



Cape Hatteras National Seashore Alternative Transportation Study for Bodie Island District: *Executive Summary*



Cape Hatteras National Seashore welcome sign on NC 12 near Whalebone Junction
Source: Volpe Center photographs (August 2010)

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Report Notes

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Acronym List

AADT	Annual average daily traffic
AASHTO	American Association of Highway Transportation Officials
ACS	American Community Survey
ADA	American Disability Act
ATPPL	Alternative Transportation in Parks and Public Lands
BID	Business Improvement District
BILH	Bodie Island Lighthouse
CCRTA	Cape Cod Regional Transit Authority
CID	Community Improvement District
CIRS	Case Incident Reporting System
CMP	Corridor Management Plan
CRIMES	Crime Reporting Incident Management Entry System
CTIP	Coordinated Technology Implementation Program
CUA	Commercial Use Authorization
CUYD	Cubic Yards
DCTS	Dare County Transportation System
DOI	Department of Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
FLHP	Federal Lands Highway Program
FLREA	Federal Lands Recreation Enhancement Act
FTA	Federal Transit Administration
FWS	Fish & Wildlife Service
GMP	General Management Plan
HARS	highway advisory radio system
HSIP	Highway Safety Improvement Program
IT	information technology
ITS	intelligent transportation systems
ICPTA	Inter-County Public Transportation Authority
IMARS	Incident Management, Analysis, and Reporting System
LH	Lighthouse
LOS	Level of service
MDT	Montana Department of Transportation
MOU	Memorandum of Understanding
mph	miles per hour

MUTCD	Manual of Uniform Traffic Control Devices
NCDOT	North Carolina Department of Transportation
NEPA	National Environmental Policy Act
NHS	National Historic Site
NM	National Memorial
NPS	National Park Service
NS	National Seashore
NSBP	National Scenic Byways Program
NWR	National Wildlife Refuge
OBSB	Outer Banks Scenic Byway
O&M	Operations and maintenance
ONPS	Operation of the NPS
ORV	Off-road vehicle
PEPC	Planning, Environment, and Public Comment
PLHDP	Public Lands Highway Discretionary Program
PMIS	Project Management Information System
PRP	Park Roads and Parkways
RIP	Road Inventory Program
RPO	Rural planning organization
RTCA	Rivers, Trails, and Conservation Assistance
RTP	Recreational Trails Program
SAFETEA-LU	Safe Accountable Flexible Efficient Transportation Equity Act – A Legacy for Users
SDEIS	Supplemental draft EIS
SR	secondary road
STARS	Service-wide Traffic Accident Reporting System
STIP	State Transportation Improvement Plan
STP	Surface Transportation Program
SQYD	square yards
TAB	Transportation Advisory Board
TAG	Transportation Assistance Group
TE	Transportation Enhancements
TIF	Tax Increment Financing
TMA	transportation management association
TODS	Tourist Oriented Directional Signage (TODS) Program
TRIP	Paul S. Sarbanes Transit in Parks Program
VMS	variable message sign
VSP	Visitor Services Program

Introduction

This document provides an overview of the Cape Hatteras National Seashore Alternative Transportation Study for Bodie Island District and describes key findings and recommendations. The study context, background, goals, and approach, including public outreach, are described first, followed by a summary of the recommendations. The study consists of three separate reports, which will be referenced throughout:

- Conditions Inventory/Assessment
- Needs Assessment
- Alternative Transportation Analysis

Study context

The National Park Service's (NPS) Cape Hatteras National Seashore (NS) is located along the Outer Banks, a chain of barrier islands stretching approximately 200 miles along the coast of Virginia and North Carolina. The region is a popular tourist destination and is challenged by traffic congestion and parking shortages as well as a dynamic land base that is impacted by storms, coastal processes, and climate change. This study focuses on the Bodie Island District (pronounced like *body*), defined by NPS as the northernmost portion of Cape Hatteras NS. The District stretches approximately ten miles from Whalebone Junction, or the intersection of U.S. 64, U.S. 158, and NC 12, to the Oregon Inlet and the Bonner Bridge, which connects the District to the rest of Cape Hatteras NS (see Figure 1 in the Conditions Inventory/Assessment). To ensure connections to these other entities and the region, the study area will be considered within the context of Cape Hatteras NS and the region, defined as Dare County but also referred to in the text as the Outer Banks.

Study background

Cape Hatteras NS staff submitted a planning grant application to the Federal Transit Administration's Paul S. Sarbanes Transit in Parks (TRIP) Program,¹ formerly the Alternative Transportation in Parks and Public Lands (ATPPL), in early 2007 to request funding to explore alternative transportation improvements for the Bodie Island District, especially in anticipation of expected increases in visitation to the Bodie Island Lighthouse. The U.S. Department of Transportation's Volpe National Transportation Systems Center (U.S. DOT Volpe Center) began the study in the fall of 2009.

Currently, NPS is working on the Off-Road Vehicle (ORV) Management Plan and it will soon be starting an update to the General Management Plan (GMP). The focus of this study is distinct and separate from that of these studies but references and acknowledges them. In addition, Dare County will be involved in the development of a 25-year transportation plan with the Albemarle Commission, the region's rural planning organization, and the North Carolina Department of Transportation (NCDOT). This study may also inform that effort.

In addition to the three ongoing and future planning efforts, a number of transportation planning studies and related planning documents have been completed for the region that serve to inform this study (see Table 1 in the Conditions Inventory/Assessment).

¹ The TRIP Program began in 2005, under the Safe, Accessible, Flexible, and Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), the most recent transportation authorization bill. It has had an annual funding level of \$20-25 million and has funded 40-50 projects each year.

