National Park Service
U.S. Department of the Interior

Northeast Region

Long Range Transportation Plan

Final Report

Cover photo:

New River Gorge Bridge, New River Gorge National River. Photo by VHB.

Insert photos (left to right):

***Island Expedition* passenger ferry, Boston Harbor Islands NRA.** Photo by VHB.

Statue of Liberty National Monument. Photo by VHB.

Coast Guard Beach tram, Cape Cod National Seashore. Photo by VHB.

This first *Northeast Region Long Range Transportation Plan* was prepared as a collaborative effort between the Washington Support Office (WASO), the Northeast Regional Office, and the Federal Highway Administration's Eastern Federal Lands Highway Division.

Special thanks to the Denver Service Center for their active involvement as project managers and to the WASO Park Facilities Management Division Facilities Planning Branch for their oversight and program management.

Following a 30 day stakeholder review period, the final version of the *Northeast Region Long Range Transportation Plan* is accepted by the Northeast Regional Director.

Dan R. Ronkebart 3/5/13

ACCEPTED
Regional Director, Northeast Region

Date

Title page photo (opposite):

Skyline Drive, Shenandoah National Park. Photo by VHB.

Final Report

Northeast Region Long Range Transportation Plan

March 2013

Prepared by:
National Park Service
Northeast Region
Washington Support Office - Facilities Planning Branch

