|  2007 |  2010 |
|  2008 |  2012 |
|  2009 | |
|  2010 | |
|  2011 | |
|  2012 | |
|  2013 | |



0 200 400 Feet



NC 12

From: Ocean Pines Drive

To: Northern Town Limit

Distance: 9,600 Feet/1.80 Miles

Characteristics:

- Land use includes residential neighborhoods on both sides of NC 12, as well as the Sanderling Inn
- NC 12 is 2 lanes with narrow shoulders
- Shared use path on east side of NC 12
- Speed limit 45MPH from Memorial Day to Labor Day; 35MPH in summer
- Six existing crosswalks, including two with flashing beacons at Sanderling Inn

Recommended Pedestrian Facilities (see Figure 12)

Intersection Improvements

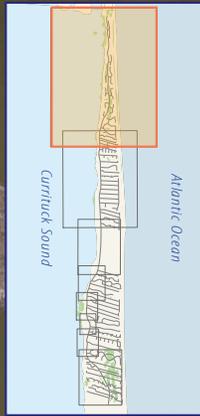
- Evaluate and clear sight lines at the stop approaches to NC 12 to increase visibility of approaching pedestrians and cyclists on the shared use path.
- Install enhanced markings for pedestrians and cyclists on the shared use path as reminders to look before entering intersections.
- Develop and install uniform signing as reminders for drivers to look both ways for pedestrians and cyclists crossing the intersection.

Paved Shoulder

- As part of roadway repaving and maintenance, consider providing a 4' paved shoulder on both sides of NC 12.

Drainage Improvement

- Undertake design study and make improvements to correct drainage problems at Ocean Pines Drive.



Parcel Boundaries

Existing Pedestrian Facilities

- Boardwalk
- Wide Shoulder
- Multi-use Path
- Existing Crosswalk
- Subdivision Access

Proposed Pedestrian Facilities

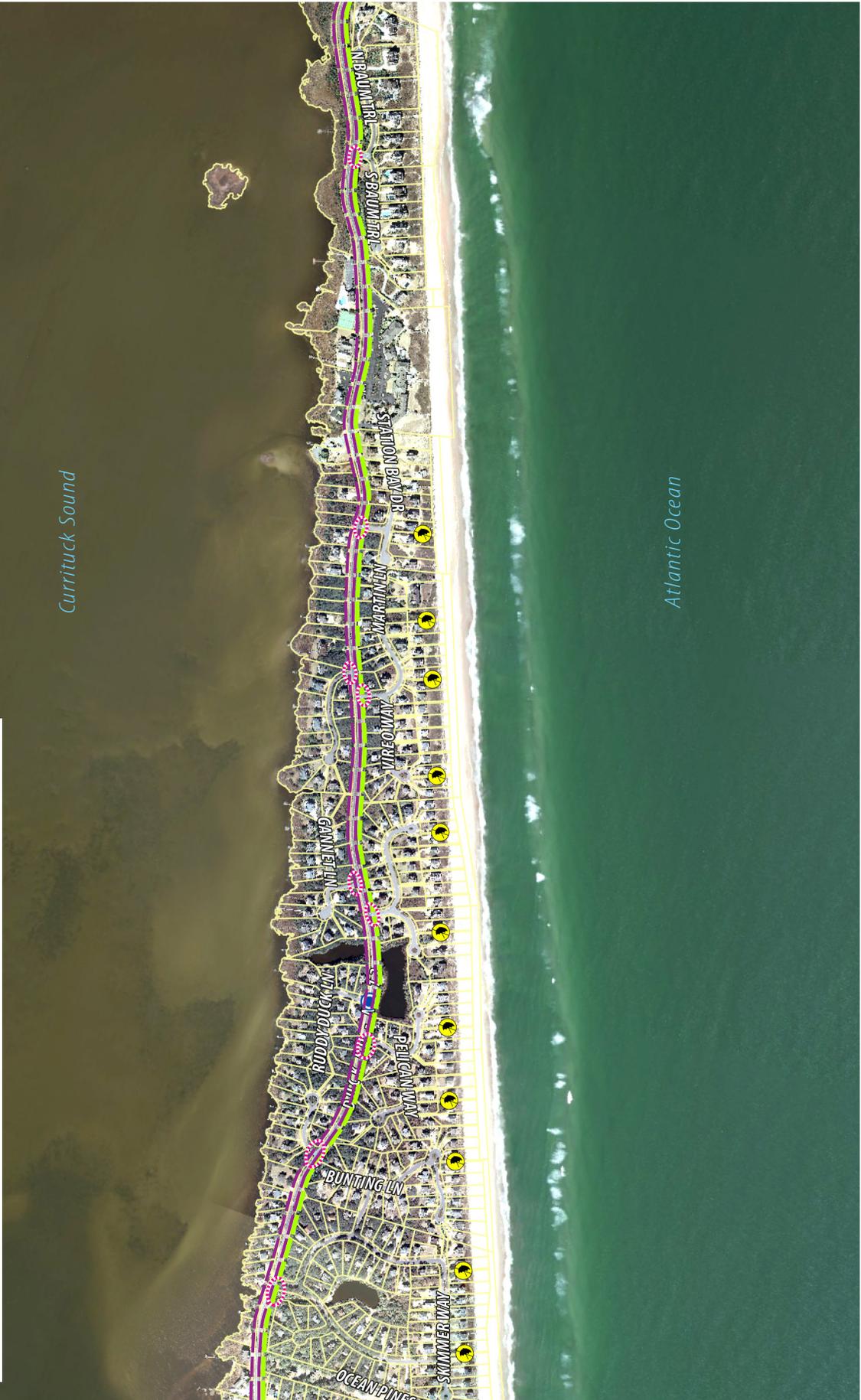
- Boardwalk
- Sidewalk
- Bike Lane
- Shared Use Path
- Paved Shoulder
- Crosswalk
- Pedestrian Island
- Raised Medians
- Intersection Improvements

CRASH DATA

Bike	Pedestrian
2007	2010
2008	2012
2009	
2010	
2011	
2012	
2013	

0 200 400 Feet

NORTH



Town Boardwalk

From: Southern End of Village Center (1174 Duck Road)

To: Northern End of Village Center (1264 Duck Road)

Distance:

Characteristics:

- Existing pedestrian boardwalk from 1188 Duck Road (Wings) to Waterfront Shops
- High pedestrian volumes
- Large section of boardwalk abuts Town Park (a major pedestrian attractor)
- Boardwalk also connects directly to Village businesses

Recommended Pedestrian Facilities (see Figure 13)

- Extend boardwalk from 1188 Duck Road (Wings) south to 1174 Duck Road (Aqua Restaurant) (this project is completed).
- Conduct a feasibility study to assess potential for extending boardwalk to the north.



Town Boardwalk

Currituck Sound



	Parcel Boundaries		
Existing Pedestrian Facilities			
	Boardwalk		
	Wide Shoulder		
	Multi-use Path		
	Existing Crosswalk		
	Subdivision Access		
Proposed Pedestrian Facilities			
	Boardwalk		
	Sidewalk		
	Bike Lane		
	Shared Use Path		
	Paved Shoulder		
	Crosswalk		
	Pedestrian Island		
	Raised Medians		
	Intersection Improvements		
CRASH DATA			
	Bike 2007		Pedestrian 2010
	2008		2012
	2009		
	2010		
	2011		
	2012		
	2013		



Beach Trail

From: Southern Town Limit

To: Sandy Ridge Road

AND

From: Nor Banks Drive

To: Ocean Pines

Characteristics:

- Residential neighborhoods, existing neighborhood streets and cul-de-sacs

Recommended Pedestrian Facilities

Connect existing cul-de-sacs and residential streets to form a linked Beach Trail. At this time, the Beach Trail is presented as a conceptual idea, and no alignment or conceptual layout is proposed.

These improvements are recommended as potential long term measures to provide pedestrian linkages along the east side of Town. The Beach Trail would not allow vehicular access, but could provide an alternative north-south route for pedestrians and cyclists not wishing to travel along NC 12. In addition to providing such an alternative, use of a Beach Trail could alleviate some of the pedestrian volume in the NC 12 corridor. Finally, although the linkages would not be open to vehicular traffic, they could provide access to emergency vehicles if needed, thus delivering a public safety benefit.

Town of Duck Comprehensive Pedestrian Plan

Town of Duck Comprehensive Sidewalk Plan
 Corridor Segment Summary and Planning Level Cost Opinion
 VHB # 33733.00 13-Jan-14

Figure #	NC12 Corridor Start/End Points	Side	Sidewalk (Linear Feet)	Complexity of sidewalk construction	Cost/LF ¹	Cost	Median islands	Cost @\$25k each	Shared use path (LF)	Cost @\$145/LF	New crosswalk	Cost @\$1,000 each	Crosswalk illumination	Cost @\$12,500	Paved shoulder (LF)	Cost @\$15/LF	Intersection imp's ²	Cost @\$5,000 each	Total
5	S Town Limit to Four Seasons	east west	0	NA	\$0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	4600	\$69,000	7	\$35,000	\$ 104,000
6	Four Seasons Ln to Poteskeet Dr	east west	1050	High	\$80	\$84,000	3	\$75,000	238	\$34,510	0	\$0	3	\$37,500	671	\$1,085	3	\$15,000	\$ 247,095
7	Poteskeet Dr to Schooner Ridge Dr	east west	1300	Medium	\$55	\$71,500	1	\$25,000	0	\$0	1	\$1,000	4	\$50,000	0	\$0	3	\$15,000	\$ 162,500
8	Schooner Ridge Dr to Cook Dr	east west	1600	High	\$80	\$128,000	0	\$0	0	\$0	2	\$2,000	3	\$37,500	0	\$0	3	\$15,000	\$ 182,500
9	Cook Dr to Sandy Ridge Dr	east west	1650	High	\$80	\$132,000	2	\$50,000	126	\$18,270	0	\$0	1	\$12,500	600	\$9,000	6	\$30,000	\$ 251,770
10	Sandy Ridge Rd to Nor Banks Dr	east west	0	NA	\$0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	3700	\$55,500	0	\$0	\$ 55,500
11	Nor Banks Dr to Ocean Pines Dr	east west	0	NA	\$0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	7000	\$105,000	18	\$90,000	\$ 195,000
12	Ocean Pines Dr to N Town Limit	east west	0	NA	\$0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	9600	\$144,000	6	\$30,000	\$ 174,000
					\$0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	9600	\$144,000	3	\$15,000	\$ 159,000
	Total					\$699,000		\$150,000		\$817,075		\$3,000		\$137,500		\$767,170		\$275,000	\$ 2,848,745

Figure #	Boardwalk Extension	Linear Feet	Cost/LF	Cost
13	Wings to Aqua	1050	\$450	\$ 472,500

Notes

1 Basis of sidewalk costs:

Complexity	Utility Relocation	Drainage	Earthwork	Cost per LF
Low	Minor utility relocation. Mostly meter boxes and pedestals.	Stormwater to be accommodated in the planted grass strip.	Shaping the edges and landscaping is minimal.	\$31
Medium	Moderate utility relocation.	Planted grass strip is a part of the stormwater management to convey water to a BMP or similar facility	Reworking driveways and landscaping is necessary.	\$55
High	Utility pole and/or underground relocation. (It is assumed vaults will be avoided.)	Stormwater chambers are incorporated into the design	Reworking driveways and landscaping using retaining walls is required.	\$80

2 Intersection improvements include crosswalks, truncated dome strips, and pavement removal.

3 Includes low-complexity sidewalk-level clearing/grading/accessibility improvements - does not include potential costs for obtaining easements

5: Program and Policy Recommendations

In addition to engineered infrastructure, strong programs and policies can help encourage and support pedestrians within the Town. While development of facilities relates directly to engineering, pedestrian programs tend to focus on encouragement, education, enforcement, and evaluation efforts. In addition, strong pedestrian policies can help encourage pedestrian friendly design and development of both public and private sector projects. Many of the activities listed below represent continuations and/or enhancements of programs and policies already being implemented by the Town. The seasonal and transient/tourist nature of the Town’s population poses challenges to reaching and engaging the public in a consistent way; the recommendations in this Chapter seek to offer ways for the Town to enhance ongoing activities and reach a broader array of people with meaningful results.

Program Recommendations

Encouragement Programs

Walking and bicycling maps

User maps are an important tool for encouraging walking. The Town already has a map available on-line, in brochures, and posted at key locations, which identifies the Boardwalk, the Duck Trail, and other pedestrian facilities. The map should be refined and updated as new facilities are developed, and additional opportunities for distribution to residents and visitors should be investigated. The maps should continue and enhance their educational and etiquette components.

Self-guided and group walking tours

Walking tours can encourage walking in Town, and can also enhance the Town marketing and tourism efforts. By developing and advertising one or more formal tour routes in association with the walking and bicycling maps described above, the Town could identify routes to take pedestrians to recreational, shopping, dining, and natural destinations. Tour routes could begin with existing facilities and expand as the pedestrian network develops. Walking tours could include organized groups with Town-sponsored tour guides.

Wayfinding signs

The Town currently maintains signs for the Duck Trail and the Boardwalk, with the latter including an extensive system of wayfinding and orientation. As the pedestrian system develops, and especially as sidewalks are installed and neighborhood connections made, additional wayfinding will help contribute to the overall pedestrian environment. Items such as mile markers, consistent themes and logos, and regular wayfinding kiosks will become important elements to encourage walking throughout Town.



Tip sheets

The Town should continue and update the pedestrian, bicyclist, and vehicle tips that can be found on the Town’s website. Additional efforts to publicize these, including partnering with rental agencies and retailers, should be investigated.

Lights and helmets for rentals

Duck boasts several bicycle rental businesses, and these represent potential partners in encouraging safe cycling and walking. In addition to serving as outlets for educational information, rental shops could be encouraged to include safety lights on their bicycles and to ask renters to sign a pledge to wear helmets while riding the bicycles.

Education Programs

Rental Agency Coordination

To reach out to the large transient/tourist population in Duck, the Town should work with the various real estate rental companies to distribute educational brochures and mapping. This could take the form of hard copy products delivered to renters and/or electronic outreach prior to arrival in Town.

Professional development

Town staff, law enforcement, and emergency services personnel should be encouraged to undertake regular professional development courses on design and policy issues. Available options include courses on facility design, accessibility, Complete Streets, law enforcement, and traffic safety.

Watch for Me NC

Watch for Me NC is a comprehensive program, run by the North Carolina Department of Transportation (NCDOT) in partnership with local communities, aimed at reducing the number of pedestrians and bicyclists hit and injured in crashes with vehicles. The Town has begun distributing Watch for Me NC information provided by NCDOT, and should continue and expand this coordination.

<http://www.watchformenc.org/>

Town events

As part of the Town’s programming for events at the amphitheater and/or Town Green, consideration should be given to including pedestrian and bicycle education, either as stand-alone events or as part of a larger event. This could include discussions with Town Police in addition to inviting outside experts to speak. The Town currently distributes pedestrian and bicycle educational and mapping information at events; this effort could be expanded to provide specific educational instruction. Consideration could also be given to providing bicycle lights for free or for purchase at Town events.



Enforcement Programs

Speeding

High-speed driving results in more frequent crashes and crashes with higher likelihood of serious injury or death. The Town Police Department should continue efforts to enforce speed limits throughout Town, with potential targeted enforcement at the start of the tourist season. In addition, the Town should continue its use of speed radar trailers.

Crosswalks

The Town should consider potential locations for targeted enforcement of the obligation of motorists to yield to pedestrians in crosswalks. At the same time, enforcement against unmarked midblock pedestrian crossings could be undertaken. Target locations could be based on the crossing counts taken as part of this plan. These high-visibility actions could generate publicity as important as tickets in emphasizing the importance of pedestrian crossing laws.

Cite good behavior

In addition to enforcement activities, the Town should consider citations for appropriate behavior. This might involve Town Police simply commending pedestrians for using crosswalks, or could go as far as handing out citations or gift certificates for appropriate behavior. This should be conducted as a highly visible and widely publicized encouragement effort.

Evaluation Programs

Pedestrian and bicycle counts

As part of the 2009 Road Safety Audit, and again as part of this Plan, the Town conducted extensive pedestrian and bicycle counts, including crosswalk and midblock crossings. Similar counts should be conducted annually, both to monitor trends and also to help evaluate the effectiveness of the improvements recommended in this Plan. Annual counts could utilize automated counters, while manual counts could be conducted on a regular but less frequent interval or as conditions warrant. The Town should also coordinate with NCDOT and its emerging pedestrian/bicycle count program.

Report card

To help continue public engagement in making Duck a pedestrian-first community, the Town should publish an annual report documenting progress made and issues encountered. The report could include count and crash data, new facility details, pedestrian event/program attendance, public outreach, and qualitative information such as public feedback and perceptions of the network.

Policy Recommendations

The Town has in place many local provisions for encouraging and requiring pedestrian-friendly accommodations as part of the development review process. This section highlights potential ways to continue and enhance these policy provisions.

Complete Streets

The Town should consider adopting a Complete Streets policy, to encourage the development of roadways that accommodate all users. NCDOT has adopted a Complete Streets policy, and local action could support this state initiative and foster enhanced collaboration as roadway development and redevelopment occurs.

Development Partners

Sidewalk construction and connections

Where new development and redevelopment occur, the Town should have ordinances in place to require the integration of sidewalks, crosswalks, and connections to existing and proposed sidewalks. Particular attention should be given to development within the Village Commercial district.

Pedestrian access through parking lots

As part of the design of new development and redevelopment projects, existing and proposed parking lots should be evaluated for pedestrian accommodation. This could include features such as pedestrian refuges, sidewalks, and defined pedestrian access to building entrances. Design guidelines should allow flexibility for shared parking lots and location of parking lots behind buildings.

Neighborhood connections

Establishing and maintaining the neighborhood connections proposed in this plan will require coordination with homeowners associations and in some cases with individual property owners. The Town should establish design guidelines for such connections, and encourage participation by the private sector in development of the connections over time.

Access Management

The Town has had significant recent success in achieving access management goals as part of redevelopment design and review; these efforts should continue as a way to help reduce conflict points between motor vehicles and pedestrians and bicyclists. The NCDOT policy on “Street and Driveway Access to North Carolina Highways” is a primary resource.

Program and Policy Resources

The NCDOT Division of Bicycle and Pedestrian Transportation web page includes references and links to state and federal policies to support accommodation of pedestrians as part of the transportation system. See <http://www.ncdot.gov/bikeped/lawspolicies/policies/> along with the summaries below:

NC Board of Transportation Resolution on Mainstreaming

The NC Board of Transportation has strongly demonstrated its commitment to improving conditions for bicycling and walking in North Carolina by passing a resolution to make bicycling and walking a critical part of the state’s transportation system. The resolution also encourages cities and towns to make bicycling and pedestrian improvements an integral part of their transportation planning and programming.

Complete Streets Policy and Guidelines

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

Bicycle Policy

To help integrate bicycle transportation into the overall transportation system, this policy details guidelines for planning, design, construction, maintenance, and operations of bicycle facilities and accommodations.

Pedestrian Policy Guidelines

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

Administrative Action to Include Local Adopted Greenway Plans in the NCDOT Highway Planning Process and Guidelines

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

Bridge Policy

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

Guide for Temporary Pedestrian Accommodations

This section of the web link provides a flow chart and guidance to help determine when existing pedestrian traffic can be maintained in a Work Zone and how impacts to pedestrian access can be considered at different stages of the project development process before construction begins.

Relevant US DOT Policies

The Division of Bicycle and Pedestrian Transportation web page includes links to:

Memorandum: Guidance on Bicycle and Pedestrian Provisions of the Federal-aid Program

Policy: Mainstreaming Nonmotorized Transportation

Integrating Bicycling and Walking into Transportation Infrastructure – Policy Statement

The DBPT web page also provides summaries and links to relevant laws (see <http://www.ncdot.gov/bikeped/lawspolicies/laws/>) which are summarized below:

Bicycle & Bikeway Act

This act established the first state bicycle program in the nation, and granted authority for what became the Division of Bicycle and Pedestrian Transportation.

Bicycle Laws

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

Bicycle Helmet Law

This law requires every person under 16 years old to wear an approved bicycle helmet when operating a bicycle on any public road, public bicycle path, or other public right-of-way.

Bicycle Racing Guidelines

Legislation requires that all bicycle races involving state and local roads must be authorized by designated state and local authorities.

Pedestrian Laws

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

School Crossing Guard Laws

A valuable resource, even though there are no schools in Duck.

Consideration about Bicycling Where the Law is Silent

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

- Bicycling on Interstate or fully controlled limited access highways, such as beltlines, is prohibited by policy, unless otherwise specified by action of the Board of Transportation. Currently, the only exception to the policy is the US 17 bridge over the Chowan River between Chowan and Bertie Counties.
- There is no law that requires bicyclists to ride single file, nor is there a law that gives cyclists the right to ride two or more abreast. It is important to ride responsibly and courteously, so that cars may pass safely.
- There is no law that prohibits wearing headphones when riding a bicycle; however, it is not recommended. It is important to use all your senses to ensure your safety when riding in traffic.

6: Implementation

This section of the Plan provides specific steps for the Town to take in order to implement the recommendations included herein. These are intended to build upon the momentum already generated by recent projects, the 2022 Vision Statement, and the process that led to development of this Plan. This section also includes a priority ranking for infrastructure projects, and a phasing plan that identifies short-term, mid-term, and long-term action items for infrastructure, programs, and policies. The phasing plan suggests a logical sequence for implementation, recognizing that changing conditions and unforeseen opportunities might require that individual projects be advanced or delayed. Furthermore, the phasing plan recognizes that factors such as cost and project sequencing mean that some highly-ranked projects might not become short-term action items. Finally, the chapter identifies potential sources of funding to assist with implementation.

Implementation Steps

Adopt Plan

As a first step in implementation, Town Council should adopt this Plan. Formal adoption will provide the foundation for the Town and its partners to undertake the remaining steps to achieve the goals established as part of the Plan development process. Plan adoption also improves the Town's eligibility to receive certain types of funding for priority projects.

Continue Staff Responsibilities

Duck has a relatively small staff of Town employees, and the current assignment and distribution of duties should continue through Plan adoption and implementation. As such, the Community Development Department should have the primary responsibility for Plan implementation, with direct support from the Administration, the Police Department, and the Fire Department. Specific roles and responsibilities for individual projects, programs, and policies are identified in the phasing plan below.

Continue Steering Committee Involvement

In collaboration with Town Staff, the Steering Committee represents a direct link to business owners, neighborhood groups, residents, and advocates. Their participation has been essential to the development of this Plan, and they should have defined roles (as identified in the phasing plan) in the implementation of the Plan's recommendations. To sustain their engagement, the Committee should continue to meet on a regular basis (quarterly and as-needed for specific projects).

Undertake Program and Policy Recommendations

The Town has recently made significant progress in pursuing pedestrian-friendly programs and policies, including efforts such as pedestrian tip sheets, wayfinding signs, and access management policies. The Town should continue these activities, expand them where appropriate, and enact additional measures to foster education, encouragement, and enforcement. Some of these can be implemented immediately, while others may require additional time and coordination.

Pursue Funding and Undertake Infrastructure Improvements

As part of its Capital Improvements Program, using local funds supplemented by funding from various outside sources (see section below on Funding Resources), the Town has made systematic improvements to its pedestrian network over time. Specific improvements have included the Town Boardwalk, improved crosswalks, and pedestrian signage. The Town used a combination of local and grant funds to construct a southern extension of the Boardwalk. This approach should continue, with the Town expanding its range of funding sources and programming priority infrastructure projects in a logical and phased manner. In addition, inclusion of priority projects in the Transportation Improvement Program (TIP) should be pursued.

Seek Walk Friendly Community Designation

The Walk Friendly Communities Program recognizes cities and towns that have demonstrated a commitment to walkability and pedestrian safety. By applying for designation, Duck will receive specific suggestions and resources on ways to further pursue its pedestrian first goals. Once designated a Walk Friendly Community, Duck will receive national recognition.

<http://www.walkfriendly.org/>

Evaluate and Refine Plan

This Plan should be used as a flexible guide for decision-making over time. As action items are completed, and as conditions change over time, the recommendations herein will warrant reevaluation and refinement.

Infrastructure Priorities

The following priorities have been set based on Committee review along with the criteria in the table below. Individual projects are taken from the project sheets in Chapter 3, but generally involve combinations or discrete project elements, rather than the full suite of improvements included on any one project sheet. Also, based on project costs, and the need to phase costs over time, a high priority ranking might not result in designation of a project as a short-term action item.

Prioritization Criteria:

- A. Public input
- B. Separation of modes
- C. Traffic calming
- D. Serves Village Center
- E. Pedestrian and/or bicycle crash reported
- F. Fills system gap
- G. Benefit to traffic flow

Priority	Project	A	B	C	D	E	F	G
1	Sidewalk and bike lane on east side of NC 12 in Village	*	*		*	*		*
2	Sidewalk and bike lane on west side of NC 12 in Village	*	*		*	*		*
3	Extend existing shared use path on east side of NC 12 north to existing crosswalk at 1174 Duck Road (Aqua Restaurant)	*			*		*	*
4	Crosswalks and refuge islands	*		*	*			*
5	Sidewalk Cook Drive to 1264 Duck Road (Sunset Grille)	*	*		*			*
6	Extend existing shared use path south to 1264 Duck Road (Sunset Grille)	*			*		*	*
7	Gateway islands	*		*	*			
8	Warning signs	*		*	*	*		
9	Intersection/shared use path improvements	*				*		*
10	Paved shoulders north and south of Village	*	*			*		*
11	Extend boardwalk	*	*		*		*	*
12	Install shared use path on west of NC 12 south of Village						*	*
13	Beach Trail				*		*	*

Short-term Action Items (0-5 years)

Infrastructure Projects					
Description	Responsibility	Potential Partners	Cost	Benefits	Constraints
Construct sidewalk on east side of NC 12 from 1174 Duck Road (Aqua Restaurant) to Cook Drive	Community Development	NCDOT, RPO	\$328,500 (includes intersection improvements)	Additional capacity and separation of bicycle/pedestrian traffic; continuous connection through Village; focus on side of roadway with reported pedestrian and bicycle crashes	Existing signs, landscape beds, retaining walls, utility boxes
Install pedestrian warning signs north and south of Village Center	Community Development	NCDOT	\$2,000	Enhanced driver awareness; traffic calming	Potential sign clutter
Extend existing shared use path on east side of NC 12 north to existing crosswalk at 1174 Duck Road (Aqua Restaurant)	Community Development	NCDOT, private landowners	\$34,510	Fills gap in transition from SUP to sidewalk/bike lane section; provides single transition point	Grading, existing landscaping

Short-term Action Items (0-5 years) (continued)

Programs				
Description	Responsibility	Potential Partners	Benefits	Constraints
Update and distribute user maps	Administration	Business owners; Steering Committee	Outreach to residents and tourists; enhanced understanding of pedestrian system	Limited ability to reach tourists with additional information
Publicize tip sheets	Administration	Business owners; Steering Committee	Outreach to residents and tourists; enhanced understanding of pedestrian system	Limited ability to reach tourists with additional information
Safety lights and helmets for rentals	Administration	Business owners; Police Department	Improved visibility of cyclists; enhanced safety	Participation by users
Speeding enforcement	Police Department		Improved safety for all modes of transportation	Limited ability to expand beyond current enforcement levels
Professional development	Administration	Other departments; NCDOT	Enhanced education and awareness for Town Staff	Funding limitations; conflicts with other staffing commitments
Town events	Administration	Steering Committee; private businesses	High visibility opportunities for education and outreach	Participation by users
Pedestrian and bicycle counts	Community Development	Steering Committee	Ability to monitor conditions over time	Time and volunteer commitment
Report card	Administration	Steering Committee	Communicate progress and challenges to residents and tourists	Limited ability to reach tourists
Policies				
Adopt Complete Streets Policy	Town Council	Community Development; Administration	Formal policy to reflect Town priorities and support NCDOT policy	Competing priorities
Continue Access Management Enhancements	Community Development	Private businesses	Improved safety and traffic flow	Physical space constraints

Mid-term Action Items (5-10 years)

Infrastructure Projects					
Description	Responsibility	Potential Partners	Cost	Benefits	Constraints
Construct sidewalk on west side of NC 12 from 1174 Duck Road (Aqua Restaurant) to Cook Drive	Community Development	NCDOT, RPO	\$283,500	Additional capacity and separation of bicycle/pedestrian traffic; continuous connection through Village	Existing signs, landscape beds, retaining walls, utility boxes, underground utilities, right-of-way
Crosswalks and refuge islands	Community Development	NCDOT	\$290,500 (includes lighting)	Additional crosswalk capacity; 2-step crossings at high volume locations; night-time visibility	Potential traffic impacts associated with refuge islands
Construct sidewalk on east side of NC 12 from Cook Drive to 1264 Duck Road (Sunset Grille)	Community Development	NCDOT, RPO	\$162,000 (includes intersection improvements)	Additional capacity and separation of bicycle/pedestrian traffic; continuous connection through Village	Existing signs, landscape beds, retaining walls, utility boxes, underground utilities, right-of-way
Extend existing shared use path on east side of NC 12 from Ships Watch Drive to 1264 Duck Road (crosswalk at 1264 Duck Road (Sunset Grille))	Community Development	NCDOT; private landowners	\$18,270	Fills gap in transition from SUP to sidewalk/bike lane section; provides single transition point	Constrained space; existing parking lot
Implement improvements to intersections of shared use path with east-west streets	Community development	Homeowners associations	\$200,000	Improved sight lines; consistent pavement markings and signage	Coordination with numerous HOA's

Mid-term Action Items (5-10 years) (continued)

Infrastructure Projects (continued)					
Description	Responsibility	Potential Partners	Cost	Benefits	Constraints
Widen shoulders as part of repaving	Community Development	NCDOT	\$767,170 (includes full length of NC 12 north and south of Village)	Provide additional accommodation for bicyclists	Space constraints; stormwater management requirements
Programs					
Description	Responsibility	Potential Partners	Benefits		Constraints
Establish walking tours	Administration	Business owners	Public education; community involvements		Community participation
Install wayfinding signs	Community development	NCDOT	Promote use of formal pedestrian routes		Compliance
Crosswalk enforcement	Police Department		High visibility effort with high potential impact		Negative reaction from community; conflict with other time commitments
Cite good behavior	Police Department		Positive community reaction		Conflict with other time commitments
Policies					
Sidewalk connections	Community Development	Private businesses and landowners	Improved pedestrian flow and safety; enhanced business access		Participation by affected owners
Parking lot access	Community Development	Private businesses and landowners	Improved pedestrian flow and safety; enhanced business access		Participation by affected owners

Long-term Action Items (10+ years)

Infrastructure Projects					
Description	Responsibility	Potential Partners	Cost	Benefits	Constraints
Construct shared use path on west side of NC 12 from south Town limit to 1174 Duck Road (Aqua Restaurant)	Community Development	NCDOT, RPO	\$764,295	Additional capacity and separation of bicycle/pedestrian traffic; continuous connection through Village	Existing signs, landscape beds, retaining walls, utility boxes, underground utilities, right-of-way
Construct Beach Trail connections	Community Development	Homeowners associations; individual property owners	To be determined	Provide alternative north-south pedestrian access	Lack of existing right-of-way; coordination with numerous HOA's
Extend boardwalk north	Community Development	Private property owners	To be determined	Provide alternative west side pedestrian access along this segment of NC 12	Private access to Sound; existing piers; condition of shoreline

Funding Resources

The following sources may provide funding for certain of the improvement described above. The NCDOT and the North Carolina Association of Rural Planning Organizations also offer guidance on potential funding resources.

<http://www.ncdot.gov/bikeped/funding/>

<http://www.nctransportationanswers.org/fundsrc/fundsrc.htm>

Capital Improvements Program (CIP)

The Town has a successful record using its annual CIP to fund priority pedestrian projects. Examples include the Town Boardwalk, pavement marking and signage improvements, and wayfinding signage. The CIP represents one source of continued funding for the projects identified in this Plan.

Statewide Transportation Improvement Program (STIP)

In terms of STIP funding, bicycle and pedestrian projects are divided into two categories, which determine the types of funds that may be available. *Independent projects* are those which are not related to a scheduled highway project. *Incidental projects* are those related to a scheduled highway project.

Independent Projects

The Strategic Mobility Formula component of the Strategic Transportation Investments bill (passed into law in 2013) outlines the general structure of NCDOT's project prioritization process. The formula includes three funding categories – Statewide Mobility, Regional Impact and Division Needs. Bike and pedestrian are only eligible within the Division Needs category. Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs), and NCDOT Divisions may submit projects through the prioritization process. Independent bike and pedestrian projects (shared-use paths, bike lanes, sidewalks, intersection improvements, etc.) are comparatively evaluated based on safety, access, demand/density, constructability, and benefit-cost criteria. Bike/pedestrian projects must compete with all other transportation modes with projects across all modes ranked collectively. Projects that score well are selected for programming in the State Transportation Improvement Program (TIP). This process occurs every two years. Priority projects are included in the developmental STIP (years 6 to 10) and the 10-year Program & Resource Plan. Further information on state transportation funding legislation and the prioritization process can be found at the following link.

<https://connect.ncdot.gov/projects/planning/Pages/StrategicPrioritization.aspx>

Incremental Projects

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.

In addition, bicycle-safe drainage grates are a standard feature of all highway construction. Most pedestrian safety accommodations built by NCDOT are included as part of scheduled highway improvement projects funded with a combination of federal and state roadway construction funds or with a [local fund match](#).

For the Town of Duck, inclusion of projects in the STIP will also require coordination with the Albemarle Rural Planning Organization for inclusion of projects in the Regional TIP.

Highway Safety Improvement Program

The purpose of the North Carolina Highway Safety Improvement Program (HSIP) is to provide a continuous and systematic process that identifies reviews and addresses specific traffic safety concerns throughout the state. The program is structured in several distinct phases:

- A system of safety warrants is developed to identify locations that are possibly deficient.
- Locations that meet warrant criteria are categorized as potentially hazardous (PH) locations.

- Detailed crash analyses are performed on the PH locations with the more severe and correctable crash patterns.
- The Regional Traffic Engineering staff performs engineering field investigations.
- The Regional Traffic Engineering staff utilizes Benefit: Cost studies and other tools to develop safety recommendations.
- Depending on the cost and nature of the countermeasures, the investigations may result in requesting Division maintenance forces to make adjustments or repairs, developing Spot Safety projects, developing Hazard Elimination projects, making adjustments to current TIP project plans or utilizing other funding sources to initiate countermeasures.
- Selected projects are evaluated to determine the effectiveness of countermeasures.

The ultimate goal of the HSIP is to reduce the number of traffic crashes, injuries and fatalities by reducing the potential for and the severity of these incidents on public roadways.

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% federal funds and 10% 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).

Statewide Discretionary Fund

The Statewide Discretionary Fund consists of \$10 million and is administered by the Secretary of the Department of Transportation. This fund can be used on any project at any location within the State. Primary, urban, secondary, industrial access, and spot safety projects are eligible for this funding.