Goals & objectives

The objective of the study is to perform a transportation analysis to identify optimal transportation strategies that serve visitors originating from the villages north and south of Cape Hatteras NS destined for sites within the Bodie Island District of Cape Hatteras NS. The goals of the study are in line with those of the TRIP program² with a focus on resource protection and enhancement of the visitor experience and are coordinated with existing, planned, and proposed initiatives by NPS and planning partners and stakeholders, as appropriate. The following goals and objectives were identified by the study team, working with park staff:

- To conserve natural, historical, and cultural resources
 - To minimize impacts to resources
- To reduce congestion and pollution
 - To decrease vehicle miles traveled
- To improve visitor mobility and accessibility.
 - To improve visitor access and circulation
 - To improve connectivity within the study area as well as to the study area from other sites
- To enhance the visitor experience
 - To enhance health, safety, and security
- To ensure access to all, including persons with disabilities
 - To provide access to individuals without access or ability to drive a vehicle
 - To provide infrastructure that can accommodate all users
- To achieve efficient management, operations and maintenance
 - To estimate future visitation for Bodie Island Lighthouse to assess needs of potential future visitation
 - To provide a financially sustainable transportation system in which life -cycle revenue exceeds (or is equal to) life-cycle costs
- To coordinate with NPS and other planning entities and stakeholders as appropriate
 - To identify relevant plans and studies
 - To identify potential conflicts and partnerships

Public involvement

The study team and NPS staff engaged in public outreach activities throughout the duration of the study to encourage full public participation in the transportation planning process. Public involvement for the study consisted of an initial scoping meeting, the development of a study website for dissemination of study materials to the public for comment, and a public comment period and public meeting. The initial scoping meeting and study website are described in detail in the Conditions Inventory/Assessment while the public comment period and public meeting are described in detail in the Alternative Transportation Analysis.

Study approach

The main elements of the study were as follows:

- Evaluation of the existing transportation network and existing and future project forecasted travel conditions;
- Assessment of unmet transportation needs (existing and projected); and
- Identification of alternative transportation strategies and solutions to address needs.

² To conserve natural, historical, and cultural resources; to reduce congestion and pollution; to improve visitor mobility and accessibility; to enhance visitor experience; and to ensure access to all, including persons with disabilities.

These elements translated into three deliverables:

- Conditions Inventory/Assessment;
- Needs Assessment; and
- Alternative Transportation Analysis.

Conditions Inventory/Assessment

The Conditions Inventory/Assessment provides an account of existing and forecasted future conditions that characterize the transportation network, travel patterns, and conditions within the study area and within the region. The report provided the foundation for the analysis to be provided in the Needs Assessment. Some of the key characteristics identified for the area were:

- A number of transportation-related and other planning studies have been conducted in the region.
- There are several other federal, state, city and privately owned destinations within the region.
- Visitors primarily use private vehicles to access Bodie Island District and move between the sites within the District.
- Traffic and parking are not current issues for the Bodie Island District, with the exception of the three major summer holidays (Memorial Day, July 4th, and Labor Day).
- Parking may become an issue for the Bodie Island Lighthouse once it opens for climbing in 2012 or 2013.
- There are some existing bicycle and pedestrian facilities, with new facilities being built or proposed.
- There is very limited public transportation and some private transportation in the area.
- Coastal vulnerability in terms of storms and climate change are important considerations for future infrastructure investment.

Needs Assessment

The Needs Assessment draws upon the Conditions Inventory/Assessment to conduct select analyses and identify key deficiencies, or unmet needs, of the transportation system and opportunities for the future for the study area. It incorporates needs identified in previous studies relevant to the study area, stakeholder and park staff comments, and observations made during the site visit. The report considers both current needs and future anticipated needs for planning and programming and for the following modes and categories: roadway, parking, transit, bicycle and pedestrian, marine, traveler information and wayfinding, and intermodal.

Overall, the report concluded that data collection, safety, and wayfinding/traveler information needs exist across all modes. In addition, there are needs to address bicycle and pedestrian connectivity and opportunities for enhancing nonmotorized water access. As use of alternative modes increase within the Bodie Island District, it will be important for considerations to be made of intermodal needs, such as storage and parking. There are opportunities for transit in the region, although there may be limited demand and such a system would need to be financially sustainable.

The parking demand assessment indicates that current parking is sufficient to accommodate the full capacity of the lighthouse and other uses on site at any one time, but that demand for climbing may exceed the lighthouse capacity. Consequently, there is a need for demand management strategies to ensure that demand for parking is matched with the capacity for the lighthouse to accommodate climbers. If this excess demand were to be accommodated, there would be a need for additional parking capacity or the provision of other transportation options to Bodie Island Lighthouse once it is open for climbing. There is also a need for designated bus parking that may involve a new parking area and there is a need for more data collection, in terms of information on the parking use at Cape Hatteras Lighthouse for

comparison, and of parking use at Bodie Island Lighthouse, once it opens for climbing. Any decisions regarding increased parking capacity should include consideration of visitor experience and resource protection goals.

Alternative Transportation Analysis

The Alternative Transportation Analysis identifies, describes, and evaluates potential alternative transportation strategies based on the goals and objectives noted above. The analysis considers technical feasibility, cost, timeline, and partnerships for each strategy as well as overall funding, phasing, and implementation strategies. A summary of the main findings is provided below.