Federal Highway Administration
Eastern Federal Lands Highway Division

Table of Contents

Acronyms ..... **viii**

Chapter 1 | Introduction **1**

1.1 The Northeast Region 3

1.2 Need for a Long Range Plan 5

1.3 Long Range Transportation Planning Process 5

1.4 Outreach and Coordination 6

Chapter 2 | Purpose of the LRTP **7**

2.1 Goals and Objectives 8

2.2 Relationship to National Policies and Guidance 10

2.3 Roadmap to the Long Range Transportation Plan 18

Chapter 3 | Manage Assets Wisely **19**

3.1 Existing NER Transportation Conditions 20

3.2 Future Trends 25

3.3 Strategies for Moving Forward to Manage Assets Wisely 39

Chapter 4 | Ensure Access, Safety, and Mobility **43**

4.1 Existing Access & Mobility Conditions 44

4.2 Existing Safety Conditions 46

4.3 Future Trends and Considerations 49

4.4 Access, Safety, & Mobility Needs 51

4.5 Strategies for Moving Forward to Ensure Access, Safety, & Mobility 53

Chapter 5 | Enhance Visitor Experiences **57**

5.1 Visitor Use and Characteristics 58

5.2 Visitor Experiences and Transportation 61

5.3 Future Trends and Considerations 62

5.4 Visitor Needs and Opportunities 65

5.5 Strategies for Moving Forward to Enhance Visitor Experiences 67

Chapter 6 | Protect Resources **69**

6.1 Existing Resource Protection Issues 70

6.2 Future Resource Protection Trends 76

6.3 Resource Protection Needs and Opportunities 77

6.4 Strategies for Moving Forward to Protect Resources 78

Chapter 7 | Ensure Sustainable Operations **81**

7.1 Financially Sustainable Portfolio of Assets 82

7.2 Identification and Programming of Operational and Maintenance Needs 86

7.3 Regional, Community, and Private Partnerships 86

7.4 Organization Requirements 87

Chapter 8 | Summary of Recommendations **89**

8.1 Implementation Plan 90

8.2 Key Findings and Future Planning Efforts 101

8.3 Transportation Plan Benchmarks and Updates 102

Figures

Figure 1-1: Northeast Region Map 2
Figure 1-2: Distribution of National Park Visitor Spending 5
Figure 1-3: NER Transportation Planning Towards a LRTP 6
Figure 3-1: Northeast Region Transportation Asset Portfolio, by Percentage of Current Replacement Value 21
Figure 3-2: Optimizer Banding of Assets by API and FCI 22
Figure 3-3: NER Ownership of Surface and Water Transit Assets 23
Figure 3-4: Annual Capital Funding Need for Northeast Region Transportation Assets 29
Figure 3-5: HPMA Modeling for NER Roads 30
Figure 3-6: HPMA Modeling for NER Parking 30
Figure 3-7: Pontis Modeling for NER Bridges 31
Figure 3-8: ATS Needs in the Northeast Region, Including Trails 32
Figure 3-9: Forecasted Capital Funding, FY 12-FY 31 33
Figure 3-11: Funding Gap Analysis: Annual Capital Needs 33
Figure 3-12: Funding Gap Analysis: Annual O&M Needs 33
Figure 3-10: Forecasted O&M Funding, FY 12-FY 31 33
Figure 4-1: NER Congestion Survey Results by Emphasis Area 46
Figure 4-2: Northeast Region Crash Collision Types, 1990-2005 47
Figure 4-3: U.S. Obesity Trends from 1990 to 2010 50
Figure 5-1: Northeast Region Visitation (2002–2011) 58
Figure 5-2: Park Units and Visitation by Park Type in Northeast Region (2011) 59
Figure 5-3: Northeast Region Distribution of Park Unit Visitation by Area Classification (2011) 60
Figure 5-4: Northeast Region Visitation by Park (2011) 61
Figure 5-5: Population Growth Forecast in the Northeast Region (2008-2030) 64
Figure 6-1: Northeast Region Historic Transportation Assets, by Current Replacement Value 70
Figure 6-2: Optimizer Banding of Historic and Non-Historic Assets 71
Figure 6-3: 8-Hour Nonattainment and Maintenance Areas 73
Figure 6-4: Northeast Region Parks and Visitation, by Air Quality Attainment 74

Tables

Table 2-1: Northeast Region LRTP Vision, Goals, and Objectives 9
Table 2-2: Comparison of LRTP Goals to National Policies 10
Table 2-2: Comparison of LRTP Goals to National Policies (continued) 11
Table 2-3: Comparison of LRTP Goals to Capital Investment Strategy 13
Table 2-4: Comparison of LRTP Goals to A Call to Action 16
Table 2-5: A Reader's Roadmap to this LRTP Document 18
Table 3-1: Northeast Region Transportation Asset Portfolio 21
Table 3-2: Northeast Region Road Inventory 22
Table 3-3: Existing NER Alternative Transportation Systems 24
Table 3-4: Summary of Required Transportation-Related Operations and Maintenance Funding 25
Table 3-5: Northeast Region LRTP Investment Scenarios: Allocation of Resources 35
Table 3-6: Investment Scenario Outcomes 36
Table 4-1: Private Automobile Mode Share by Visitors 44
Table 4-2: Strategies Currently Used by Northeast Region Park Units to Address Congestion 46
Table 4-3: Northeast Region Average Annual Vehicle Crashes 1990-2005 47
Table 4-4: Key Transportation Management Considerations for the Northeast Region 49
Table 5-1: Influence of Mode Choice on Visitor Experience 63
Table 6-1: Historic Northeast Region Transportation Assets 70
Table 6-2: Percentage of Transportation Assets in Good Condition 71
Table 6-3: Potential Threats Posed by Climate Change 76
Table 7-1: Status of Key Performance Metric Data 85
Table 8-1: Northeast Region LRTP Recommendations and Performance Metrics — Goal: Manage Assets Wisely 92
Table 8-2: Northeast Region LRTP Recommendations and Performance Metrics — Goal: Ensure Access, Safety, & Mobility 94
Table 8-3: Northeast Region LRTP Recommendations and Performance Metrics — Goal: Enhance Visitor Experiences 96
Table 8-4: Northeast Region LRTP Recommendations and Performance Metrics — Goal: Protect Resources 98
Table 8-5: Northeast Region LRTP Recommendations and Performance Metrics — Goal: Ensure Sustainable Operations 100
Table 8-6: Northeast Region LRTP Performance Benchmarks and Summary of Investment Strategies 103

