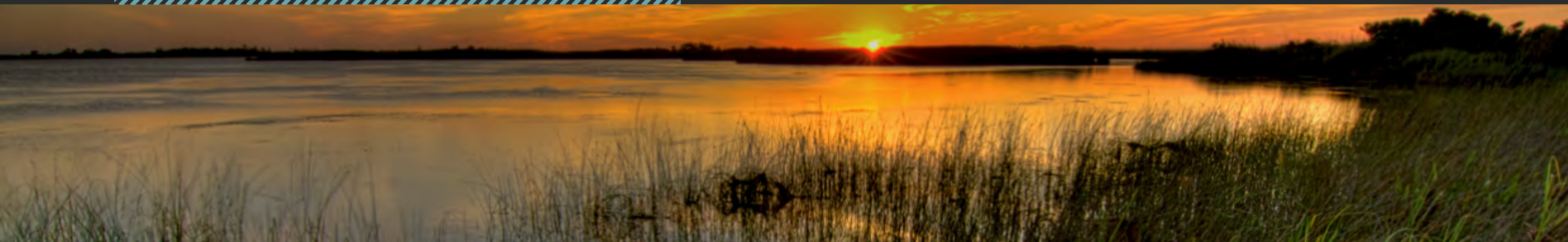


# 1.0 INTRODUCTION



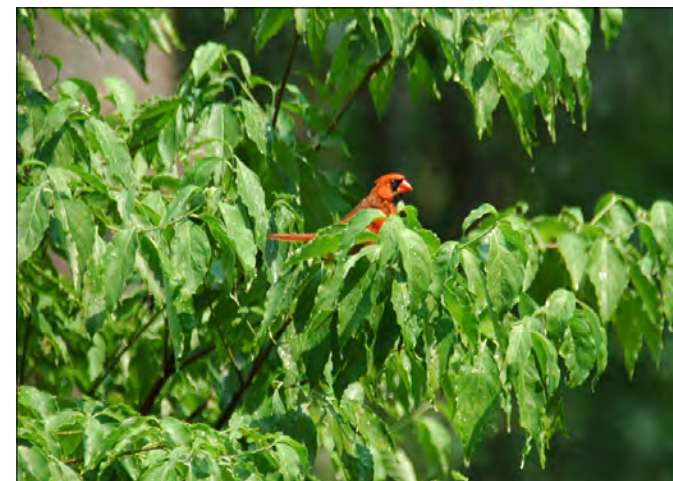
In fiscal year 2011, the City received funding through the Paul S. Sarbanes Transit in Parks Program to study options for providing alternative transportation access to the Back Bay National Wildlife Refuge (BBNWR). Currently, visitors access the BBNWR primarily by automobile, via a congested roadway corridor, and alternatives for non-vehicular travel are limited. This report documents the process and results of the study, which analyzed alternatives to enhance visitor's ability to get to BBNWR by means other than their automobiles.

The BBNWR was established on June 6, 1938 to provide feeding and resting habitat for migratory birds. BBNWR includes over 9,250 acres, and provides critical wildlife habitat along the Atlantic Flyway, while also buffering development and helping protect and improve water quality in Back Bay. BBNWR provides over eight miles of trails, a Visitor Contact Station, interpretive programming, and group educational opportunities. The Visitor Contact Station hosts more than 100,000 visitors per year.

False Cape State Park (FCSP) lies directly south of BBNWR bounded by North Carolina, the Atlantic Ocean, and Back Bay. The park was acquired in 1966, offering 4,321 acres of forests,

dunes, marshes, and islands for exploration and enjoyment by visitors. The park offers facilities for primitive wooded and beach camping in addition to overnight accommodations for 22 guests within the Wash Woods Environmental Center. Access to FCSP is through the BBNWR on the Refuge Tram, from the beach on the Atlantic Ocean side or by boat from the bay side. Only pedestrian land access is available across the North Carolina state line.

Access to BBNWR, FCSP and the Sandbridge Area is provided via Sandbridge Road, a narrow two-lane facility that can become congested during periods of high demand, and Sandpiper Road, a two-lane roadway that provides direct driveway access to homes and businesses in the Sandbridge area. Sandpiper Road includes paved shoulders, originally built in the late 1980s as bike lanes, which sometimes are obstructed by sand, landscaping, trash cans, mail boxes, and other items. Situated between the Sandbridge area and BBNWR is the City of Virginia Beach's Little Island Park, which attracts an average of more than 3,000 visitors per day in June and July.



## 1.1 Study Area and Planning Context

The project study area includes the southeastern portion of the City of Virginia Beach (see Figure 1.1). This area encompasses residential and commercial development in the northern portion of the study area, residential in the Sandbridge Beach resort area, and rural and agricultural lands west of Back Bay. For the elements of the study, consideration was given to key destinations beyond the study area such as the 25/50 Bike Loops, the Virginia Aquarium in Virginia Beach, as well as downtown Norfolk.