Findings and Recommendations

The document builds upon the evaluation of regional and local transportation conditions provided in the Conditions Inventory/Assessment report and the identification of unmet transportation needs in the Needs Assessment report. The purpose of this report is to describe and evaluate proposed alternative transportation strategies, with particular attention to the feasibility of several transit options but also consideration of improvements to policies and roadway, parking, bicycle, pedestrian, marine, wayfinding, and traveler information facilities.

Strategies

The study team identified 38 potential strategies and six potential transit routes based on research and additional input from public outreach in August 2010 (see Section 1.3). These strategies are presented in Table 1. The study team recognizes that at the time this list was developed, Cape Hatteras NS had already proposed and in some cases begun pursuit of funding for several of the strategies included in this report. These strategies are in *italics* in the table and accompanied by the status of these projects as of the finalization of this report. Their inclusion was made to ensure a complete list and to provide specific recommendations for their implementation.

Table 1
Final List of Proposed Strategies

Strategy number	Potential strategy (items in red bold with asterisk are safety-related; items already in progress are in <i>italics</i> and status is given)
Transit (see Section 2.1 for more details)	
N/A	Explore opportunities for a regional transit system and/or temporary shuttle service from satellite parking as a partnership.
Planning and programming strategies	
1	Encourage the development of a regional transportation committee
2	Participate in Dare County Comprehensive Transportation Plan (to start in 2011 or 2012)
3	Develop a comprehensive signage plan
4	Implement a reservation system for Lighthouse climbing at Bodie Island Lighthouse that includes a management system for motorcoach and school bus visitation
5	Collect alternative transportation visitation information
6	Collect information on parking lot utilization at major parking lots on Bodie Island
7	Conduct a transportation focused visitor survey
8	Conduct a marketing campaign to promote alternative transportation to and through Cape Hatteras NS
9	Implement park-level practices to encourage alternative transportation
10	Prepare for adoption of the Department of Interior (DOI) Incident Management Analysis, and Reporting System (IMARS)*
11	Offer and/or encourage interpretive alternative transportation tours of Bodie Island

Strategy number	Potential strategy (items in red bold with asterisk are safety-related; items already in progress are in <i>italics</i> and status is given)
12	Offer NPS employees a bicycle share program, combined with volunteer bicycle patrols
Infrastructure strategies	
Roadway	
13	Change outgoing speed limit from 25 mph to 15 mph on Lighthouse Bay Drive (RIP Route #0202)*
14	Add advance information and warning signage at roadside pull-offs*
15	Add share the road/bicycle signs along planned expanded shoulders on NC12*
16	Reduce speed limit along NC 12 near Bodie Island attractions, if a traffic/safety study verifies the need for, and appropriateness of, such a strategy*
17	<i>Widen Lighthouse Bay Drive (RIP Route #0202³) (project partially complete)*</i>
18	Construct southbound and northbound exclusive right turn lanes on NC12 at Lighthouse Bay Drive (RIP Route #0202) intersection, if a traffic/safety study verifies the need for, and appropriateness of, exclusive right turn lanes*
Parking	
19	Add a northern entrance/exit to the Coquina Beach parking lot
20	Add a viewing platform for Bodie Island Lighthouse and pull-off area on the west side of NC 12, parallel to the road, if a traffic/safety study verifies the need for, and appropriateness of, such a strategy*
21	Reconfigure, relocate, and/or expand the capacity of Bodie Island Lighthouse parking, including spaces for motorcoaches and oversized vehicles
22	Designate seasonal satellite shared parking for transit service
23	Develop vehicle parking with bicycle and pedestrian accommodations at northern end of Bonner Bridge
Bicycle	
24	<i>Provide bicycle racks at all Bodie Island District sites (pursuing funding)</i>
25	Connect bicycle infrastructure in South Nags Head to NC12 (along South Old Oregon Inlet Road, RIP Route #0011)*
26	Create a bicycle amenity station at Bodie Island Lighthouse and Whalebone Junction
27	Connect NC 12 shoulder to Nags Head multi-use trail at Whalebone Junction*
28	Enhance nonmotorized infrastructure along SR 1243
29	Add a bicycle lane along NC 12*
30	Add a multi-use path parallel to NC 12*
Pedestrian	
31	Install pedestrian infrastructure on NC12 at Bodie Island sites
32	Install pedestrian infrastructure on NC 12 at Whalebone Junction
33	Extend the Dike Trail to the intersection of Lighthouse Bay Drive (RIP Route #0202) and NC 12
Marine	
34	Develop formal Sound access for non-motorized watercraft
35	Provide kayak/canoe rental concessions within the Bodie Island District
36	Investigate potential for water taxi/ferry services between Bodie Island and other parts of the Outer Banks
Wayfinding and Traveler Information	
37	Add bicycle/pedestrian directional signage at key locations
38	Provide static and/or real-time transportation information online, by phone, by radio, and or/via variable message sign

Transit assessment

In the Needs Assessment, the study found that there has been regional and local town interest in transit and that transit would provide another transportation option for visitors, may reduce vehicle use and parking demand, and may have interpretive opportunities. However, transit ridership is unlikely to be high, especially if a user fee were charged, given the availability of parking⁴ and the barriers to

³ Federal Highway Administration, Eastern Federal Lands Highway Division, Road Inventory Program (RIP), Cycle 3

⁴ Discussed in Section 2. 2 of the Needs Assessment and documented in Section 3.2 of the Conditions Inventory/Assessment.

implementing any type of parking fee. In addition, Cape Hatteras NS staff report that the unit is currently not in a position to provide operations or maintenance funding or management oversight to directly operate a transit service on its own or contract with another entity to provide the service due to staff and resource constraints. As concessions also require a significant amount of park resources for oversight and administration, at this time it is recommended that Cape Hatteras NS consider cooperative agreement/partnership models rather than service contract/concessions or NPS operated models. In a partnership, a range of roles for NPS are possible, from helping with funding and management to participating in planning and providing permissions for the shuttle to serve stops within NPS.