Transportation Alternatives (Enhancement Program)

Federal Transportation Alternatives funding is administered by the NCDOT and serves to strengthen the cultural, aesthetic, and environmental aspects of the Nation's intermodal transportation system. Transportation Enhancement (TE) activities, awarded through the North Carolina Call for Projects process, must benefit the traveling public and help communities increase transportation choices and access, enhance the built or natural environment and create a sense of place.

Parks and Recreation Trust Fund (PARTF)

The North Carolina General Assembly established the Parks and Recreation Trust Fund (PARTF) on July 16, 1994 to fund improvements in the state's park system, to fund grants for local governments and to

increase the public's access to the state's beaches. The Parks and Recreation Authority, a nine-member appointed board, was also created to allocate funds from PARTF to the state parks and to the grants program for local governments.

PARTF is the primary source of funding to build and renovate facilities in the state parks as well as to buy land for new and existing parks.

The PARTF program also provides dollar-for-dollar grants to local governments. Recipients use the grants to acquire land and/or to develop parks and recreational projects that serve the general public. At this website, you can learn how to apply for a grant, see lists of past grant recipients and download an application. You can also learn about the Parks and Recreation Authority and how to contact us.

A portion of PARTF is the primary funding source for the Public Beach and Coastal Waterfront Access Program. The program, administered by the Division of Coastal Management (DCM), offers matching grants to local governments throughout North Carolina's twenty coastal counties. To learn more about this program, go to the [Division of Coastal Management website](#).

The Town has successfully used PARTF funding to help construct the Town Boardwalk.

Outer Banks Visitors Bureau (Short Term) Restricted Fund Grant

The (Short Term) Restricted Fund Grant is designed to help Dare County based Municipalities and nonprofit organizations with projects such as highway beautification, beach and sound accesses, or hike/bike walk trails. Grants are disbursed on a 50/50-match basis. The Town has successfully used this funding source to assist with improvements at Town Park and the Town Boardwalk.

Recreational Trails Program (RTP)

The RTP is a federal grant program authorized by Congress in 2012 as Moving Ahead for Progress in the 21 Century (MAP-21). The intent of the RTP is to help fund trails and trail-related recreational needs at the State level. Funding for the RTP comes from federal gas taxes paid on non-highway fuel used in off-highway vehicles, and the program is administered at the Federal level by the Federal Highway Administration.

At the State level, the Secretary of the DENR has assigned that responsibility to the Division of Parks and Recreation and its State Trails Program. The North Carolina Trails Committee is a seven-member advisory committee who will review all applications and make recommendations for funding. The Secretary of DENR has the final approval authority for North Carolina.

Powell Bill

Annually, State Street-Aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. The general statutes require that a sum equal to ten and four-tenths percent (10.4%) of the net amount after refunds that was produced during the fiscal year by the tax imposed be disbursed to the qualifying municipalities. The statutes also provide that funds be disbursed to the qualified municipalities on or before October 1st and

January 1st, thereby allowing sufficient time after the end of the fiscal year for verification of information and to determine the proper allocations and preparation of disbursements. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of any street or public thoroughfare within the municipal limits or for planning, construction, and maintenance of bikeways, greenways or sidewalks.

Kodak American Greenways Awards Program

The Kodak American Greenways Awards Program, a partnership project of the Eastman Kodak Company, the Conservation Fund and the National Geographic Society, provides small grants to stimulate the planning and design of greenways in communities throughout America.

The organization is interested in funding activities such as mapping, eco-logical assessments, surveying, conferences and design activities; developing brochures, interpretative displays, audio-visual productions or public opinion surveys; hiring consultants; incorporating land trusts; and/or building footbridges, planning bike paths or other creative projects.

In general, grants can be used for all appropriate expenses needed to complete a greenway project, including planning, technical assistance, legal and other costs. Grant sizes range from \$500 to \$2,500.

Awards will be given primarily to local, regional or statewide nonprofit organizations. Although public agencies may also apply, community organizations will receive preference. Grants may not be used for academic research, general institutional support, lobbying or political activities.

Grants will be awarded based on the following criteria:

- Importance of the project to local greenway development efforts;
- Demonstrated community support for the project;
- Extent to which the grant will result in matching funds or other support;
- Likelihood of tangible results; and
- Capacity of the organization to complete the project.

National Trails Fund

American Hiking Society's National Trails Fund offers "hiking trail improvement" grants to active member organizations of our [Hiking Alliance](#). Once a year, Alliance Members have the opportunity to apply for a grant (value between \$500 and \$5,000) in order to improve hiking access or hiker safety on a particular trail. If your organization is interested in applying, but is not yet an Alliance member, please [follow this link to sign up](#).

American Hiking Society's National Trails Fund is the only privately funded, national grants program dedicated solely to building and protecting hiking trails. Created in response to the growing backlog of trail maintenance projects, the National Trails Fund has helped hundreds of grassroots organizations

acquire the resources needed to protect America’s cherished hiking trails. To date, American Hiking Society has funded [182 trail projects](#) by awarding over \$560,000 in National Trails Fund grants.

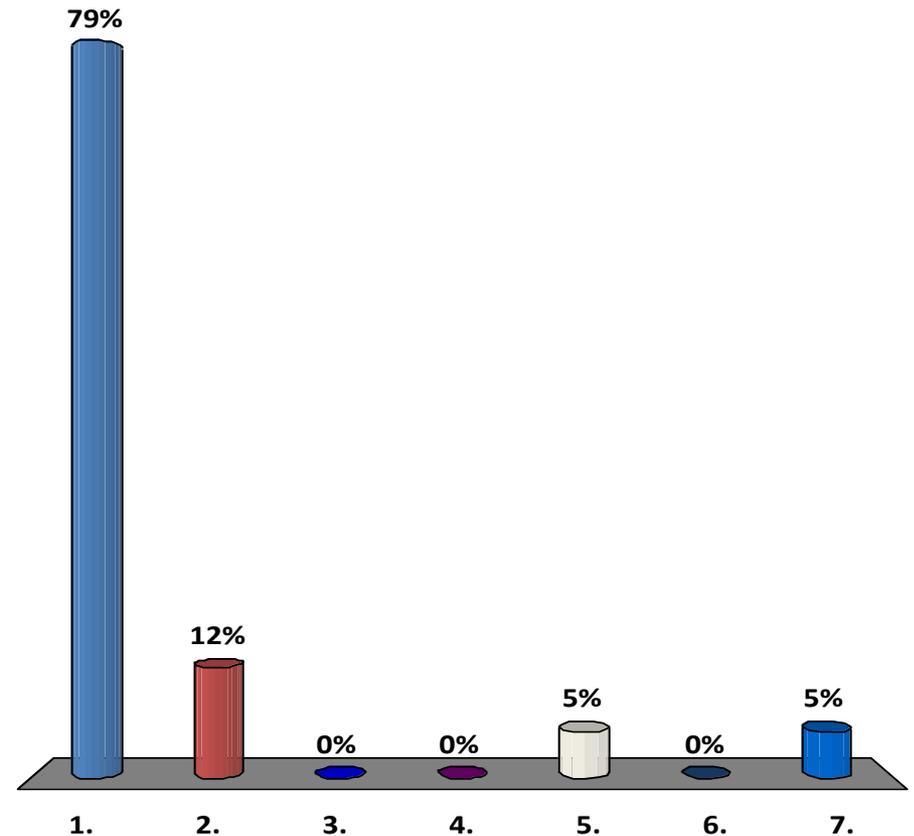
Appendices

Appendix A: Public Meeting Voting Results



What BEST describes your interest?

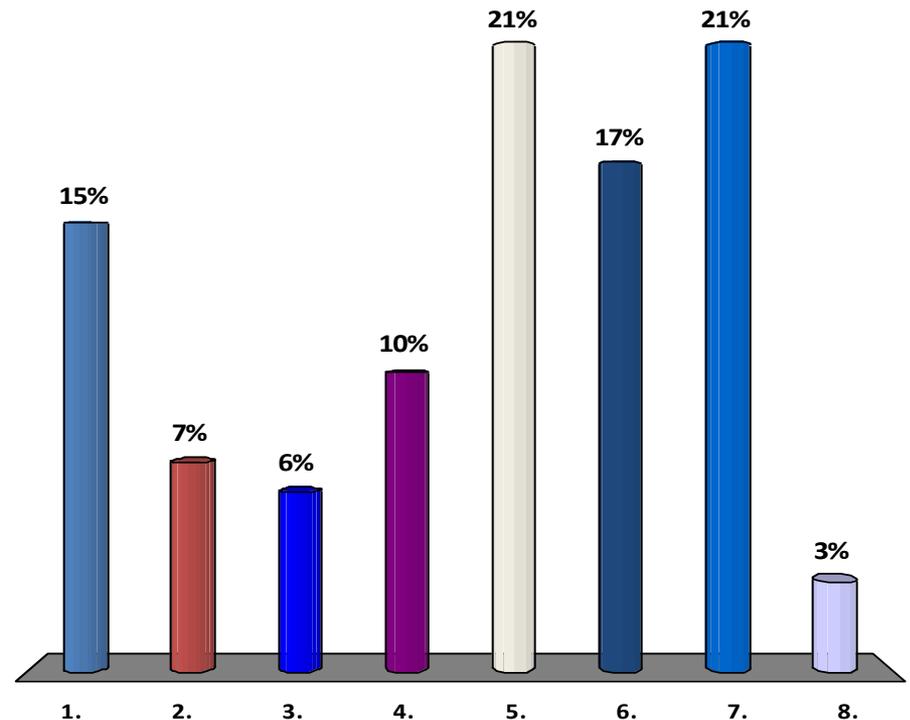
1. Year round resident
2. Seasonal resident
3. Seasonal visitor
4. Recreational group
5. Business owner
6. Employee
7. Other





What discourages you from walking in Duck?

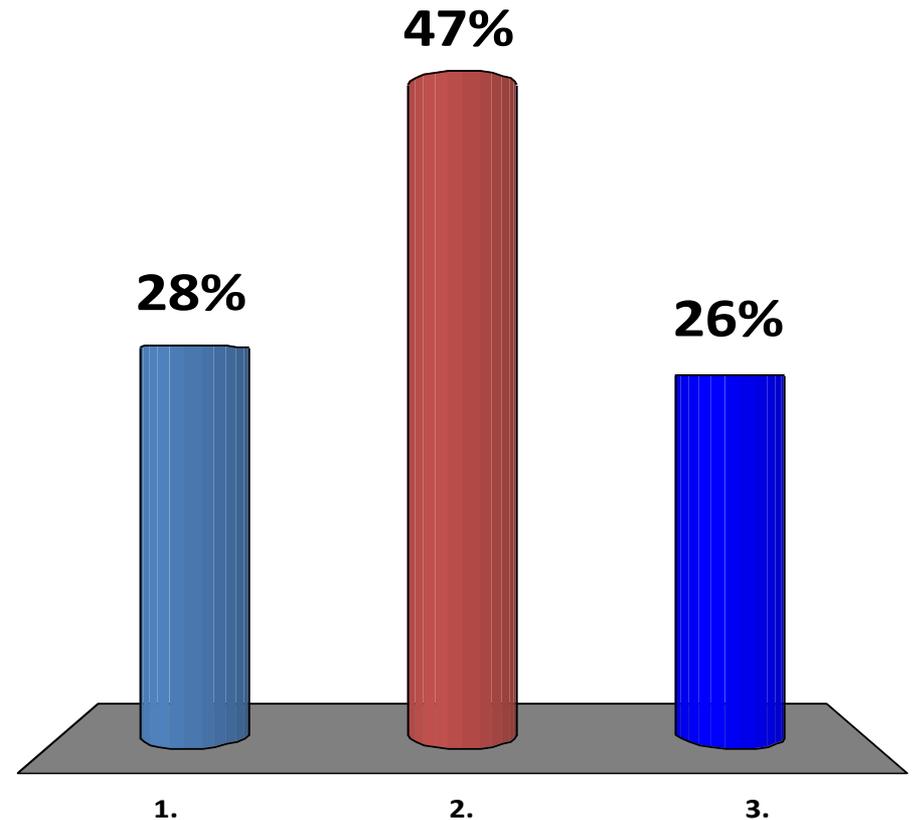
1. Lack of sidewalks/trails
2. Lack of crosswalks
3. Lack of pedestrian signals
4. Lack of pedestrian lighting
5. Automobile traffic volume
6. Automobile speed
7. Bicycle-pedestrian conflict
8. Other





A pedestrian/bicycle education program would be...

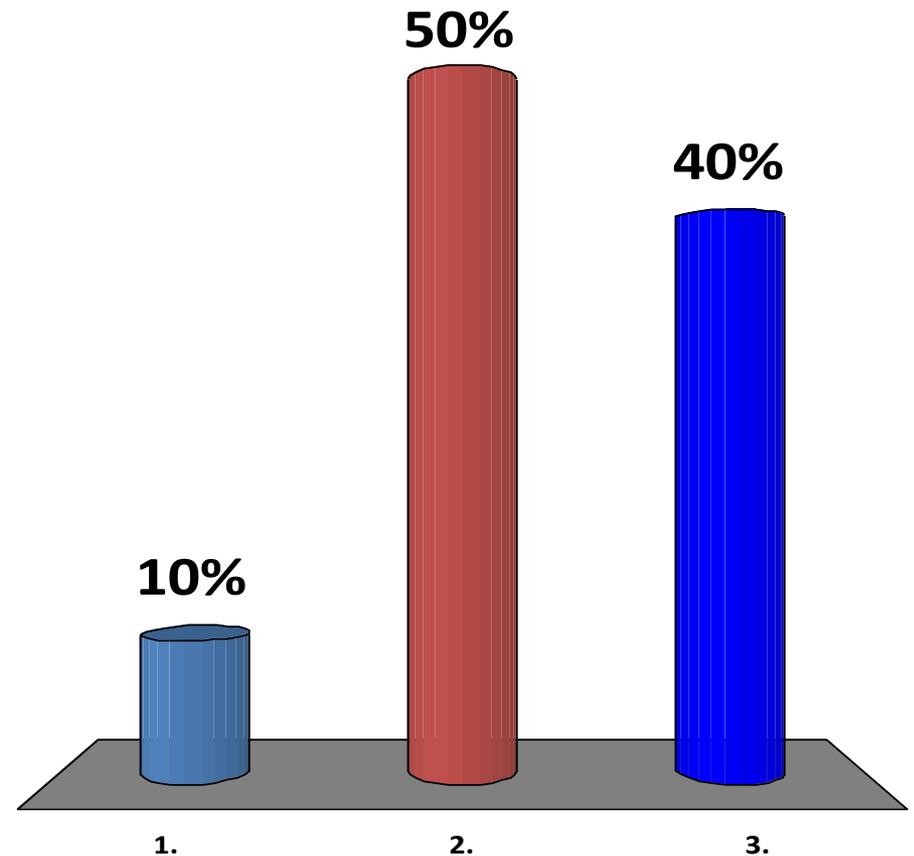
1. Not useful
2. Somewhat useful
3. Very useful





A system of wayfinding and directional signs would be...

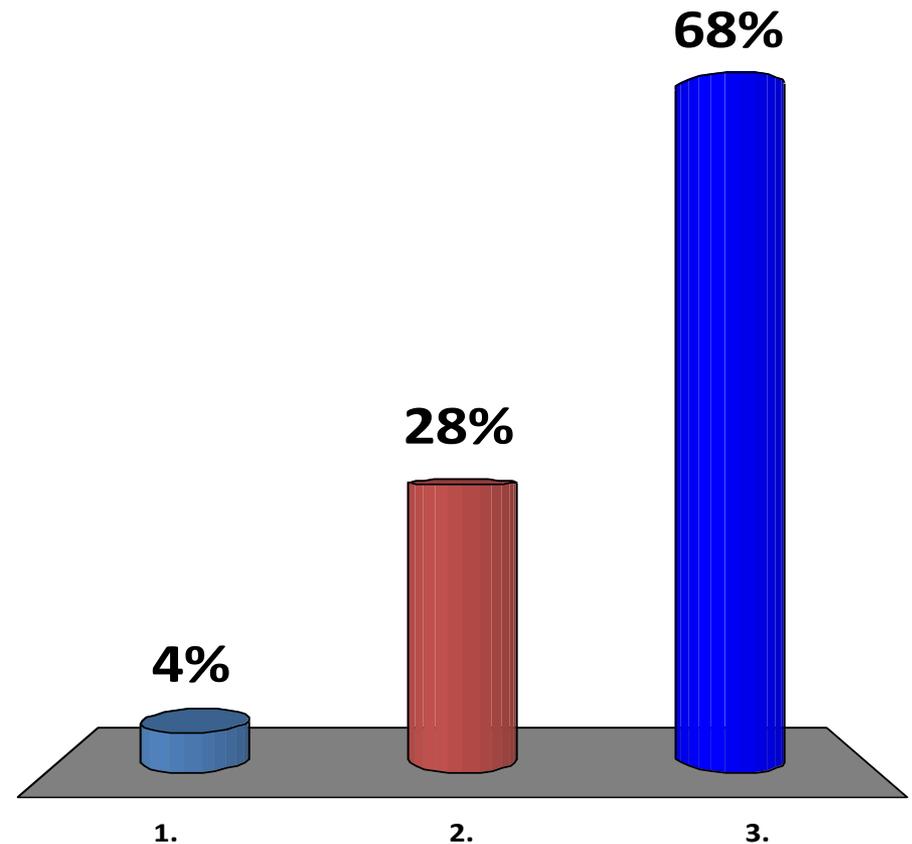
1. Not useful
2. Somewhat useful
3. Very useful





Pedestrian design standards for new development and redevelopment would be...

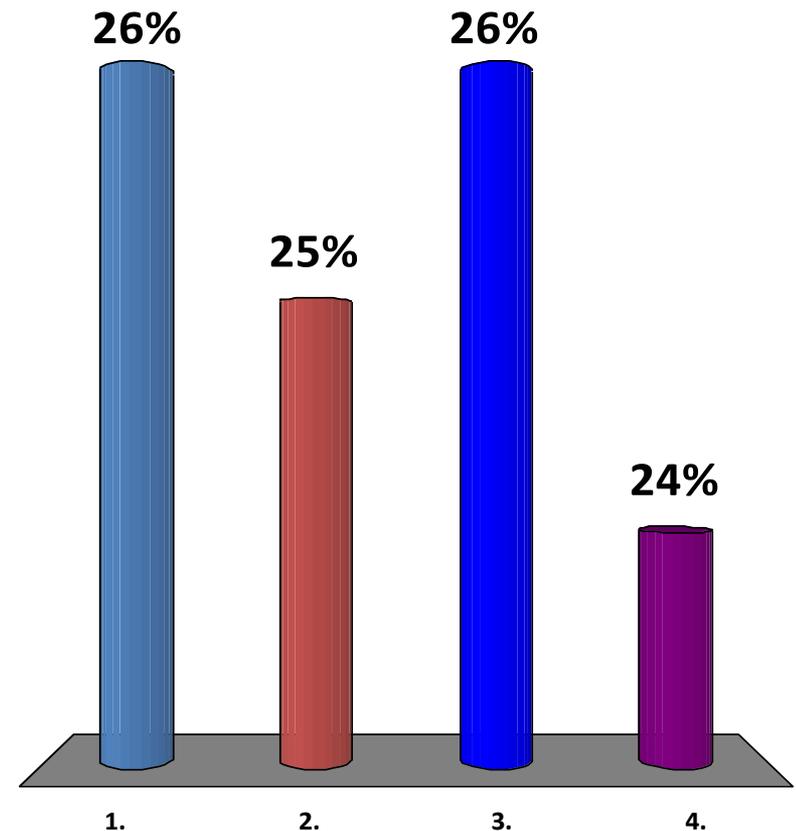
1. Not useful
2. Somewhat useful
3. Very useful





Please rank the following in priority order

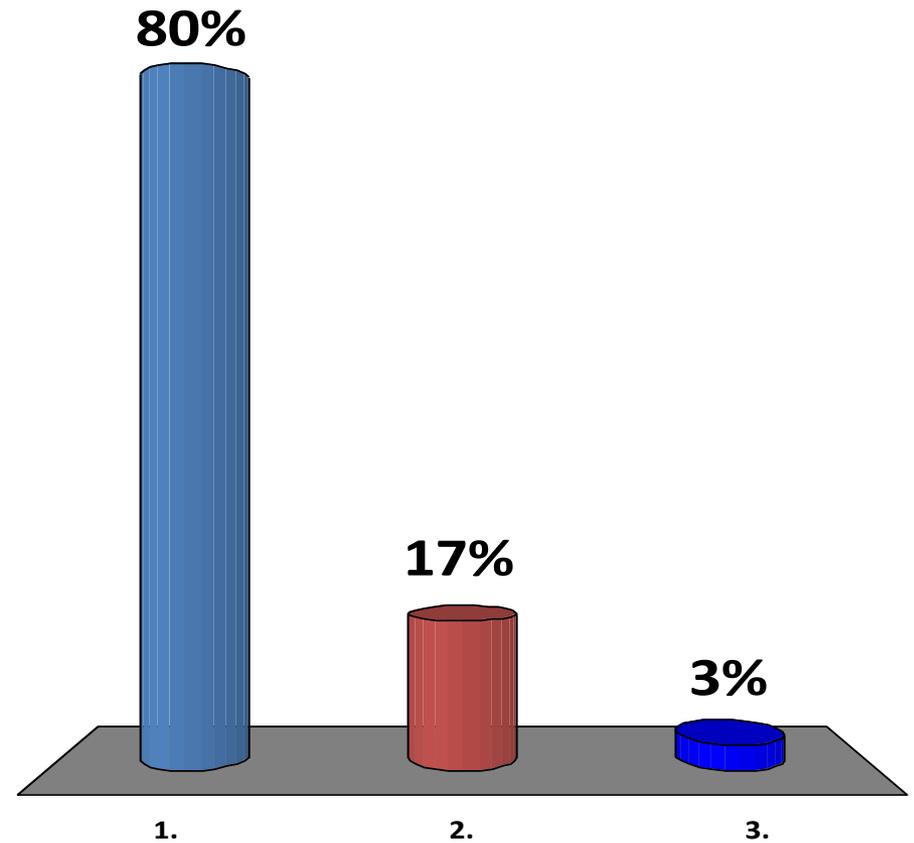
1. Sidewalks
2. Crossings with refuges and signals
3. Shared use paths
4. Neighborhood connections/Beach Trail





Tell us who you are...

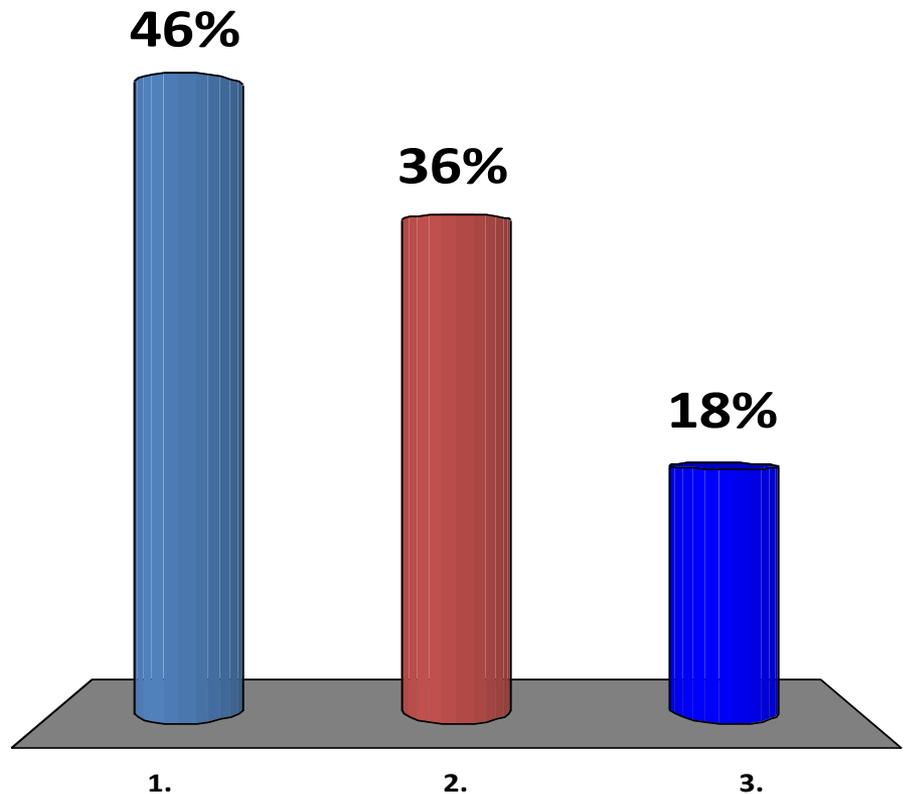
1. Resident
2. Property owner
3. Business owner





Tell us how often you walk/run/bicycle...

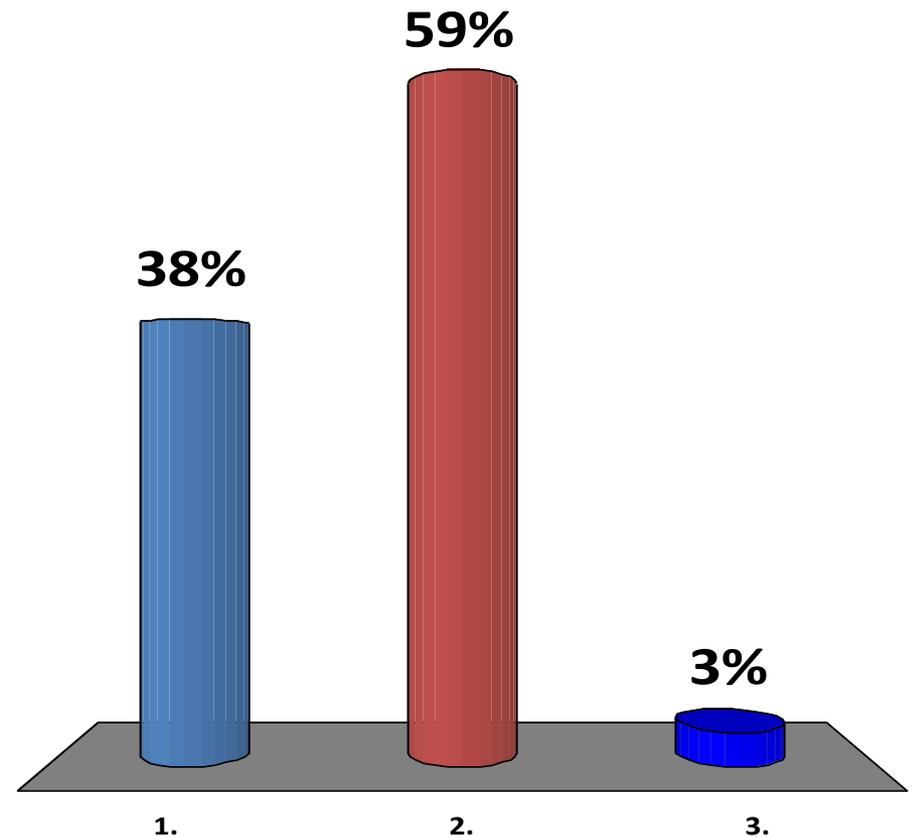
1. Daily
2. Weekly
3. Monthly





The plans will help make Duck a Pedestrian First Community...

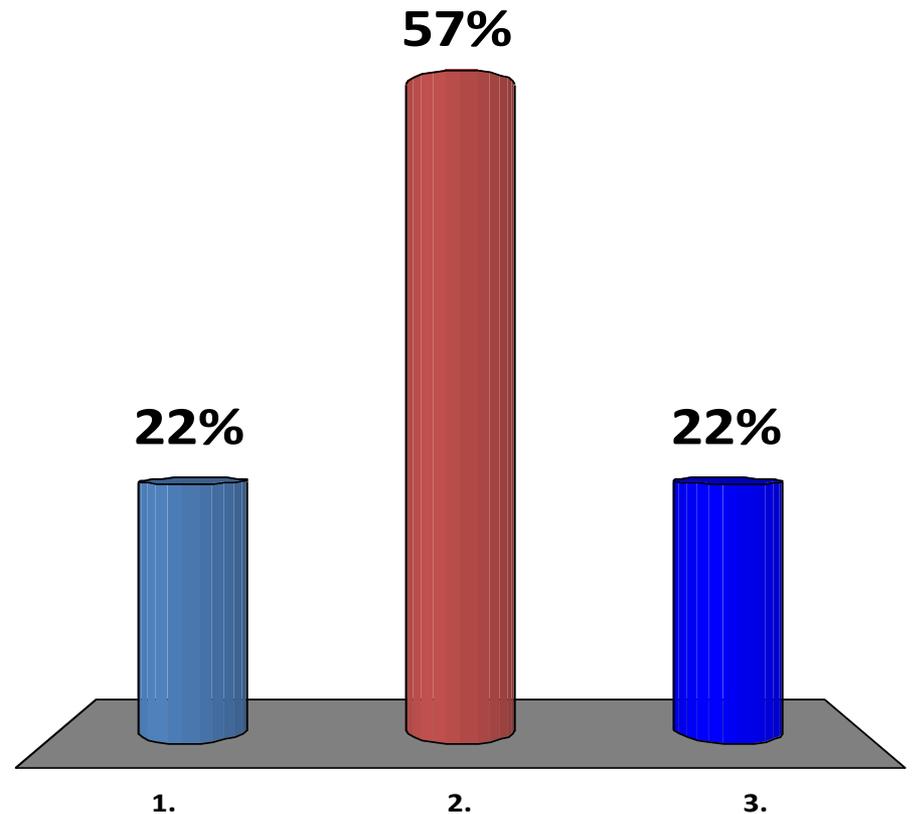
1. Agree
2. Agree somewhat
3. Disagree





How urgent is implementation of the proposed improvements?

1. Critical
2. Necessary
3. Not urgent





The draft recommendations include the following suggested improvements:

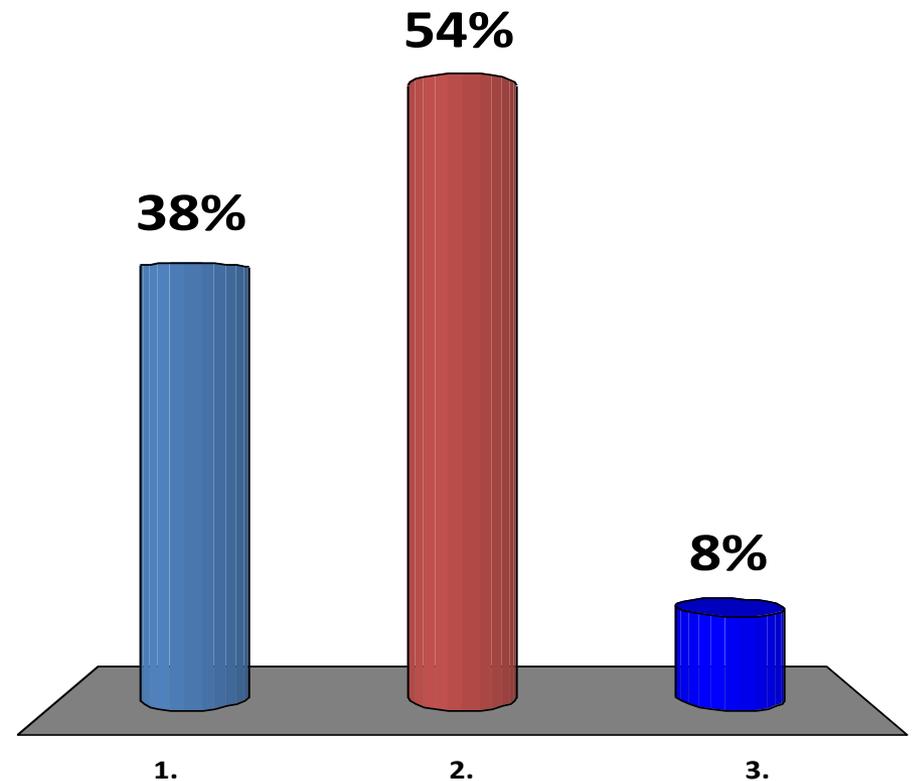
- Enhanced crosswalk treatments (signage, striping, signals)
- Traffic calming measures
- Sidewalks to separate pedestrians and bicycles
- Marked bike lanes
- Pedestrian lighting improvements
- Drainage improvements
- Beach Trail
- New shared use path west of NC 12 in south part of town
- Sidewalks on side streets
- Education/outreach/enforcement

Indicate how strongly you feel about the need for the recommendations listed on the following slides...