Little Island Park, at the southernmost end of Sandbridge Beach, is a City park offering beach access, a fishing pier, recreational facilities, restrooms, and a canoe/kayak launch to Back Bay. The existing 725 space parking lot routinely fills up, and the City is undertaking plans to expand the parking lot to a total of 1,000 spaces. Due to the high number of people accessing Little Island Park, traffic frequently backs up on Sandpiper Road; and because all BBNWR traffic must use Sandpiper Road, Refuge visitors get caught in this congestion during the summer months.

The natural environment within the study area is reflective of the lower coastal plain generally underlain by fine marine sediments such as sandy loams, loams, and clays. Terrain is relatively flat with natural elevations no greater than eight feet. Many of the soil types in the area have drainage classes described as poorly drained or very poorly drained (NRCS 2015). The study area is part of the Currituck Sound watershed draining towards the south into the Albemarle Sound (Hydrologic Unit Code 03010205).

Vegetative communities include a network of upland pine/hardwood forest knolls, upland meadows and fallow farm fields, pine flats, hardwood/cypress drainageways, as well as scrub-shrub and emergent marsh wetlands. Open water habitat is presently

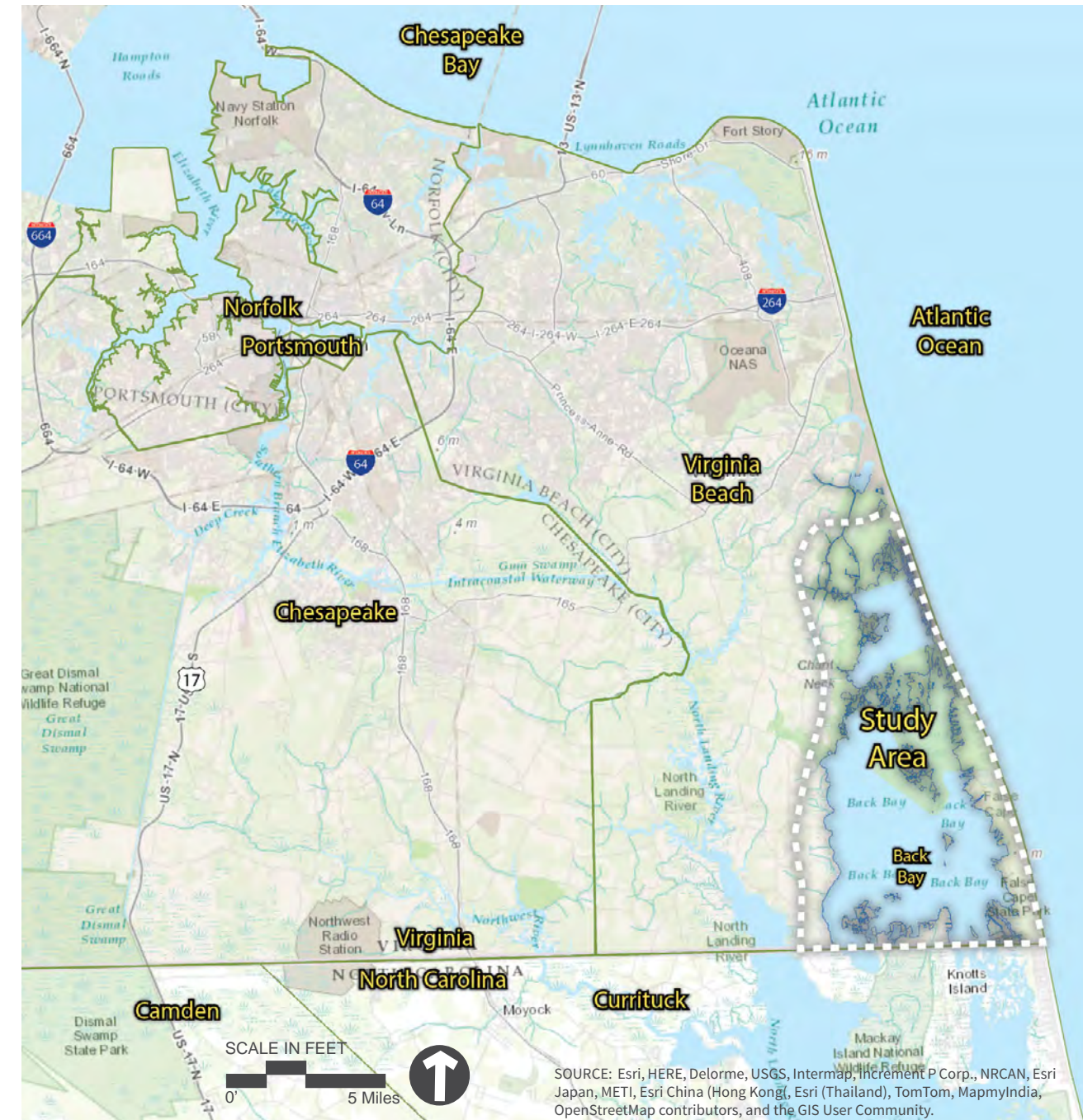
associated with North Bay, Shipps Bay, and other locally named bays located between BBNWR on the east and Charity Neck on the west. Habitats found on the barrier island-side, east side, of the bay include beach and dune systems near the Atlantic Ocean and a variety of forested and marsh habitats along the back side of the barrier island as the topography transitions to the water level.