Due to the uncertainties in ridership and funding, especially for operations, it is not immediately apparent that any of the transit services proposed could be financially sustainable at this time. However, the study does conclude that Cape Hatteras NS should increase its participation in regional transit discussions and conduct future analyses to continue to assess the feasibility of a transit system in partnership with others.

It should be noted that according to NPS Management Policies 2006, “before a decision is made to design, construct, expand, or upgrade access to or within a park, nonconstruction alternatives—such as distributing visitors to alternative locations—must be fully explored. If nonconstruction alternatives will not achieve satisfactory results, then a development solution should consider whether the project” meets a number of criteria, including positive net impact on resources and visitor experience and ability to demonstrate financial and operational sustainability.⁵ Additionally, current NPS policy is only to advance requests for new alternative transportation systems that can demonstrate long term financial sustainability. Financial proforma and feasibility studies are needed to inform decisions, and implementation of a new transportation system requires the approval of the Director.

With this in mind, the study recommends the following actions:

- Explore opportunities for a regional transit system as a partnership.
 - Outreach to Dare County Transportation System (DCTS) to request participation on their Transportation Advisory Board (TAB) and to coordinate on future transportation planning efforts, such as the recommendation by the County’s Community Transportation Service Plan (2010) to conduct a comprehensive study of a tourist-based transit service.
 - Explore opportunities for a partnership with local (county and city) and state elected officials and governments, other Federal Land Management Agencies, land trusts, chambers of commerce and tourism organizations, local business owners, non-profit organizations and other entities.
- Once a potential partnership opportunity for transit service has been identified, take appropriate steps to coordinate with the NPS Southeast Region Office (SERO) on next steps.
 - Coordinate with the SERO Transportation Program Manager to identify the required steps/studies and approvals and undertake the appropriate planning/analyses to ensure feasibility and long term sustainability of a proposed partnership transit system. This should include consideration of NPS responsibility for capital costs and operating arrangement.
 - Coordinate with the SERO Contracting and Property Management Division and SERO Partnership Coordinator to establish the legal framework in which the partnership must operate and to identify the appropriate way to structure the partnership (e.g. through a Memorandum of Understanding (MOU), Memorandum of Agreement (MOA), Grant Agreement, Cooperative Agreement or other mechanism).
- Identify temporary use of a satellite parking area and partner with DCTS or others to provide shuttle service from a satellite parking area around the opening of Bodie Island Lighthouse for

⁵ NPS Management Policies 2006. “9.2 Transportation Systems and Alternative Transportation.”

climbing, similar to the event planning done in partnership with NCDOT for the Wright Brothers National Memorial Centennial.

If a transit system is implemented in the region and serves Cape Hatteras NS, ensure the following:

- Any vehicle used at Cape Hatteras NS should be compliant with the American with Disabilities Act (ADA), able to accommodate bicycles through bicycle racks or brackets, and have speaker capabilities for interpretive opportunities.
- A marketing plan with identified strategies (see Appendix B of the Alternative Transportation Analysis) should be developed for any service.
- Low-speed vehicles, which include several trams, are not appropriate for operation on NC 12. Low-floor transit vehicles or a cutaway vehicle would be most appropriate for the service conditions.
- Biodiesel, methanol/ethanol or hybrid electric vehicles should be considered if possible.

The main sources of funding for planning and capital for transit for NPS are the Federal Transit Administration's TRIP Program and the Federal Land Highway Program's Park Roads and Parkways (PRP) Category III alternative transportation program⁶ (see Appendix B and Section 3.1 (Funding Opportunities of the Alternative Transportation Analysis for more information). Any applications to these programs should be done in coordination with the NPS Southeast Region Office.

Planning and programming assessment

The planning and programming strategies consist primarily of recommendations that encourage coordination by Cape Hatteras NS with other groups; promotion of alternative transportation in public outreach and in activities offered; and data collection and analysis. These actions are as important to providing transportation options to visitors as the infrastructure strategies. These strategies can provide justification and leverage for funding for infrastructure, information that will inform the best design and selection of infrastructure strategies, and increased interest and use of alternative modes.

Roadway assessment

The roadway strategies focus on improving safety for both motorized and non-motorized users. Short-term improvements in signage, in terms of raising awareness of bicycles, pull-off areas, and the speed limit, can result in a significant increase in safety. Longer term strategies involve the widening of roadways to provide for shared use and fewer conflicts from turning vehicles. It is important for Cape Hatteras NS to work with the North Carolina Department of Transportation (NCDOT) on all of the strategies within this section. In addition, several of the safety-related strategies identified by this study need to be substantiated and verified through proper analysis, such as a safety study or traffic engineering analysis, prior to a project request. This is necessary because this study relied on limited field observations and staff and public input, such analysis can be required to qualify for funding, and some strategies have the potential of introducing new safety issues. Such additional analysis will ensure that all potential impacts are considered and that the proper strategy and approach can be identified.

Parking assessment

The parking strategies focus on improving access to important recreation and viewing areas. Several of the longer-term parking strategies should be delayed until more information is available and/or other strategies are implemented or actions are taken by others. For example, the reconfiguration, relocation, or

⁶ Category III funding is dependent on the determination that the service directly benefits the park and on approval by the NPS Washington Office.

expansion of the Bodie Island Lighthouse parking area is dependent on information gained from future parking utilization and the successful implementation of a reservation system.