Acronyms

API	Asset Priority Index
ARRA	American Recovery and Reinvestment Act
ATS	Alternative Transportation System
BIP	Bridge Inspection Program
CCRS	Climate Change Response Strategy
CIS	Capital Investment Strategy
CMAQ	Congestion Mitigation and Air Quality
CMS	Congestion Management System
CRV	Current Replacement Value
DM	Deferred Maintenance
DOT	Department of Transportation
EFLHD	Eastern Federal Lands - Highway Division
EPA	Environmental Protection Agency
ERFO	Emergency Relief for Federally Owned Roads
FCI	Facility Condition Index
FHWA	Federal Highway Administration
FLHBO	Federal Lands Highway Bridge Office
FLHP	Federal Lands Highway Program
FMSS	Facility Management Software System
GHG	Greenhouse Gas
HI	Health Index
HPMA	Highway Pavement Management Application
ITS	Intelligent Transportation Systems
LCS	List of Classified Structures
LRTP	Long Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NB	National Battlefield
NBP	National Battlefield Park
NER	Northeast Region of the National Park Service
NHP	National Historical Park
NHS	National Historic Site
NM & HS	National Monument & Historic Shrine
NM	National Monument
NMem	National Memorial
NMP	National Military Park
NMTR	Non-Motorized Transportation Route
NP	National Park
NPS	National Park Service
NR	National River
NRA	National Recreation Area
NS	National Seashore
O&M	Operations and Maintenance
OB	Optimizer Band
PAMP	Park Asset Management Plan
PCR	Pavement Condition Index
RIP	Roadway Inventory Program
ROS	Roadway Objective Score
STARS	Servicewide Traffic Accident Reporting System
TCFO	Total Cost of Facility Ownership
TRIP	Transit in the Parks Program
PAMP	Park Asset Management Plan
TSMS	Transportation Safety Management System
UTAP	Universal Trail Assessment Process
WASO	Washington Support Office

CHAPTER 1 | Introduction

The Long Range Transportation Plan (LRTP) sets forward an ambitious goal to define an overall strategy for transportation investment in the Northeast Region of the National Park Service. This plan describes how transportation can help to protect and preserve our treasured resources, provide access to a more diverse and growing constituency, and respond to the ever-growing challenges of the 21st century. The principal goals of the plan are listed below. The manners in which these goals will be addressed are described in the subsequent chapters of this document.

Summit of Cadillac Mountain, Acadia National Park. Photo by VHB.

Goals:

- **Manage Assets Wisely**
- **Ensure Access, Safety, & Mobility**
- **Enhance Visitor Experiences**
- **Protect Resources**
- **Ensure Sustainable Operations**

Figure 1-1: Northeast Region Map

The National Park Service (NPS) and the Federal Highway Administration (FHWA) in partnership undertook this long range transportation planning process to guide transportation program development and implementation, and provide NPS leadership with benchmarks for evaluating transportation projects in an asset-informed environment across the region. This pilot LRTP followed planning guidance provided by both the Washington Support Office (WASO) – Facilities Planning Branch (FPB)[1] and the Eastern Federal Lands Highway Division (EFLHD) of FHWA.[2] The long range plan brings the Northeast Region of the National Park Service into compliance with federal legislation requiring federal land management agencies to conduct long range transportation planning consistent with US Department of Transportation planning requirements for states and metropolitan planning organizations. The Northeast Region LRTP may serve as a model for region-level transportation planning within the National Park Service.

As this long range plan documents, the transportation needs of the parks of the Northeast Region today far exceeds available funds. Coordination, communication, and cooperation among federal, state, regional, and local officials to successfully maintain and improve critical transportation infrastructure within and near the park units of the Northeast Region have never been more important.

1.1 The Northeast Region

The Northeast Region (NER) of the National Park Service features approximately 20 percent of national park system units in 76 parks among 13 states extending from Maine to Virginia. It is also home to numerous affiliated National Heritage Areas and Corridors, National Wild & Scenic Rivers, and National Historic and Scenic Trails, as illustrated in **Figure 1-1.** This LRTP focuses on the transportation infrastructure owned by the National Park Service and the facilities and services that provide access to the national park system units.

In 2011, approximately 53 million visitors experienced the parks of the Northeast Region for the enjoyment of their natural resources, exploration into the history of America, and recreation. This represents about 19 percent of the 279 million total annual visitors to all NPS units nationally. These Northeast Region park units attract visitors from across the nation and around the world and their settings extend from remote and pristine environments like that of Acadia National Park in Maine, to urban parks like those in New York City, Philadelphia, and Boston.

The Northeast Region is responsible for the operation and upkeep of over 875 centerline miles of roads, more than 150 bridges and tunnels, some 600 acres of parking, approximately 150 miles of transportation trails, and alternative transportation systems at 23 parks. All of the transportation assets support the mission of enabling visitors to experience the national park system. Some of these transportation assets are themselves cultural assets to be protected and enjoyed. They include iconic historic roads like Skyline Drive through Shenandoah National Park and the Colonial Parkway within Colonial National Historical Park.