Enhanced crosswalk treatments

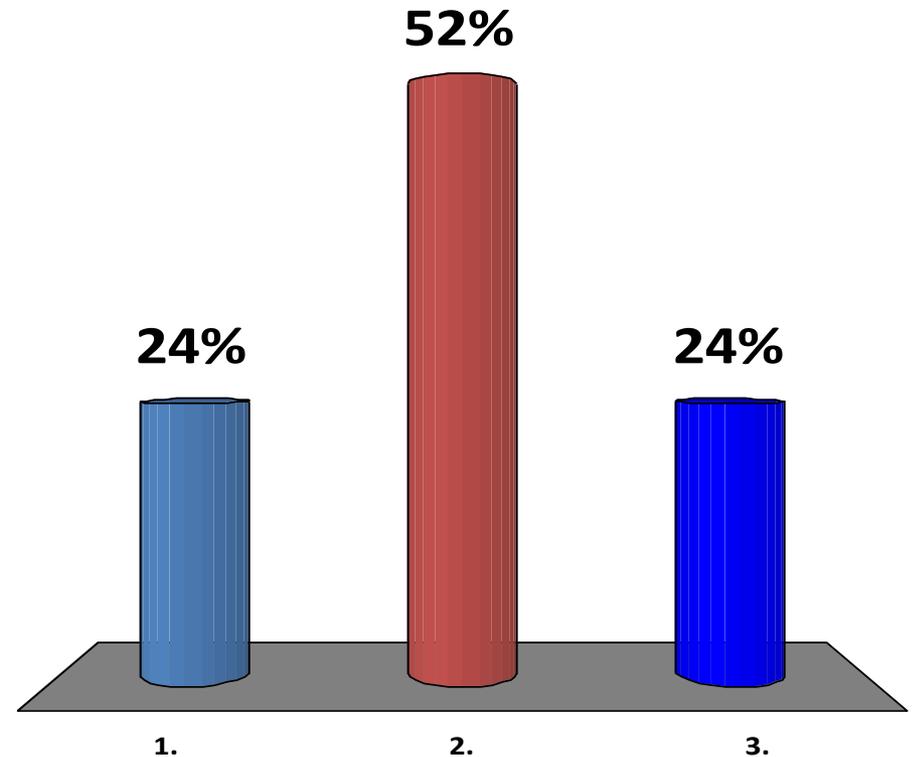
1. Absolutely necessary
2. Necessary
3. Unnecessary





Traffic calming measures

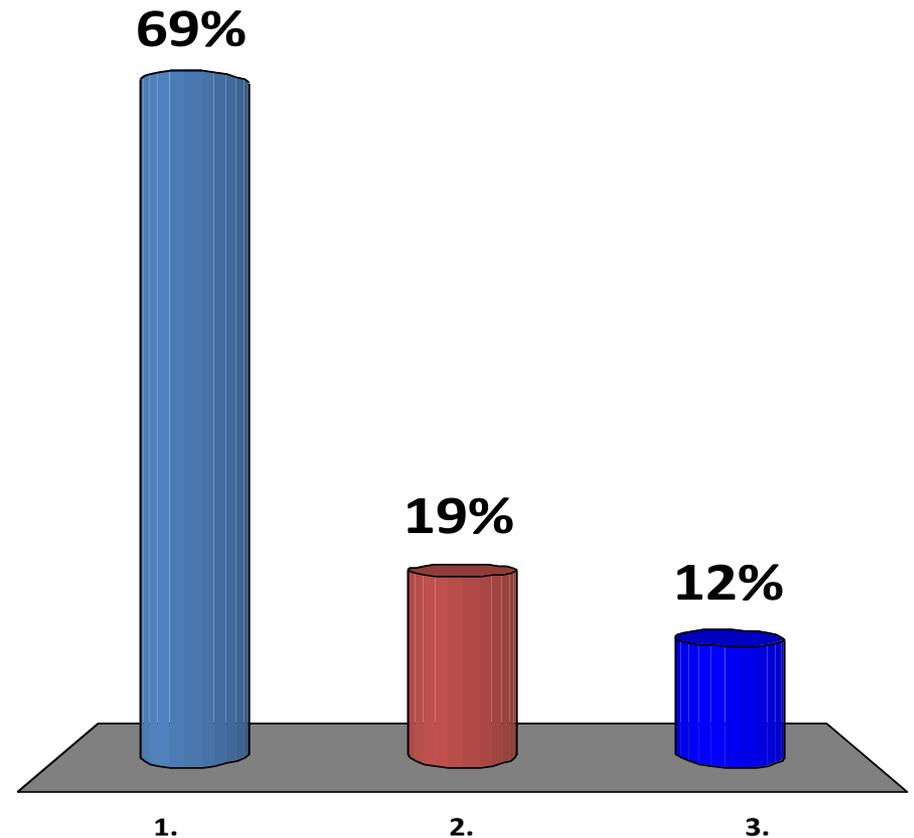
1. Absolutely necessary
2. Necessary
3. Unnecessary





Sidewalks to separate pedestrians and bicycles

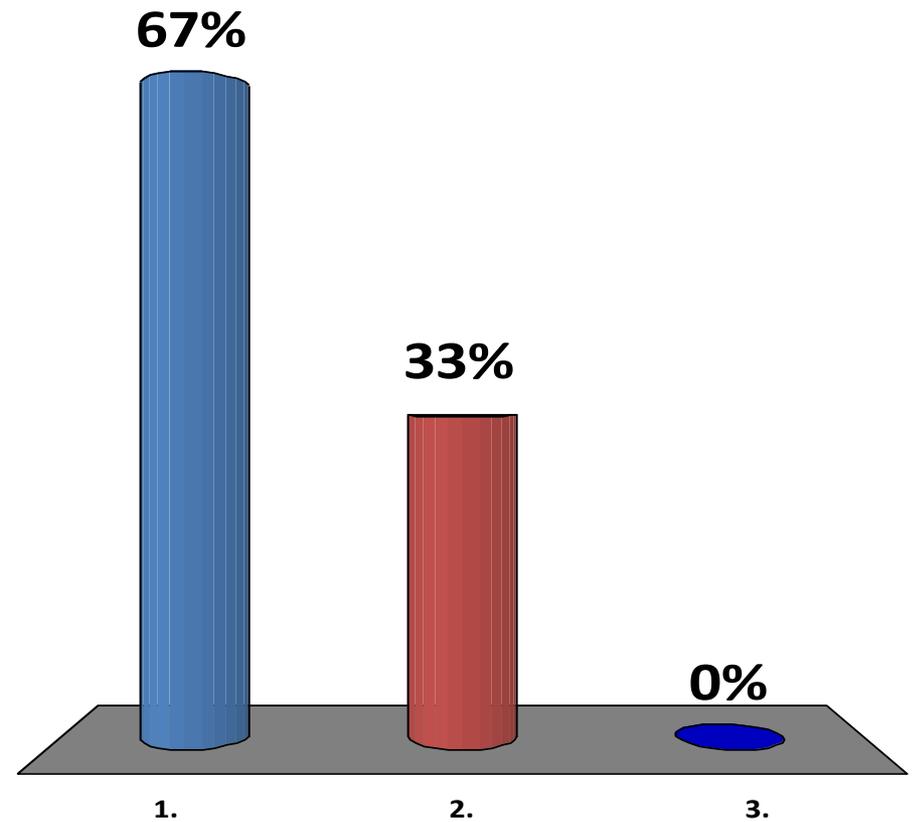
1. Absolutely necessary
2. Necessary
3. Unnecessary





Marked bike lanes

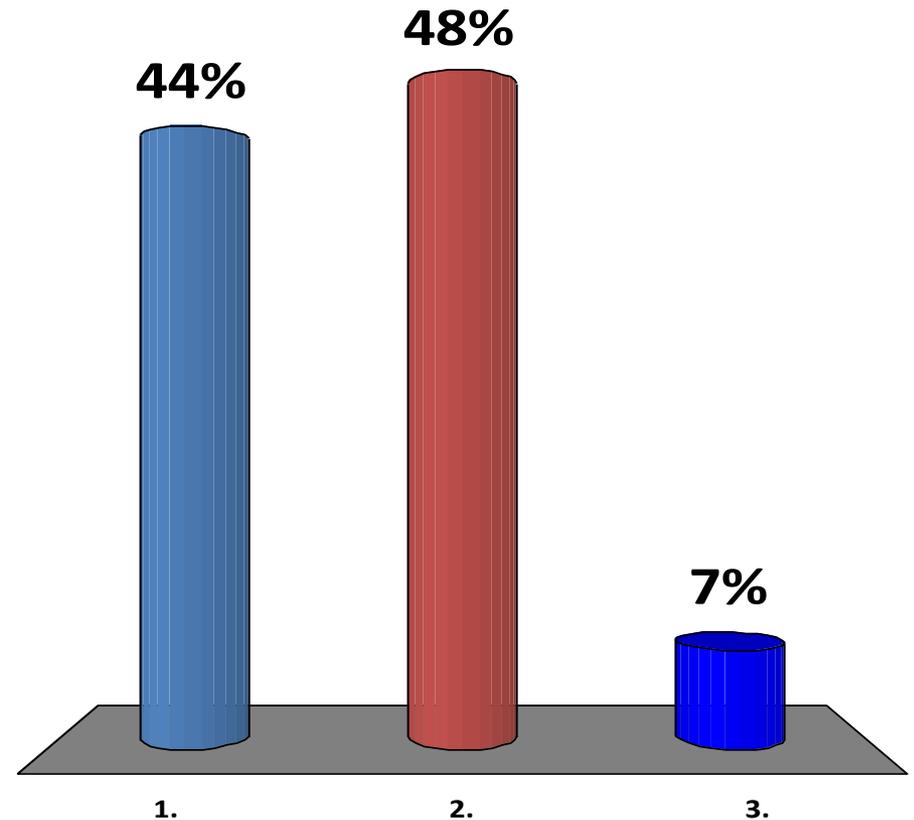
1. Absolutely necessary
2. Necessary
3. Unnecessary





Pedestrian lighting improvements

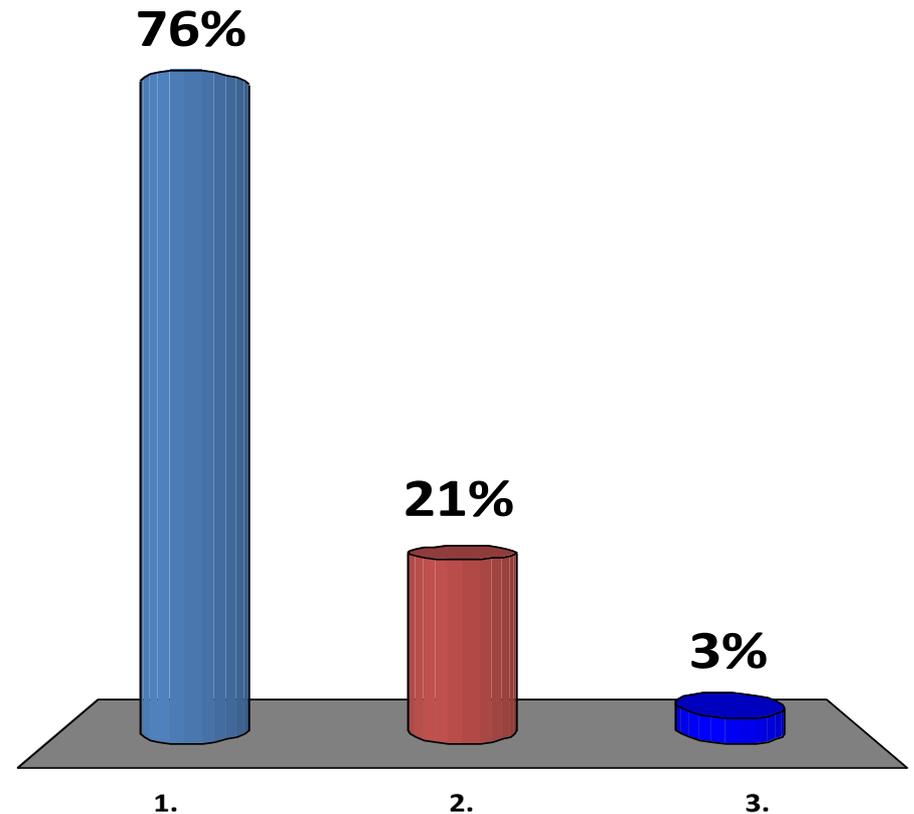
1. Absolutely necessary
2. Necessary
3. Unnecessary





Drainage improvements

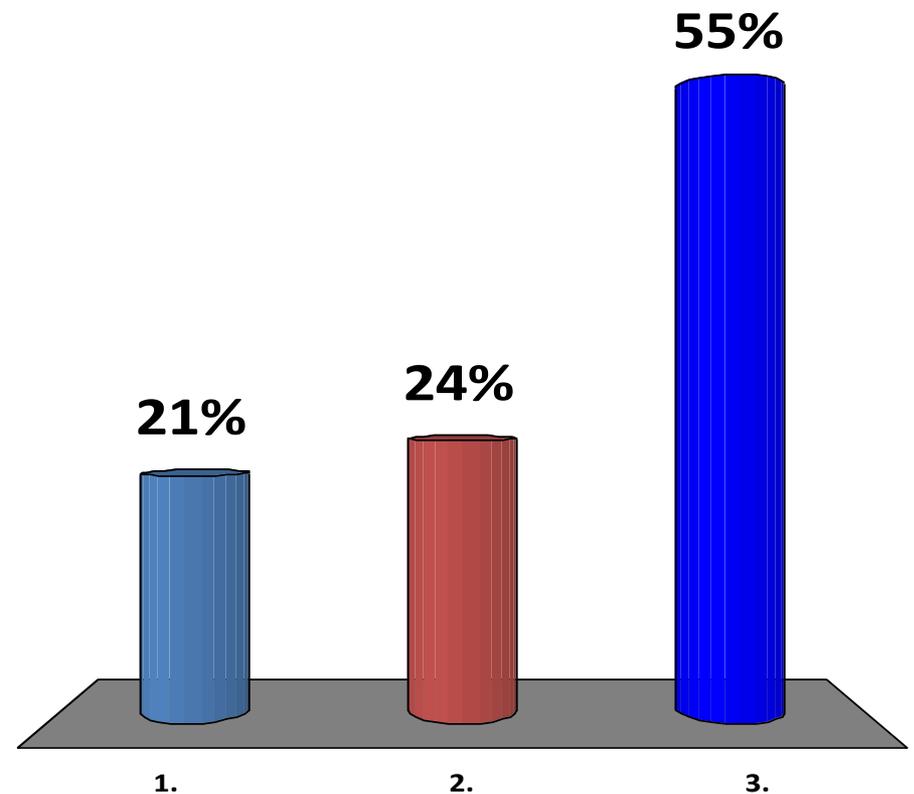
1. Absolutely necessary
2. Necessary
3. Unnecessary





Beach trail

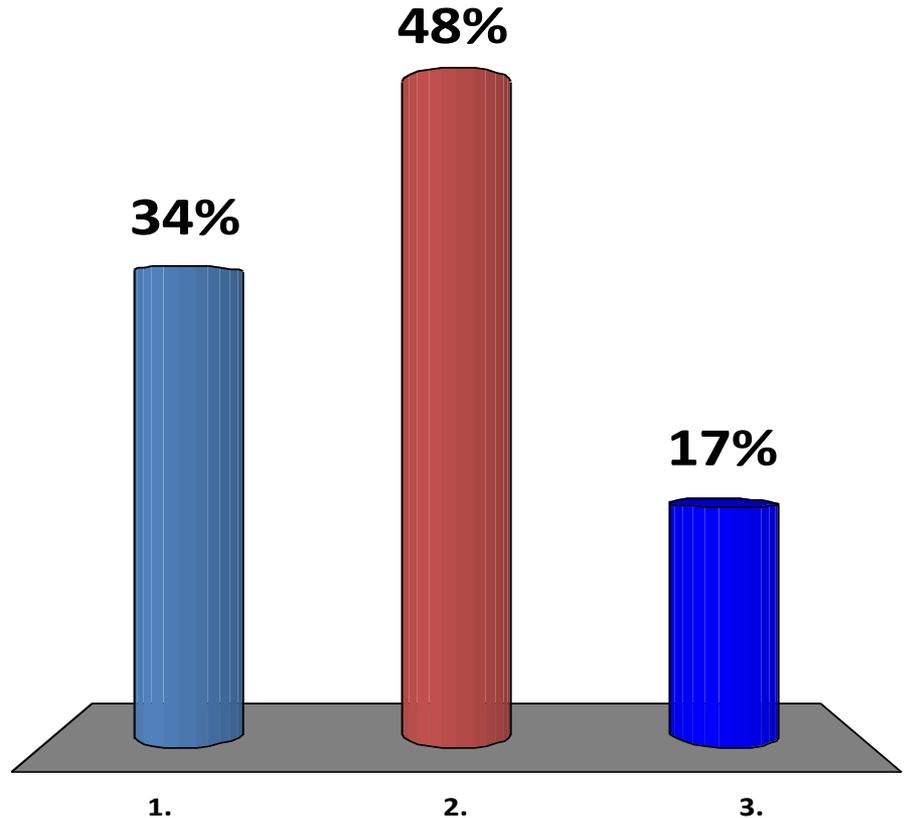
1. Absolutely necessary
2. Necessary
3. Unnecessary





New shared use path west of NC 12 in south part of town

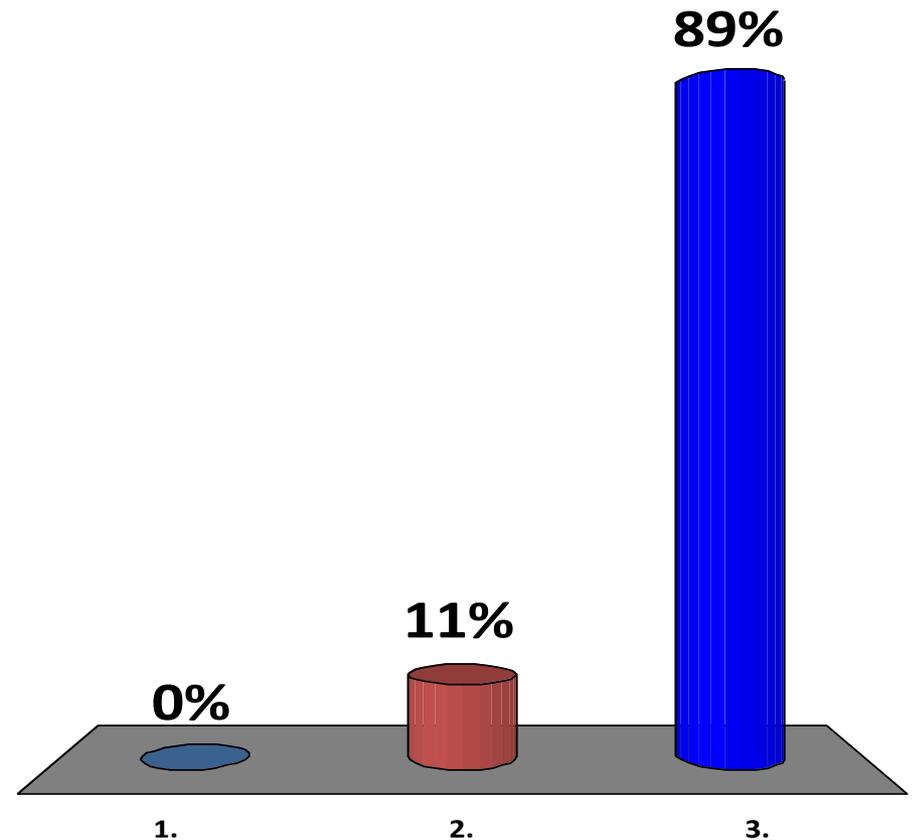
1. Absolutely necessary
2. Necessary
3. Unnecessary





Sidewalks on side streets

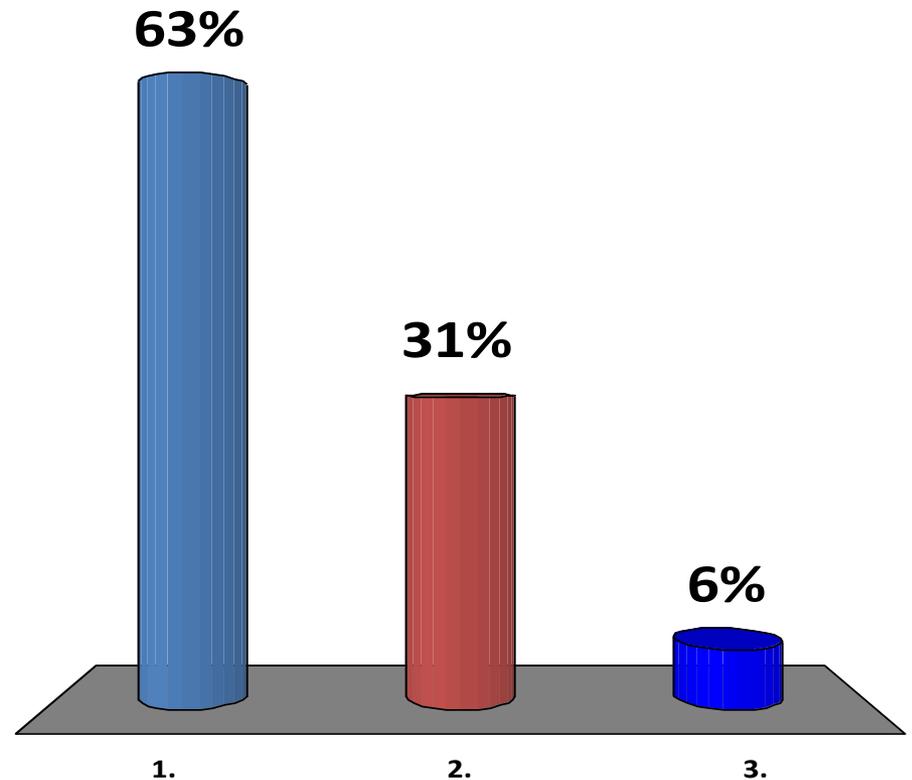
1. Absolutely necessary
2. Necessary
3. Unnecessary





Education/outreach/enforcement

1. Absolutely necessary
2. Necessary
3. Unnecessary



Appendix B: Road Safety Audit

**Pedestrian and Bicycle Road Safety Audit
of
Duck Trail
and
NC 12 (Duck Rd.) from Plover Dr. to Cook Dr.**

**Town of Duck
Dare County, North Carolina**



**Dan Nabors
Kevin Moriarty**

VHB *Vanasse Hangen Brustlin, Inc.*

December 7 – 9, 2009

1. Introduction

1.1. Objectives of Study

The objective of this study was to complete a pedestrian and bicycle road safety audit (RSA) for Duck Trail in the Town of Duck, Dare County, North Carolina. The primary area of focus was along NC 12 (Duck Rd.) between Plover Dr. and Cook Dr. in the area known as the Village Commercial Area (see Figure 1).



Figure 1. Project Study Area

1.2. Background

NC 12 (Duck Rd.) is a two-lane, north-south Federal-aid highway which passes through the resort community of Duck, Dare County, North Carolina. The length of the primary area of focus for this study is approximately 1 mile. Surrounding land uses include both commercial business and residential property. Duck is home to approximately 500 permanent residents. However, during peak vacationing season, Duck hosts more than 25,000 people. During this time period, there is a significant volume of vehicle, pedestrian, and bicycle traffic.

NC 12 also serves as a commuter route. The highway provides access to Corolla (north of Duck) and to Nags Head and Manteo (south of Duck). Currently, all traffic coming from or going to Corolla must pass through Duck as the only bridge crossing (Wright Memorial Bridge) is located to the south of town. However, plans are progressing to begin construction of a bridge approximately 30 miles to the north of Duck, thus reducing vehicular traffic volume through the Village Commercial Area.

Twelve (12) pedestrian and bicycle collisions were reported in the primary study area between January 1, 2006 and October 31, 2009. An additional ten (10) pedestrian and bike collisions were reported outside of the primary study area. The purpose of this RSA was to identify safety issues that may be contributing to the observed pedestrian and bicycle collisions and suggest approaches that can be taken to mitigate the issues. The RSA team also considered proactive approaches to improving safety for pedestrians and bicyclists given planned facilities and the Town's desire to promote walking and biking as a mode of travel.

The RSA team consisted of 8 members, representing the consultant, Town of Duck administration and community development, Duck Volunteer Fire Department, Town of Duck Police, NCDOT Division 1 (Division of Highways), and NCDOT Division of Bicycle and Pedestrian Transportation. The RSA was performed on December 7 – 9, 2009, during daytime and nighttime hours.

2. Existing Conditions

2.1. Site Characteristics and Pedestrian and Bicycle Accommodations

In the primary study area, NC 12 has two-lanes with a continuous two-way left-turn lane. To the south NC 12 maintains the two-way left-turn lane through Plover Dr. The turn lane tapers away to Settlers Ln., thereafter becoming a two-lane roadway. To the north, the two-way left-turn lane is maintained on NC 12 through Cook Dr. The turn lane tapers away to Dune Rd., thereafter becoming a two-lane roadway. The two-lane roadway continues to Olde Duck Rd. where the taper begins for another segment of two-way left-turn lane. The section continues past the northernmost access point to Sunset Grille & Raw Bar where it tapers away and thereafter becomes a two-lane roadway.

NC 12 has a posted speed limit of 25 mph in both directions through downtown Duck. To the north of downtown, the posted speed limit changes to 45 mph north of Sandy Ridge Rd. However, during the months of May through September, the posted speed limit to the north of downtown is 35 mph. To the south of downtown, the posted speed limit changes to 35 mph at Osprey Ridge Rd. Duck Trail, a 7-mile long multi-use path, traverses the entire length of Duck. The path is intended for shared use by pedestrians, bicyclists, and in-line skaters. The north-south trail parallels NC 12 along the east side of the roadway. A variable-width grass buffer separates Duck Trail from the traveled way of NC 12. Traveling southbound, the Trail and NC 12 maintain separation until the northernmost access point to the Duck Post Office. At this location, the multi-use path transitions to roadway shoulders along NC 12. The shoulders, delineated by “◇” pavement markings and separated from the traveled way by a white edgeline and white raised paint rumble strips, vary in width. They are, however, still intended to function as a multi-use facility through the village commercial area of Duck. The shared shoulders transition back to the multi-use path to the east of NC 12 near Aqua-S restaurant. Along the entire length of the Trail (including the shoulder through the commercial area), there are numerous conflict points due to side streets and commercial access points.

There are no sidewalks along either side of NC 12 in the study area. Marked east-west crosswalks are provided at the following locations:

- Aqua-S restaurant,
- Scarborough Ln.,
- Poteskeet Dr.,
- Wampum Dr., and
- Tommy’s Gourmet Market

2.2. Traffic Data

Based on data provided in the Mid-Currituck Bridge Study Statement of Purpose and Need (October 2008), the 2006 annual average daily traffic (AADT) along NC 12 in the Duck business area is 19,500 vehicles per day (vpd). Projected to the year 2035, the AADT along NC 12 in the Duck business area is expected to grow to 29,000 vpd. Volumes for three peak travel periods (non-summer weekday, summer weekday, and summer weekend) were also reported for 2006 and 2035. These volumes, shown in Table 1 below, were derived from AADT values and daily factors determined from year-round traffic count data obtained on Wright Memorial Bridge.

Table 1. Peak Travel Period Volumes

Year	Non-summer Weekday	Summer Weekday	Summer Weekend
2006	17,400	24,000	28,800
2035	26,500	36,500	44,100

Besides a heavy presence of vehicular traffic, there is also a significant volume of pedestrians and bicyclists through Duck during peak vacationing season. Pedestrian and bicycle count data in the primary study area was collected in 10 “zones” in August 2009 by Town volunteers (see Figure A in Appendix A). The boundaries of the zones were arbitrarily set for means of data collection and analysis. Data was collected from 7 AM – 10 AM and from 4 PM – 6 PM. The data was recorded by category: adult bicycle (AB), adult pedestrian (AP), child bicycle (CB), and child pedestrian (CP). The data was recorded in such a manner that origin-destination could be determined as well as crossings. Figures B and C in Appendix A illustrate the number of entering and exiting pedestrians and bicyclists to/from the primary study area on the east and west sides of NC 12. Additionally, the figures show the number of pedestrians and bicyclists crossing the roadway at either marked locations or midblock within each data collection zone.

The data shows that the highest concentration of entering and exiting pedestrians and bicyclists in the primary study area is along the east side of NC 12. The data also shows that pedestrians and bicyclists cross NC 12 at multiple locations throughout the primary study area. Where it was possible to determine from the data collection sheets, the arrows and summary blocks shown in Figures B and C were placed at “desired” crossing locations for pedestrians and bicyclists. The locations with the highest number of pedestrian and bicycle crossings are at Bob’s Bait & Tackle, Christopher Dr., the Municipal Park, and Schooner Ridge Dr.

2.3. Collision Analysis

Collision information was provided for pedestrian, bicycle, and vehicle incidents along NC 12 in Dare County from January 1, 2006 to October 31, 2009. During this time period, twelve (12) pedestrian and bicycle collisions were reported in the primary study area. Also within the primary study area, thirty-seven (37) vehicle crashes were reported. The location and type of each incident is shown in Figures B and C in Appendix A. Additional detail for the pedestrian and bicycle collisions is also provided on the figure.

Figure 2 summarizes the reported pedestrian and bicycle incidents within the primary study area by month. The figure shows that collisions involving pedestrians and bicycles occur mainly during the vacationing season in Duck, particularly July and August. This corresponds to the dramatic increase in pedestrian and bicyclist volume coupled with the increase of vehicular traffic within the downtown Duck commercial area.

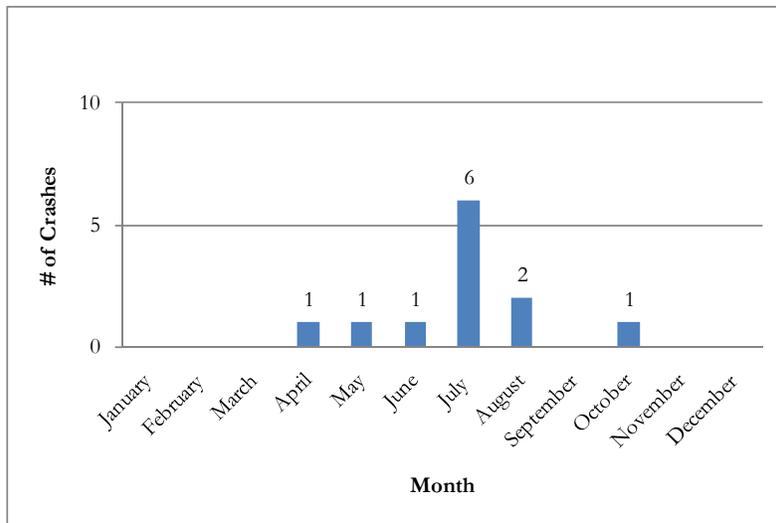


Figure 2. Pedestrian and Bicycle Crashes by Month

Outside of the primary study area, ten (10) pedestrian and bicycle collisions were reported on Duck Trail during the same 2006 – 2009 time period. An additional seventy-six (76) vehicle crashes were also reported during this time outside of the primary study area.

Table 2 summarizes the number of reported pedestrian, bicycle, and vehicle incidents within the primary study area and outside of this area. Table 3 presents the information shown in Table 2 in terms of percentage. Table 3 indicates that collisions involving pedestrians and bicyclists are approximately double in proportion within the primary study area as compared to outside of this area. This corresponds to the higher volume of pedestrian and bicycle traffic in the village commercial area.

Table 2. Number of Reported Incidents along NC 12/Duck Trail in Dare Co. (Jan. 2006 – Oct. 2009)

Area	No. of Reported Incidents			Total
	Pedestrian	Bicycle	Vehicle	
Primary Study Focus	2	10	37	49
Outside Primary Study Focus	2	8	76	86
Total	4	18	113	135

Table 3. Percent of Reported Incidents along NC 12/Duck Trail in Dare Co. (Jan. 2006 – Oct. 2009)

Area	Percent of Reported Incidents			Total
	Pedestrian	Bicycle	Vehicle	
Primary Study Focus	4%	20%	76%	100%
Outside Primary Study Focus	2%	9%	88%	100%
Total	3%	13%	84%	100%

Figure 3 illustrates the crash experience within the primary study area. The total number of reported vehicular incidents is shown by zone within this area. As previously stated in Section 2.2, the boundaries of the zones were arbitrarily set for means of data collection and analysis (see Figure A in Appendix A). The figure shows that the highest percentage of reported crashes to occur in Zone 10 to Plover Dr. (16%), followed by Zones 1 and 4 (14%) and Zones 3 and 6 (11%). These areas correspond to the boundaries of downtown Duck (Zone 1 and Zone 10 to Plover Dr.) or to densely populated commercial properties (Zones 3, 4, and 6).

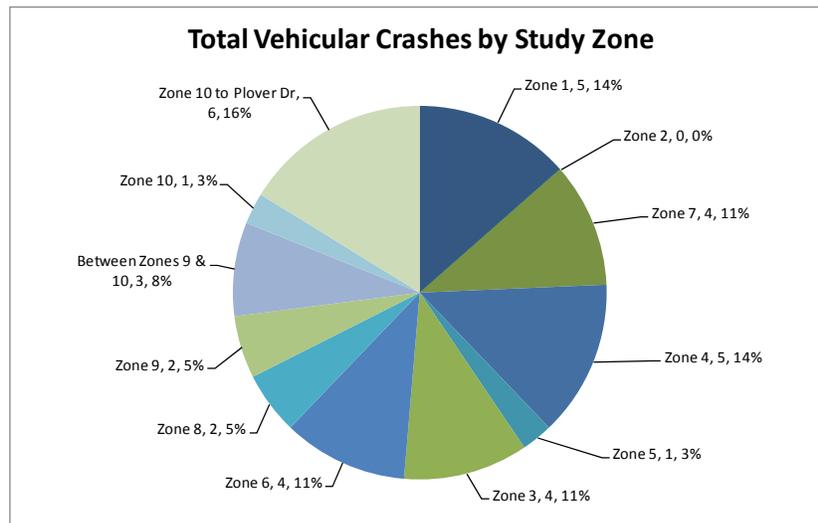


Figure 3. Vehicular Crash Summary by Study Zone

Based on the reported incidents analyzed between January 2006 and October 2009, the following trends were identified:

- The majority of the crashes occurred during the daytime under clear conditions and dry pavement.
- The most predominant crash type was rear end, followed by other (i.e., deer) and left turn.

- The largest percentage of crashes resulted in property damage only (Type O), followed by possible injury (Type C) and evident injury (Type B). No disabling injury (Type A) or fatality (Type K) crashes were reported during the analysis period.
- Eight (8) of 10 incidents within the primary study area involving bicycles occurred on the east side of NC 12. The bicycles were traveling southbound against the flow of vehicular traffic.
- One (1) of 10 incidents involving a bicycle within the primary study area involved a left-turning vehicle and a bicyclist crossing a driveway.
- Several rear end crashes within the primary study area were caused by drivers stopping to allow pedestrians to cross NC 12.
- Seven (7) of 8 incidents outside of the primary study area involving bicycles occurred on the east side of NC 12, both on the multi-use trail or the shoulder.

Representatives from the Town of Duck fire and police departments state that many of the incidents involving pedestrians and/or bicyclists are often unreported. The hospital commonly reports more occurrences of pedestrian/bicycle crashes than are called in to the police or fire departments. This condition is described in the “Pedestrian Road Safety Audits Guidelines and Prompt Lists” document (FHWA-SA-07-007), which illustrates that pedestrian crashes are vastly unreported due to crashes occurring in non-roadway locations (private property or shared-use paths) and the number of crashes that do not involve police.

The above trends are based upon the available data. It should be noted that other crash trends may be present along NC 12, but were not investigated due to lack of information.

3. Assessment Findings

3.1. Safety Benefits of Existing Highway Features and Programs

The Town of Duck and NCDOT are taking a proactive approach to addressing pedestrian and bicycle safety issues on this busy corridor. Several measures are already in place to improve safety for pedestrians and bicyclists. Notable existing highway features and programs initiated by the Town that enhance pedestrian and bicycle safety in the study area include:

- **Existing Boardwalk** – The commercial properties of the Waterfront Shops are connected by a boardwalk along the Currituck Sound. The provision of the boardwalk allows pedestrians to access the commercial properties, thus removing them from the shared shoulder along NC 12. This reduces the potential for conflict between pedestrians and bicycle and vehicular traffic.
- **Planned Boardwalk** – The Town is currently planning on extending the existing boardwalk along the Currituck Sound. The planned boardwalk would extend from the Aqua-S restaurant to the existing boardwalk at the Waterfront Shops. The proposed boardwalk is 10 feet wide. It has not yet been determined if bicycles will be allowed on the boardwalk. The alignment will provide customers of the commercial properties along the sound direct access from the shops to the boardwalk. There will be several locations to access the boardwalk or shared shoulder along NC 12. The provision of the boardwalk is intended to reduce pedestrian traffic along the shared shoulder of NC 12, thus reducing the potential for conflict with bicycle and vehicular traffic.
- **Mid-Currituck Bridge** – To help alleviate traffic congestion associated with the projected growth, plans are in place to begin construction of a new bridge 30 miles north of Wright Memorial Bridge. The Mid-Currituck Bridge is scheduled for construction beginning in late 2010 with completion in 2013. The new toll bridge will accommodate approximately 40,000 vehicles per week. This is projected to dramatically decrease traffic through Duck, as vehicles using NC 12 as a commuter route to Corolla will have an alternate route. For further information about the project and its projected impacts, refer to the Mid-Currituck Bridge Study Statement of Purpose and Need (October 2008).
- **Public Input** – A public meeting was held the afternoon before the RSA kickoff meeting. The meeting was attended by 12 residents of Duck as well as members of the Town administration, community development, and fire and police departments. This public forum presented an opportunity for residents to present concerns to Town representatives and the RSA team. The issues and concerns identified by the residents were investigated and discussed by the RSA team. A map of the primary study corridor annotated with the public comments is shown in Figures D and E in Appendix B.