Bicycle assessment

The bicycle strategies focus on providing amenities and facilities throughout the Bodie Island District and providing connections between Nags Head and Bodie Island. Many of the recommended strategies are long-term and set high standards for the level of bicycle facility that could be provided at some point. The study recognizes that there is existing bicycle infrastructure in place and prioritizes filling in gaps between that existing infrastructure. Similar to roadway, it is important for Cape Hatteras NS to work with the NCDOT on all of the strategies within this section. The Town of Nags Head is also an important partner because of the potential to address gaps in connectivity between Cape Hatteras NS and Nags Head.

Pedestrian assessment

The pedestrian strategies primarily focus on improving safety though they also address making connections between sites by foot. Due to the distance between sites regionally, pedestrian infrastructure is most relevant for crossing NC 12 and within smaller areas, such as between Bodie Island Lighthouse and Coquina Beach, rather than connecting Bodie Island District to residential or commercial areas. Similar to roadway and bicycle strategies, it is important for Cape Hatteras NS to work with the NCDOT on all of the strategies within this section.

Marine assessment

The marine strategies focus on improving nonmotorized access primarily for the purpose of transportation and on exploring the possibility for a public-private partnership for motorized water transit services. The study concludes that it is important for Cape Hatteras NS to work regionally on these strategies. For non-motorized marine access, this means linking up with efforts by NPS Rivers, Trails, and Conservation Assistance (RTCA) Program to develop the Southeast Coast Saltwater Paddling Trail and statewide efforts of the North Carolina Blueways (NC Blueways), a cooperative effort by the North Carolina State Parks System, North Carolina State University, and North Carolina Paddle Trails Association. For motorized marine access, this means requesting a Transportation Assistance Group (TAG) to assess whether further exploration of water-based transit is warranted. Such a request and any further actions should be done in coordination with local towns that have expressed interest, such as Manteo, and the NPS Southeast Region, including the Concessions Services and Planning and Compliance divisions.

Traveler information and wayfinding assessment

The traveler information and wayfinding strategies focus on both small-scale improvements that can be done within Bodie Island District and on regional system-wide changes that will require coordination with partners.

Conclusion and next steps

The intent of this study was to consider the need and feasibility of alternative transportation strategies for the Bodie Island District of Cape Hatteras NS. Although the study focused on a specific area of Cape Hatteras NS, it took into consideration the regional context and many of the strategies recommended are applicable throughout the region. This study should be viewed as one step forward, building off of previous alternative transportation efforts by NPS and regional partners throughout Cape Hatteras NS and the Outer Banks, and providing a foundation upon which future efforts will be able to draw for ideas and information.

Table 2 provides a summary of the strategies, which goals they address, and what the key implementation considerations are, including partners, timeline, technical feasibility, cost, and potential funding sources. The study encourages that Cape Hatteras NS continue to coordinate with its partners and local government entities about its projects as appropriate. The study recommends that the park immediately pursue those strategies identified as low cost and minimal difficulty. A significant number of the proposed strategies are within the NCDOT right-of-way along NC 12 and thus necessitate coordination between NCDOT and NPS. The study provides its recommendations for which strategies may be best addressed first but recommends that representatives from Cape Hatteras NS and NCDOT meet to review the list of strategies and establish a prioritization and timeline that matches both agencies' resources and goals.

There are a couple of strategies included in the study that would only result from a decision by the Town of Nags Head. The study recommends that Cape Hatteras NS ask the town to consider these strategies.

Finally, there are a number of strategies that require close coordination regionally. The study recommends that Cape Hatteras NS begin work with its transportation partners by forming a transportation committee to discuss short-term strategies, such as further planning and improvement of information dissemination and marketing, and long-term strategies, such as water taxi/ferry and transit services.

In preparation for the opening of the Bodie Island Lighthouse to climbing, the study recommends the following actions for Cape Hatteras NS:

- Work with NCDOT to add signage to NC 12 near Whalebone Junction to indicate the hours of Bodie Island Lighthouse for climbing;
- Set up the reservation system – ideally testing it with Cape Hatteras NS first during the summer of 2011;
- Delay implementation of any large expansion or reconfiguration of the parking until after the first season of climbing, during which the park should collect information on parking lot utilization at the lighthouse, with particular attention to the needs of motor coaches;
- Consider partnering with others to support a small transit shuttle from other parking sites for the first summer that the climbing is opened, similar to the event planning done in partnership with NCDOT for the Wright Brothers National Memorial Centennial. Satellite parking would ideally be located within the Bodie Island District or to the north, but also possibly at the Oregon Inlet South Bridge parking lot.