Back Bay water levels are shallow with an average depth of less than 5.0 feet MSL (mean sea level). Tides are wind driven, resulting in frequent flooding during summer months with sustained southerly winds. The water is more shallow with northerly winds. The water is fed mostly by springs and surface water maintaining a fresh to slightly brackish salinity level.

This natural environment provides the ideal place for people to enjoy wildlife photography and observation, environmental education and interpretation, hunting, and fishing. As participants in the natural environment through the alternative modes of transportation studied here, visitors may foster an appreciation for wildlife and habitat.

The study team's review of existing documents included the following plans and studies relative to the project area:

- ◆ Back Bay National Wildlife Refuge Comprehensive Conservation Plan, September 2010
- ◆ City of Virginia Beach Comprehensive Plan, 2009
- ◆ City of Virginia Beach Bikeways and Trails Plan, 2011
- ◆ City of Virginia Beach Sandbridge Corridor Improvements Study, 2002
- ◆ City of Virginia Beach The Green Sea Blueway and Greenway Management Plan, 2015

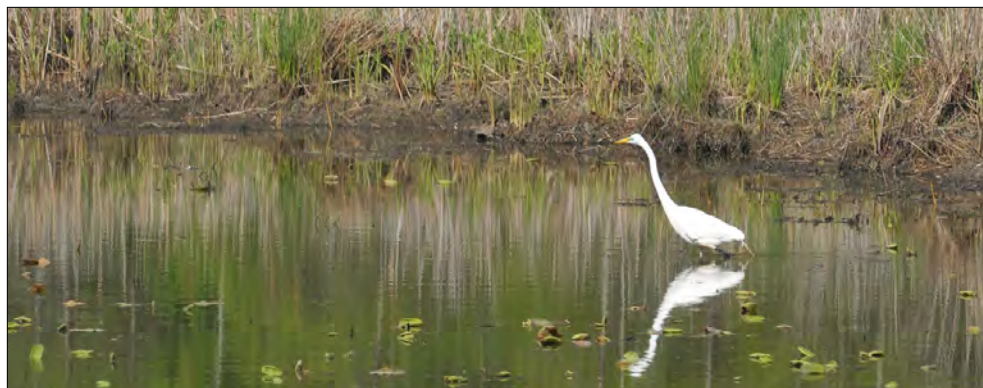


1.1

Vicinity Map

### 1.1.1 Back Bay National Wildlife Refuge Comprehensive Conservation Plan, 2010

U.S. Fish and Wildlife Service (FWS) manages BBNWR, which provides a sustainable land management ecosystem within the Audubon Atlantic Flyway, a north-south migration corridor from eastern Canada to the Bahamas used by many species of North American birds. The strategic location of BBNWR within the flyway is one of the primary reasons for the area's designation as a National Wildlife Refuge. According to the BBNWR Comprehensive Conservation Plan (2010), water quality has seen long-term improvement, yet at the same time waterfowl and submerged aquatic vegetation have seen declines. This apparent contradiction reflects the complex and regional relationships among various environmental factors helping to shape the Refuge and the study area. Since the 1990s, the BBNWR has doubled in geographic area, and this land acquisition opens the possibility for new visitor facilities along the western border of the Refuge; in fact there are plans for a future Visitor Contact Station on FWS-owned property in the southwest corner of the intersection of Sandbridge Road and New Bridge Road. The study assumes the future Visitor Contact Station is in use; however, the success of the alternatives are not solely dependent on the construction of it. The alternatives within this study support Goals 5 and 7 of the Comprehensive Plan.



## REFUGE GOALS

OUR PLANNING TEAM DEVELOPED THESE GOALS AFTER REVIEWING THE REFUGE PURPOSES, THE MISSION OF THE SERVICE AND REFUGE SYSTEM, OUR PROPOSED VISION, PUBLIC AND PARTNER COMMENTS, AND THE MANDATES, PLANS AND CONSERVATION STRATEGIES.