3.2. Identified Safety Issues and Suggestions for Improvement

During the public meeting and the RSA field observations, safety issues along the study corridor were identified and reviewed. The RSA team members prioritized the issues based upon their perceived importance. A detailed discussion of each issue and the suggestions for improvement are presented in the section that follows. Conceptual sketches are illustrated in Appendix C.

Frequent wrong-way pedestrians and cyclists: *A high number of pedestrians and bicyclists were observed to travel in the wrong direction on the shoulders.* This can be particularly dangerous as motorists turning right out or left into a driveway are focused on finding gaps in vehicular traffic approaching from the opposite direction and may not see a bicyclist traveling in the wrong direction (in the shoulder against traffic). The crash data also shows that this is a major problem along the corridor. Within the primary study area, eight (8) of 10 incidents involving a bicycle occurred on the east side of NC 12 with the bicycle traveling in the southbound direction. Outside of the primary study area, seven (7) of eight (8) incidents involving a bicycle occurred on the east side of NC 12. These bicycles were also traveling in the southbound direction. One (1) of the two (2) pedestrian crashes within the study zone involved a pedestrian walking along the west side of the roadway in the southbound direction (with their backs toward traffic). For detailed information pertaining to incidents involving pedestrians and bicycles within the primary study area, refer to Figures B and C in Appendix A.

Studies have been conducted to quantify the effects of walking against traffic versus walking with traffic. The studies have shown that walking along a roadway in the same direction as traffic has a far greater safety risk than walking along the roadway against traffic. A 1995 statewide study in Florida found that pedestrian fatalities were four times likely to occur when walking with traffic opposed to walking against traffic. Other studies have shown that the occurrence of crashes were between 1.5 and 3.5 times more likely when walking with traffic versus walking against traffic.

Several potential conditions may be attributed to wrong-way use of the shoulder. One potential cause may be a lack of suitable crossing locations. As the count data shows in Figures B and C in Appendix A, the pedestrian and bicycle volume is concentrated along the east side of NC 12. This significant volume may be a result of the location of the residential property in Duck. Pedestrians and bicyclists entering the Village Commercial Area from these residences may not perceive adequate and/or safe locations to cross NC 12, thus remaining on the east side and traveling either northbound or southbound. Another potential cause may be the lack of useable shoulder along the west side of NC 12. Overgrown grass, stones/gravel, and standing water reduce the useable width of shoulder (capacity) and present potential safety hazards to pedestrians and bicyclists (see “Maintenance” for further discussion). These conditions are unfavorable to users, thus encouraging pedestrians and bicyclists to remain on the east side of the roadway. Lastly, the transition points between the multi-use Duck Trail and the shared-use shoulder along NC 12 does not entice pedestrians and/or bicyclists to cross and use the correct side of the roadway. The transition points at the northern and southern ends of the primary study corridor are shown in the photos on the following page (north, left photo; south, right photo). There is no advanced signage along Duck Trail to warn users of the transition between the multi-use path and the roadway shoulder. The

multi-use trail parallels the east side of NC 12. The transition between the Trail and the shoulder does not give the perception that pedestrians or bicyclists should cross to use the correct side of the roadway. Instead, the transition points invite users to enter on the east side of NC 12 and continue traveling along the east side of NC 12.



Northern Trail Transition



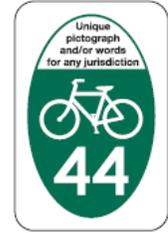
Southern Trail Transition

SUGGESTIONS FOR IMPROVEMENT:

- Short-term
 - Update the Town brochure and the Town website link to Duck Trail to provide information with regard to correct walking and biking practices (i.e., pedestrians walk against traffic; bicycles ride with traffic). Provide a map showing where the multi-use Duck Trail transitions to the shared shoulder along NC 12. Include practices on sharing the shoulder between pedestrian and bicycle traffic.
 - Public safety can be improved through education and enforcement measures as well as engineering. Education measures should focus on high-risk groups, such as wrong-way bicyclists. Improvements should be announced with public service messages. Enforcement campaigns should target areas where pedestrian and/or bicyclist crashes are most frequent. More information about potential education and enforcement strategies can be found in Section 5 “References”.
 - Install guide signs at the transition points to/from Duck Trail. At the northern transition point on the east side of NC 12, install a bicycle route guide sign (D11-1) with an arrow (M7-1) pointing to the right. At the southern transition point on the west side of NC 12, install a bicycle route guide sign (D11-1) with a supplementary “DUCK TRAIL” message sign (D1-1) and an arrow (M7-1) pointing to the left.



- The 2009 MUTCD presents a variation of a bicycle route guide sign which allows for a pictograph or words associated with the route or agency having jurisdiction over the route to be included. This version of a bicycle route guide sign (M1-8a) could be considered for placement at locations along both Duck Trail and NC 12. The sign could be designed such that it contains the Town of Duck seal or reads “DUCK TRAIL”.

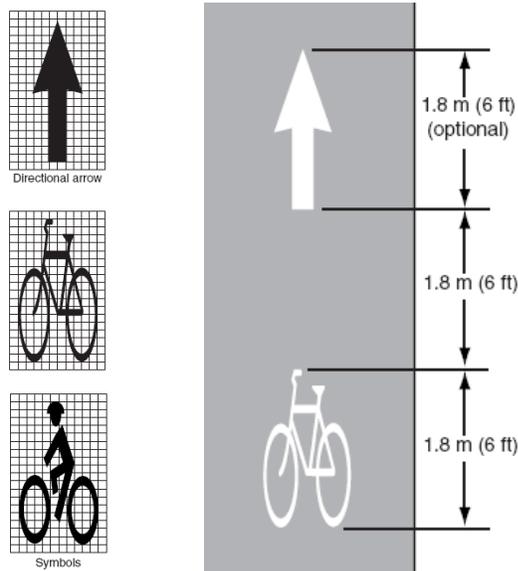


M1-8a

- Install “WRONG WAY” (R5-1b) and “RIDE WITH TRAFFIC” (R9-3c) signs along NC 12. Face the signs to the north along the east side of NC 12 and to the south along the west side of NC 12.



- Eradicate the “◇” pavement markings (and related signage) along the shared-use shoulder and replace with bicycle lane pavement markings (i.e., bicycle symbol and arrow) to reinforce correct direction of bicycle travel. Align the markings such that the arrow points to the north along the east side of NC 12 and to the south along the west side of NC 12.



- Intermediate
 - Realign the northern and southern transition points between the multi-use trail and the shared-use shoulders (see Figures F and G in Appendix C). Provide separation from NC 12 via the use of a grass buffer. Provide wide landings for pedestrian and bicycle staging at the crossings.
 - At the northern transition point, realign Duck Trail to extend to the southernmost access point to the Duck Post Office before connecting to the shoulder along NC 12. Remove the two-way left-turn lane and provide a left-turn bay into the northernmost access point to the Duck Post Office. Extend the landscaping in front of Sunset Grille & Raw Bar to allow only right turns into the northernmost access point. Provide a raised median pedestrian refuge at the existing marked crossing and stripe out the remainder of the two-way left-turn lane.
 - At the southern transition point, realign Duck Trail to extend to the existing marked crossing at Aqua-S. Install a raised median just to the north of the access to parcels 1166 and 1168. Please note that the placement of the raised median is the best with regard to negative impacts to access points. Ideally, the raised median should be located at the existing marked crossing to provide a refuge area which would allow pedestrians and bicyclists to cross one direction of traffic at a time.
 - See also enhancements of crossing locations in section entitled “Location of pedestrian/bicyclist desire lines.”

Access management: *A lack of access control in the primary study area creates many conflict points between motor vehicles and pedestrians and bicyclists.* Nearly all reported incidents involving pedestrians or bicyclists occurred at an access point of some form along NC 12. Within the primary study area, 9 of the 12 reported collisions occurred at an access point with a commercial property, not at an intersection with a side street. For detailed information pertaining to incidents involving pedestrians and bicycles within the primary study area, refer to Figures B and C in Appendix A.

In addition, several access points in the primary study area were identified as being very wide. Wide access points encourage higher speed conflicts between motorists and non-motorized users and provide a longer stretch of roadway where pedestrians and bicyclists are exposed to roadside vehicular conflicts. Furthermore, there is less predictability as to where motorists and non-motorized users may be traveling when space is not clearly marked.

There are also access points where there is potential for conflicts between backing vehicles and pedestrians and bicyclists traveling along the shared shoulder on NC 12. The risk of collision is increased where tall vehicles, such as trucks or SUVs, block sightlines for a driver backing out of an adjacent stall. These conditions occur at Duck Deli and Wee Winks Market (see photo on the following page). Some motorists leaving Wee Winks Market were observed to not look behind when backing. The decreased predictability of the intended motorist path and the backing into the pedestrian/bicycle facility increase the risk of a collision.



Vehicle Backing onto NC 12 from Wee Winks Market

SUGGESTIONS FOR IMPROVEMENT:

- Intermediate
 - Consider developing an access management plan to support decisions to close or reduce access points.
 - Coordinate with commercial properties along NC 12 to promote efficient use of their available space, particularly when considering the redevelopment of the parcel. This could include parking, eliminating backing onto NC 12, narrowing driveway widths, etc. For example, consider converting access at Duck Deli and Wee Winks Market. Parking along the storefronts could be converted to pull-in angle parking and a buffer or barrier placed along the roadway to separate pedestrians and bicyclists from traffic.
- Long-term
 - Explore opportunities to consolidate commercial access points along NC 12, particularly if one or more parcels have access from a side street.

Conflicts associated with the use of the shoulder: *The shared use of the shoulder along both sides of NC 12 presents safety hazards for all roadway users.* Pedestrians and bicyclists must share the available shoulder width along NC 12 through the village commercial area, as the separated multi-use Duck Trail does not continue through the downtown. The shared use presents conflicts between pedestrian and bicycle traffic. The lack of separation from the roadway may also present conflicts between pedestrian/bicycle and vehicle traffic. Eleven (11) of the 12 reported incidents within the primary study area involved pedestrians or bicyclists traveling on the shoulder along NC 12. As mentioned previously in Section 2.3, not all of the crashes involving pedestrians and bicyclists are reported. However, crash trends based on available data and field observations imply that the shared use of the shoulder and the associated conflicts between all roadway users is a safety issue.

Ideally, pedestrians and bicyclists should not wait on a shoulder to cross. In downtown Duck, pedestrians and/or bicyclists wishing to cross NC 12 do not have a staging area that is separated from the other shoulder users. This may create choke points along the shoulder, decreasing the capacity and increasing the potential for conflict between those waiting to cross and those traveling along the road. The situation also creates the potential for conflict between those waiting to cross and vehicular traffic, as large platoons of pedestrians and bicycles may overflow into the traveled

way. It may also cause pedestrians and bicyclists to cross at midblock locations more frequently, as the limited staging area at a marked crossing may promote discomfort or impatience.

The use of a shared shoulder is common in rural areas where vehicle volumes and speeds are low. As traffic volumes of any mode increases, the provision of adequate separation from vehicular traffic becomes more necessary. An example of an ideal cross section is shown in Figure 4 below. This provides separated space for pedestrians, bicyclists, and motor vehicles and is justified based on the demand for each mode. Attaining the ideal cross section, however, is a long-term goal and may not be feasible due to the lack of available right-of-way along NC 12. Primary consideration should be given to providing separation between the traveled way and pedestrians along the east side of NC 12, as the boardwalk will provide an alternate route along the west side. Development of a connecting network of paths through the residential area on the east side and paralleling NC 12 could be considered as a means of separating pedestrians from the traveled way. Creating separation by providing an ideal cross section or path network will require coordination between the Town and the surrounding commercial and residential properties.

It should also be noted that, in areas where a multi-use path is provided, the effectiveness such a facility decreases with the number of access points due to the increased potential for conflict with vehicles entering from the side streets. A factor that increases risk is the unfamiliarity that many of the road users may have in the area. This issue was first presented in the crash analysis section.

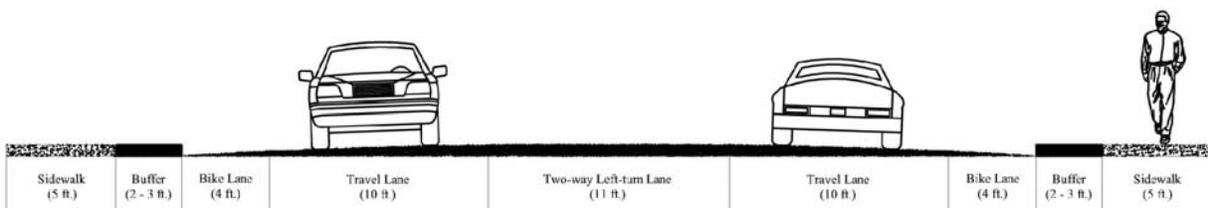


Figure 4. Ideal Cross Section

SUGGESTIONS FOR IMPROVEMENT:

- Short-term
 - Update the Town brochure and Town website (see “Frequent wrong-way pedestrians and cyclists”).
 - Install guide signs at the transition points to/from Duck Trail (see “Frequent wrong-way pedestrians and cyclists”).
 - Eradicate the “◇” pavement markings (and related signage) along the shared-use shoulder and replace with bicycle lane pavement markings (see “Frequent wrong-way pedestrians and cyclists”).
- Intermediate
 - Consider allowing bicycles on the boardwalk (existing and planned) during restricted periods. Some beach communities restrict bicycling on the boardwalk to hours before store openings (but not at dark).

- Coordinate with commercial properties along NC 12 to explore access management opportunities (see “Access management”).
- Long-term
 - Explore opportunities to increase the available right-of-way as a means of obtaining the “ideal” cross section through downtown Duck. Priority should be given to creating a sidewalk on the east side of NC 12 first since that is where many of the conflicts are occurring and pedestrians may be provided an alternative on the west side with the boardwalk. The “Toolbox of Countermeasures” (FHWA-SA-014) reports that the installation of sidewalk to avoid walking along the roadway reduces all pedestrian crashes by 88 percent.

Blocked sight triangles: *Sight triangles at several locations are obstructed by roadside features.* This includes landscaping, commercial signage, and utility poles (see top photos below). These conditions can block a pedestrian’s or bicyclist’s views of oncoming traffic at crossing locations and vice versa. Signs warning of limited sight distance conditions and the presence of pedestrian/bicycle and vehicle traffic have been installed at several locations. One such location, shown in the bottom photos below, is at the northernmost access point to the Duck Post Office.



Sight Distance Obstructed by Landscaping



Sight Distance Obstructed by Landscaping



Sight Distance Warning Signs



Sight Distance Warning Signs

In addition, the placement of the stop signs at Scarborough Ln. and Olde Duck Rd. are well in advance of the stop bar. If a motorist were to stop at the sign instead of the bar, sight distance to

either the right or left may be inhibited due to the presence of roadside features. Scarborough Ln. is shown in the picture below; Olde Duck Rd. is shown in the top right picture on the preceding page.



Stop Sign Placement vs. Stop Bar Location

SUGGESTIONS FOR IMPROVEMENT:

- Short-term
 - Trim/remove landscaping, vegetation, decorations, etc. within the line of sight of motorists turning onto NC 12.
 - Relocate stop signs at the identified locations.
 - Install advanced signage on side street/access point approaches to NC 12 and along the shared-use shoulder to warn of limited sight distance conditions (see existing examples in the photos on the previous page).
- Intermediate
 - Enforce landscaping requirements through a local ordinance.
 - Elevate the multi-use trail north and south of the Duck commercial area. Trail elevation projects should be considered in connection with other planned projects along NC 12 that are addressing drainage issues. Provide a 3- to 6-inch raised and painted crossing across side street approaches. This will increase the conspicuity of Duck Trail to approaching motorists, reinforce the potential presence of crossing pedestrians/bicyclists, and encourage motorists to slow down prior to the Trail.

Nighttime visibility: *Pedestrians and/or bicyclists using the shared shoulder of NC 12 or crossing NC 12 may not be seen due to lack of street lighting.* During the January 2006 to October 2009 crash analysis period, only two (2) pedestrian/bicycle incidents have been reported within the primary study area during dark conditions. One of the incidents involved a pedestrian near Scarborough Ln. The other collision occurred near Schooner Ridge Dr. and involved a bicyclist. One (1) pedestrian collision occurred during dark conditions outside of the primary study area, near Carroll Dr.

Several dark areas within the primary study area were observed during nighttime RSA field visits:

- South of the southern transition point from shared shoulder to multi-use trail
- Crossing just north of Scarborough Ln., near Fishbones restaurant (See photos on the following page. Photo on the right is the location during the day. Photo on the left is the location during the night.)
- North of Wampum Dr., near the water tower
- Crossing just south of Cook Dr., near Tommy's Gourmet Market



Scarborough Ln. Crossing (Day)



Scarborough Ln. Crossing (Night)

Ambient lighting from roadside businesses provides minimal lighting along NC 12 through the downtown area. The Town’s “dark sky” ordinance prohibits the installation of overhead lighting to illuminate the corridor. The dark conditions do not provide adequate visibility of pedestrians and/or bicyclists to drivers. This becomes more of a safety issue during the peak vacationing season, as nighttime pedestrian traffic is substantial. It was reported during the RSA public meeting that, during the peak summer season, the only significant lull in pedestrian/bicycle traffic is approximately 3 to 4 AM.

SUGGESTIONS FOR IMPROVEMENT:

- Short-term
 - Restripe the existing crossings and edgelines with a reflective paint to increase conspicuity of the crossings and improve nighttime guidance.
 - Install raised pavement markers (RPMs) to improve nighttime guidance, primarily along the edgelines.
- Long-term
 - Explore low-level lighting options (i.e., “pedestrian-level lighting”) that will increase visibility along the study corridor without significantly disrupting the Town’s “dark sky” ordinances.

Location of pedestrian/bicyclist “desire lines”: *Pedestrians and bicyclists were observed to cross NC 12 at both marked and unmarked locations. “Desire lines” are the preferred paths of pedestrians and/or bicyclists in a highway network. The desire lines often trace the shortest or most convenient paths between two points. The pedestrian and bicycle counts show that crossings occur frequently at unmarked locations as well as at marked crosswalks. Pedestrians tend to cross in large groups to create a “safety in numbers” effect. While some crossings are used regularly (e.g., near Cook Dr. at Tommy’s Gourmet Market), others are very rarely used (e.g., near Wampum Dr. at Kitty Hawk Kites or near Scarborough Ln. at Fishbones restaurant / Outer Banks Surf Shop). Several desire lines were identified from the count information and from Town input:*

- Between Duck Deli and Stan White’s Realty / Waterfront Shops
- Between Wee Winks Market and Wee Winks Square
- South side of Schooner Ridge Dr., near the Church

- Between the Surf Shop / RBC Centura and the Municipal Park
- Between Kellogg's and the Municipal Park
- Between Duck Landing Ln. and the Municipal Park
- Between Fishbones restaurant and Bob's Bait & Tackle

The locations with the highest number of pedestrian and bicycle crossings are at Bob's Bait & Tackle, Christopher Dr., the Municipal Park, and Schooner Ridge Dr. If the Town observes future prevalent pedestrian and bicycle crossings at locations other than those identified above, counts should be conducted in a similar manner to those for this study.

A number of pedestrians and bicyclists were also observed to continue to cross at the diagonal crossing near Aqua-S restaurant. This crossing has been eradicated and a new perpendicular crossing has been installed directly in front of Aqua-S. However, the eradicated markings are still visible. Pedestrian and bicycle volumes at the locations identified above are included in Figures B and C in Appendix A of this report.

SUGGESTIONS FOR IMPROVEMENT:

- Short-term
 - Consider enhancing marked crossings with signage and adequate staging areas at the peak "desire line" locations.
- Intermediate / Long-term
 - Mill and overlay the old crossing location at the southern transition point (near Aqua-S). This will eliminate the visual presence of the old pavement markings and, hopefully, reduce the urge to cross at the unmarked location.
 - Where possible, install raised islands with pedestrian/bicycle refuges that will not negatively impact access management (intermediate). At locations where access management is an issue, consider installing raised islands with pedestrian refuges as a long-term option. Raised median refuges increase conspicuity of a crossing, enable redundant signage to be placed in the median, and allow pedestrians and bicyclists to focus on one direction of traffic at a time, providing for a safer crossing. The "Toolbox of Countermeasures" (FHWA-SA-014) reports that the installation of raised medians reduces all pedestrian crashes at unsignalized intersections by 46 percent; refuge islands reduce all pedestrian crashes by 56 percent.
 - Install pedestrian warning signs with a flashing beacon device to increase conspicuity of the crossings. If it is deemed unfavorable to have warning signs with flashing beacons installed at each crossing, consider installing the flashing beacons only at the periphery of the village commercial area to alert motorists that they are entering an area with significant crossing activity.
 - Consider the installation of both raised median pedestrian refuges and pedestrian warning signs with beacons as a combination treatment. The speed and volume characteristics of the downtown Duck commercial area do not fully support the installation of marked crossings as a standalone treatment. Based on previous

studies, there is the potential to increase crash risk if crosswalks are added without other enhancements.

Conspicuity of crossings: *The presence of marked crossings may not be evident to approaching motorists.* There are several segments along NC 12 where the horizontal and vertical curvature of the roadway reduces visibility of marked crossings. One location of note, shown in the left photo below (background), is the crossing north of Scarborough Ln. near Fishbones restaurant. Another location, shown in the right photo below, is north of Poteskeet Dr. near Loblolly Pines. At both locations, rear end crashes have been reported. The probable cause of these incidents is vehicles unexpectedly stopping for pedestrians/bicyclists in the crossing. Rear end crashes have also been reported at other crossing locations, most likely resulting from unexpected stopping to allow pedestrians/bicyclists to cross. While each of the marked crossings is signed, there are no advance warning signs to alert motorists of the presence of the crossings or pedestrians/bicyclists crossing the roadway and there are no other visual cues to alert motorists as to the presence of a crossing. For an illustration of vehicle crashes near crossing locations, please refer to Figures B and C in Appendix A of this report.



Curvature near Scarborough Ln. Crossing (background)



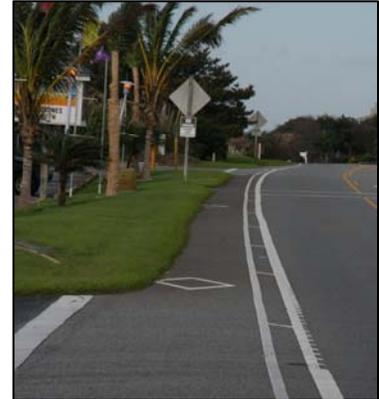
Curvature near Loblolly Pines Crossing

SUGGESTIONS FOR IMPROVEMENT:

- Short-term
 - Restripe the existing crossings / stripe the new crossings with a retro-reflective material to increase conspicuity of the crossings.
- Intermediate / Long-term
 - Where possible, install raised median pedestrian refuges that will not negatively impact access management (intermediate). At locations where access management is an issue, consider installing raised islands with pedestrian refuges as a long-term option. Raised median refuges increase conspicuity of a crossing, enable redundant signage to be placed in the median, and allow pedestrians and bicyclists to focus on one direction of traffic at a time, allowing for a safer crossing (see “Location of pedestrian/bicyclist ‘desire lines’”).
 - Install pedestrian warning signs with a flashing beacon device to increase conspicuity of the crossings (see “Location of pedestrian/bicyclist ‘desire lines’”).

- Consider the installation of both raised median pedestrian refuges and pedestrian warning signs as a combination treatment (see “Location of pedestrian/bicyclist ‘desire lines’”).

Signing and marking: *The delineation and the striping of the shared shoulder is outdated or in need of refreshing.* The shared shoulder is currently delineated by “◇” pavement markings and separated from the traveled way by a white edgeline and white raised paint rumble strips. The “◇” pavement markings are commonly used to delineate high occupancy vehicle (HOV) lanes, not shared-use shoulders. Members of the Town administration and fire and police departments have reported that vehicles have tried to use the shared shoulder as an HOV travel lane. Additionally, the white edgelines and white raised paint rumble strips are in need of refreshing.



Shared Shoulder Pavement Markings

SUGGESTIONS FOR IMPROVEMENT:

- Short-term
 - Install guide signs at the transition points to/from Duck Trail (see “Frequent wrong-way pedestrians and cyclists”).
 - Eradicate the “◇” pavement markings along the shared-use shoulder and replace with bicycle lane pavement markings (see “Frequent wrong-way pedestrians and cyclists”).
 - Restripe the existing crossings and edgelines with high-visibility markings to increase conspicuity of the crossings and improve nighttime guidance.
 - Reconstruct the painted “rumble strips” along NC 12 that separate the traveled way from the shared-use shoulder.
- Intermediate / Long-term
 - Consider installing pedestrian warning signs with a flashing beacon device to increase conspicuity of the crossings (see “Location of pedestrian/bicyclist ‘desire lines’”).

Drainage: *Inadequate roadside drainage causes sections of Duck Trail and NC 12 to flood during significant rain events.* Trail and roadway flooding was observed during the RSA. Members of the Town administration, fire and police departments, and community have stated that flooding is a major issue along the NC 12 study corridor. In some instances, certain sections of the Trail and NC 12 become impassible. When major flooding is anticipated, the Town positions police and fire units to the north and south of these areas to prevent vehicles from attempting to traverse the water.

During the RSA public meeting, it was reported that water may accumulate and remain on the Trail for upwards of 1 month. Several sections where Trail and/or roadway flooding was noted include (approximate locations):

- Ocean Pines Dr.
- Ocean Bay Blvd. / North Duck Watersports (see top left photo on the following page)
- Sound Sea Ave. (see top right photo below)

- Snow Geese Dr.
- Stan White’s Realty (see bottom left photo below)
- Wee Winks Market / Wee Winks Square
- Kellogg Building / Park Entrance (see bottom right photo below)



Trail Flooding near Ocean Bay Blvd.



Roadway Flooding near Sound Sea Ave.



Shoulder Flooding near Stan White’s Realty



Roadway & Trail Flooding near Municipal Park

SUGGESTIONS FOR IMPROVEMENT:

- Short-term
 - Inspect the existing roadway drainage structures to ensure that they are working properly. Remove debris inhibiting the flow of water, as necessary.
- Intermediate
 - Explore the possibility of installing a drop inlet near Stan White’s Realty that connects to the existing drainage structure at Wee Winks Square.
- Long-term
 - Consider the use of permeable pavements in future development/redevelopment projects along NC 12 to reduce run-off.

Please note that there are projects to the north and south of the village commercial area that are either currently underway or scheduled to address drainage issues on Duck Trail and NC 12. These projects involve reconstructing the Trail and the roadway at a higher elevation. As previously described, projects to provide raised trail crossings may be combined with these efforts.

Speeding: Excessive speed has been anecdotally cited by the Town of Duck police department as a safety issue, particularly through the village commercial area. Representatives from the Town of Duck police department report that the public commonly files complaints about speeding. In the public meeting held for purposes of identifying problems for the RSA, it was noted that about 1 out of every 5 vehicles passing through Duck is traveling approximately 10 miles per hour (mph) over the posted speed limit. It was also recognized that the perception of speed may be worse than the reality. A representative from the police department reported that, on average, vehicles through downtown Duck are traveling approximately 37 mph in a posted 25 mph zone. Vehicles have also been frequently observed to pass in the two-way left-turn lane when following another vehicle obeying the posted speed limit. The Town relies heavily on warnings to get the message about speed across.



Posted Speed Limit is 25 MPH through the Village

More detailed speed data and information regarding speed citations was requested from the Town of Duck police department for further review. Using Hi-Star units, the department collected speed data in both directions of travel along NC 12 near Plover Dr. In the northbound direction, data was collected between January 13th and January 17th, 2010 for a period of 96 hours. Data was collected and recorded in 16-minute intervals, as shown in Table A in Appendix D. The speed of 9,969 vehicles was recorded during the data collection period. The average speed of these vehicles was 29.97 mph, with 44.59% exceeding the posted speed limit of 25 mph. The 85th percentile speed was 35.56 mph. In the southbound direction, data was collected on January 13th, 2010 for a period of 8.5 hours. Data was collected and recorded in 16-minute intervals, as shown in Table B in Appendix D. The speed of 7,831 vehicles was recorded during the data collection period. The average speed of these vehicles was 21.11 mph, with 9.25 percent exceeding the posted speed limit. The 85th percentile speed was determined to be 28.17 mph. These results imply that many vehicles are not decelerating to the posted speed limit until they are within the village commercial area.

Speed affects driver's field of vision by narrowing it as speed increases, thus making it more difficult to see a pedestrian or bicyclist. Increased speed also affects a driver's ability to react and avoid a crash. As speed increases, the distance traveled during reaction and braking increases. Lastly, studies have shown that increases in speed increase the likelihood of injury or fatality in crashes involving vehicles and pedestrians (see Figure 5).

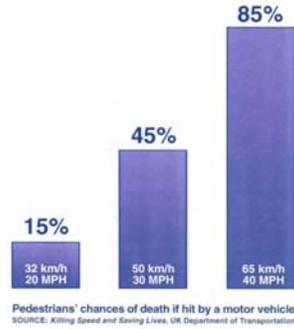


Figure 5. Likelihood of Pedestrian Fatality vs. Speed

SUGGESTIONS FOR IMPROVEMENT:

- Short-term
 - Increase enforcement of speed through Duck commercial area.
 - Consider conducting a comprehensive speed study through the commercial area to further quantify speeding.
- Intermediate
 - Install a gateway (e.g., median, landscaped median, etc.) at the north and south commercial area limits (see Figures F and G in Appendix C) to provide motorists with a visual cue that they are entering a more densely populated area where they may expect to find reduced speeds and pedestrians and bicyclists. Designs for gateway treatments will need approval from NCDOT. If implemented, the Town will be responsible for the maintenance/upkeep of a landscaped gateway treatment.
- Long-term
 - Consider realigning NC 12 at the north and south commercial area limits (e.g., chicane).
 - Consider the installation of both raised median pedestrian refuges and pedestrian warning signs as a combination treatment (see “Location of pedestrian/bicyclist ‘desire lines’”).

Maintenance: Several roadside conditions have been identified that pose potential safety issues to pedestrians and/or bicyclists.

- **Grass** - Grass along NC 12 has grown over the shoulder, reducing the useable width for pedestrians and bicyclists. In some locations, grass reduces the shoulder pavement width by 1 to 2 feet. Pedestrians and/or bicyclists position themselves closer to the traveled way, thus increasing the potential risk of conflict with a vehicle. One location where this condition is apparent is near Sunset Grille & Raw Bar and is shown in the photos on the following page.



Grass Overgrowing Shared Shoulder on West Side of NC 12

- **Stones/gravel** - Stones/gravel from commercial access points along NC 12 present an unsafe travel surface for pedestrians and/or bicyclists. Pedestrians can easily slip on the stones and bicyclists can lose control when riding over the stones. In addition, vehicles traveling over the stones cause scarring in the pavement, creating an uneven surface. These conditions also pose a hazard to pedestrians with mobility restrictions. As with the grass, the stones/gravel reduce the available usable width and decrease capacity of the roadside facility, forcing pedestrians and/or bicyclists closer to the traveled way. Locations where stones/gravel was observed in the shared shoulder include the Duck Deli and Osprey Landing, as shown in the photos on the following page. These conditions were also observed on Poteskeet Dr. at the Loblolly Pines access.



Stones/Gravel Scattered into Shared Shoulder on West Side of NC 12

- **Drop inlets** - Drop inlets were found to be clogged. This is a contributing factor to the shoulder and roadway flooding (refer to “Drainage” for more information). One particular location where the drop inlet was observed to be clogged, shown in the photo below, was at the driveway of Wee Winks Square.



Clogged Drop Inlet on West Side of NC 12

- **Roadside rutting** – There is evidence of motorists “cutting corners” as they turn right from NC 12 into side streets or commercial access points. This causes rutting along the shoulder aprons. One particular location where rutting was observed was at the intersection of NC 12 and Scarborough Ln., as shown in the photo on the following page.



Rutting at Corner of Scarborough Ln. and NC 12

SUGGESTIONS FOR IMPROVEMENT:

- Short-term
 - Trim back the grass from the shared-use shoulder along both sides of NC 12 to maintain the maximum useable width.
 - Remove the stones/gravel from the shared-use shoulder along both sides of NC 12 to maintain the maximum useable width. Repair scaring in the pavement caused by traveling over the stones.
 - Inspect the existing drainage structures to ensure proper function (see “Drainage”).
 - Fill in rutting along shoulder aprons at intersections/access points caused by turning vehicles.
- Intermediate
 - Consider installing curbing or similar functioning structure (e.g., large boulders) to keep turning vehicles on the paved surface.
 - Create a paved apron at gravel driveways to decrease amount of gravel in the shared shoulder.

4. Conclusions

Eleven (11) potential safety issues have been identified in this in-service RSA. Based on a review of the available collision data and field observations, frequent wrong-way travel by bicyclists along the shared-use shoulder was determined to be the most critical issue for the study area. This was followed by the conflicts associated with the shoulder as a shared-use facility. Other potential safety issues included location of pedestrian “desire lines”, conspicuity of existing marked crossings, nighttime visibility along the corridor, drainage, maintenance, and speeding. All of the identified potential safety issues along Duck Trail and NC 12 through the Town of Duck have been described in this report. In general, developing a cross-section to better serve the needs of pedestrians and bicyclists is recommended for the study corridor. Suggestions for mitigating these issues have been identified and have been categorized by short-term, intermediate, and long-term based on the resources needed to implement the suggestion. Beyond engineering measures, safety throughout the study corridor can be improved through education and enforcement. These measures are also discussed in the report.