Table 2
Assessment of Final Potential Strategies

Strategy number	Potential strategy (items in red bold with asterisk are safety-related; items already in progress are in <i>italics</i> and status is given)	NPS Transportation Goals								Implementation Considerations					
		<i>To conserve natural, historical, and cultural resources</i>	<i>To reduce congestion and pollution</i>	<i>To improve visitor mobility and accessibility</i>	<i>To enhance the visitor experience</i>	<i>To ensure access to all, including persons with disabilities</i>	<i>To achieve efficient management, operations, and maintenance</i>	<i>To coordinate with NPS and other planning entities and stakeholders as appropriate</i>	<i>Partners</i>	<i>Location</i>	<i>Technical Feasibility</i> <i>Minimal difficulty</i> <i>Moderate difficulty</i> <i>High difficulty</i>	<i>Timeline</i> <i>Short-term (0-2 years)</i> <i>Mid-term (2-5 years)</i> <i>Long-term (5+ years)</i>	<i>Cost</i> <i>Low <= \$5,000</i> <i>Medium - \$5,001 - \$100,000</i> <i>High - > \$100,000</i>	<i>Potential Funding Source(s)</i>	
Transit															
N/A	Explore opportunities for a regional transit system and/or temporary shuttle service from satellite parking as a partnership.	x	x	x	x	x	x	x	NPS / Multiple	Bodie Island District / Regional	Moderate to high difficulty	Short to long term	Medium to High	FTA Transit in Parks (TRIP) / PRP Category III ⁷ / fares / towns or Dare County / private	
Planning and programming strategies															
1	Encourage the formation of a regional transportation committee.	x	x	x	x	x	x	x	Multiple	Bodie Island District / Cape Hatteras NS / Regional	Minimal difficulty	Short-term	Low	Operation of NPS (ONPS)	
2	Participate in Dare County Comprehensive Transportation Plan (to start in 2011 or 2012)		x	x	x			x	Dare County, NCDOT, and Albemarle RPO	Regional	Minimal difficulty	Short-term	Low	ONPS	

⁷ Category III funding is dependent on the determination that the service directly benefits the park and on approval by the NPS Washington Office.

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		<i>To conserve natural, historical, and cultural resources</i>	<i>To reduce congestion and pollution</i>	<i>To improve visitor mobility and accessibility</i>	<i>To enhance the visitor experience</i>	<i>To ensure access to all, including persons with disabilities</i>	<i>To achieve efficient management, operations, and maintenance</i>	<i>To coordinate with NPS and other planning entities and stakeholders as appropriate</i>	<i>Partners</i>	<i>Location</i>	<i>Technical Feasibility</i> <i>Minimal difficulty</i> <i>Moderate difficulty</i> <i>High difficulty</i>	<i>Timeline</i> <i>Short-term (0-2 years)</i> <i>Mid-term (2-5 years)</i> <i>Long-term (5+ years)</i>	<i>Cost</i> <i>Low <= \$5,000</i> <i>Medium - \$5,001 - \$100,000</i> <i>High - > \$100,000</i>	<i>Potential Funding Source(s)</i>
3	Develop a comprehensive signage plan			x	x			x	OBSB Committee, NCDOT, towns	Bodie Island District / Cape Hatteras NS	Minimal difficulty	Short-term	Medium	FHWA National Scenic Byways Program (NSBP)
4	Implement a reservation system for Lighthouse climbing at Bodie Island Lighthouse that includes a management system for motorcoach and school bus visitation		x	x	x		x		-	Bodie Island Lighthouse	Moderate difficulty	Short-term	Medium	ONPS / Recreation Fees (Rec Fees)
5	Collect alternative transportation visitation information						x		NCDOT, NPS Public Use Office, Eastern National, other	Bodie Island District / Cape Hatteras NS	Moderate difficulty	Short-term - Mid-term	Low-Medium	ONPS
6	Collect information on parking lot utilization at major parking lots on Bodie Island			x	x		x		NPS Public Use Statistics Office, NCDOT	Bodie Island District / Cape Hatteras NS	Moderate difficulty	Short-term - Mid-term	Low	ONPS
7	Conduct a transportation focused visitor survey				x		x		VSP, local university	Bodie Island District / Cape Hatteras NS	Moderate difficulty	Short-term - Mid-term	Medium	FTA TRIP / PRP Category III / ONPS

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		<i>To conserve natural, historical, and cultural resources</i>	<i>To reduce congestion and pollution</i>	<i>To improve visitor mobility and accessibility</i>	<i>To enhance the visitor experience</i>	<i>To ensure access to all, including persons with disabilities</i>	<i>To achieve efficient management, operations, and maintenance</i>	<i>To coordinate with NPS and other planning entities and stakeholders as appropriate</i>	<i>Partners</i>	<i>Location</i>	<i>Technical Feasibility</i> Minimal difficulty Moderate difficulty High difficulty	<i>Timeline</i> Short-term (0-2 years) Mid-term (2-5 years) Long-term (5+ years)	<i>Cost</i> Low <= \$5,000 Medium - \$5,001 - \$100,000 High - > \$100,000	<i>Potential Funding Source(s)</i>
8	Conduct a marketing campaign to promote alternative transportation to and through Cape Hatteras NS	x	x	x	x			x	OBVB, OBSB Committee, Dare County, towns	Bodie Island District/Cape Hatteras NS / Regional	Moderate difficulty	Short-term - Mid-term	Medium	ONPS
9	Implement park-level practices to encourage alternative transportation		x	x	x		x		-	Bodie Island District / Cape Hatteras NS	Varies	Varies	Varies	ONPS
10	Prepare for adoption of the Department of Interior (DOI) Incident Management, Analysis, and Reporting System (IMARS)*			x	x		x		NPS Headquarters, local/state law enforcement	Bodie Island District / Cape Hatteras NS	Moderate difficulty	Mid-term	Unknown	ONPS
11	Offer and/or encourage interpretive alternative transportation tours of Bodie Island			x	x				concessionaire / nonprofit, North Carolina Paddle Trails Association	Bodie Island District	Moderate difficulty	Long-term	Low	ONPS
12	Offer NPS employees a bicycle share program, combined with volunteer bicycle patrols	x	x				x		-	Bodie Island District (Cape Hatteras NS / Regional)	Minimal difficulty	Long-term	Medium	ONPS