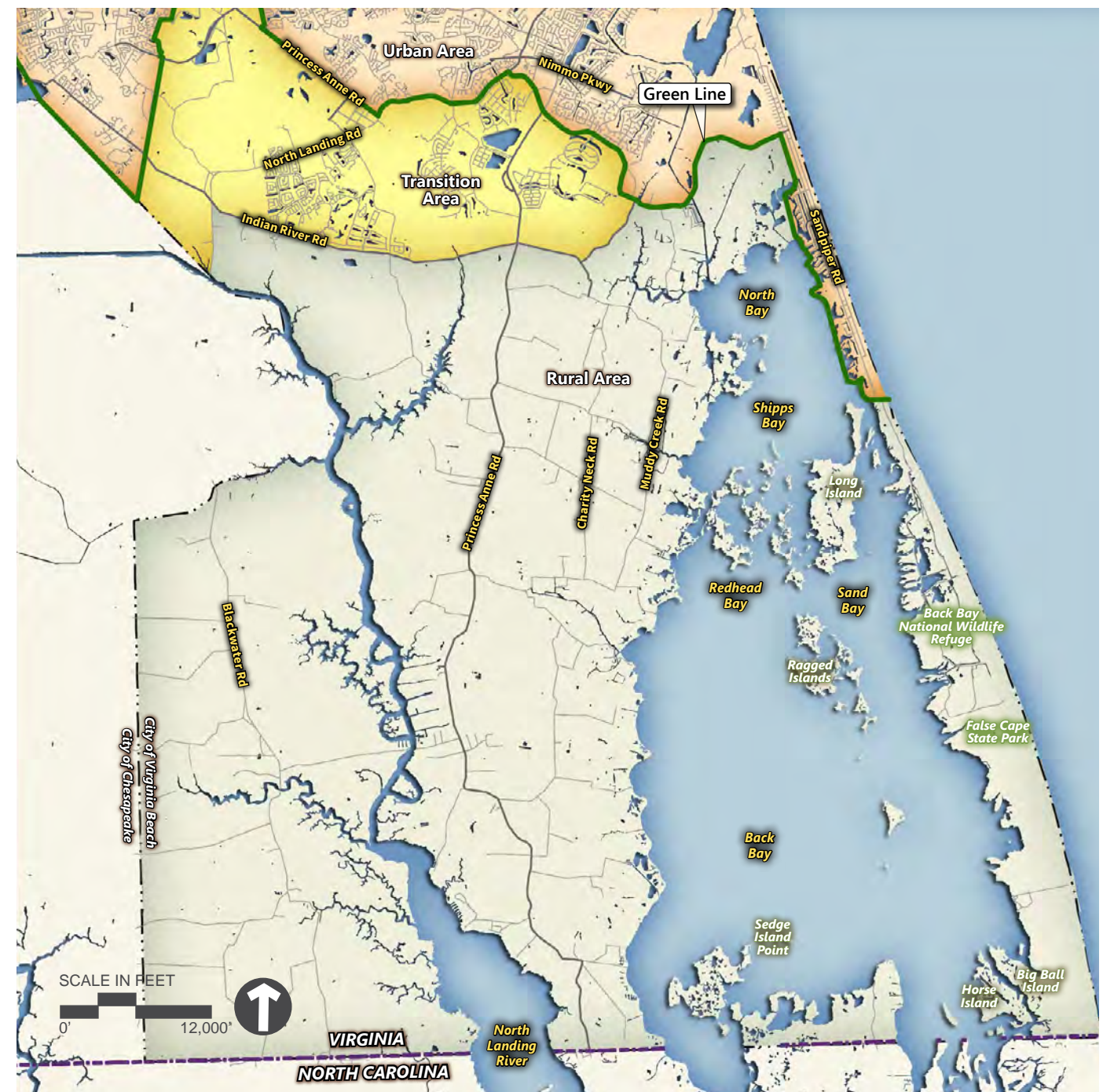
- GOAL 1** MAINTAIN AND ENHANCE A DIVERSITY OF WETLAND HABITATS FOR MIGRATORY BIRDS.
- GOAL 2** ENHANCE AND PRESERVE NATIVE WOODLAND DIVERSITY AND HEALTH.
- GOAL 3** MANAGE BEACH AND DUNES TO PRESERVE AND PROTECT MIGRATORY BIRD AND OTHER WILDLIFE HABITATS.
- GOAL 4** PROVIDE HEALTHY NATURAL ENVIRONMENTS FOR NATIVE FISH, WILDLIFE, AND PLANT POPULATIONS (WITH SPECIAL CONSIDERATION TO THOSE SPECIES WHOSE SURVIVAL IS IN JEOPARDY).
- GOAL 5** PROVIDE ADDITIONAL VIEWING OPPORTUNITIES OF MIGRATORY BIRDS AND OTHER WILDLIFE TO INCREASE THE GENERAL PUBLIC'S APPRECIATION AND SUPPORT OF NATURAL RESOURCES.
- GOAL 6** PROVIDE AND EXPAND HUNTING AND FISHING OPPORTUNITIES TO THE PUBLIC WHERE COMPATIBLE WITH REFUGE PURPOSES.
- GOAL 7** PROMOTE UNDERSTANDING AND APPRECIATION FOR THE CONSERVATION OF FISH, WILDLIFE AND THEIR HABITATS AND THE ROLE OF THE REFUGE IN THIS EFFORT THROUGH EFFECTIVE COMMUNITY OUTREACH PROGRAMS AND PARTNERSHIPS.