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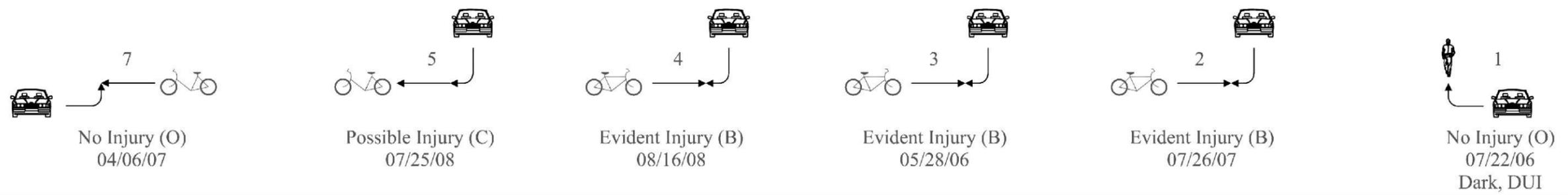
How to Develop a Pedestrian Safety Action Plan (FHWA-SA-05-12)
<http://drusilla.hsrb.unc.edu/cms/downloads/howtguide2006.pdf>

A Resident's Guide for Creating Safe and Walkable Communities (FHWA-SA-07-016)
http://safety.fhwa.dot.gov/PED_BIKE/ped/ped_walkguide/residentsguide.pdf

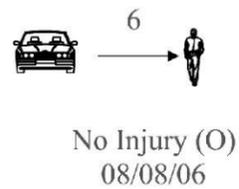
Appendix A: Annotated Study Area Maps



Figure A. Corridor Study Zones



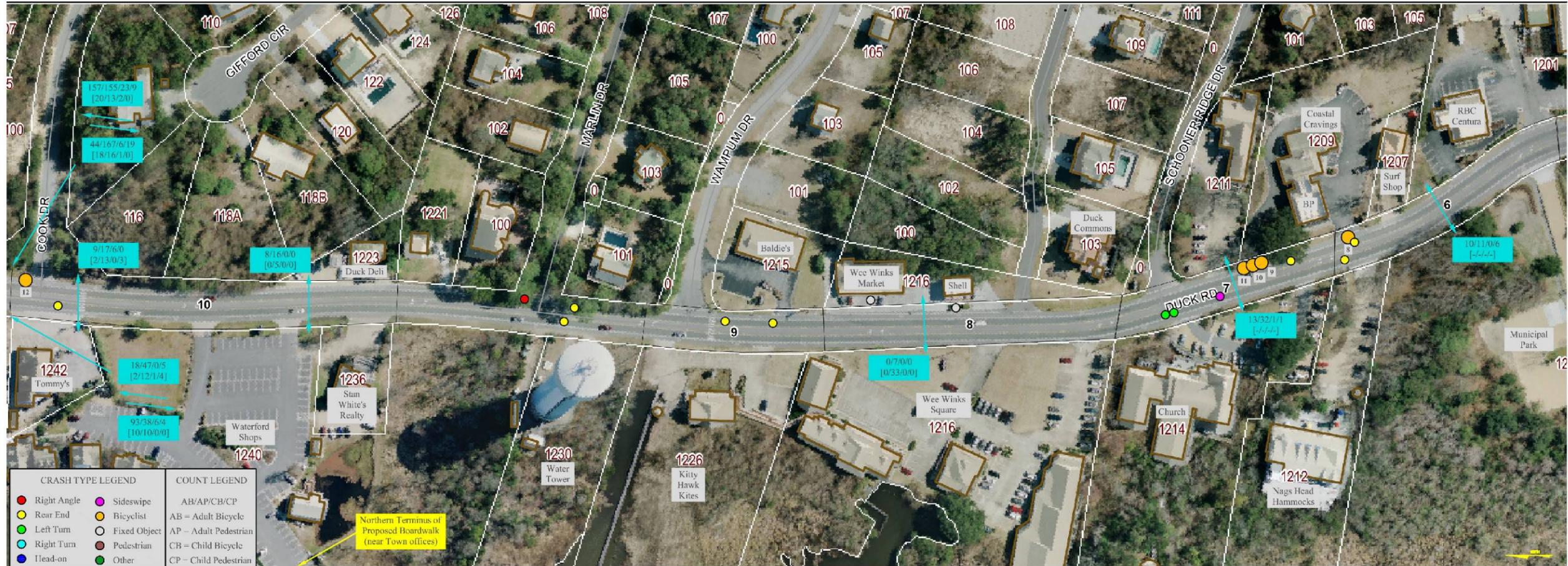
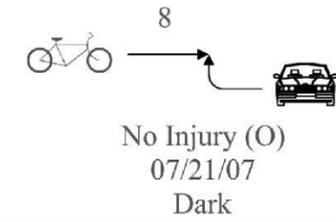
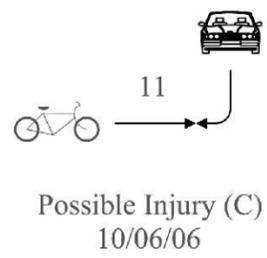
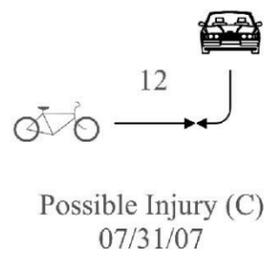
Proposed Boardwalk Extents



*Unless otherwise noted, all pedestrian/bicycle crashes occurred during the daytime under clear conditions and on dry pavement.



Figure B. South End Corridor Analysis



Proposed Boardwalk Extends

*Unless otherwise noted, all pedestrian/bicycle crashes occurred during the daytime under clear conditions and on dry pavement.

Figure C. North End Corridor Analysis

Appendix B: Annotated Map of Public Comments



Figure D. South End Public Comment



GENERAL STUDY
CORRIDOR COMMENTS:

- Provide interior pathways on east side of NC 12 to facilitate N/S pedestrian movements.
- Install crossing signals/warning lights and signage.
- Use permeable pavement for future development.

- Majority of traffic on east side where development is. Not enough safe crossing locations.
- Crossings at ineffective locations. Frequent midblock crossing.
- Width disparities along Trail. East side is consistent. West side becomes narrow due to grass, stones/gravel, etc.

- Increase enforcement of vehicles stopping for pedestrians/bicycles in crossings.
- Passing in two-way left-turn lane.
- Visual cues to help people slow down at posted 25 mph, not after posting.
- Intimidating to use shoulder in Village, as no separation from traffic.

- Road lighting inadequate.
- Acquire additional 2-3 feet of right-of-way to help implement improvements. Require business owner easements.

Figure E. North End Public Comment

Appendix C: Suggested Improvement Concepts



Figure F. South End Improvements



Figure G. North End Improvements

Appendix D: Speed Data

Table A. Northbound Speed Data at Plover Dr.

Date/Time/Volume/Average Speed/Temperature Report

HI-Star ID: 3574	Begin: Jan/13/2010 03:00:00 PM	End: Jan/17/2010 03:00:00 PM
Street: NC 12	Lane: Driving	Hours: 96.00
State: NC	Oper: OOS	Period: 16
City: Duck	Posted: 25	Raw Count: 9969
County: Dare	AADT Factor: 1	AADT Count: 2,492

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry
Wed, Jan/13/2010				
[15:00-15:16]	35	31 MPH	39 F	Dry
[15:16-15:32]	35	29 MPH	39 F	Dry
[15:32-15:48]	39	29 MPH	39 F	Dry
[15:48-16:04]	26	32 MPH	37 F	Dry
[16:04-16:20]	26	29 MPH	37 F	Dry
[16:20-16:36]	31	29 MPH	35 F	Dry
[16:36-16:52]	28	30 MPH	35 F	Dry
[16:52-17:08]	26	30 MPH	35 F	Dry
[17:08-17:24]	23	33 MPH	35 F	Dry
[17:24-17:40]	28	30 MPH	33 F	Dry
[17:40-17:56]	23	30 MPH	33 F	Dry
[17:56-18:12]	16	28 MPH	31 F	Dry
[18:12-18:28]	17	28 MPH	31 F	Dry
[18:28-18:44]	21	31 MPH	31 F	Dry
[18:44-19:00]	11	32 MPH	31 F	Dry
[19:00-19:16]	11	27 MPH	29 F	Dry
[19:16-19:32]	10	29 MPH	29 F	Dry
[19:32-19:48]	9	30 MPH	29 F	Dry
[19:48-20:04]	9	28 MPH	29 F	Dry
[20:04-20:20]	8	32 MPH	29 F	Dry
[20:20-20:36]	11	30 MPH	29 F	Dry
[20:36-20:52]	3	25 MPH	29 F	Dry
[20:52-21:08]	9	30 MPH	29 F	Dry
[21:08-21:24]	12	29 MPH	29 F	Dry
[21:24-21:40]	5	25 MPH	29 F	Dry
[21:40-21:56]	5	34 MPH	29 F	Dry
[21:56-22:12]	3	33 MPH	29 F	Dry
[22:12-22:28]	4	34 MPH	29 F	Dry
[22:28-22:44]	3	36 MPH	29 F	Dry
[22:44-23:00]	1	28 MPH	29 F	Dry
[23:00-23:16]	2	25 MPH	27 F	Dry
[23:16-23:32]	1	38 MPH	27 F	Dry
[23:32-23:48]	1	22 MPH	27 F	Dry
[23:48-00:04]	5	33 MPH	27 F	Dry
Wed, Jan/13/2010	497	30 MPH	31 F	

Thu,Jan/14/2010				
[00:04-00:20]	4	31 MPH	27 F	Dry
[00:20-00:36]	1	32 MPH	27 F	Dry
[00:36-00:52]	3	31 MPH	27 F	Dry
[00:52-01:08]	0	0 MPH	27 F	Dry
[01:08-01:24]	0	0 MPH	27 F	Dry
[01:24-01:40]	0	0 MPH	27 F	Dry
[01:40-01:56]	0	0 MPH	25 F	Dry
[01:56-02:12]	1	0 MPH	25 F	Dry
[02:12-02:28]	1	28 MPH	25 F	Dry
[02:28-02:44]	0	0 MPH	25 F	Dry
[02:44-03:00]	0	0 MPH	25 F	Dry
[03:00-03:16]	0	0 MPH	25 F	Dry
[03:16-03:32]	0	0 MPH	25 F	Dry
[03:32-03:48]	0	0 MPH	25 F	Dry
[03:48-04:04]	0	0 MPH	25 F	Dry
[04:04-04:20]	1	28 MPH	25 F	Dry
[04:20-04:36]	0	0 MPH	25 F	Dry
[04:36-04:52]	2	30 MPH	25 F	Dry
[04:52-05:08]	0	0 MPH	25 F	Dry
[05:08-05:24]	4	28 MPH	25 F	Dry
[05:24-05:40]	8	32 MPH	25 F	Dry
[05:40-05:56]	2	30 MPH	25 F	Dry
[05:56-06:12]	9	28 MPH	25 F	Dry
[06:12-06:28]	6	27 MPH	25 F	Dry
[06:28-06:44]	29	28 MPH	25 F	Dry
[06:44-07:00]	34	30 MPH	25 F	Dry
[07:00-07:16]	31	30 MPH	25 F	Dry
[07:16-07:32]	46	27 MPH	25 F	Dry
[07:32-07:48]	66	29 MPH	27 F	Dry
[07:48-08:04]	71	28 MPH	27 F	Dry
[08:04-08:20]	119	27 MPH	29 F	Dry
[08:20-08:36]	112	27 MPH	29 F	Dry
[08:36-08:52]	110	28 MPH	29 F	Dry
[08:52-09:08]	96	28 MPH	31 F	Dry
[09:08-09:24]	102	27 MPH	33 F	Dry
[09:24-09:40]	80	30 MPH	35 F	Dry
Thu,Jan/14/2010				
[09:40-09:56]	69	30 MPH	37 F	Dry
[09:56-10:12]	75	30 MPH	39 F	Dry
[10:12-10:28]	59	30 MPH	39 F	Dry
[10:28-10:44]	68	29 MPH	37 F	Dry
[10:44-11:00]	44	31 MPH	37 F	Dry
[11:00-11:16]	62	29 MPH	35 F	Dry
[11:16-11:32]	67	31 MPH	35 F	Dry
[11:32-11:48]	44	30 MPH	35 F	Dry
[11:48-12:04]	51	28 MPH	35 F	Dry
[12:04-12:20]	45	30 MPH	37 F	Dry
[12:20-12:36]	42	28 MPH	37 F	Dry
[12:36-12:52]	42	29 MPH	37 F	Dry
[12:52-13:08]	41	29 MPH	39 F	Dry
[13:08-13:24]	44	31 MPH	39 F	Dry
[13:24-13:40]	46	29 MPH	39 F	Dry
[13:40-13:56]	50	32 MPH	41 F	Dry
[13:56-14:12]	40	30 MPH	42 F	Dry
[14:12-14:28]	42	31 MPH	44 F	Dry
[14:28-14:44]	49	31 MPH	42 F	Dry
[14:44-15:00]	45	29 MPH	42 F	Dry
[15:00-15:16]	35	29 MPH	42 F	Dry
[15:16-15:32]	45	32 MPH	42 F	Dry
[15:32-15:48]	28	30 MPH	42 F	Dry
[15:48-16:04]	45	29 MPH	41 F	Dry
[16:04-16:20]	28	30 MPH	41 F	Dry
[16:20-16:36]	26	31 MPH	39 F	Dry
[16:36-16:52]	27	28 MPH	39 F	Dry
[16:52-17:08]	26	29 MPH	39 F	Dry
[17:08-17:24]	26	31 MPH	39 F	Dry
[17:24-17:40]	28	27 MPH	37 F	Dry
[17:40-17:56]	28	30 MPH	37 F	Dry
[17:56-18:12]	30	30 MPH	37 F	Dry
[18:12-18:28]	25	28 MPH	35 F	Dry
[18:28-18:44]	14	32 MPH	35 F	Dry
[18:44-19:00]	34	31 MPH	35 F	Dry
Thu,Jan/14/2010				
[19:00-19:16]	15	28 MPH	35 F	Dry
[19:16-19:32]	10	30 MPH	35 F	Dry
[19:32-19:48]	13	29 MPH	35 F	Dry
[19:48-20:04]	8	34 MPH	35 F	Dry
[20:04-20:20]	14	29 MPH	33 F	Dry
[20:20-20:36]	16	30 MPH	33 F	Dry
[20:36-20:52]	13	33 MPH	33 F	Dry
[20:52-21:08]	11	29 MPH	33 F	Dry
[21:08-21:24]	10	35 MPH	33 F	Dry
[21:24-21:40]	8	29 MPH	33 F	Dry
[21:40-21:56]	5	32 MPH	33 F	Dry
[21:56-22:12]	6	32 MPH	33 F	Dry
[22:12-22:28]	9	30 MPH	33 F	Dry
[22:28-22:44]	7	37 MPH	31 F	Dry
[22:44-23:00]	7	31 MPH	31 F	Dry
[23:00-23:16]	9	29 MPH	31 F	Dry
[23:16-23:32]	5	31 MPH	31 F	Dry
[23:32-23:48]	2	30 MPH	31 F	Dry
[23:48-00:04]	5	34 MPH	31 F	Dry
Thu,Jan/14/2010	2581	29 MPH	32 F	

Fri,Jan/15/2010					
[00:04-00:20]	6	31 MPH	29 F	Dry	
[00:20-00:36]	5	28 MPH	29 F	Dry	
[00:36-00:52]	1	28 MPH	29 F	Dry	
[00:52-01:08]	2	33 MPH	29 F	Dry	
[01:08-01:24]	3	32 MPH	29 F	Dry	
[01:24-01:40]	3	31 MPH	29 F	Dry	
[01:40-01:56]	1	32 MPH	29 F	Dry	
[01:56-02:12]	1	32 MPH	29 F	Dry	
[02:12-02:28]	1	32 MPH	29 F	Dry	
[02:28-02:44]	0	0 MPH	29 F	Dry	
[02:44-03:00]	0	0 MPH	29 F	Dry	
[03:00-03:16]	2	33 MPH	29 F	Dry	
[03:16-03:32]	1	18 MPH	29 F	Dry	
[03:32-03:48]	0	0 MPH	29 F	Dry	
[03:48-04:04]	0	0 MPH	29 F	Dry	
Fri,Jan/15/2010					
[04:04-04:20]	0	0 MPH	29 F	Dry	
[04:20-04:36]	1	22 MPH	29 F	Dry	
[04:36-04:52]	1	22 MPH	29 F	Dry	
[04:52-05:08]	3	34 MPH	29 F	Dry	
[05:08-05:24]	4	26 MPH	29 F	Dry	
[05:24-05:40]	9	29 MPH	29 F	Dry	
[05:40-05:56]	6	30 MPH	29 F	Dry	
[05:56-06:12]	9	23 MPH	29 F	Dry	
[06:12-06:28]	6	27 MPH	29 F	Dry	
[06:28-06:44]	33	29 MPH	29 F	Dry	
[06:44-07:00]	30	27 MPH	29 F	Dry	
[07:00-07:16]	31	28 MPH	29 F	Dry	
[07:16-07:32]	40	29 MPH	29 F	Dry	
[07:32-07:48]	62	28 MPH	29 F	Dry	
[07:48-08:04]	77	27 MPH	29 F	Dry	
[08:04-08:20]	98	28 MPH	29 F	Dry	
[08:20-08:36]	108	29 MPH	31 F	Dry	
[08:36-08:52]	108	28 MPH	33 F	Dry	
[08:52-09:08]	81	27 MPH	35 F	Dry	
[09:08-09:24]	89	29 MPH	37 F	Dry	
[09:24-09:40]	77	29 MPH	39 F	Dry	
[09:40-09:56]	70	30 MPH	41 F	Dry	
[09:56-10:12]	78	29 MPH	42 F	Dry	
[10:12-10:28]	70	29 MPH	42 F	Dry	
[10:28-10:44]	80	29 MPH	42 F	Dry	
[10:44-11:00]	55	31 MPH	41 F	Dry	
[11:00-11:16]	67	29 MPH	41 F	Dry	
[11:16-11:32]	42	29 MPH	41 F	Dry	
[11:32-11:48]	62	30 MPH	41 F	Dry	
[11:48-12:04]	49	31 MPH	41 F	Dry	
[12:04-12:20]	45	30 MPH	42 F	Dry	
[12:20-12:36]	48	29 MPH	42 F	Dry	
[12:36-12:52]	52	31 MPH	42 F	Dry	
[12:52-13:08]	59	29 MPH	42 F	Dry	
[13:08-13:24]	52	31 MPH	42 F	Dry	
Fri,Jan/15/2010					
[13:24-13:40]	46	30 MPH	44 F	Dry	
[13:40-13:56]	50	30 MPH	44 F	Dry	
[13:56-14:12]	43	32 MPH	44 F	Dry	
[14:12-14:28]	68	30 MPH	46 F	Dry	
[14:28-14:44]	48	31 MPH	46 F	Dry	
[14:44-15:00]	50	30 MPH	46 F	Dry	
[15:00-15:16]	52	28 MPH	46 F	Dry	
[15:16-15:32]	58	30 MPH	44 F	Dry	
[15:32-15:48]	61	30 MPH	44 F	Dry	
[15:48-16:04]	66	33 MPH	44 F	Dry	
[16:04-16:20]	57	29 MPH	42 F	Dry	
[16:20-16:36]	36	31 MPH	42 F	Dry	
[16:36-16:52]	40	31 MPH	42 F	Dry	
[16:52-17:08]	42	32 MPH	42 F	Dry	
[17:08-17:24]	42	31 MPH	42 F	Dry	
[17:24-17:40]	45	31 MPH	41 F	Dry	
[17:40-17:56]	49	31 MPH	41 F	Dry	
[17:56-18:12]	27	31 MPH	39 F	Dry	
[18:12-18:28]	42	32 MPH	39 F	Dry	
[18:28-18:44]	26	31 MPH	39 F	Dry	
[18:44-19:00]	28	30 MPH	39 F	Dry	
[19:00-19:16]	36	28 MPH	39 F	Dry	
[19:16-19:32]	36	30 MPH	39 F	Dry	
[19:32-19:48]	38	31 MPH	39 F	Dry	
[19:48-20:04]	30	29 MPH	37 F	Dry	
[20:04-20:20]	24	30 MPH	37 F	Dry	
[20:20-20:36]	28	29 MPH	37 F	Dry	
[20:36-20:52]	31	32 MPH	37 F	Dry	
[20:52-21:08]	27	30 MPH	37 F	Dry	
[21:08-21:24]	28	32 MPH	37 F	Dry	
[21:24-21:40]	26	30 MPH	37 F	Dry	
[21:40-21:56]	28	33 MPH	37 F	Dry	
[21:56-22:12]	18	35 MPH	35 F	Dry	
[22:12-22:28]	23	31 MPH	35 F	Dry	
[22:28-22:44]	13	29 MPH	35 F	Dry	
[22:44-23:00]	14	31 MPH	35 F	Dry	
Fri,Jan/15/2010					
[23:00-23:16]	11	33 MPH	35 F	Dry	
[23:16-23:32]	9	31 MPH	35 F	Dry	
[23:32-23:48]	16	31 MPH	35 F	Dry	
[23:48-00:04]	13	33 MPH	35 F	Dry	
Fri,Jan/15/2010					
	3153	30 MPH	36 F		

Sat,Jan/16/2010					
[00:04-00:20]	10	33 MPH	35 F	Dry	
[00:20-00:36]	6	35 MPH	35 F	Dry	
[00:36-00:52]	5	33 MPH	35 F	Dry	
[00:52-01:08]	5	32 MPH	35 F	Dry	
[01:08-01:24]	0	0 MPH	33 F	Dry	
[01:24-01:40]	1	38 MPH	33 F	Dry	
[01:40-01:56]	7	32 MPH	33 F	Dry	
[01:56-02:12]	3	46 MPH	33 F	Dry	
[02:12-02:28]	2	35 MPH	33 F	Dry	
[02:28-02:44]	2	35 MPH	33 F	Dry	
[02:44-03:00]	0	0 MPH	33 F	Dry	
[03:00-03:16]	0	0 MPH	33 F	Dry	
[03:16-03:32]	1	38 MPH	33 F	Dry	
[03:32-03:48]	2	38 MPH	33 F	Dry	
[03:48-04:04]	0	0 MPH	31 F	Dry	
[04:04-04:20]	0	0 MPH	31 F	Dry	
[04:20-04:36]	1	32 MPH	31 F	Dry	
[04:36-04:52]	2	30 MPH	31 F	Dry	
[04:52-05:08]	0	0 MPH	31 F	Dry	
[05:08-05:24]	7	28 MPH	31 F	Dry	
[05:24-05:40]	9	32 MPH	31 F	Dry	
[05:40-05:56]	8	27 MPH	31 F	Dry	
[05:56-06:12]	6	25 MPH	31 F	Dry	
[06:12-06:28]	7	33 MPH	31 F	Dry	
[06:28-06:44]	15	29 MPH	31 F	Dry	
[06:44-07:00]	13	29 MPH	31 F	Dry	
[07:00-07:16]	18	27 MPH	31 F	Dry	
[07:16-07:32]	18	30 MPH	31 F	Dry	
[07:32-07:48]	38	31 MPH	33 F	Dry	
Sat,Jan/16/2010					
[07:48-08:04]	50	30 MPH	33 F	Dry	
[08:04-08:20]	40	30 MPH	35 F	Dry	
[08:20-08:36]	81	29 MPH	35 F	Dry	
[08:36-08:52]	57	29 MPH	37 F	Dry	
[08:52-09:08]	58	28 MPH	39 F	Dry	
[09:08-09:24]	57	31 MPH	39 F	Dry	
[09:24-09:40]	53	30 MPH	41 F	Dry	
[09:40-09:56]	69	32 MPH	42 F	Dry	
[09:56-10:12]	48	31 MPH	44 F	Dry	
[10:12-10:28]	49	29 MPH	44 F	Dry	
[10:28-10:44]	57	30 MPH	44 F	Dry	
[10:44-11:00]	47	30 MPH	44 F	Dry	
[11:00-11:16]	60	32 MPH	46 F	Dry	
[11:16-11:32]	65	30 MPH	46 F	Dry	
[11:32-11:48]	69	30 MPH	48 F	Dry	
[11:48-12:04]	66	28 MPH	48 F	Dry	
[12:04-12:20]	52	32 MPH	50 F	Dry	
[12:20-12:36]	56	32 MPH	50 F	Dry	
[12:36-12:52]	75	30 MPH	50 F	Dry	
[12:52-13:08]	46	33 MPH	50 F	Dry	
[13:08-13:24]	65	31 MPH	50 F	Dry	
[13:24-13:40]	62	31 MPH	52 F	Dry	
[13:40-13:56]	58	32 MPH	52 F	Dry	
[13:56-14:12]	50	32 MPH	52 F	Dry	
[14:12-14:28]	59	32 MPH	52 F	Dry	
[14:28-14:44]	66	31 MPH	52 F	Dry	
[14:44-15:00]	53	29 MPH	52 F	Dry	
[15:00-15:16]	45	33 MPH	50 F	Dry	
[15:16-15:32]	49	32 MPH	50 F	Dry	
[15:32-15:48]	56	30 MPH	50 F	Dry	
[15:48-16:04]	54	31 MPH	50 F	Dry	
[16:04-16:20]	36	32 MPH	50 F	Dry	
[16:20-16:36]	58	32 MPH	48 F	Dry	
[16:36-16:52]	47	32 MPH	48 F	Dry	
[16:52-17:08]	45	31 MPH	48 F	Dry	
Sat,Jan/16/2010					
[17:08-17:24]	42	32 MPH	48 F	Dry	
[17:24-17:40]	28	30 MPH	46 F	Dry	
[17:40-17:56]	29	31 MPH	46 F	Dry	
[17:56-18:12]	27	30 MPH	44 F	Dry	
[18:12-18:28]	37	33 MPH	44 F	Dry	
[18:28-18:44]	36	31 MPH	44 F	Dry	
[18:44-19:00]	35	31 MPH	44 F	Dry	
[19:00-19:16]	21	32 MPH	44 F	Dry	
[19:16-19:32]	24	29 MPH	44 F	Dry	
[19:32-19:48]	17	29 MPH	42 F	Dry	
[19:48-20:04]	12	33 MPH	42 F	Dry	
[20:04-20:20]	15	31 MPH	42 F	Dry	
[20:20-20:36]	14	29 MPH	42 F	Dry	
[20:36-20:52]	16	32 MPH	42 F	Dry	
[20:52-21:08]	18	29 MPH	42 F	Dry	
[21:08-21:24]	13	33 MPH	42 F	Dry	
[21:24-21:40]	9	30 MPH	42 F	Dry	
[21:40-21:56]	11	30 MPH	42 F	Dry	
[21:56-22:12]	23	27 MPH	42 F	Dry	
[22:12-22:28]	8	31 MPH	42 F	Dry	
[22:28-22:44]	7	31 MPH	42 F	Dry	
[22:44-23:00]	8	30 MPH	42 F	Dry	
[23:00-23:16]	1	28 MPH	42 F	Dry	
[23:16-23:32]	3	27 MPH	42 F	Dry	
[23:32-23:48]	2	30 MPH	42 F	Dry	
[23:48-00:04]	0	0 MPH	42 F	Dry	
Sat,Jan/16/2010	2600	31 MPH	41 F		

Sun,Jan/17/2010				
[00:04-00:20]	4	34 MPH	42 F	Dry
[00:20-00:36]	2	35 MPH	42 F	Dry
[00:36-00:52]	2	35 MPH	42 F	Dry
[00:52-01:08]	0	0 MPH	42 F	Dry
[01:08-01:24]	0	0 MPH	42 F	Dry
[01:24-01:40]	1	22 MPH	42 F	Dry
[01:40-01:56]	1	48 MPH	42 F	Dry
[01:56-02:12]	0	0 MPH	44 F	Dry
Sun,Jan/17/2010				
[02:12-02:28]	1	38 MPH	44 F	Dry
[02:28-02:44]	2	28 MPH	44 F	Dry
[02:44-03:00]	0	0 MPH	44 F	Dry
[03:00-03:16]	0	0 MPH	44 F	Dry
[03:16-03:32]	0	0 MPH	44 F	Dry
[03:32-03:48]	2	28 MPH	44 F	Dry
[03:48-04:04]	1	28 MPH	44 F	Dry
[04:04-04:20]	0	0 MPH	44 F	Dry
[04:20-04:36]	2	33 MPH	44 F	Dry
[04:36-04:52]	1	18 MPH	44 F	Dry
[04:52-05:08]	1	0 MPH	44 F	Dry
[05:08-05:24]	3	33 MPH	44 F	Dry
[05:24-05:40]	2	35 MPH	44 F	Dry
[05:40-05:56]	6	30 MPH	44 F	Dry
[05:56-06:12]	5	26 MPH	44 F	Dry
[06:12-06:28]	4	35 MPH	44 F	Dry
[06:28-06:44]	5	28 MPH	44 F	Dry
[06:44-07:00]	14	29 MPH	44 F	Dry
[07:00-07:16]	5	30 MPH	46 F	Dry
[07:16-07:32]	18	30 MPH	46 F	Dry
[07:32-07:48]	43	29 MPH	46 F	Dry
[07:48-08:04]	45	29 MPH	46 F	Dry
[08:04-08:20]	26	30 MPH	46 F	Dry
[08:20-08:36]	41	29 MPH	48 F	Dry
[08:36-08:52]	46	29 MPH	48 F	Dry
[08:52-09:08]	41	31 MPH	48 F	Dry
[09:08-09:24]	19	32 MPH	48 F	Dry
[09:24-09:40]	42	30 MPH	48 F	Dry
[09:40-09:56]	65	30 MPH	50 F	Dry
[09:56-10:12]	36	32 MPH	50 F	Dry
[10:12-10:28]	31	30 MPH	52 F	Dry
[10:28-10:44]	37	31 MPH	52 F	Dry
[10:44-11:00]	37	32 MPH	54 F	Dry
[11:00-11:16]	46	29 MPH	54 F	Dry
[11:16-11:32]	32	33 MPH	52 F	Dry
Sun,Jan/17/2010				
[11:32-11:48]	44	30 MPH	54 F	Dry
[11:48-12:04]	42	31 MPH	56 F	Dry
[12:04-12:20]	35	32 MPH	56 F	Dry
[12:20-12:36]	30	33 MPH	56 F	Dry
[12:36-12:52]	37	33 MPH	58 F	Dry
[12:52-13:08]	32	32 MPH	56 F	Dry
[13:08-13:24]	41	33 MPH	56 F	Dry
[13:24-13:40]	40	31 MPH	58 F	Dry
[13:40-13:56]	31	30 MPH	60 F	Dry
[13:56-14:12]	43	33 MPH	60 F	Dry
[14:12-14:28]	34	33 MPH	60 F	Dry
[14:28-14:44]	30	30 MPH	60 F	Dry
[14:44-15:00]	30	32 MPH	60 F	Dry
Sun,Jan/17/2010	1138	30 MPH	48 F	
Jan/13/2010 03:00:00 PM				
Jan/17/2010 03:00:00 PM	9969	30 MPH	38 F	

Table B. Southbound Speed Data at Plover Dr.

Date/Time/Volume/Average Speed/Temperature Report

HI-Star ID: 6894
 Street: NC 12
 State: NC
 City: Duck
 County: Dare

Begin: Jan/13/2010 03:00:00 PM
 Lane: Driving
 Oper: OOS
 Posted: 25
 AADT Factor: 1

End: Jan/13/2010 11:32:00 PM
 Hours: 8.53
 Period: 16
 Raw Count: 7831
 AADT Count: 22,025

Date And Time Range	Period Volume	Average Speed	Roadway Temperature	Roadway Surface Wet/Dry
Wed, Jan/13/2010				
[15:00-15:16]	64	23 MPH	33 F	Dry
[15:16-15:32]	60	23 MPH	33 F	Dry
[15:32-15:48]	55	23 MPH	33 F	Dry
[15:48-16:04]	53	26 MPH	31 F	Dry
[16:04-16:20]	92	25 MPH	31 F	Dry
[16:20-16:36]	69	24 MPH	31 F	Dry
[16:36-16:52]	95	23 MPH	31 F	Dry
[16:52-17:08]	91	22 MPH	31 F	Dry
[17:08-17:24]	111	22 MPH	29 F	Dry
[17:24-17:40]	111	23 MPH	29 F	Dry
[17:40-17:56]	57	21 MPH	29 F	Dry
[17:56-18:12]	56	22 MPH	29 F	Dry
[18:12-18:28]	34	20 MPH	29 F	Dry
[18:28-18:44]	15	21 MPH	29 F	Dry
[18:44-19:00]	15	30 MPH	29 F	Dry
[19:00-19:16]	113	23 MPH	29 F	Dry
[19:16-19:32]	201	20 MPH	29 F	Dry
[19:32-19:48]	315	20 MPH	29 F	Dry
[19:48-20:04]	341	23 MPH	27 F	Dry
[20:04-20:20]	393	21 MPH	27 F	Dry
[20:20-20:36]	339	20 MPH	27 F	Dry
[20:36-20:52]	486	0 MPH	27 F	Dry
[20:52-21:08]	467	23 MPH	27 F	Dry
[21:08-21:24]	487	20 MPH	27 F	Dry
[21:24-21:40]	460	55 MPH	27 F	Dry
[21:40-21:56]	433	26 MPH	27 F	Dry
[21:56-22:12]	445	19 MPH	25 F	Dry
[22:12-22:28]	531	17 MPH	25 F	Dry
[22:28-22:44]	424	18 MPH	25 F	Dry
[22:44-23:00]	463	18 MPH	25 F	Dry
[23:00-23:16]	490	16 MPH	25 F	Dry
[23:16-23:32]	465	18 MPH	25 F	Dry
Jan/13/2010 03:00:00 PM				
Jan/13/2010 11:32:00 PM	7831	22 MPH	28 F	

Appendix C: NCDOT Drainage Plans

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
6.051035	6
R/W SHEET NO.	6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Curve Data -L10-

PI Sta 47+65.32
 $\Delta = 9^{\circ} 37' 44.1''$ (LT)
 $D = 3^{\circ} 44' 13.0''$
 $L = 257.67'$
 $T = 129.14'$
 $R = 1,533.22'$

Curve Data -L12-

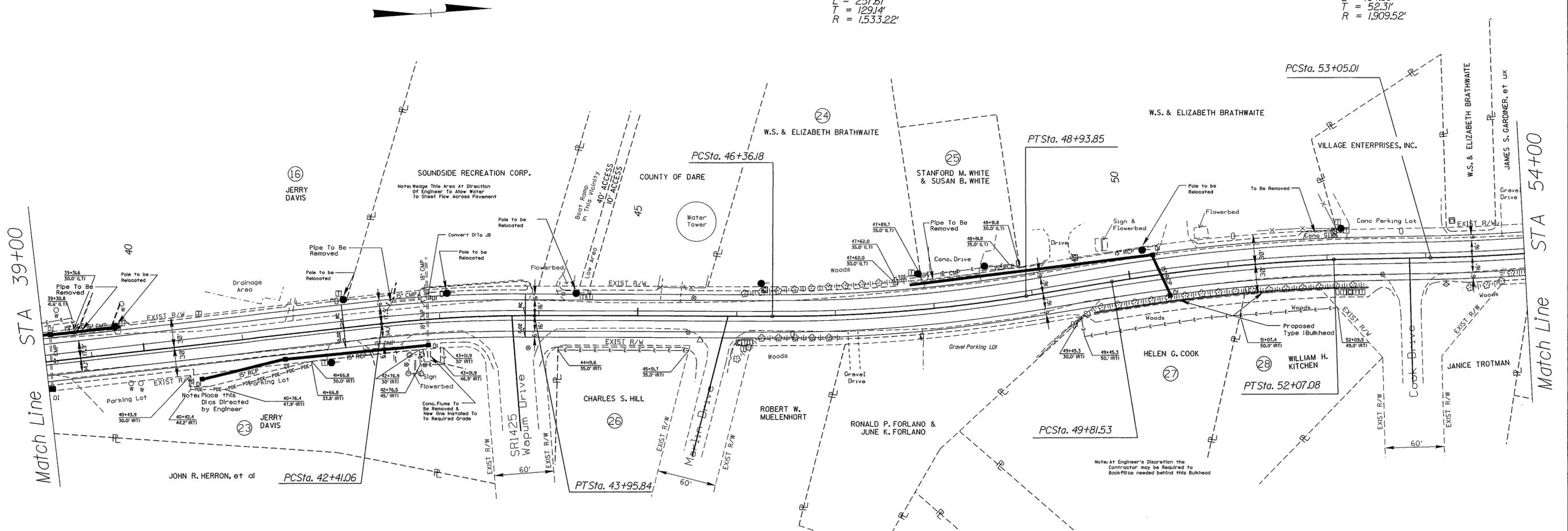
PI Sta 53+57.33
 $\Delta = 3^{\circ} 08' 19.1''$ (LT)
 $D = 3^{\circ} 00' 01.9''$
 $L = 104.60'$
 $T = 52.31'$
 $R = 1,909.52'$

Curve Data -L9-

PI Sta 43+18.54
 $\Delta = 6^{\circ} 37' 30.2''$ (RT)
 $D = 4^{\circ} 16' 49.8''$
 $L = 154.77'$
 $T = 77.47'$
 $R = 1,338.53'$

Curve Data -L11-

PI Sta 50+94.46
 $\Delta = 7^{\circ} 31' 53.8''$ (RT)
 $D = 3^{\circ} 20' 21.3''$
 $L = 225.55'$
 $T = 112.94'$
 $R = 1,715.83'$



261050

03-SEP-1998 08:45
 dt:\p\c\6\627\proj\3627\3.sph

Appendix D: Survey Questionnaire and Results

Town of Duck, NC

Comprehensive Pedestrian Plan

Questionnaire/Comment Sheet

Town Of Duck, NC

Comprehensive Pedestrian Plan

Questionnaire/Comment Sheet



Questionnaire

Thank you for your interest in the Duck Comprehensive Pedestrian Plan. Your participation is greatly appreciated and is critical to the plan's success. Please print your comments clearly and concisely.