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		<i>To conserve natural, historical, and cultural resources</i>	<i>To reduce congestion and pollution</i>	<i>To improve visitor mobility and accessibility</i>	<i>To enhance the visitor experience</i>	<i>To ensure access to all, including persons with disabilities</i>	<i>To achieve efficient management, operations, and maintenance</i>	<i>To coordinate with NPS and other planning entities and stakeholders as appropriate</i>	<i>Partners</i>	<i>Location</i>	<i>Technical Feasibility</i> <i>Minimal difficulty</i> <i>Moderate difficulty</i> <i>High difficulty</i>	<i>Timeline</i> <i>Short-term (0-2 years)</i> <i>Mid-term (2-5 years)</i> <i>Long-term (5+ years)</i>	<i>Cost</i> <i>Low <= \$5,000</i> <i>Medium - \$5,001 - \$100,000</i> <i>High - > \$100,000</i>	<i>Potential Funding Source(s)</i>
Infrastructure strategies														
Roadway														
13	Change outgoing speed limit from 25 mph to 15 mph on Lighthouse Bay Drive (RIP Route #0202)*			x	x			x	-	Lighthouse Bay Drive (RIP Route #0202)	Minimal difficulty	Short-term	Low	ONPS
14	Add advance information and warning signage at roadside pull-offs*				x				NCDOT	Bodie Island District (NC 12)	Minimal difficulty	Short-term	Low	ONPS / FHWA Highway Safety Improvement Program (HSIP) or NSBP
15	Add share the road/bicycle signs along planned expanded shoulders on NC12*			x	x				NCDOT, FHWA	Bodie Island District (NC 12)	Moderate difficulty	Short-term	Low	ONPS / FHWA Transportation Enhancement (TE) or NSBP
16	Reduce speed limit along NC 12 near Bodie Island attractions, if a traffic/safety study verifies the need for, and appropriateness of, such a strategy*			x	x				NCDOT	Bodie Island District	Moderate difficulty	Mid-term	Medium	FHWA TE or HSIP / NCDOT
17	Widen Lighthouse Bay Drive (RIP Route # 0202) (project partially complete)*			x	x		x		-	Bodie Island Lighthouse	Moderate difficulty	Mid-term	High	NPS Recreation Fee

Strategy number	Potential strategy (items in red bold with asterisk are safety-related; items already in progress are in <i>italics</i> and status is given)	NPS Transportation Goals							Implementation Considerations					
		<i>To conserve natural, historical, and cultural resources</i>	<i>To reduce congestion and pollution</i>	<i>To improve visitor mobility and accessibility</i>	<i>To enhance the visitor experience</i>	<i>To ensure access to all, including persons with disabilities</i>	<i>To achieve efficient management, operations, and maintenance</i>	<i>To coordinate with NPS and other planning entities and stakeholders as appropriate</i>	<i>Partners</i>	<i>Location</i>	<i>Technical Feasibility</i> Minimal difficulty Moderate difficulty High difficulty	<i>Timeline</i> Short-term (0-2 years) Mid-term (2-5 years) Long-term (5+ years)	<i>Cost</i> Low <= \$5,000 Medium - \$5,001 - \$100,000 High - > \$100,000	<i>Potential Funding Source(s)</i>
18	Construct southbound and northbound exclusive right turn lanes on NC12 at Lighthouse Bay Drive (RIP Route #0202) intersection, if a traffic/safety study verifies the need for exclusive right turn lanes.^{8 *}		x		x				NCDOT, FHWA	Intersection of NC12 and Lighthouse Bay Drive (RIP Route #0202)	Moderate difficulty	Mid-term	High	FHWA HSIP / PRP Category I ⁹
Parking														
19	Add a northern entrance/exit to the Coquina Beach parking lot		x	x	x		x		-	Coquina Beach	Moderate difficulty	Mid-term	Medium	ONPS / Rec Fees
20	Add a viewing platform for Bodie Island Lighthouse and a pull-off area on the west side of NC 12, parallel to the road, if a traffic/safety study verifies the need for, and appropriateness of, such a strategy.^{8 *}		x		x				NCDOT, OBSB Committee, NC Audubon Society, other	Bodie Island District (between Bodie Island Lighthouse and Oregon Inlet Fishing Center) on NC 12)	Moderate difficulty	Mid-term	High	NSBP / FHWA TE or HSIP

⁸ This strategy requires that a safety study/traffic engineering analysis be conducted to consider all possible impacts, both in terms of NEPA compliance and safety. Such analysis may be required for funding and ensures the identification of any new safety issues that may be introduced.

⁹ To be eligible for Category I, project would need a safety study that determines a safety need for the project.

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		<i>To conserve natural, historical, and cultural resources</i>	<i>To reduce congestion and pollution</i>	<i>To improve visitor mobility and accessibility</i>	<i>To enhance the visitor experience</i>	<i>To ensure access to all, including persons with disabilities</i>	<i>To achieve efficient management, operations, and maintenance</i>	<i>To coordinate with NPS and other planning entities and stakeholders as appropriate</i>	<i>Partners</i>	<i>Location</i>	<i>Technical Feasibility</i> Minimal difficulty Moderate difficulty High difficulty	<i>Timeline</i> Short-term (0-2 years) Mid-term (2-5 years) Long-term (5+ years)	<i>Cost</i> Low <= \$5,000 Medium - \$5,001 - \$100,000 High - > \$100,000	<i>Potential Funding Source(s)</i>
21	Reconfigure, relocate, and/or expand the capacity of Bodie Island Lighthouse parking, including spaces for motorcoaches and oversized vehicles	x			x				-	Bodie Island Lighthouse	Moderate difficulty	Mid-term	High	ONPS / Rec Fees
22	Designate seasonal satellite shared parking for transit service			x	x				Various	Regional	Moderate difficulty	Long-term	Medium-High	ONPS
23	Develop vehicle parking with bicycle and pedestrian accommodations at northern end of Bonner Bridge			x	x				NCDOT, OBSB Committee, Outer Banks Visitors Bureau, other	Bonner Bridge	Moderate difficulty	Long-term	Medium-High	FHWA Recreational Trails Program (RTP or NSBP
Bicycle														
24	<i>Provide bicycle racks at all Bodie Island District sites (pursuing funding)</i>		x	x	x		x		-	Bodie Island District	Minimal difficulty	Short-term	Low - Medium	ONPS / Rec Fees
25	Connect bicycle infrastructure in South Nags Head to NC12 (along South Old Oregon Inlet Road, RIP Route #0011)*		x	x	x			x	Nags Head, NCDOT	South Nags Head	Moderate difficulty	Short-term	Medium-High	ONPS / FHWA RTP
26	Create a bicycle amenity station at Bodie Island Lighthouse and Whalebone Junction		x	x	x				-	Whalebone Junction and/or Coast Guard buildings	Minimal difficulty	Mid-term	Medium	ONPS / FHWA NSBP