Visitor expectations of unfettered access to park units and sites can jeopardize the very resources they have come to enjoy. The National Park Service is challenged to deliver an efficient transportation system that meets the demands for visitation to the region, is designed in a context-sensitive manner, and is mindful of transportation's role in visitor experiences; all while advancing the stewardship responsibility of the National Park Service for the national treasures in its care.

The future of the northeastern region of the United States is evolving and the National Park Service needs to be responsive to new challenges and opportunities. Continued urban population growth, interest in recreational activities and non-motorized transportation such as biking and walking, widespread technology integration, increased energy and resource demands, and long-term effects of climate change are all issues that will help shape the region and influence the National Park Service's transportation system investments. Transportation planning for the national park system of the future must recognize and respond to these evolving socioeconomic, environmental, and visitor needs.

1 National Park Service-WASO Denver, "NER Long Range Transportation-Plan Guidance," January 26, 2012.

2 Federal Highway Administration, "Transportation Planning Guidance for Federal Land Management Agencies," December 13, 2011.

1.1.1 Regional Context

The Northeast Region encompasses the most densely populated, urbanized, and ethnically diverse section of the nation. The total population of the states within the Northeast Region as of 2010 was 72 million, or about 23 percent of the U.S. total. The Northeast Region is home to many large cities including the economic hubs of New York City, Philadelphia, Baltimore, and Boston and its residents are among the highest transit users in the country. The national park units offer residents of the region diverse cultural and recreational opportunities "in their backyard". The Northeast Region is conscious of its responsibility to connect these parks with the communities they serve.

FestiFall at Friendship Hill National Historic Site. Photo by NPS

1.1.2 Historical/Cultural Significance

Park units of the Northeast Region connect visitors to the storied history of our nation. The Northeast Region is home to more than half of the nation's national historic landmarks and one quarter of the national park system historic sites.

More than 28 million people annually visit the Northeast Region to explore the 60 historical and cultural park units in the region for which visitation data are available.[3] Cultural/historical park units are comprised of national battlefields, national battlefield parks, national historic sites, national historical parks, national memorials, national military parks, and national monuments. The chief purposes of these visits are to explore the birth of our nation and its first settlements, to relive the battles for independence during the Revolutionary War, to better understand our struggles for unity and equality during the Civil War, and to appreciate the industrialization of the nation's economy.

Rafting on New River, New River Gorge National River. Photo by VHB

1.1.3 Recreational Assets

The park units of the Northeast Region provide unparalleled recreational opportunities for the urban and suburban residents in the region. Comprised of national parks, national recreation areas, national rivers, and national seashores, recreational park units attracted almost 25 million visitors in 2011. The intensity of visits to recreational park units, driven by season and weather conditions, has generated a need for more bicycle and pedestrian connections, as well as more active transportation management strategies such as advanced traveler information systems to advise on traffic congestion and parking availability, reservation systems, intercept parking locations, and shuttle services.

Outdoor recreational resources at Gateway National Recreation Area, the Delaware Water Gap National Recreation Area, and Cape Cod National Seashore comprise almost two-thirds of the recreational visitation in the Northeast Region, demonstrating their importance as resources for the urban populations of the northeast, including New York City, New Jersey, Philadelphia, and Boston. With a renewed focus by the federal government, the Department of the Interior, and the National Park Service on reconnecting young people to the great outdoors, and on overcoming obesity trends in the U.S. through more active lifestyles, the relevance of these resources to the region is only expected to increase in the future.

1.1.4 Economic Importance to the Northeast

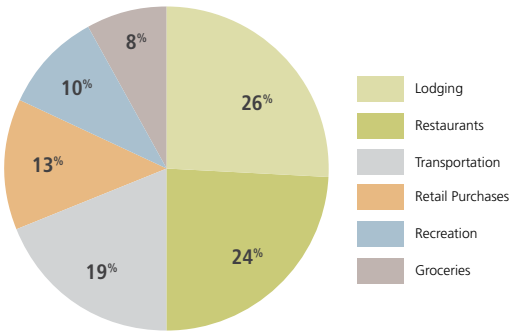
Beyond its intrinsic value, the national park system within the Northeast Region is an important economic engine and contributes significantly to the vitality and sustainability of its gateway communities.