1. Check the one that best describes your interest in the Pedestrian Plan (please check one):

- Year-round resident Seasonal resident Recreational group
 Seasonal visitor Business owner Employee
 Other _____

2. Check the one that describes your age (please check one):

- Under 18 years old 18-24 years old 25-34 years old 35-44 years old
 45-54 years old 55-64 years old 65 years or older

3. When not driving an automobile, what is your primary mode of travel in Duck? (please check one)

- Walking Bicycling Other _____

4. How often do you walk/bicycle/other in Duck? (please check one)

- Daily Several times a week A few times a month Never

5. Why do you walk/bicycle/other in Duck? (please check all that apply)

- Social visits Home to Village Home to beach Home to work
 Recreation/exercise Other _____

6. What times of day do you walk/bicycle/other in Duck? (please check all that apply)

- Early morning Mid-morning Afternoon Evening
 Night



The Town of Duck, North Carolina, is currently developing a Comprehensive Pedestrian Plan to improve pedestrian safety and access throughout the Town and within the Village Center. As we pursue our goal to become a Pedestrian-First Community, we would like to know how you and your family use the existing pedestrian network and where you think we should enhance it. Your involvement in the planning process is essential to the success of the project.

Please take a moment and complete this questionnaire. The questionnaire may be returned via mail or fax to Chris DeWitt, VHB, 351 McLaws Circle, Suite 3, Williamsburg, Virginia, 23185, Fax: (757) 220-8544. You can also mail or drop it off at the Duck Town offices located at 1200 Duck Road (PO Box 8369), Duck, NC 27949. If you prefer, you may also access this survey and complete it online at the following address, <http://townofduck.wufoo.com/forms/pedestriansurvey/>. Survey responses will be accepted through August 7, 2013. Thank you!

7. Where do you walk/bicycle/other in Duck? (please check all that apply)
- | | |
|--|--|
| <input type="checkbox"/> Front door to mailbox | <input type="checkbox"/> Front door to car |
| <input type="checkbox"/> Duck Trail north of Village | <input type="checkbox"/> Duck Trail within Village |
| <input type="checkbox"/> Duck Trail south of Village | <input type="checkbox"/> Boardwalk/Park |
| <input type="checkbox"/> Residential Streets_____ | |
| <input type="checkbox"/> Other_____ | |

8. What is the most interesting thing you see or experience during your trip(s)?

9. How would you rate the pedestrian network in Duck? (please check one)
- Excellent Fair Poor

10. Which of the following phrases best define walkability? (please check three)
- | | |
|---|--|
| <input type="checkbox"/> Safe sidewalks/trails | <input type="checkbox"/> Connected sidewalks/trails |
| <input type="checkbox"/> Safe roadway crossings | <input type="checkbox"/> Well-maintained sidewalks/trails |
| <input type="checkbox"/> Scenic walks | <input type="checkbox"/> Curb ramps and wheelchair accessibility |
| <input type="checkbox"/> Destinations within walking distance | <input type="checkbox"/> Other_____ |

11. How important is improving the walkability of Duck? (please check one)
- Extremely important Moderately important Not important

12. What discourages you from walking in Duck? (please check all that apply)
- | | |
|--|---|
| <input type="checkbox"/> Lack of sidewalks or trails | <input type="checkbox"/> Poorly maintained sidewalks/trails |
| <input type="checkbox"/> Automobile traffic/speed | <input type="checkbox"/> Lack of crosswalks |
| <input type="checkbox"/> Lack of pedestrian signals | <input type="checkbox"/> Lack of pedestrian lighting |
| <input type="checkbox"/> Bicycle/pedestrian conflict | <input type="checkbox"/> Distance between destinations |
| <input type="checkbox"/> Other_____ | |

13. What destinations would you most like to walk to in Duck? (please check all that apply)
- | | |
|--|--|
| <input type="checkbox"/> The beach | <input type="checkbox"/> Currituck Sound |
| <input type="checkbox"/> Town Park/Boardwalk | <input type="checkbox"/> Town Hall |
| <input type="checkbox"/> Shopping/dining | <input type="checkbox"/> Place of work |
| <input type="checkbox"/> Place of worship | <input type="checkbox"/> Other_____ |

14. Which of the following improvements would most encourage you to increase your walking in Duck? (please check all that apply)
- | | |
|---|--|
| <input type="checkbox"/> Constructing new sidewalks | <input type="checkbox"/> Repairing existing sidewalks/trails |
| <input type="checkbox"/> Adding crosswalks and pedestrian signals | <input type="checkbox"/> Constructing curb ramps and wheelchair access |
| <input type="checkbox"/> Adding pedestrian refuges at major crossings | <input type="checkbox"/> Building greenways and shared use paths |
| <input type="checkbox"/> Installing lights along pedestrian routes | <input type="checkbox"/> Installing street furniture such as benches |
| <input type="checkbox"/> Planting street trees/landscaping | <input type="checkbox"/> Other_____ |

15. Please indicate the street/subdivision that you stay/reside in Duck. _____

Please use the space below to provide additional comments relative to improving the pedestrian transportation system in Duck:

Thank you for your participation in the project. You may submit this form in person at the July 31, 2013 public meeting, fax it to Chris DeWitt at (757) 220-8544, or mail it to Chris DeWitt, VHB, 351 McLaws Circle, Suite 3, Williamsburg, VA 23185. You can also mail or drop it off at the Duck Town offices located at 1200 Duck Road (PO Box 8369), Duck, NC 27949. The deadline for returning the survey is August 7, 2013. For more information on the Comprehensive Pedestrian Plan, visit the project website: www.townofduck.com/pedplan/.

Help us gather additional data! Download VHB BikeWays and use your iPhone or Android's GPS support to track trip routes. It's simple to use: tap Start to start recording your trip, save at the end, and specify a purpose (commuting, shopping, exercise, etc.). Data representing the purpose, route, date and time are sent to VHB's servers. Think of it as a travel survey that asks you why and where you are riding, but automatically maps your route rather than asking you to write it down from memory.

All personally identifiable data will be kept confidential. We will know your iPhone's Unique Device Identifier (UDID) or your Android phone's Device ID in order to group trip data by users. No other identifying information is collected except with your opt-in permission. Anonymous data may be shared with other public agencies for planning purposes. Users can cancel a trip at any time for any reason and no data will be sent unless explicitly directed by the user.

PEDESTRIAN PLAN COMMENTS - CATEGORIZED

Thanks and Commendation

- The things listed in 14 are largely unnecessary. Our family feels that Duck gets better with each passing year, and we support our Town leaders. Especially Councilperson Caviness.
- I appreciate all of Duck's recent improvements. Keep up the good work.
- I have seen such a healthy approach to growth over the 40+ years that I have been coming to Duck. I appreciate the commitment to creating a town which values and respects its natural environment. My husband and I purchased the family home two years ago and we spend as much time as we can in Duck....by ourselves, with friends, and with family.
- I think it is excellent, only suggestion, more boardwalk on the sound.
- It is encouraging that the town is doing this survey to access the needs of everyone! I look forward to the improvements!
- The walkways in Duck are great. We love the boardwalk. Walking in town is a little less enjoyable due to traffic and the close proximity of the roadside walkways. We still love it. Maybe they will build the bridge someday so that some of the traffic will be diverted.
- Duck is a unique friendly and welcoming small town providing residents and worldwide visitors a pleasant community to experience natural beauties and live intimate family moments on the OBX. The pedestrian experience like Duck is not comparable anywhere else between Corolla and Nags Head. The town of Manteo comes close and could be studied having positive examples of pedestrian friendly areas.
- I think everything is fine as it already is. Remember that the Village must accommodate automobile traffic as much as it does pedestrians and I think that is already adequately done.
- We've been visiting Duck from Ohio since 1985. The walkway is brilliant and enjoyable. Sad to see such an out of place shop like Wings though. It detracts from the rest of the village. Too bad you can't force them to re- model it to look more like the new Town Hall or the new Winks.
Thank you
- The walking/biking path has been a huge enhancement of our enjoyment of the area. We often walk the two miles from our home into Duck to visit restaurants and shops as well as to walk on the boardwalk. We need to encourage ALL pedestrians to use only the marked crosswalks and for cars to stop when someone is in the cross walk or about to cross.
- Boardwalk is great! Any expansion would be appreciated.
- When we come to Duck we walk everywhere and take our dog. We love it there. Our grown children and families come with us and love it too! We love the new boardwalk. It is great to be able to walk to shops and dining!
- We are constrained by the width of Duck Rd. through the village. I really like all the new crosswalks and think that the slowness through town really helps avoid accidents. It's a zoo out there in the summer, but somehow it works. Anything we can do to improve that area and get rid of the flooding near Sound Sea Village will really help. The sidewalk is a great success so far!

Thanks and Commendation, Cont.

- We have been owners in the Duck area for almost 23 years. All of the changes e.g. the town park and the board walk have been marvelous. Duck is not a huge place and that's what makes it special. That said, it doesn't mean that there isn't always work to be done. Maintenance is very important. Suggestion, perhaps some volunteers in some kind of a stand-out walking uniform to meander around the area and the boardwalk to be available for inquiries from the visitors?
- It's already great and can't think of a lot to improve it. There are plenty of pedestrian crosswalks--maybe signs reminding pedestrians to cross at those points and reminding drivers to stop for pedestrians would help.
- Duck is so small and quaint. Congratulations! Help you businesses stay the same or have that appearance and your success will continue.
- Overall, I am pleased with the walkability of Duck....it far exceeds the walkability of other towns on the Outer Banks.
- Love it here!
- Duck is beautifully maintained. We enjoy the community programs (storytime, shows, live music). A great family vacation. Expanding the boardwalk is exciting.
- We love your town. Very clean. Keep up the good work w/the bike paths. Maybe arrows on the paths so people realize if they are riding bikes, they should still follow the rules of the road and ride with traffic.
- Keep up the good work! Next year will be our fifth consecutive visit to your lovely Town. :) I'd say the best way to keep us coming back would be to continue improvements to the town area--things to do, places to walk to, etc.
- I live in Southern Shores and frequently use the current footpath as a route for exercise/running. I also enjoy being able to bike from my house to the Roadside Grill for lunch. Because of the low speed limit in town I find the current paths to be suitable. However, if there is any way to improve what we have and/or avoid a tragedy I would be for it.
- Thank you for studying this. It is hard to cross the street there, most drivers do not stop at crosswalks. We love the new soundside boardwalk and used it daily when we were there this year!
- It's a great system. You do a great job
- Love the boardwalk and boat dock - add more
- option of "good" not available for rating the pedestrian network in Duck - it is good
- love the boardwalk
- The Town of Duck Sound Boardwalk is a gem. We spend a lot of time strolling on it when we are "downtown".
- Improvements have been excellent over the years. Continuing this trend will make Duck even better to live and visit.
- We love the walkability in Duck and it is a primary reason for our living in this area. The pathways / sidewalks are great! Vehicle speed and ignorance of crosswalk locations/laws are a constant danger to pedestrians. :(

Thanks and Commendation, Cont.

- Thanks for working on this issue.
- Love the area and have seen much improvement over the years. Keep it up!
- The village of Duck is improving every year! I greatly appreciate the improvements that have already been made to the walking/bike lanes, trails, boardwalk, and pedestrian cross walks. We love being seasonal residents in Duck and fully support the Pedestrian Plan and continued improvements.

General Suggestions for Improvement

- For bikes. More paved areas so do not need to use roads north of duck. Really dirt trails are fine for walking in natural areas ,,if safe
- new bridge!!!! to Currituck
- The biggest improvement the Town could make to the pedestrian experience while walking and biking along the trail is likely a low cost improvement: Cut back 20-30' between each cross-road along the East side of the trail so that vehicles approaching Duck Rd can clearly see pedestrian and bikers. We have a lot of out-of-towners during the summer who are already unfamiliar with the neighborhood and with pedestrian traffic. And in most cases they approach Duck Rd from the East which means in the afternoon they're looking into the sun and squinting. There have been a couple of times where my wife and I have been walking/biking and as we approached an intersection we observed a driver roll up to Duck Rd while looking to the north (whereas we are approaching from the south) and fortunately we stopped in order to avoid colliding with them. The problem is the vegetation is so thick that most drivers roll up into the crosswalk at the stop sign and they're only looking 1 way as they approach, thus putting people approaching from their blind side in danger. I think if you simply cut back a good amount on the north and south side of the trail at each intersection cars wouldn't have to drive all the way into the trail and it'd be a lot safer... Another thing you could consider using is pedestrian sensors and lights on a pedestrians sign underneath the stop signs. I've seen this near metro stations in the DC area. When the foot sensors register pedestrians crossing in cross-walks a lighted sign is illuminated notifying drivers there are ped's crossing. It's enough to get their attention. That's probably a lot more expensive than simply cutting back though... And that's where I would start - with cutting back along the path to increase visibility. The south side of Widgeon Drive is a perfect example of a blind spot where people violate the crosswalk all the time.
- I'd like to see the north and south trails connected through the Village. Public Safety is my most pressing concern in the Village. Use the Sanderling Style Pedestrian crossing to encourage pedestrians to use the marked crosswalks. If we are unable to extend the paved trails, put 12"-36" concrete barriers on the walkways to separate the walkers from the vehicles. Perhaps separating walkers and bicyclists on separate sides of Rte 12 might be investigated as an alternative to having both on the same side.

General Suggestions for Improvement, Cont.

- The speed limit in the northern section of Duck (past fire station) should stay no more than 35 mph all year round vs just the summer!!!! Cars always go 10 mph over anyway! We miss being Duck residents but still come back to visit!!!!
- Where are the many police officers listed in the budget. The traffic through the village seems far in excess of 25mph. This summer, the young folks in pickups sometimes are not stopping at the crosswalks for pedestrians. This past June, several instances of cars not stopping for we who are in the official crosswalks. This occurred Am, PM and early evening trying to cross over to the Cantena section of the boardwalk. Where are your signs telling motorist to stop?? Where are your officer "Friendlies to help ensure safety? You need to study university campus' such as ODU, UVA, etc. and learn how they control speeding! Finally, there is a completely incompatible set up with the walk lanes. You cannot have bikers, walkers, children, seniors, joggers and baby carriage pushers all trying to squeeze together in such a tiny space. Again study other set ups-- Look at how it is done in NJ, MD and DE.
- Duck village needs traffic control most hours. Police presence on bikes or foot would be a good deterrent
- I love the town of Duck as my second home. I think traffic lights would detract from the town's quaintness. I believe one well located walking bridge would solve the crossing problems.
- Would like more foot/bike police presence in Duck----esp on turnover days to expedite traffic.
- Temporary speed bumps or speeding alerts at each end of town. More police presence during early morning and 5 pm.
- Traffic control needs to be addressed. If you are driving it is difficult, sometimes impossible, to make turns in and out of driveways because of all of the bicycles and pedestrians. Some of the bicyclists ride on the multi-use path and some ride on the road. Some pedestrians stop and look before crossing driveways and streets, others simply forge ahead. It's a very dangerous situation. While we love to refer to Duck as a "walking village", there are no streets closed to cars, so it really is not a walking village. I really think you need to consider some type of flyovers at certain crossings.
- The bike paths are too narrow for bikes and pedestrians walking and biking in all directions. The 25 MPH speed limit is very often not adhered to. Many people do not respect crosswalks. It might be good to have signs in each crosswalk.
- Overall its good. BUT the main issue to me is how dangerous it can be right in the village. There's too many things happening...pedestrians, cyclists, especially crossing road or cars trying to turn left on to road out of various parking areas. There needs to be more control in the village itself....perhaps a curb between multi use path and roadway. I would like to see cars only turning right with roundabouts interspersed to allow U-turns to other side.
- need more advertising about boardwalk; put rumble bumps 50 ft. before each crosswalk north and southbound lanes and at the beginning of Duck North and South. A series of 10 bumps.

General Suggestions for Improvement, Cont.

- It takes a while, after driving 1500 miles of interstate to get here to remember to slow down to walkers/bikers. Cops/fines to cars which don't stop. Allow motorists/bikers to report cars that don't stop.
- more water stations
- I think as a whole the pedestrian transportation system in Duck is very commendable. The only thing I would change is to extend the trail/sidewalks throughout the town as it can get quite narrow within the village between traffic, bikes, and other pedestrians.
- The problem is not the residential streets, and spending money on sidewalks there is a waste. The problem is that Rt. 12 lacks both adequate space for pedestrians and bicycles and the appropriate separation of cars, bikes and pedestrians. Also there need to be more crosswalks on Rt. 12, and ideally the signs should be lighted similar to the signs near the Sanderling Inn. Finally, land use policy should promote walkability -- too much of the discussion surrounding the new Wee Winks focused on parking and, given the lack of even a sidewalk, not enough on facilitating pedestrians and bikes.
- Would like to see trees, bushes, and shrubs trimmed back to see if traffic is coming . Also, if on a trail the cyclist and pedestrians should stop to avoid accidents with cars coming off of side streets. It's sometimes is hard to see the trails that people use. If they go out into the road way because we can't see them it can cause a accident with another car driving on the main road.
- Additional crosswalks would be needed if the paths were directed for "walk against-bike with"traffic flow
- Renters need to be more informed regarding observing speed limits
- I love to walk in the early morning. I get a cup of coffee and walk the boardwalk. Planting that provides shade from the daytime sun may increase the afternoon walking. The group I vacation with could rent in Corolla or Nags Head but we love the walkability of Duck.
- the shared right of way between cars and ped/bike in downtown needs upgrade. Too many conflicts with cars (poor line of sight), cars entering/exiting shopping center, and cars parking at wee winks. More enforcement/education on pedestrian laws - peds have right away in crosswalks.
- no golf carts on the bike trail or NC 12
- I come annually at least. I have no strong complaints. However, visitors/vacationers need to be extra aware of pedestrians
- Extend walking path from where it stops into the village to the end of the boardwalk.
- I am uncomfortable walking in Duck because the combination of road/walkway in the village is dangerous. More separation is needed between the cars and pedestrians. Currently it is an accident waiting to happen. My suggestion is to move the road completely to the west and have the one 2way walkway to the east with a small grass buffer between the two. Since we now have the boardwalk trail on the east side of town, the businesses on both sides would be adequately served with this plan. Additionally this plan would not need additional land.

General Suggestions for Improvement, Cont.

- In the decade plus my family has been coming to Duck I have noticed the large increase in foot and bicycle traffic; the pavement trail handles both fairly well during peak usage but the in town experience can get dangerous. As a jogger and bicyclist I have experienced both perspectives. Any solution must do a better job establishing and communicating "rules of the road". Over the last several years I have noticed that common courtesy or common sense is not observed. Examples of what I mean - people walk/ride in the middle of the path not allowing faster movers to safely pass, people walking/riding on the wrong side of path/road, and people in headphones paying no attention to their surroundings stopping/turning in front of others. Clearly marking the paths with direction & reminders should help somewhat. I believe the town must utilize bridges for cross walks as on "shopping days" (i.e. non beach weather) Rt12 snarls to a standstill approaching the town. This is unfair to our neighbors needing to transit through Duck to/from the North. Not only that, it is situation that can negatively affect the emergency fire/rescue squad. Maybe increased usage of traffic officers/signals holding walkers at cross walks to alleviate the stop & go for small groups every 2 cars or so. This is a large issue that may be the county needs to address... adding more crosswalks will only make the situation worse.
- Last week, we crossed from Aqua restaurant, in a crosswalk, just after dark and had to run with our children to get across. The lighting in that area is very dim. No one stops, the crosswalks are poorly marked--no flashing lights or anything to alert drivers that they need to watch for peds. The yellow signs are useless. The traffic coming in on the weekends is so poorly managed. Why no police presence at all when the traffic is so backed up and people are dodging cars trying to cross the street? It's as if the local authorities are in denial about the safety problems. How about building some walkways over the road? People who have been driving for hours are tired and frustrated and then encounter that traffic mess...it's not a good situation for drivers or peds. There are no simple solutions but at the very least, you can have police helping things move more smoothly, especially on the weekends.
- Better crosswalks, slower traffic, less bikers in street since they cause accidents
- With the constant Rt 12 traffic and attractions on both sides of the road, it is difficult to balance traffic flow with pedestrian access. Pedestrian bridges might help.
- A one-way street option? Trail on just one side of road, with double lines to indicate north/south. "Push" road over, widen trail
- Trolley with stops in shopping areas (not all), bench space in trolley for strollers, wheel chairs. Greenway and path through parks
- There needs to be a crosswalk between WeeWinks Market and WeeWinks Square shopping Center. Thank you. Your efforts are both comforting and appreciated. -David Williams TdavidW@hotmail.com
- The Duck Police Station is located too far outside of the major pedestrian and vehicular traffic areas. The old saying " out of sight, out of mind" is most applicable in this case. Consider moving the Duck Police station to the center of Duck, so that the Duck Police Officers are in the middle of the action.

General Suggestions for Improvement, Cont.

- A crosswalk needs to be added south of the AQUA Restaurant & Spa so you connect directly with the walking/biking path that is not adjacent to the road. Now when biking you must cross at the AQUA Restaurant & Spa and bike on the wrong side of the road in order to reach to bike path that continues south along Duck road. It is very dangerous when meeting other bikers and pedestrians going in both directions when you are still on the side of the road with the cars.

Add Signage and Lighting

- Duck is a lovely town for pedestrians and is growing with more walker-friendly destinations every year. My family enjoys being within walking distance of our favorite restaurants, shops, site-seeing points, etc. However, during the summer months the pedestrian paths can become very congested and there seems to be a lack of "road rules" for pedestrians. New signage letting pedestrians know which side of the street they should be on when walking, cycling running, in certain directions would be helpful. We have seen many near collisions between joggers, cyclists and pedestrians. Tips for pedestrians, such as "look behind you before you pass someone," "stay to the right at all times," "do not walk more than two wide" would be beneficial. It seems like a lot of visitors to Duck are not familiar with how to be a pedestrian in a highly populated area. Added signage with rules and tips would be a help!
- My family and I have been visiting Duck for ten years now; the only issue with "walkability" that I can think of is that the center of town can be a bit clogged and awkward during peak travel and shopping hours, which is, of course, natural and unsurprising. Perhaps a traffic light? Otherwise, common sense and good timing suffice. Good luck and many thanks!
- One of the biggest problems is that cars don't stop @ crosswalks. Need flashing lights/sound to get driver's attention. And education/fines for blasting through even when people are waiting @ crosswalks.
- more flashing pedestrian signals
- I don't think we need to spend any more money on landscaping or lights or benches. Duck does pretty well with what it has and the folks keep coming every year. I do think that pedestrians & bikers need better signs to make them aware of the dangers of cross streets and car traffic. I am all for "the pedestrian has the right of way" but most walkers/bikers come zooming south on Duck Road without a care in the world as though Duck is a "car free town". It is very difficult to come out on my street (Seabreeze Drive) because it is a blind curve and these bikers/runners just zip right by at fast paces. I have to literally approach the end of the street inch by inch because peds/bikers/runners don't exercise any caution or courtesy. Some streets do not have such blind curves & have better sight lines. At least a ped/biker/runner Stop Sign might help slow these folks down and help when I need to exit my street. I am sure there are a few other streets with similar sight line issues. Thank you
- I am not sure what "pedestrian signal" means but there definitely needs to be something that alerts drivers to stop at some of the less visible crosswalks- especially at night. The crossings in front of Sunset Grill and Aqua are very hard to see at night when driving.

Add Signage and Lighting, Cont.

- Better advertisements of the boardwalk as a means of exercise and navigating town. Maybe put up some signs that denote shopping centers and how far ahead they are to let people know that it's not a 2 mile walk from the waterfront shops to Sound Feet Shoes or something. Let businesses pay for advertising no larger than 2'x3' for exposure & revenue. Lighting is really only necessary around the park, on each side of the road (Kellogg's - Pizzaz). I hear regularly that Duck is the best town on the outer banks. People who visit that are staying in KDH or Nags Head regularly say that they will try to stay here next year. Please keep that in mind when formulating any plan & try not to muck what we've got up too much.
- Rumble strips and signs on side streets alerting drivers of pedestrians and bikes. Too many people stop after the stop sign/ white line and go into the pedestrian/ bike lane. I saw several near misses because of auto drivers! Maybe lower the speed limit to 15 mph on the main road and then maybe people will drive 25 mph.
- Love the boardwalk! Extend it even longer! Make sure there are ramps at each entrance/exit for strollers. I could see it all the way from sunset grille to aqua. :) Lights would be nice too as we will walk to dinner or drinks etc and come home after dark.
- Would like signals for crossings for both cars because the bike walking traffic while trying to exit side streets is challenging.
- would like to see more signs for drivers letting them know about walking lanes
- Maybe a sign educating the newbie drivers would help with frustration. Somthing like.... Next 3 miles, chill out, enjoy the walkers, enjoy the sights.
- Maybe all cross walks should have blinking lights, like the cross walks by the Sanderling Inn?
- Signs on walking paths near intersections to remind walkers to look out for cars when crossing an intersection. Also, it would be good to have signs near road for drivers to watch out for walkers and bikers before entering into an intersection. Thanks for your hard work in making Duck a great area.
- As a driver thru Duck; evenings, lighting on the path so cars can see the pedestrians and bikers better as no one seems to wear white at night anymore.

Build Sidewalks/Widen Existing Walkways

- Widening existing walkways would be an improvement especially in Scarborough Lane vicinity
- Just build some sidewalks - it is so dangerous for bikers - we are squeezed between these folks and the automobiles - it's horrible.
- continue wide bike path; too narrow in downtown Duck and puts bikers and walkers way too close to traffic

Build Sidewalks/Widen Existing Walkways, Cont.

- The absolute worst aspects of existing walking/biking in Duck are: the narrow walkways in the main village - it is unnerving walking/riding a bike, esp. with children, along that main thoroughfare; parking lots in which cars BACK into the road across the walkways (Duck Deli area is very bad for this); cars heading through Duck not yielding to pedestrians - Duck needs to have an exception for this to install "Stop for Pedestrians" signs and/or blinking lights (drivers are maybe just oblivious - looking for their turn-off, or plain rude). It would be great if the main walkways in the area between Duck Deli and the Scarborough Shopping area could be either wider, or run behind the businesses if at all possible, even in increments if not in total. Provide at least 2-3 areas where crossing the road is easier with blinking lights and stronger signage. Perhaps near Winks, the Methodist Church, the Pizza Pizzazz area, and Scarborough or Wings. The new parking lot design at the Winks/ABC Store are a huge improvement for traffic flow. The sound side boardwalk is fabulous - thank you for that.
- would like more separation between the cars & walking/bike path. It would also be nice to have a true bike path & separate walking path so bikes are not in the road & don't have to weave around pedestrian traffic.
- The multi-use of existing pathways through the village area make for a crowded experience for all. Safety then becomes an issue. Would prefer separate paths for biking and walking
- Most people do not walk facing traffic on the left side of the road on Duck side streets which is extremely hazardous to them and those of us who do walk facing traffic. Consider painting a "center stripe" on the bike/walk path where it's wide enough. Consider opening up a walking path between side streets. That would relieve Duck road sidewalk congestion and give walkers more choices in routes.
- I think that a safe continuous sidewalk/path would be a great idea and perhaps the most cost effective. It is pretty tough to navigate through by Duck Deli with the cars and gravel- Maybe parking should be eliminated at Duck Deli forcing customers to walk across the street at that point. That would eliminate all of the cars pulling in and backing out which greatly adds to the confusion at that particular spot. The boardwalk is really so fun and takes us right to the coffee shop our favorite destination in the morning.
- North and South of town has walking paths removed from the road. Bicycling through town is dangerous because the path is narrow and it can be crowded with other bicyclists and walkers/runners. It would be helpful to have a safer crosswalk. Now walkers and bicyclists are dependent on cars stopping when they are in the crosswalk. The boardwalk is fabulous and should be extended all the way from Aqua to Sunset Grill.
- A separate pedestrian walkway would help. I think the traffic needs to be slowed!
- As a business owner I drive through Duck daily. I think that pedestrian and bicycle traffic on the edge of the road is extremely dangerous. I know that there is little space along side the road, but it would seem that the addition of a sidewalk would be helpful. I think most people use the boardwalk for pleasure rather than to get from one place to another in Duck.

Build Sidewalks/Widen Existing Walkways, Cont.

- Quite honestly, I am more afraid of driving through the downtown village area than walking through it. During the summer months, there are just too many people on bikes and walking through the town area that treat the sidewalk area as if it were in a quiet neighborhood, not a busily travelled road. People allow their toddlers and young children to ride their bikes right next to traffic and quite honestly, I am afraid one of them is going to lose their balance and end up in front of my car. Not to mention that coming out of any of the businesses in the downtown area becomes very dangerous because while I am watching the traffic on the road, there are often pedestrians and bicyclists who are coming along the path and frankly, you just don't always remember to look for them. I was turning left out of Marlin and almost hit a bicyclist coming up on my right because he came up very quickly, and the visibility is not good there. I've also witnessed on several occasions cars that are on duck road waiting to turn right into a parking area where a bicyclist is coming along side them (from behind) and the driver of the car doesn't think to look in their side mirror to check for anyone coming up from behind them. Its a dangerous situation that will result in tragedy, (if it hasn't already). The sidewalk needs to be physically separated from the road.
- The path is not wide enough for both bike and pedestrian traffic, but the biggest threat to safety is turning auto traffic
- It would be wonderful to add bikes lanes to the bay side of the road on the route from corolla to Duck
- You have put the Boardwalk in on the sound and that is a beautiful place of leisurely walking, but More people are walking on the east side of the road looking to visit the shops on that side of the road, and it is a dangerous area. I think there should be a sidewalk installed on the east side of the road as a continuation of the side walk that leads just up to the Greenleaf gallery. It will enhance the charm and safety of the town.
- I've been vacationing in Duck for 20+ yrs and have always wondered why safe sidewalks have never been installed. If they were, the town would surely realize an increase in business.
- Love that we have crosswalk signs but they need to be lighted at dusk. Some of the worst offenders on stopping for pedestrians are the locals. I have stopped many times to let someone cross while the oncoming car in the other lane just keeps going by. If we cannot work out a solution to make it safe for both walkers and bikers to get around in Duck we should eliminate biking. I still say that if we keep one side of the road for walkers and the opposite side for bikers it would solve the problem and there will be no need for more cost to Duck. This should have no bearing on whether you are going with traffic or against it. It's for everyone's safety.
- Any new sidewalks should be of low environmental impact design and not concrete or non-porous materials.
- sidewalks are safer than riding on the road
- bike path on road should be wider; signs on bike/walk path should instruct users to stay to left or right and yield to faster traffic
- Wider areas to walk along the road.

Build Sidewalks/Widen Existing Walkways, Cont.

- shade, water stations, width of walkways (wider)
- Love walking around Duck! Only thing that usually worries me is that there is no division between the road and the pedestrian walkways in town. I also don't like walking at night because most of it is unlit, but that's not as big of a deal. Thanks!
- green space between path and street
- green space between street and sidewalk
- love Duck, the town is wonderful, if the pedestrian walk can only have a small green barrier between the it & the cars then it would be perfect :)
- It would be great if it was a little wider to accommodate all bike/walker traffic in the summer
- Biking as a family is scary! Bike path in town is not sufficient and cars do not stop for bikers/pedestrians in crosswalks. Sidewalks could be wider for joggers and bikers (hard to pass people).

Move Away from Duck Road/NC 12

- Basically it works except in June, July and August. During those months there are way too many bikers, walkers, runners, etc all competing for road space. Duck Deli is a death trap, Wee Winks used to be but now is corrected. I would love it if there were some way to divert all of that pedestrian and bike traffic away from the main road through Duck.
- Probably not feasible, but some type of trail away from hwy 12. I went from Four Seasons to Currituck Lighthouse, early one morning----so many people walking/biking, several of those exercising weren't aware of cars, they were in la-la land. I know you can't discourage that but, the drive was stressful. We will return.
- connected greenways and shared paths throughout the various subdivisions keeping pedestrians, and bikes off of the Duck Road would greatly enhance lives of locals and visitors
- Love Duck and its boardwalk. Would really like to see a connecting path between all roads that terminate/dead end at the ocean. A path that connected the terminus of roads that end at the ocean would allow bikers/walkers/joggers to walk from the north end of Duck to the South end without having to go out on Duck Road. This would provide connectivity to the ocean front as the boardwalk does to the sound. Bill Gray 703-674-6180 wag9463@aol.com
- Walking trails connecting through the communities closer to the beach would be ideal
- narrow walking trails (like are in Sanderling) connecting subdivisions. this would be great when accesses are down after a storm and to get away from all of the traffic on the Duck Trail
- Ideally, construct walk/bike path off Duck Rd behind Scarborough Fair and north of shopping area
- Consider a pedestrian access from the beach to the village so that it would be possible to walk along the beach from homes to the village, instead of along the road.