- BACK BAY NATIONAL WILDLIFE REFUGE COMPREHENSIVE  
CONSERVATION PLAN, SEPTEMBER 2010

1.1.2 City of Virginia Beach Comprehensive Plan, 2009

The study area as shown in Figure 1.1 includes several area designations in the City's Comprehensive Plan, reflecting the southern edge of land use development and predominance of open space, estuarine, and agricultural features. Sandbridge Road is designated as the "Green Line", which "is the boundary between the more densely populated and higher intensity urban and suburban land use areas of the City, which are intended to be served by a full range of public infrastructure and services, and the less-populated lower density, recreational and rural areas, which are characterized by an abundance of: natural resources; larger open spaces, including Federal, state, and local parks; and the City's prime agricultural lands."

The bulk of the study area falls within the City's Rural Area, intended to promote agriculture, protect wildlife habitat, and maintain a rural community. The portion of the study area west of New Bridge Road, north of Indian River Road, and south of Sandbridge Road falls within the Transition Area, which is meant to serve as a buffer between the Urban and Rural areas. Lands north of Sandbridge Road and along Sandpiper Road fall within the Urban Area, intended to protect the character, economic value, and aesthetic quality of stable neighborhoods and commercial centers. The Sandbridge Community is designated as a Suburban Focus Area in which the City seeks to retain the existing neighborhood character, with limited commercial uses and public parking in a way that supports the environmental objectives of BBNWR.



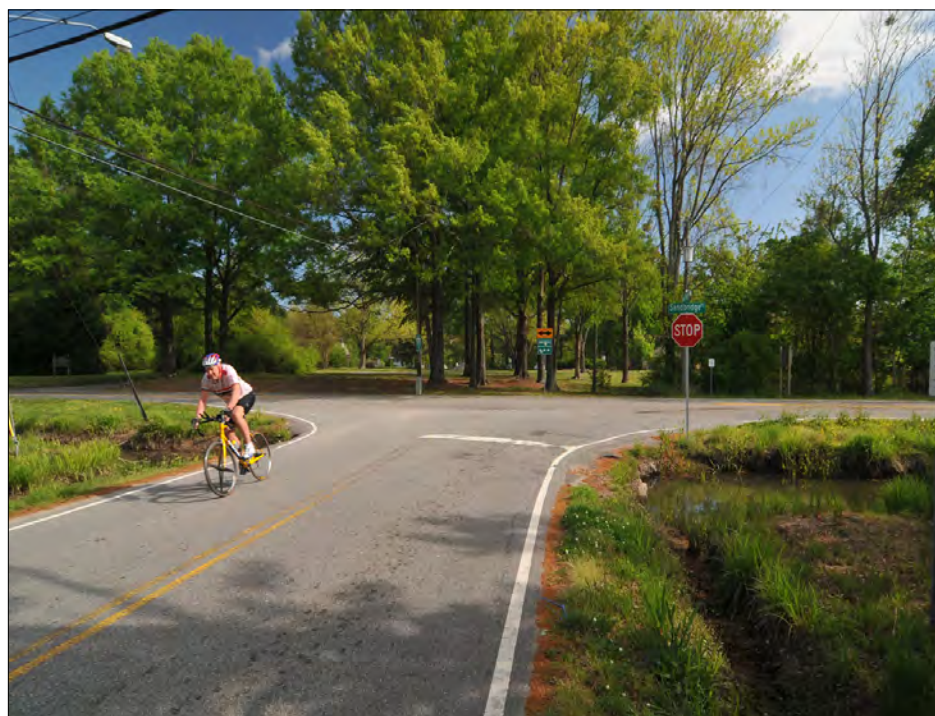
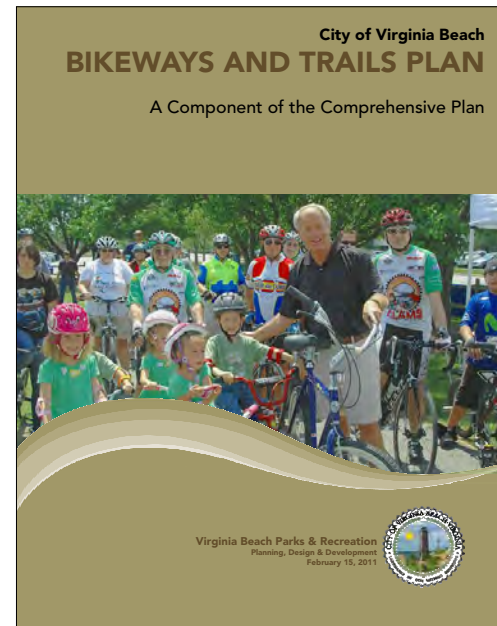
1.2