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27	Connect NC 12 shoulder to Nags Head multi-use trail at Whalebone Junction*		x	x	x				Nags Head, Dare County, Outer Banks Visitors Bureau	Whalebone Junction	Moderate difficulty	Mid-term	Medium	FHWA TE, HSIP, RTP, or NSBP
28	Enhance nonmotorized infrastructure along SR 1243		x	x	x			x	Nags Head	South Nags Head	Moderate difficulty	Mid-term	High	FHWA TE or RTP
29	Add a bicycle lane along NC 12*													
30	Add a multi-use path parallel to NC 12*		x	x	x			x	NCDOT	Bodie Island District between Whalebone Junction and Bonner Bridge	Unknown	Long-term	High	FHWA TE, HSIP, or NSBP / NCDOT RTP / FTA TRIP / PRP Category III ¹⁰

¹⁰ For TRIP and PRP Category III, eligible alternative transportation includes nonmotorized trails that have a direct connection to the transportation system but not trails primarily intended for recreation. For PRP Category III, only the section of road that belongs to NPS (RIP Route #0000) would be eligible.

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		<i>To conserve natural, historical, and cultural resources</i>	<i>To reduce congestion and pollution</i>	<i>To improve visitor mobility and accessibility</i>	<i>To enhance the visitor experience</i>	<i>To ensure access to all, including persons with disabilities</i>	<i>To achieve efficient management, operations, and maintenance</i>	<i>To coordinate with NPS and other planning entities and stakeholders as appropriate</i>	<i>Partners</i>	<i>Location</i>	<i>Technical Feasibility</i> <i>Minimal difficulty</i> <i>Moderate difficulty</i> <i>High difficulty</i>	<i>Timeline</i> <i>Short-term (0-2 years)</i> <i>Mid-term (2-5 years)</i> <i>Long-term (5+ years)</i>	<i>Cost</i> <i>Low <= \$5,000</i> <i>Medium - \$5,001 - \$100,000</i> <i>High - > \$100,000</i>	<i>Potential Funding Source(s)</i>
Pedestrian														
31	Install pedestrian infrastructure on NC12 at Bodie Island sites		x	x	x				NCDOT	Intersection of NC12 and Lighthouse Bay Drive (RIP Route #0202)	Moderate difficulty	Short-term - Mid-term	Low - Medium	NCDOT / FHWA NSBP
32	Install pedestrian infrastructure on NC12 at Whalebone Junction		x	x	x				NCDOT, Nags Head, Dare County	Whalebone Junction	Moderate difficulty	Mid-term	Low-Medium	FHWA TE, HSIP or NSBP / Dare County / Nags Head
33	Extend the Dike Trail to the intersection of Lighthouse Bay Drive (RIP Route #0202) and NC 12		x	x	x				NPS RTCA	Bodie Island Lighthouse	Unknown	Long-term	Medium	ONPS / Rec Fees / NSBP
Marine														
34	Develop formal Sound access for non-motorized watercraft		x	x	x			x	NPS	Bodie Island Lighthouse	Minimal difficulty	Short-term	Low-Medium	ONPS / Rec Fees / FTA TRIP / PRP Category III ¹¹

¹¹ For TRIP and PRP Category III, eligible alternative transportation includes nonmotorized trails that have a direct connection to the transportation system but not trails primarily intended for recreation.

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35	Provide kayak/canoe rental concessions within the Bodie Island District		x	x	x				NPS/private	Bodie Island Lighthouse and Oregon Inlet Fishing Center	Minimal difficulty	Mid-term	Low	ONPS ¹²
36	Investigate the potential for water taxi/ferry services between Bodie Island and other parts of the Outer Banks	x	x	x	x	x	X	x	NPS/Multiple	Regional	Moderate difficulty	Long-term	Low	PRP Category III / FTA TRIP
<i>Wayfinding and Traveler Information</i>														
37	Add bicycle/pedestrian directional signage at key locations		x	x	x		X		OBSB Committee, Nags Head, NCDOT	Bodie Island Lighthouse, South Nags Head, Navy Tower Yard	Minimal difficulty	Short-term	Low	ONPS / FHWA NSBP
38	Provide static and/or real-time transportation information online, by phone, by radio, and or/via variable message sign		x	x	x		x		NCDOT, Outer Banks Visitors Bureau, others	Regional	Minimal to high difficulty	Varies	Medium-High	ONPS / NCDOT / FTA TRIP / FHWA Coordinated Technology Implementation Program (CTIP)

¹² Concessionaire would provide equipment and services.

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As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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