Pedestrian/Bicyclist/Driver Education and Separation

- The pedestrians and cyclists need to be informed of proper etiquette on the bike path. I have had so many near accidents due to "clueless" children on bikes, parents with strollers, teens on skateboards, etc
- It would be helpful for the police to show more of a presence at busy times in the village of Duck. Bike stops like they have in Southern Shores would also be wonderful. I do bike as well as walk and expect to give pedestrians the right of way. That needs to be made clear and enforced in Duck also.
- Wish bicycles and people could be separated. Often see lots of close calls in summer because the paths in the town get so crowded.
- Educating visitors through signs and information from rental agencies about the speed limit in Duck, the legal requirement to stop at crosswalks for pedestrians, and the need to drive cautiously, always being aware of the likely presence of bicyclists and pedestrians on the Duck Trail on both sides of the road throughout the village.
- Very concerned about walking with bicyclists. They startle me sometimes as they come up right behind me. The "sidewalk" is narrow.
- I would like to see sidewalks on both sides of the highway going north out of the village to ease bike/pedestrian conflict
- Something has to be done with the pedestrian crossings. Visitors are not using them, crossing anywhere it's convenient. I guess the only resort would be tunnels or overpasses...
- The center of Duck needs sidewalks and crosswalks where cars are required to stop when a pedestrian wants to cross.
- In the Village, the lack of a buffer between the road and the pedestrians walking on the shoulder seems to create problems-- particularly at night. Pedestrians walking in groups often stray near the road. However, during our visit early in June, we noticed police cars out just about every evening enforcing the 25 mph speed limit. That is a good first step in increasing pedestrian safety.
- There is a very serious need for signals at crosswalks. I have personally seen several near misses because drivers don't stop for pedestrians in crosswalks. The bike/walking paths become very congested with riders and walkers sharing the paths. This sometimes causes riders and walkers to veer into the heavy traffic as they try to pass others on the paths. Even with traffic at 20 MPH this creates a potentially serious situation for people and oncoming automobiles.
- I love the board walk and agree that bikes should be used on them but riding a bike along the road is not safe. The road is always busy with traffic and so dangerous because walkers and bikers are on both sides of the road going with and against the traffic. And riding or walking at dusk is even more dangerous because there is no lighting - street lights or road/paths lights.
- Route 12 is the major road to get to any dining, stores, etc. The number of bike and pedestrians have increased and it is now dangerous due to the number of cars. Also bikes, pedestrians share a very small area. There needs to be a separate bike path and separate pedestrian walkway

Pedestrian/Bicyclist/Driver Education and Separation, Cont.

- need better/ safer separation of bikes and walkers and cars add marked cross walks- traffic must stop
- Find a way to inform people biking to bike WITH the traffic; walkers to walk against the traffic
- the in-season use of the "pathway" beside Duck Road, on both sides, mandates that something be done. Pedestrians and Bikers, plus REALLY BIG baby strollers, make getting thru the Village of Duck alive VERY difficult....people tend to move into the actual roadway to pass others, or to keep from being hit, or whatever, thus creating extremely hazardous conditions for all. understand there is a space problem here, but believe there should be a BIKE path, as well as a "real" path for walkers/joggers/baby-movers...experienced cyclists use the outside lanes for travel, but I am seeing what I would call "BARELY BIKERS" using those roadside spaces, too, without any apparent thought about CARS needing to pass them...and while the experienced cyclists seem to stay outside their white line, the "vacationing bikers" do not, and they tend to weave out into the main roadway. hope this helps.... Becky Nolan Owner All Ducked Out 1187 Duck Road (c) 571-238-2171 becky@allduckedout.biz
- We love all the things that Duck has done to improve "walkability" in Duck. BUT no one can prevent all the car traffic during the summer and holidays. I think the amount of cars on the road is the main problem especially the drivers who truly don't understand that they HAVE to stop for pedestrians in the crosswalks. Perhaps some sort of education is in order.
- As we know, Duck gets congested with traffic and the best mode of travel is walking or biking. Wider pedestrian/bike paths and more prominent pedestrian crossing markings would be very beneficial without a major construction zone occurring. Benches throughout the town would be an asset.
- One of my biggest fears along Duck Road (primarily during the height of the season, but clearly year round as well) is vehicle traffic coming from the side streets when there are walkers and bikers along NC 12. Some additional signage may be helpful as reminders for cars when coming to the stop sign to watch for pedestrians, and perhaps also for pedestrians/bikers to watch for vehicles coming out of a side street or parking lot.
- I am afraid to drive through Duck for fear of hitting a pedestrian. I think the pedestrian paths need to have a buffer from the roads. The bike trails need to be separate from the pedestrian paths. It is dangerous to ride bikes on the trails, as the cars at intersections have to cross into the bike path in order to see oncoming traffic. It would be better if the bikes had a lane in the road in most locations. Also, the bike path around Sanderling is badly damaged by tree roots, making cycling difficult at best.
- Concerned with young children on bikes in the village. A true bike lane along with pedestrian path in the village would be ideal. Greenway and trail north and south of town is great
- Need more separation between road and pedestrians in the village. Possibly a separate bike path. Also on change over days people pull out of the parking lots without looking both ways. Many near misses to bikes and walkers.

Pedestrian/Bicyclist/Driver Education and Separation, Cont.

- many recreational bicyclists are not familiar with proper riding on streets/paths w/runners & walkers. Not sure how you would educate or inform one week visitors but in my opinion this is a major issue.
- I love to bring my bike to Duck. But it is frustrating to say the least. If I ride in the road, I have cars yell at me (and sometimes throw trash at me). If I ride the path, the pedestrians make rude comments, and I have even had three teenage boys lock elbows, completely block the path forcing me to the grass. I dismounted and was ready to kick but, but the cowards took off. I would much prefer a bike lane on the side of the road, and where the pedestrian path is in the road, a dedicated bike lane. I have a bell on my bike and try be courteous and warn them, but it usually scares them and they step right in my path. So I don't know what to do. Don't get me wrong, I am a pedestrian a lot in Duck also, and I would love to coexist. I do 30+ miles a day when vacationing. If you would like to contact me, gwf@comcast.net
- I personally think improving some on the walkways that are shared by bicyclists and walkers. There are sometimes rude bicyclists that will not move over or just try to run someone over and not being polite. There should be a separate trail for walking pedestrian and then a trail for bicyclists. Families shouldn't have to worry about children being hurt while walking.
- The side walk system is pretty good. Main issue is the conflict between the bike/pedestrian trail - annoying for both - but I guess there's no space for a designated bike lane.
- increase safety awareness pedestrians and bikes on roadway together can be dangerous
- biggest problem is bike/pedestrian on same path - but love Duck and a great job on park area!!
- Would like to see some separations of pedestrian/bike routes, especially through the village area of Duck. Maybe keep the bikes on the road in the current pedestrian/bike lanes and add sidewalks for the pedestrians.
- I think the paths on Duck Road are in fine shape. There is a lot of vehicle traffic which can be unsafe and when there are bikers it can be confusing as to who goes where and which side of the pathway we should be on.

Overall Issues/Views without Suggestions

- My only issue is all the traffic and discourteous bicycle riders.
- First, the problem is not the side streets -- they are walkable even without sidewalks. The problem is that while three lanes are devoted to traffic, pedestrians and bikes must share narrow shoulders on Rt 12 (which, for better or worse, is our Main Street). There needs to be clear separation between the three which is then enforced. Second, destinations must be pedestrian friendly. The decision to allow Wee Winks, the ABS store and Brindley to essentially turn their backs on Route 12 makes that side of Route 12 less pedestrian enticing. Better idea would have been to require sidewalks along Route 12 with front doors to each establishment facing Route 12 to create a pedestrian friendly environment.

Overall Issues/Views without Suggestions, Cont.

- biggest issue is danger of bikers and walkers along roadway in peak season. especially with cars pulling in and out of shopping areas
- The pedestrian traffic in the town of Duck is really bad during summer months with people walking in the streets, crossing unsafely.
- I really have no trouble walking in Duck but getting across traffic can be a problem at times.
- From above. Walkways or paths that cross roads. Bikes should stop and or have to car stop sign before the pathway. Example would be on Four Seasons. Very dangerous.
- We need to address the problems of driving through the village--not just the pedestrian issues. A single pedestrian at a crossing backs up traffic in both direction. What used to be weekend and rainy day traffic backups now occur on weekdays and sunny days as well. Last week I personally observed two pedestrians at a crosswalk talking on cellphones and each other --at the same time--and holding up traffic both ways while they decided whether and when to cross. While the pedestrians may be "happy as clams"--and the Town seeks ways to make them happier, those of us who live and/or work here find driving through the village to be a major transportation problem almost each and every day. I suspect this isn't what you wanted to hear in this survey but sometimes the facts get in the way of the vision.
- Crossing Rt 12 is very dangerous regardless of where you are in Duck N, S or in Town.
- I wish our own street, Jaycrest, had sidewalks.
- Not sure what the answer is. It is too congested and dangerous with all the walkers, bikers, joggers, especially bikes pulling children.
- dont know what could be done in summer. It is too congested and dangerous and not enough space for the number of people. Especially dangerous when entering or exiting streets or shopping areas on foot or in car.
- No one is transporting pedestrians. Theme should reflect "Inspiring Pedestrian Use" or perhaps "Improving Pedestrian Experience"..... <http://www.merriam-webster.com/thesaurus/transporting>
- There is not enough room for a middle traffic lane on Rt. 12 all the way through Duck. I don't see how we can provide a separate sidewalk for pedestrians in addition to the Duck Trail now shared by bikes and pedestrians. And if a sidewalk were provided, I feel sure the tourists would still ride their bikes...in the wrong direction...on it!
- Because parking is so problematic in the shopping areas and because traffic is so heavy, we park at one spot and then walk to the other places we want to shop. Lot's of people are biking outside the marked path and it's hard to cross the street with all the traffic.,
- With children, walking/ biking on st is nerve wracking! I have seen 1 person hit by car & know of others.
- Since we are still waiting for the northern bridge...traffic is terrible in the summer months! My son has been hit by cars turning onto the side streets several times....it has become a dangerous situation. I love Duck and am here most of the year now, but I can see it to be a liability issue.

Overall Issues/Views without Suggestions, Cont.

- Also find it very difficult to drive in Duck in season. Bikes especially travel in path of cars and nearly hit pedestrians.
- I am always nervous when walking along the street in town. My children are grown and when I have grandchildren I will never, never let them bike through town. And when we have guests at our home I strongly urge them not to let their young children be on bikes outside of Four Seasons. I know you all do a great job of keeping the intown speed limit to 25 but the the few feet separating cars, walkers and bikers is just an accident waiting to happen. I cringe when I see little ones wobble/riding along the narrow street path... one slip and a car will on top of them. I walk every day when I'm in Duck but I think this is very dangerous for those not paying strict attention.
- Vacationers not following speed restrictions and tailgating those that do.
- I really like the crosswalks in Sanderling....when a pedestrian is crossing the street they light up.
- I like to walk and ride my bike. Unfortunately, there is too much foot and bike traffic going in both directions on the same side of Duck Road. something needs to be done so that people can safely bike and walk to and from the shops.
- I am concerned, as previously expressed, that enhancing the area for pedestrians, will make it a nightmare for traffic. Traffic flow is really bad this summer....trash trucks on the road, rainy days, end of week shopping. You may not be able to get to the airport, the hospital, work or an appointment because it is so hard to get thru Duck. That will eventually change the desirability of living and vacationing here. However, bicycles in Duck are truly in danger because the sidewalk is not a sidewalk but a shoulder. Pulling out of a parking lot onto NC 12 is an accident waiting to happen.
- The biggest problem is the drainage. We were driving through Duck yesterday, and a couple on bikes crossed at a bad spot, simply because they could not get around the huge puddle in front of Stan White's. It was really unsafe. Generally, however, drivers and walkers seem to work well together with patience. Al and Fran Slingluff 123 Widgeon Drive
- The main problem is cars not stopping at cross walks and bicyclists going down the wrong side of the road
- seeing so many visitors on the road driving, watching the sights and stores instead of the road. I worry pedestrians will get mowed down
- The bike paths in the sanderling area of duck have tree roots coming up through the pavement, making it an extremely bumpy ride! Otherwise I love biking around duck!
- Let's not overdo and citify Duck. It is nice now as a relaxed, beachfront community should be.
- The kids in our group travel to town on their bikes. Soon they will be able to drive. We worry every time. Hopefully a new path will be built for the continued safety of all
- Visibility is often poor with foliage & curvy streets; excellent signage for businesses; streets & driving destinations help drivers attend to driving rather than searching, thus reducing the risk of overseeing peds.
- don't like walking/biking on 12 - too much traffic

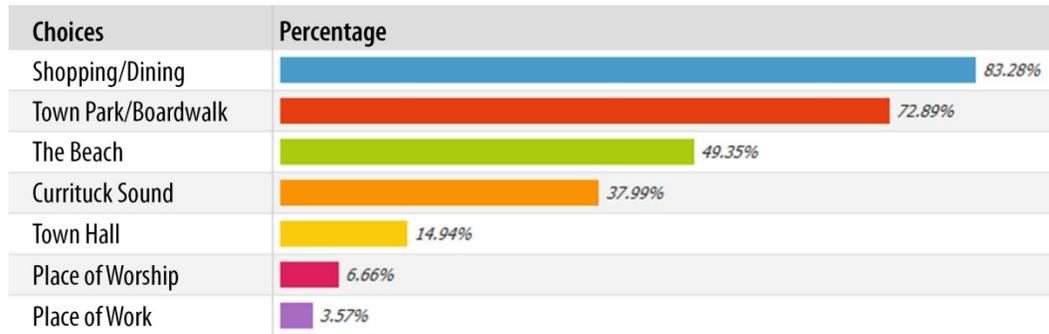
Overall Issues/Views without Suggestions, Cont.

- if walking a biker will run you over.
- cars do not slow down/stop at crosswalks - very disappointing and dangerous
- everyone needs to follow the rules - walk against traffic, ride bikes with traffic. where do skateboarders go? :)
- It is a great town but needs better walking areas.
- Duck Road Feels Unsafe
- Concerned about the safety for bikers as cars pass close by
- Too many people, bikes, strollers on too little space. Dangerous.
- So busy! Makes me fearful of walking in streets with my kids.
- Walkway on main road is too close to road. Very unsafe.
- As I get older, the less relaxing and more stressful walking becomes.
- Duck is awesome. I worry whenever my teen aged girls bike or ride to the shops. Very busy.
- Not sure how to keep people from killing themselves and others on our walkways and roads but at least you can see it coming!
- Have been coming to Duck from the UK at least annually since 2001 and the boardwalk is fantastic and the Town should be rightly proud of this addition. The main problem with walking in Duck is NC12. During the season the flow of traffic is virtually continuous which makes crossing tricky, to say the least, and the combined walkway on either side for pedestrians and cyclists is fraught with danger - cyclists travel too fast and both cyclists and pedestrians seem to switch into "holiday mode" i.e. don't look and don't listen and are all over the place! It would be a shame if street lighting was to be considered- yes it is probably safer at night - but one of the charms of the Town is the lack of light pollution.
- The pedestrian/bicycle traffic through Duck Village is a tragic accident waiting to happen not only because pedestrians/bicyclers do not pay attention, but because of the volume of traffic that passes through Duck Village. As long as there is no other way to access the Currituck County beaches except through Dare County and Duck, and as long as Currituck County neglects its' responsibilities to community safety by not aggressively pursuing a bridge, putting a moratorium on building until that happens, and stopping the construction of mini hotels, Duck's efforts to create a safe environment for our residents and visitors will have little impact.
- Pedestrian crossing of the Duck Road is unsafe. Too many cars that tend to go too fast is the big problem. I'm not sure how to improve this -- pedestrian lights or elevated crossovers. I feel pedestrians crossing the Duck Road, where ever the crossing is attempted, are in danger.
- The pedestrian system is already good - my major concerns when I walk through the village are tourists with bad automobile manners and bicyclists going far too fast in a space shared by walkers.

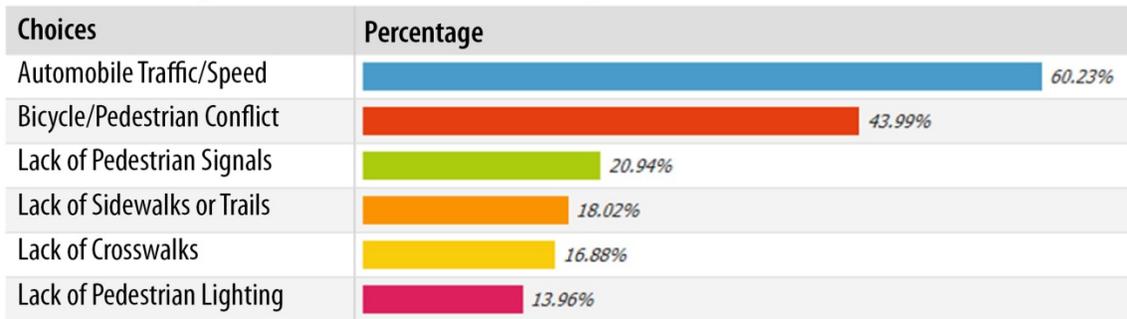
Views Unrelated to Pedestrian Plan

- We already have so many unneeded and unwanted services in Duck. Those of us who are semi-permanent residents--at least the folks I speak to--do not like the summer activities in the park, for example. These things take away from the formerly pristine nature of the town. I personally think you should take a look at when the twice-a-week garbage collection begins. It starts way too early. The town could save money by cutting this back. I could go on and on; but here is the bottom line: Do not continue to waste money on projects that those of you isolated in the Town Hall dream up to justify your existence. Let's start thinking about cutting back; living with fewer tax dollars; and returning Duck to what attracted most of us here, i. e. its undeveloped, natural state, which is perfect for family times.
- OB Voice 7-22-2013 Two vacationers from Pennsylvania walking Monday morning alongside N.C. 12 in Corolla were struck and killed after an SUV ran off the road. my GUESS is that they were much further way from the fog line than they would have been while walking in Duck. nuff said!
- improve beaches
- Have federal govt provide access to army corp of engineers pier and land.
- Just visiting for a few days
- Please improve the traffic coming into duck on check-in days/prime hours. There should be a police officer directing the flow of traffic and not dependent on the traffic lights turning in from 158. The flow is horrible and people do not get thru timely and many get stuck in the intersection blocking when another direction should be going. It took 3 hours to go 20 minutes!
- We feel the Town of Duck is going over board with expenses which do not benefit our full time residence. Our latest tax assessment shows that the town is only interested in what transpires in the town not our communities. We see no reason to try to improve THE EXPERIENCE. No additional revenue will be seen. If we are not correct please supply data to show this will improve the revenue base and reduce our over to top recent assessment. Only areas like DC can afford all of these expensive meaningless studies. REMEMBER what made us special to begin with. I've never heard a complaint from our renters regarding Duck walks etc. being a problem. Chuck Straub 101 Station Bay Drive, Duck

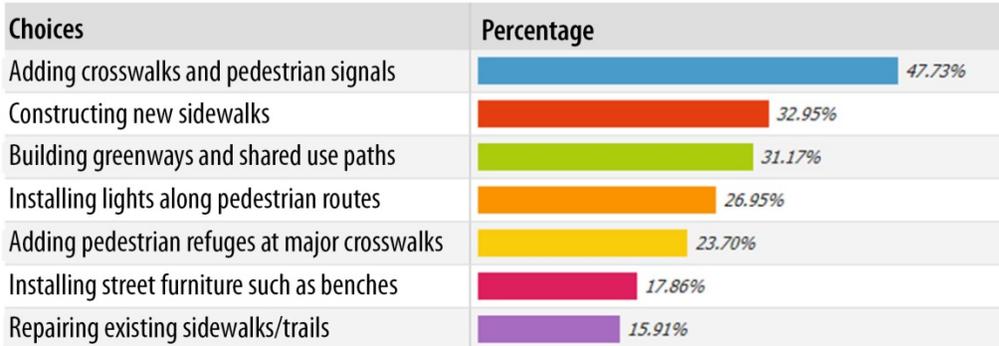
What destinations would you most like to walk to in Duck?



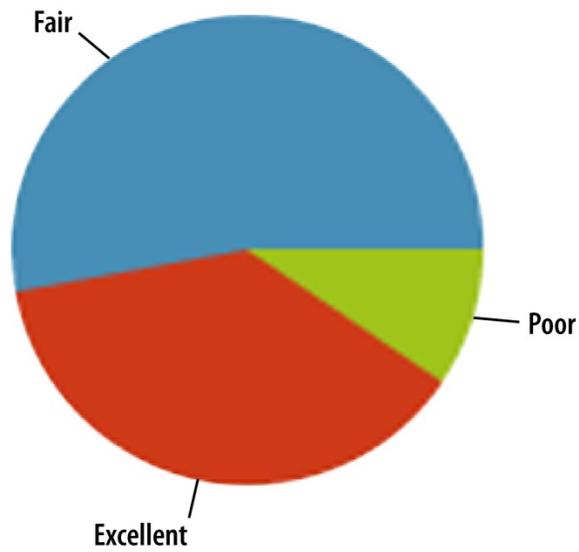
What discourages Respondents from Walking in Duck?



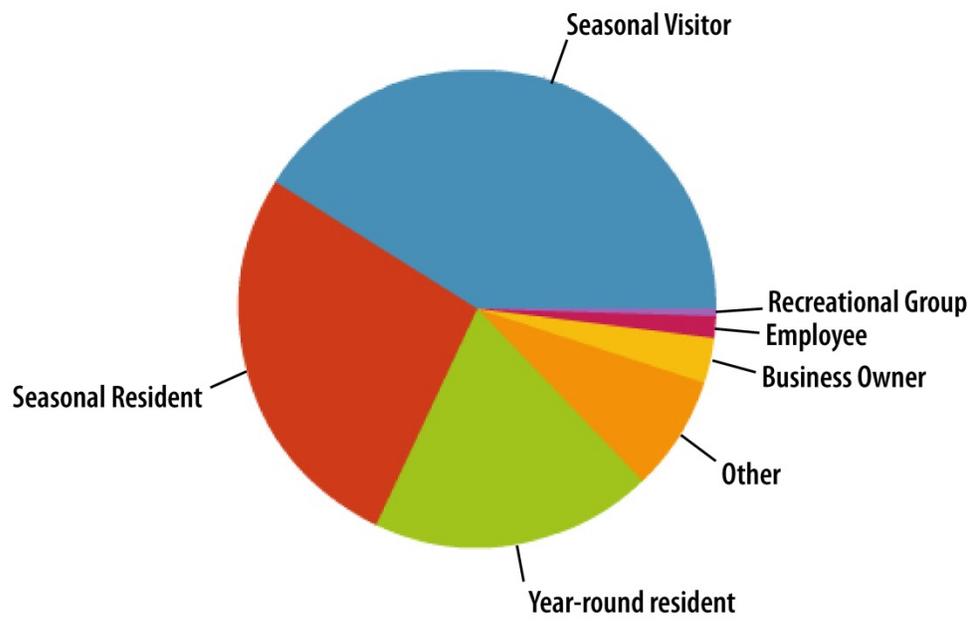
Which of the following improvements would encourage walking in Duck?



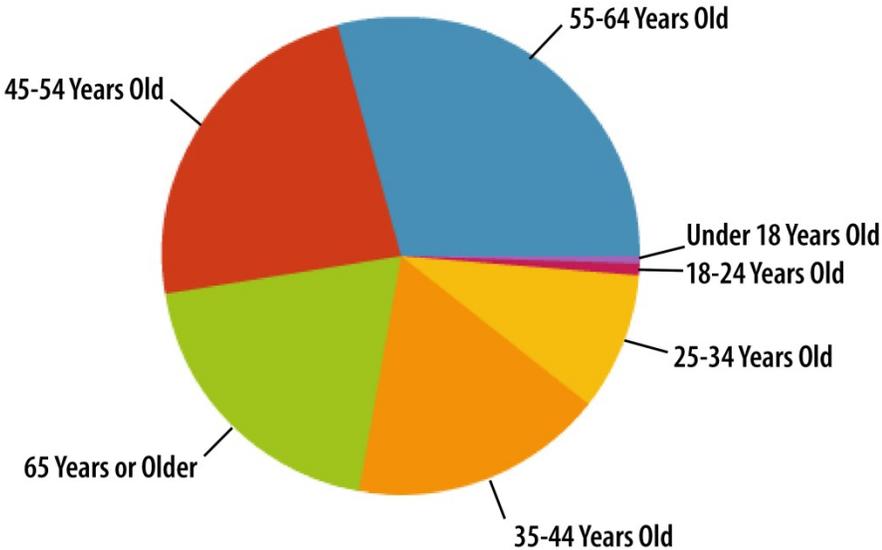
HOW WOULD YOU RATE THE PEDESTRIAN NETWORK IN DUCK



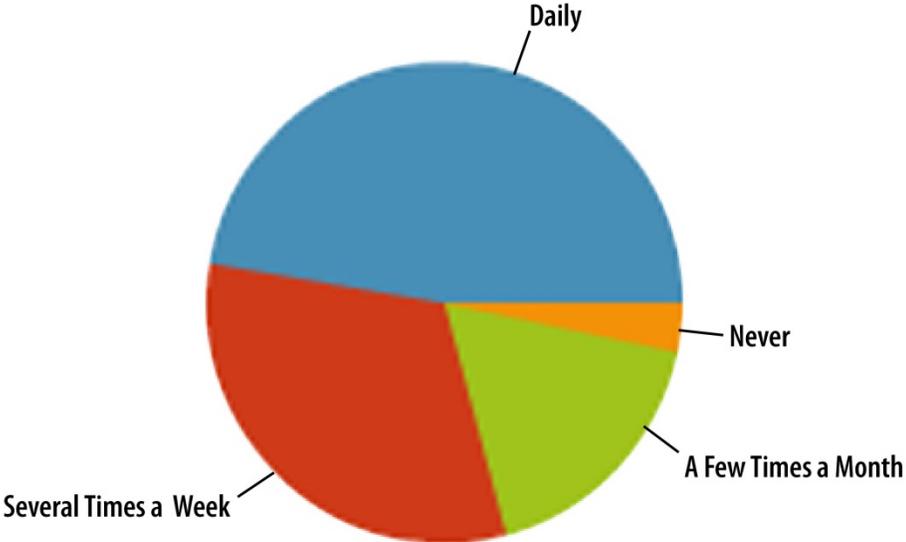
RELATIONSHIP OF RESPONDENTS TO TOWN OF DUCK



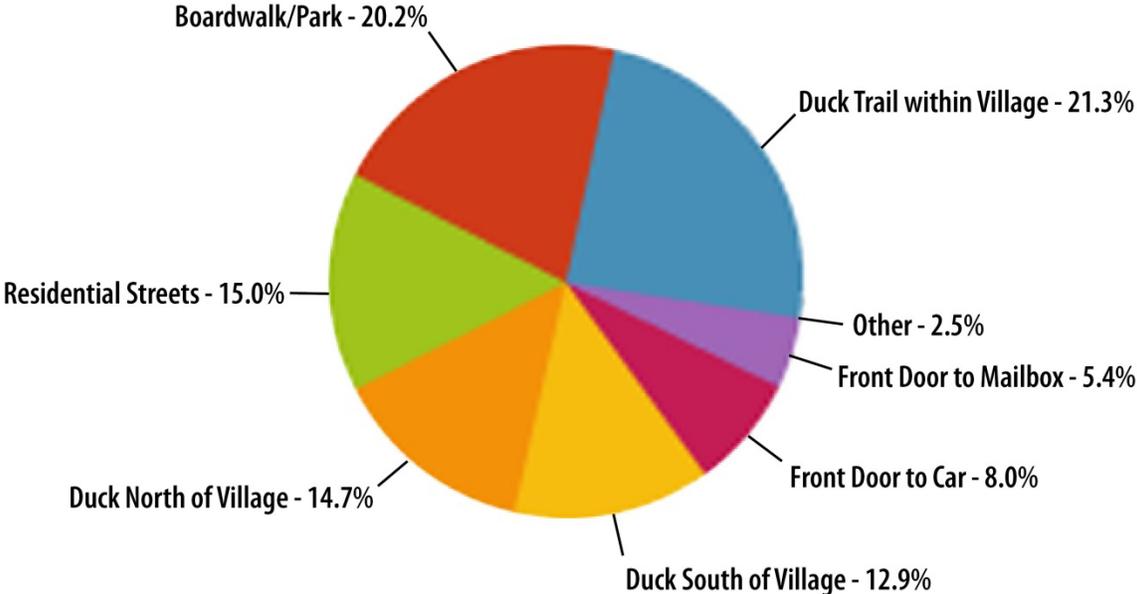
AGE OF RESPONDENT



HOW OFTEN DO YOU WALK/BICYCLE/OTHER IN DUCK



WHERE DO YOU WALK/BIKE/OTHER?



Appendix E: Automated Pedestrian Counter Results

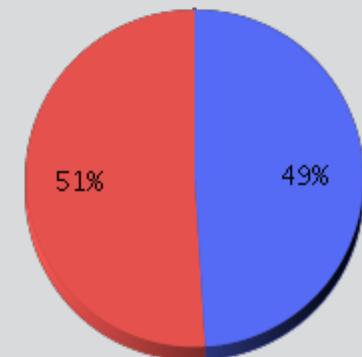
Ped_1

Period Analysed: Thursday 13 June 2013 to Friday 12 July 2013



Key Figures

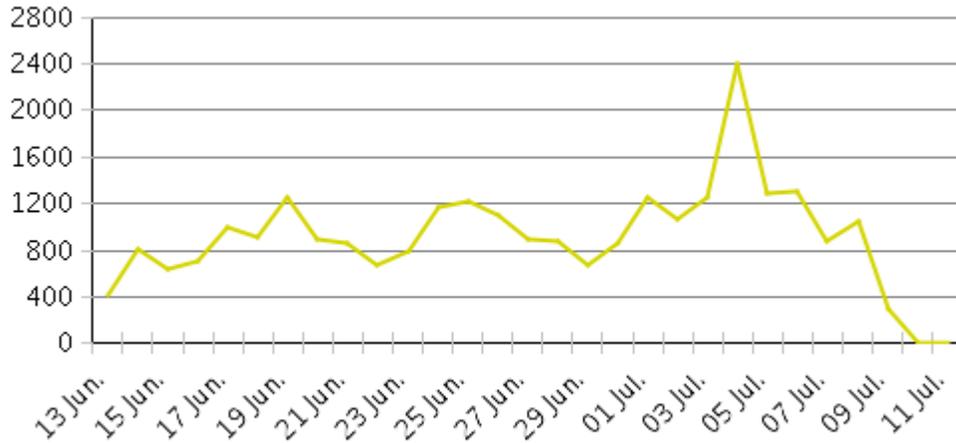
- Total Traffic for the Period Analysed: 26,572
- Daily Average : 916
- Busiest Day of the Week : Thursday
- Busiest Days of the Period Analysed:
 1. Thursday 04 July 2013 (2,392)
 2. Saturday 06 July 2013 (1,307)
 3. Friday 05 July 2013 (1,292)
- Distribution by Direction:
 - Ped_1_IN : 51%
 - Ped_1_OUT : 49%