Rural, Urban, and Transition Areas

1.1.3 City of Virginia Beach Bikeways and Trails Plan, 2011

The City's Bikeways and Trails Plan is a component of the Comprehensive Plan, and calls for a system of improvements within the study area as shown in Figure 1.3, including:

- ◆ a shared use path (SUP) within the Nimmo Parkway ROW east of Albuquerque Road;
- ◆ a combination of on-road and off-road facilities along Sandbridge Road;
- ◆ on-road facilities on Sandpiper Road;
- ◆ a combination of on-road and off-road facilities along New Bridge Road; and
- ◆ on-road facilities for roadways west of Back Bay.



1.3

Bikeways and Trails

#### 1.1.4 City of Virginia Beach Sandbridge Corridor Improvements Study, 2002

In 2002, the City completed the Sandbridge Corridor Improvements Study, which considered improving the road to current standards to enhance safety and operation. Although the study did not foresee adding lanes to the

roadway, various alternative designs for alignment, cross-section, and drainage totaled improvement costs which ranged from \$17.2 to \$23.2 million in 2002 dollars. The City has implemented several localized safety improvements along Sandbridge Road since the time of the study.

#### 1.1.5 The Green Sea Blueway and Greenway Management Plan 2015

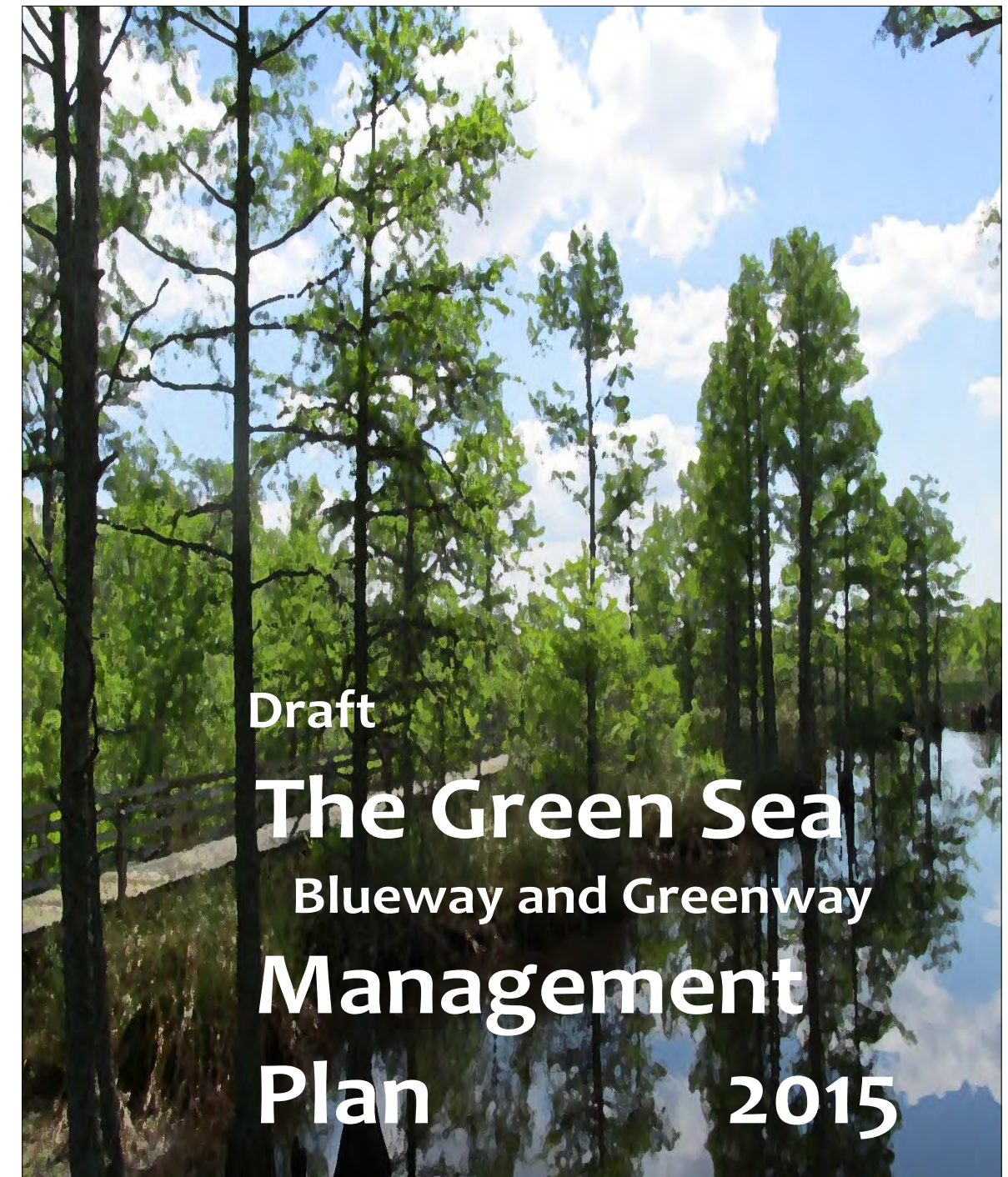
The Green Sea Blueway and Greenway Management Plan (published in the spring of 2015) built on multiple conservation and natural resource management plans for the Southern watershed area, now referred to as the Southern Rivers watershed. This area includes Back Bay, the North Landing River and the Northwest River. "It provides a proposed framework to manage a system of natural open space areas, sustainable uses, and facilities within the Green Sea area. [The] plan seeks to cultivate long-term stewardship of natural and cultural resources through education, protection of ecological integrity, and by providing opportunities for public enjoyment through low impact outdoor recreation."

The NPS publicizes that one of eleven National Wildlife Refuges of the Charles Kuralt Trail is BBNWR. The Virginia Department of Game and Inland Fisheries identifies the Seashore to Cypress Loop of the Virginia Birding and Wildlife Trail with waypoints within BBNWR and FCSP. Both BBNWR and FCSP draw anglers, bird watchers, campers, and beach comers alike. The system of trails and blueways broaden other systems within common social and ecological goals of active living through links natural wildlife habitats.

#### 1.1.6 Sandbridge Road – Nimmo Parkway Phase VII-A

The City has a design project underway to improve Sandbridge Road from its intersection with the Nimmo Parkway ROW, east to Sandpiper Road. The project scope includes straightening the two curves in the existing alignment, raising the road elevation to reduce the chances of flooding and adding a SUP on each side of the road to

increase bicycle and pedestrian connectivity between the Red Mill and Sandbridge Beach areas of Virginia Beach. This project (CIP 2-078) falls in line with the Back Bay Refuge Trail, an important element within this study. The construction of this segment of the trail would be built as a part of this roadway project.



Draft  
**The Green Sea  
Blueway and Greenway  
Management  
Plan 2015**

## 1.2 Alternative Transportation Study

**P**ublic access to federally owned BBNWR is challenging on a variety of issues:

- ◆ congestion on Sandbridge and Sandpiper Roads;
- ◆ activity associated with rental turnovers;
- ◆ peak visitation on holidays and weekends at Little Island City Park;
- ◆ vulnerability to coastal flooding; and
- ◆ safety of the roadways.

## 1.3 Methodology and Report Structure

**T**he Alternative Transportation Study began with an extensive public outreach effort which will be described in Chapter 3. The study team used various media and tools to raise awareness about the study and provide opportunities for public comment. The study team conducted a Citizen Information Meeting (CIM) early in the process, followed by an open comment period. The CIM and associated information explained the initial alternatives identified in the City's grant application, and solicited public input on potential additional alternatives. The study team compiled comments from the CIM, online forms, and other sources into a CIM report included in the Appendix to this study.

The Technical Advisory Committee (TAC) comprised of representatives from the BBNWR, FCSP, Hampton Roads Transit (HRT), and City staff, guided the study. The TAC provided guidance on the details of the public outreach campaign, helped to solicit public input, and conducted

The Back Bay National Wildlife Refuge Alternative Transportation Study is an evaluation of alternative solutions and transportation modes to bring visitors to the Back Bay National Wildlife Refuge other than in their personal motorized vehicles. The transportation options identified in this study are intended to meet the following goals:

- ◆ protect sensitive natural, cultural, and historic resources;
- ◆ enhance visitor mobility, accessibility, and safety;

- ◆ improve visitor education, recreation, and health;
- ◆ reduce traffic congestion; and
- ◆ reduce pollution.

a pre-screening exercise to review the range of potential alternatives suggested by the public. Following the pre-screening activity, the TAC scored the final alternatives against the Measures of Effectiveness (MOE) which will be described in Chapter 4. After analysis of alternatives and production of the draft report, the TAC reviewed the draft report and provided comments.