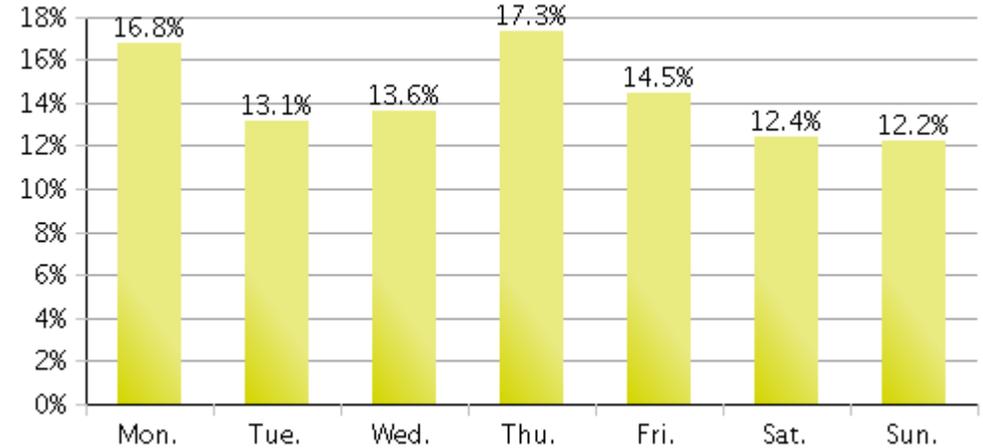
Ped_1

Period Analysed: Thursday 13 June 2013 to Friday 12 July 2013

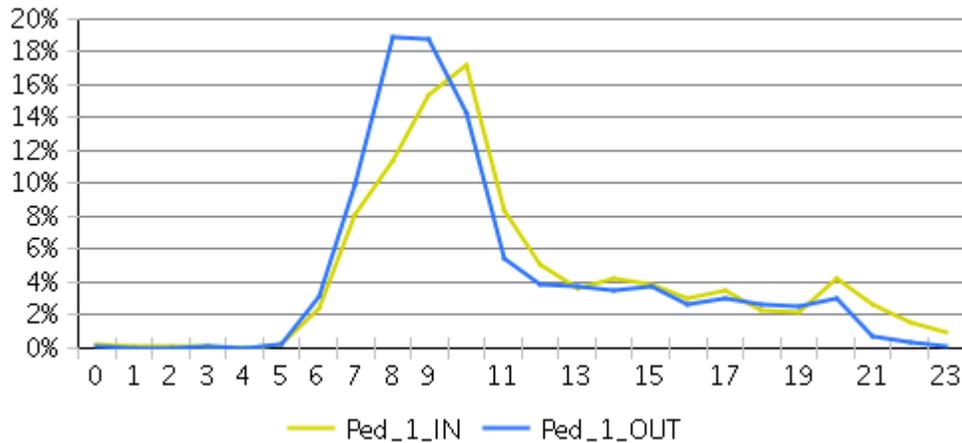
Daily Data



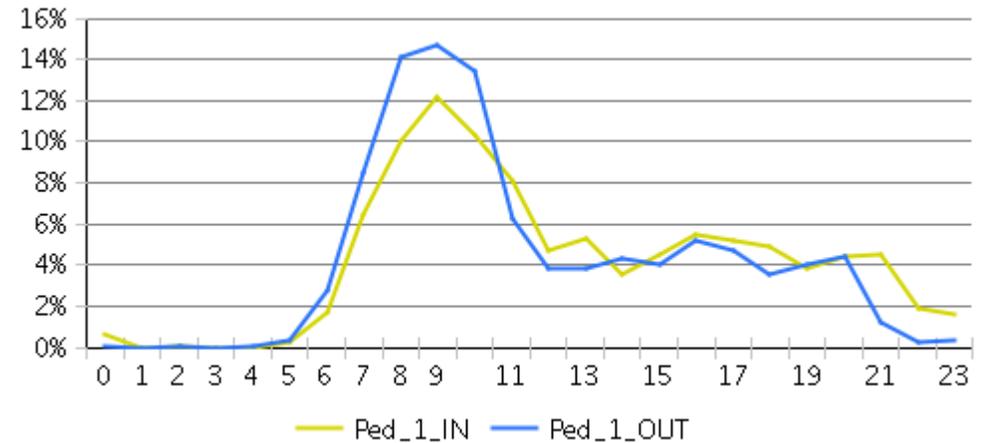
Weekly Profile



Hourly Profile during Weekdays



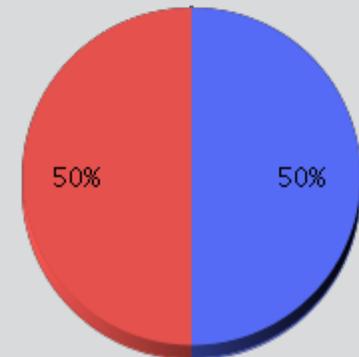
Hourly Profile during the Weekend





Key Figures

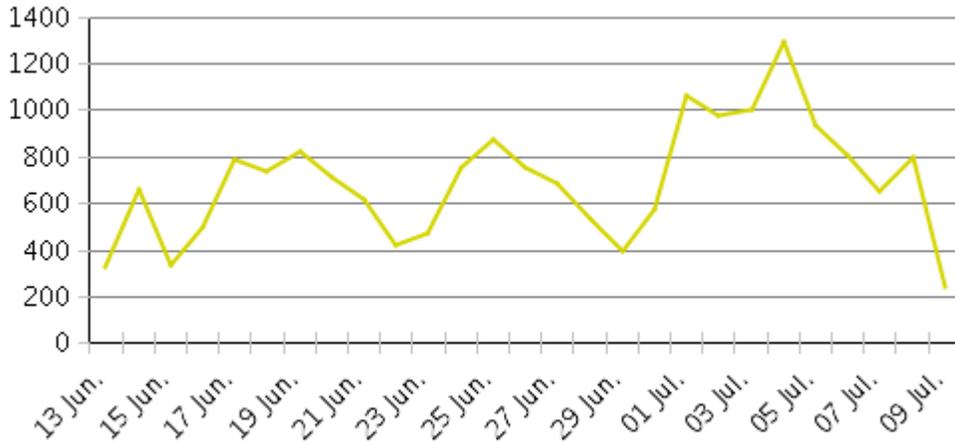
- Total Traffic for the Period Analysed: 18,735
- Daily Average : 694
- Busiest Day of the Week : Monday
- Busiest Days of the Period Analysed:
 1. Thursday 04 July 2013 (1,293)
 2. Monday 01 July 2013 (1,059)
 3. Wednesday 03 July 2013 (1,007)
- Distribution by Direction:
 - Ped_2_IN : 50%
 - Ped_2_OUT : 50%



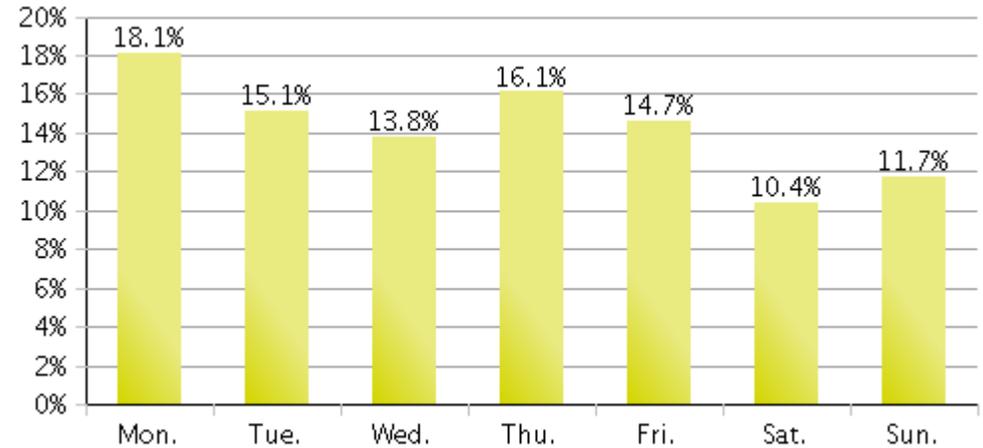
Ped_2

Period Analysed: Thursday 13 June 2013 to Tuesday 09 July 2013

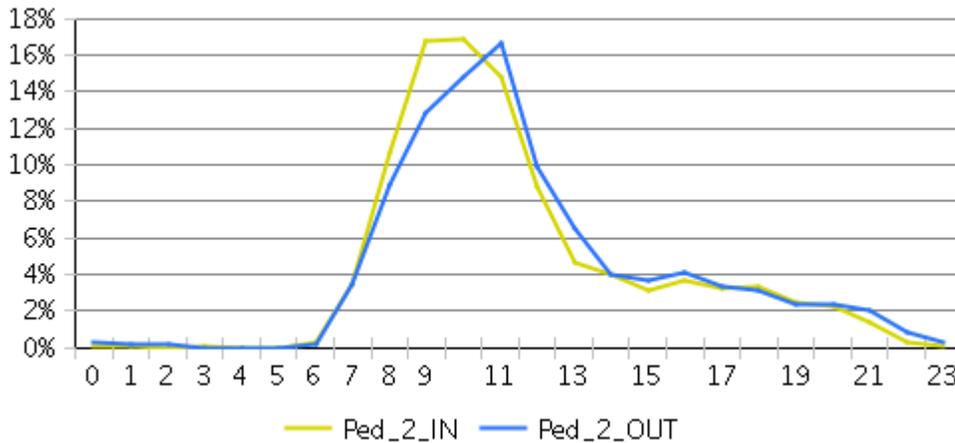
Daily Data



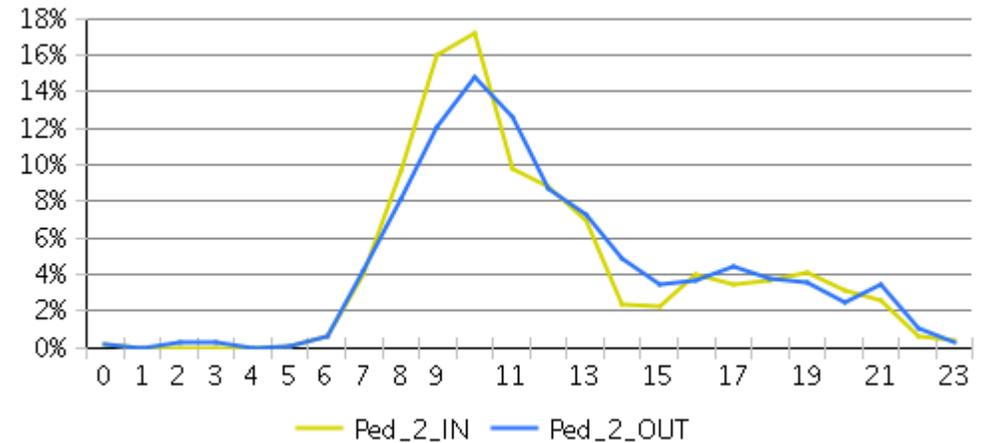
Weekly Profile



Hourly Profile during Weekdays



Hourly Profile during the Weekend



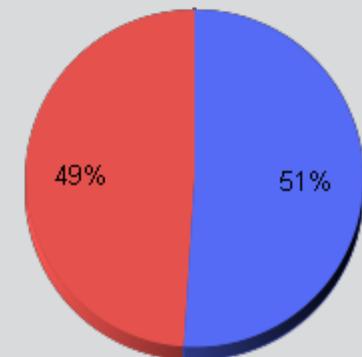


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You can add a picture
in the counter's Eco-Visio file.

Key Figures

- Total Traffic for the Period Analyzed: 32,253
- Daily Average : 1,152
- Busiest Day of the Week : Wednesday
- Busiest Days of the Period Analyzed:
 1. Wednesday 14 August 2013 (2,366)
 2. Thursday 15 August 2013 (1,955)
 3. Wednesday 31 July 2013 (1,871)
- Distribution by Direction:

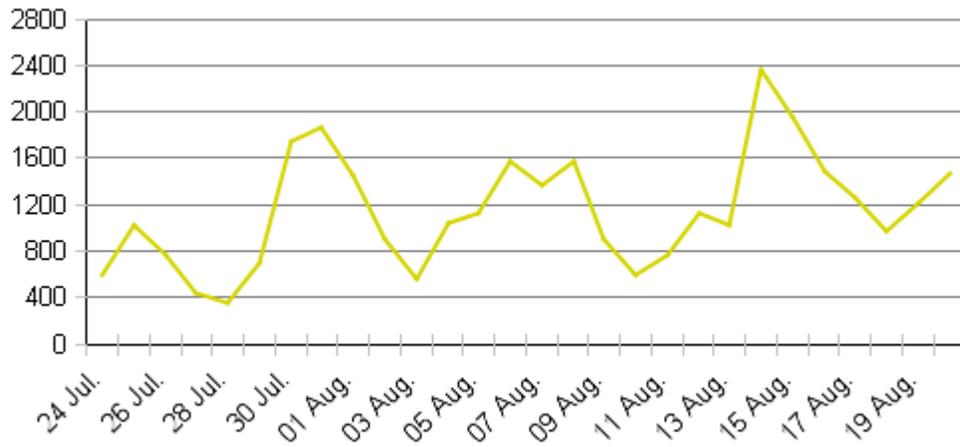
- Ped 2 Heading South : 49%
- Ped 2 Heading North : 51%



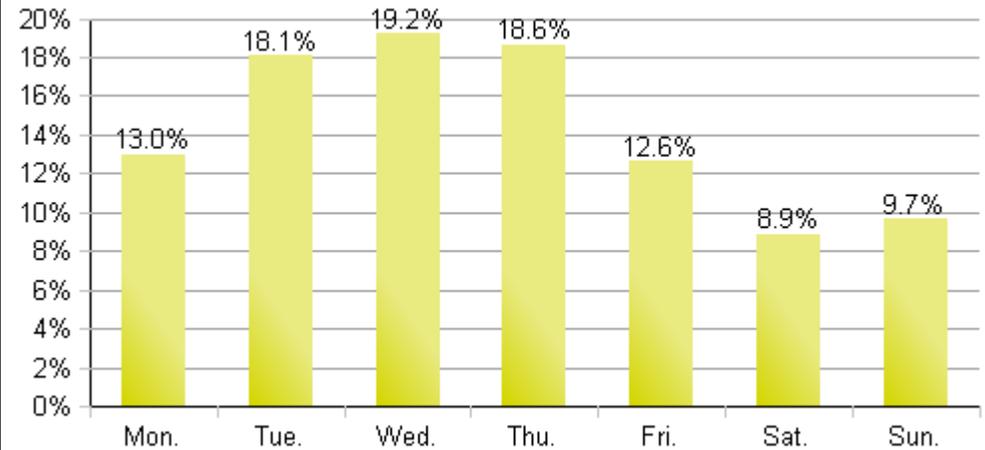
Pedestrian Counter - Boardwalk South

Period Analyzed: Wednesday 24 July 2013 to Tuesday 20 August 2013

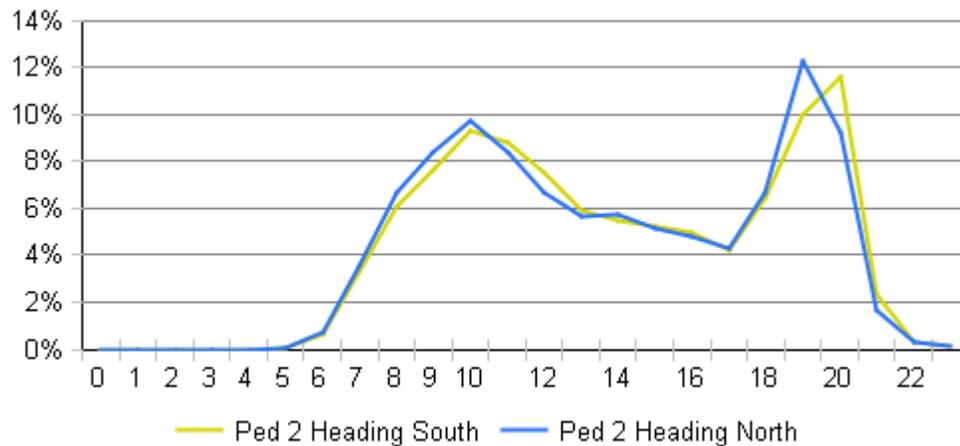
Daily Data



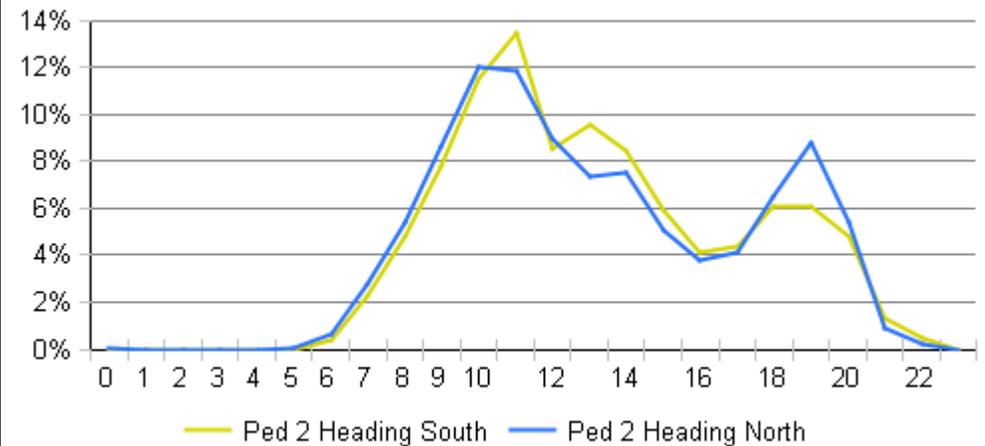
Weekly Profile



Hourly Profile during Weekdays



Hourly Profile during the Weekend



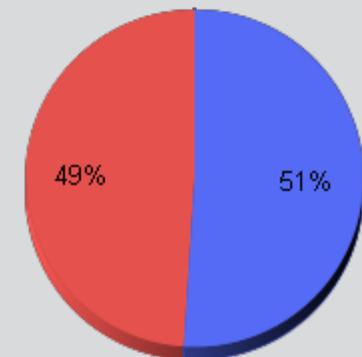


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You can add a picture
in the counter's Eco-Visio file.

Key Figures

- Total Traffic for the Period Analyzed: 39,546
- Daily Average : 1,412
- Busiest Day of the Week : Thursday
- Busiest Days of the Period Analyzed:
 1. Thursday 15 August 2013 (2,698)
 2. Wednesday 14 August 2013 (2,148)
 3. Friday 16 August 2013 (2,143)
- Distribution by Direction:

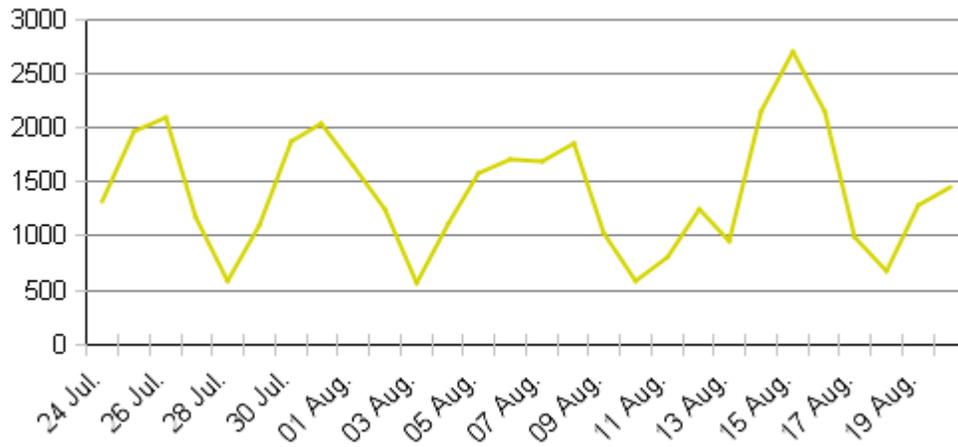
- Ped 1 Heading South : 49%
- Ped 1 Heading North : 51%



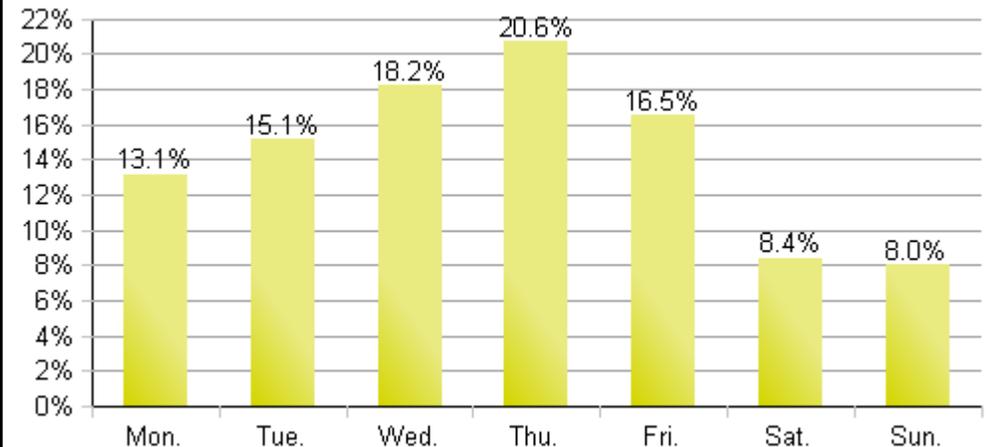
Pedestrian Counter - Boardwalk North

Period Analyzed: Wednesday 24 July 2013 to Tuesday 20 August 2013

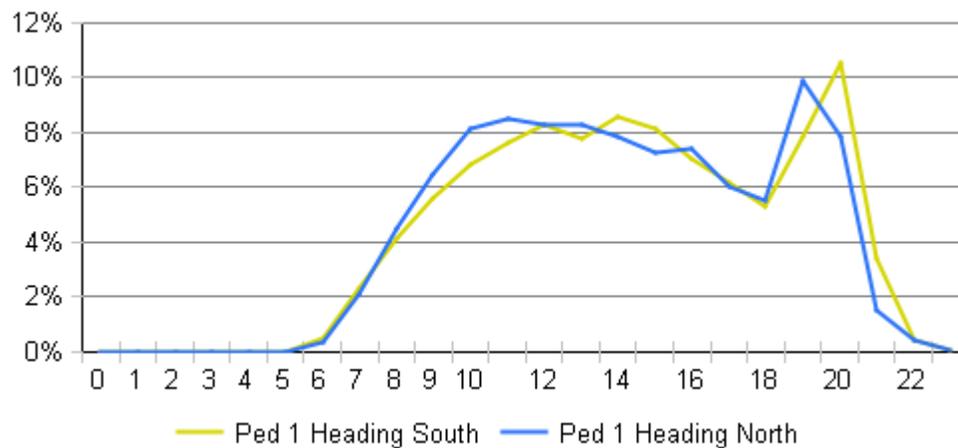
Daily Data



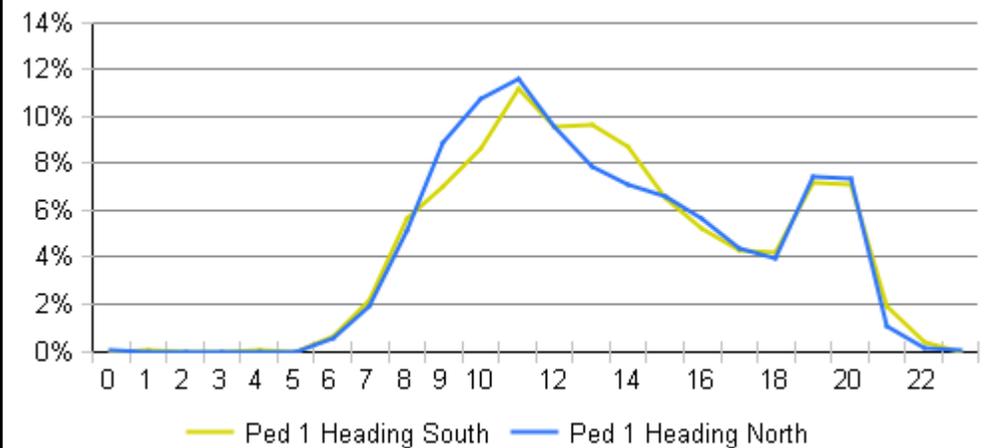
Weekly Profile

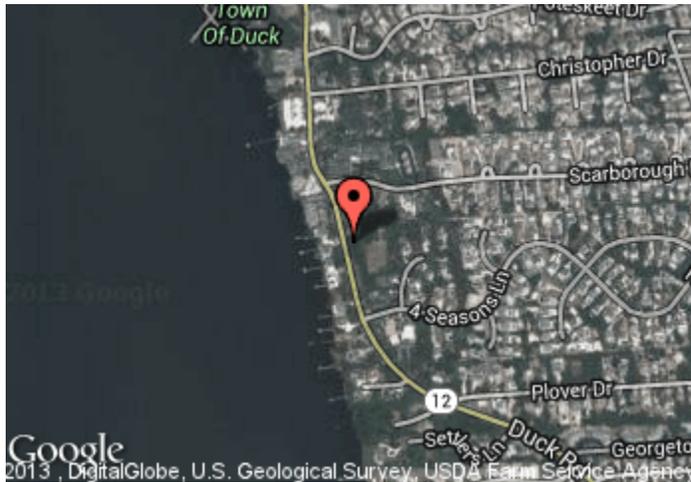


Hourly Profile during Weekdays



Hourly Profile during the Weekend





No picture available.
You can add a picture
in the counter's Eco-Visio file.

Key Figures

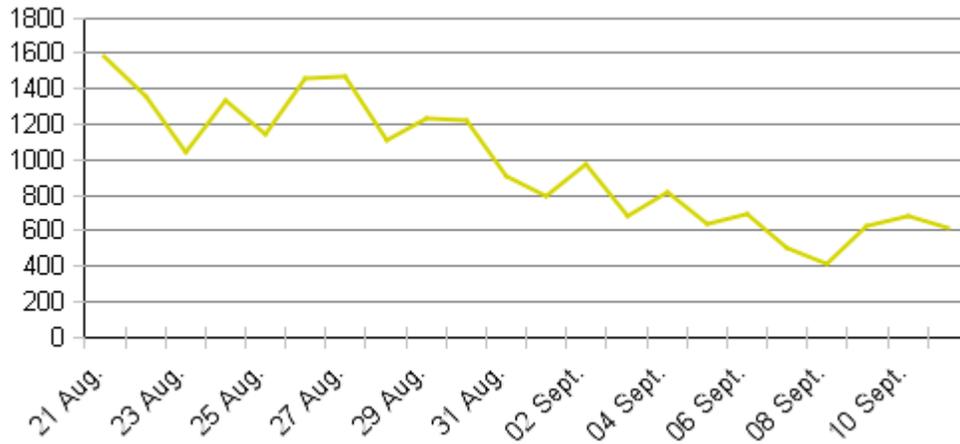
- Total Traffic for the Period Analyzed: 21,312
- Daily Average : 969
- Busiest Day of the Week : Thursday
- Busiest Days of the Period Analyzed:
 1. Wednesday 21 August 2013 (1,577)
 2. Tuesday 27 August 2013 (1,471)
 3. Monday 26 August 2013 (1,458)
- Distribution by Direction:



Pedestrian Counter - NC 12 North of 4 Seasons

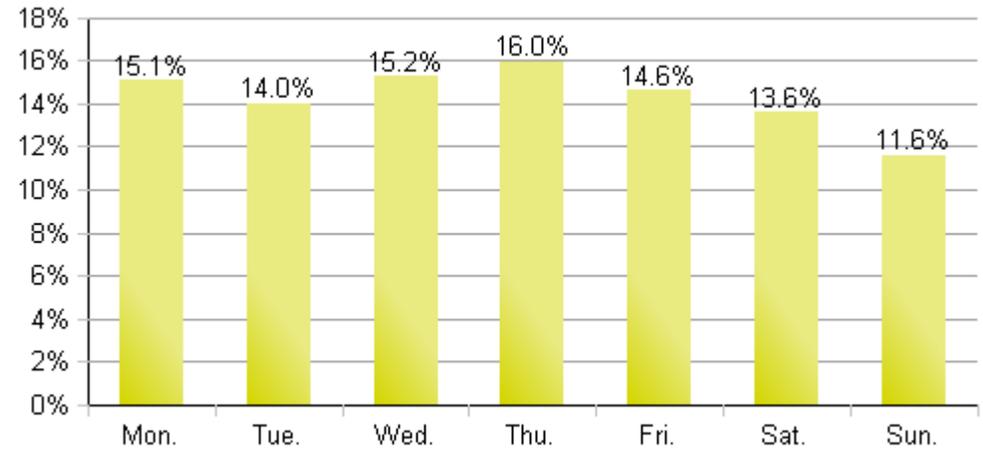
Period Analyzed: Wednesday 21 August 2013 to Wednesday 11 September 2013

Daily Data

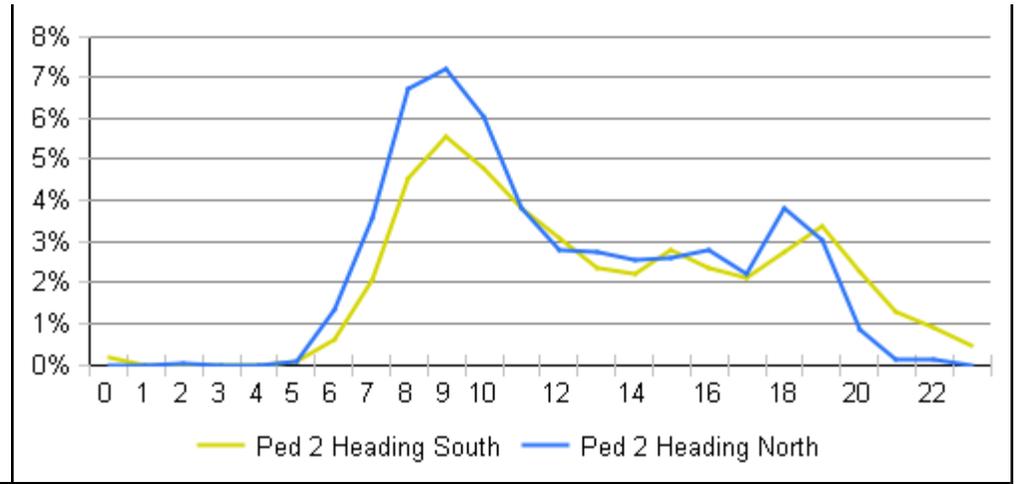
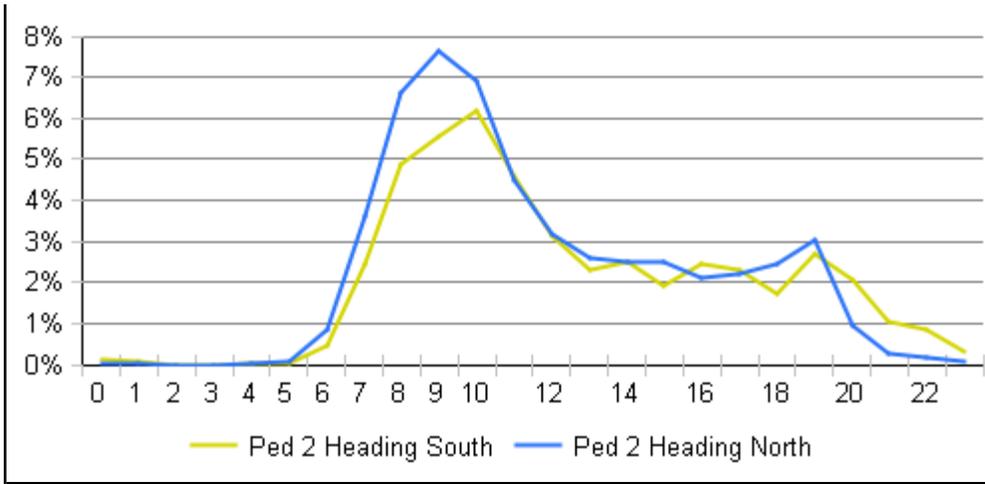


Hourly Profile during Weekdays

Weekly Profile



Hourly Profile during the Weekend





No picture available.
You can add a picture
in the counter's Eco-Visio file.

Key Figures

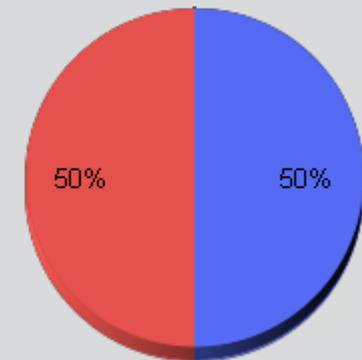
- Total Traffic for the Period Analyzed: 10,410
- Daily Average : 473
- Busiest Day of the Week : Thursday
- Busiest Days of the Period Analyzed:
 1. Wednesday 21 August 2013 (802)
 2. Thursday 22 August 2013 (676)
 3. Monday 26 August 2013 (636)
- Distribution by Direction:

50%

• Ped 1 Heading South :

50%

• Ped 1 Heading North :



Pedestrian Counter - NC 12 North of Sandy Ridge

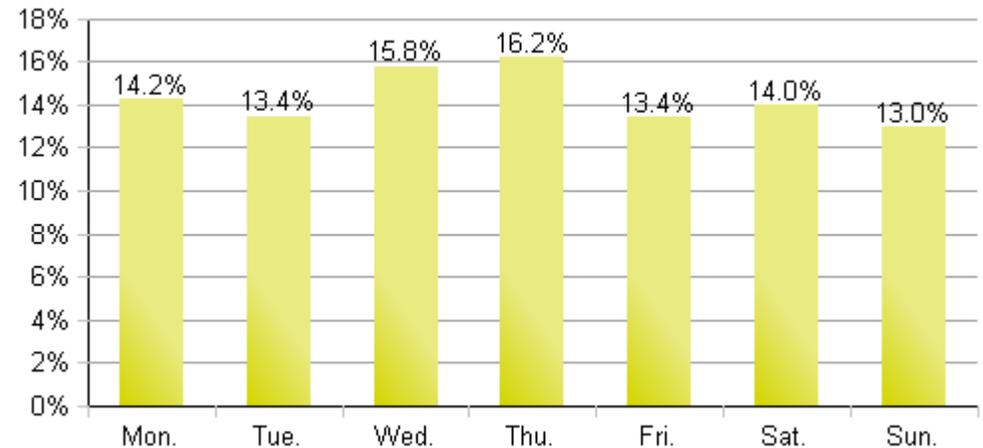
Period Analyzed: Wednesday 21 August 2013 to Wednesday 11 September 2013

Daily Data

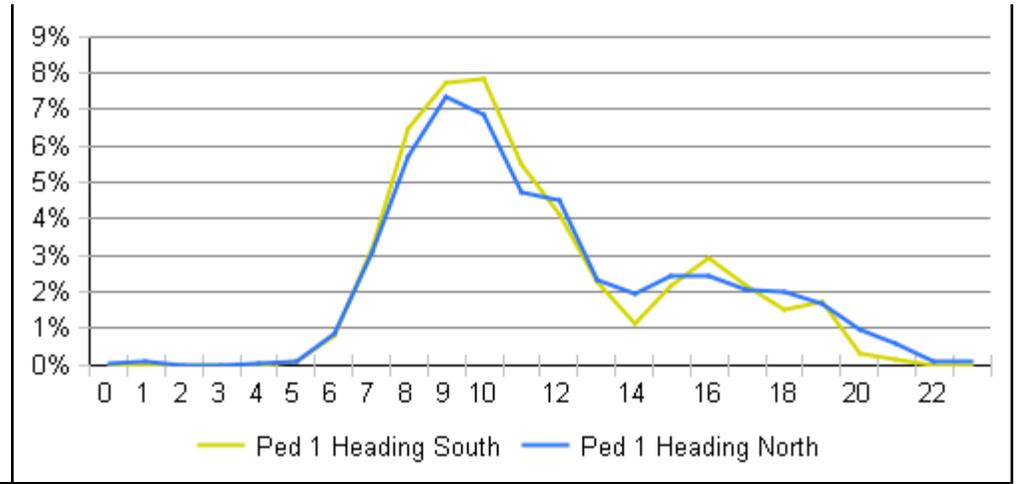
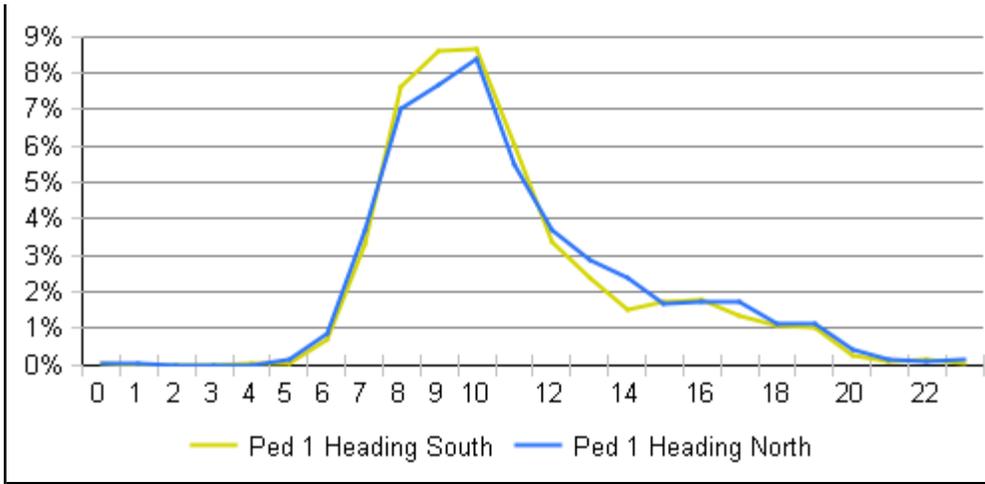


Hourly Profile during Weekdays

Weekly Profile



Hourly Profile during the Weekend





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