Following the identification of alternatives, the study team performed an extensive data collection effort. This included conducting aerial survey, ground survey, and wetland delineation of trail corridors, performing site walkovers at canoe/kayak launch sites; performing cultural resource research, hazardous material investigation, and geotechnical analyses; and collecting traffic data in the study area.

Utilizing the data collected, the study team prepared schematic designs of the final alternatives. This effort began with development of concept plans reviewed with the City, BBNWR, and the Virginia Department

of Conservation and Recreation (DCR). The study team then developed preliminary plans for trail facilities and water access sites; and routing and operational plans for shuttle and water taxi services. The study team then performed ridership forecasts for each alternative. Upon completion of the planning, design and ridership forecasts, the study team compiled construction cost estimates and benefits analyses.

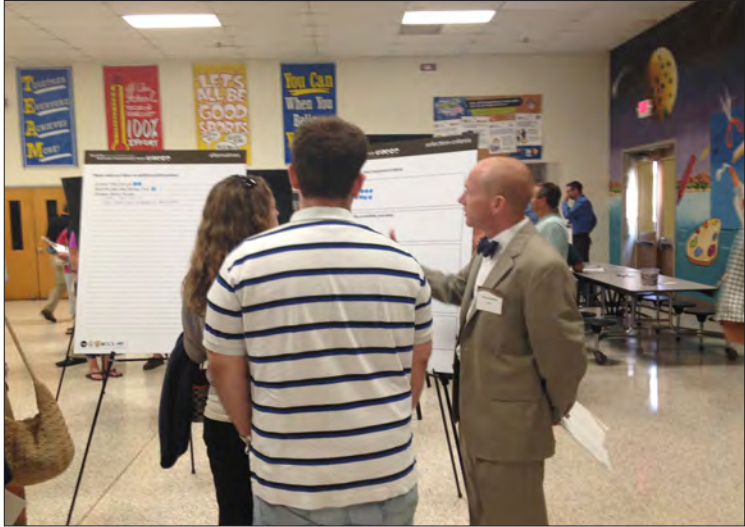
The study report presents a Master Plan of the transportation system. Subsequent chapters provide detailed evaluation of each alternative closing with discussion on Project Advancement and Study Findings.

The study team produced a draft report for review by the City, the TAC, and the public and conducted a second CIM to present results prior to development of the final report. The final report will serve as a guiding document for coordinating transportation alternatives working in a system for access to BBNWR and FCSP.



1.4 Study Team

The study team was responsible for leading the development of the alternatives, managing experts and resources, and keeping the public informed.



STUDY TEAM MEMBERS INCLUDED:

- WAYNE WILCOX CITY OF VIRGINIA BEACH - PARKS & RECREATION
- JASON WILSON CITY OF VIRGINIA BEACH - PUBLIC WORKS
- MARGARET KUBILINS VANASSE HANGEN BRUSTLIN, INC.
- CHRIS DEWITT VANASSE HANGEN BRUSTLIN, INC.

1.5 Technical Advisory Committee

The TAC met six times during the study process to help screen and select additional ATS options beyond the initial list of alternatives, and to review the draft results and study report. Early in the process, the TAC helped develop information for the CIM #1, and helped to refine and weight the evaluation criteria. TAC members also participated in the CIM and interacted with meeting attendees. Based on public input, the TAC conducted a scoring/screening exercise that helped determine the final list of options to be studied. Near the conclusion of the study process, the TAC reviewed the final ATS options and preliminary plans, as well as provided input on the final report.

TAC MEMBERS INCLUDED:

- WAYNE WILCOX, PLA CITY OF VIRGINIA BEACH - PARKS & RECREATION
- JASON WILSON, PE CITY OF VIRGINIA BEACH - PUBLIC WORKS
- MICHAEL MOORE CITY OF VIRGINIA BEACH - PARKS & RECREATION
- HEATHER HARTLE, PE CITY OF VIRGINIA BEACH - PUBLIC WORKS TRAFFIC
- MARK SHEA CITY OF VIRGINIA BEACH - STRATEGIC GROWTH AREA
- DOUG BREWER U.S. FISH & WILDLIFE SERVICE
- KATHRYN OWENS U.S. FISH & WILDLIFE SERVICE
- WALTER TEGGE U.S. FISH & WILDLIFE SERVICE
- KYLE BARBOUR DEPARTMENT OF CONSERVATION AND RECREATION
- SAMANTHA SINK HAMPTON ROADS TRANSIT