Parks contribute to local economies by drawing visitors to the host community and generating employment opportunities. A recent study quantified the visitor spending and job creation of parks throughout the country, including the Northeast Region.[4] In 2010, national parks in the Northeast Region experienced more than 55 million recreational visits, with estimated spending by non-local visitors of $1.8 billion at local establishments. Jobs attributable to non-local visitor spending were estimated to be approximately 25,600 and the National Park Service contributed another 4,600 jobs for individuals directly on their payroll. Spending by visitors occurs in several sectors including lodging, restaurants and grocery stores, recreation, and transportation. Lodging and restaurants account for about half of the spending, as illustrated by **Figure 1-2.**

3 National Park Service Public Use Statistics Office, "Annual Recreation Visits Report" Note: Data presented for the 71 park units for which data are available.

4 Daniel J. Stynes, "Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010." Natural Resource Report NPS/NRSS/EQD/NRR-2011/481, December 2011.

Figure 1-2:
Distribution of National Park Visitor Spending



Source: Daniel J. Stynes, "Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010." Natural Resource Report NPS/NRSS/EQD/NRR-2011/481, December 2011.

Top among the parks in the Northeast Region, in terms of their contributions to their local economies, are (in rank order) Acadia National Park in Maine, Cape Cod National Seashore in Massachusetts, Statue of Liberty National Monument in New York, Gateway National Recreation Area in New York and New Jersey, and Delaware Water Gap National Recreation Area in New Jersey and Pennsylvania.

1.2 Need for a Long Range Plan

Transportation in America has experienced several transformative periods that have shaped our communities, our way of life, and our landscapes. The water and horse drawn transportation era of our founding fathers, the completion of the transcontinental railroad in 1869, the introduction of public transit systems in our urban areas in the late 1800s, the emerging dominance of the automobile in the 1930s and 1940s, and growth in air travel over the last half century have each dramatically changed our physical world, our economics, and our daily patterns. This history is an integral part of the parks of the Northeast Region. As a result, the transportation system of the Northeast Region is as varied as the parks it serves; comprised of transportation assets that range in age from 1 to 100 years, or more, and providing access by all modes of travel.

Significant legislative expansion of park facilities and resources occurred across the nation and within the Northeast Region in the early to mid 20th century, followed by several decades of investment in transportation facilities in the 1960s and 1970s. But without adequate and sustained support for the maintenance and upkeep of these park assets, the conditions of many of these facilities have deteriorated, and some have reached their useful life. Despite increased attention to this issue over the past decade, it is estimated that there remains more than $490 million in backlog deferred maintenance of transportation facilities in the Northeast Region.[5] This backlog severely limits the region's ability to respond to issues of safety and congestion, provide new programs to enhance the visitor experiences, or address the future physical and operational implications of climate change.

No transportation provider in America has a more difficult "balancing act" than our National Park Service. Its mission, as established by the Organic Act of 1916, is: "…to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations". The diversity of transportation assets in the portfolio (many of which are historic or cultural resources themselves), their varied conditions, their sensitive environs, and the growing and evolving needs of its visitors are chief among the challenges facing the Northeast Region. The modern day needs of safety, congestion, and addressing the implications of climate change, as evidenced most recently by Hurricane Sandy, within a fiscally constrained environment add to these challenges. And so it is imperative that the Northeast Region prioritizes its transportation needs and investments across all modes and facilities and spends every transportation dollar wisely with an eye on maximizing the return on its investment. This LRTP provides the Northeast Region of the National Park Service with the policy and planning framework to develop an integrated, targeted, and performance-based transportation program.

The Northeast Region currently faces more than $490 million in deferred maintenance for its transportation system

1.3 Long Range Transportation Planning Process

This LRTP summarizes several years of multimodal transportation planning and technical studies. A chronology of these studies, including the evolution of asset management systems in the region, is provided in the Compendium of Technical Studies and summarized in **Figure 1-3.**

5 Northeast Region Office, FMSS Analysis of Transportation Assets in the Northeast Region. Booz Allen Hamilton, March 2012.

This is the first long range transportation plan for the Northeast Region. The policy framework and planning recommendations within this document will be used to develop a more targeted, performance based transportation program in the short term. The plan will require periodic updates over the medium to long-term — as conditions evolve, better data become available, and in response to new national policies and directives.

1.4 Outreach and Coordination

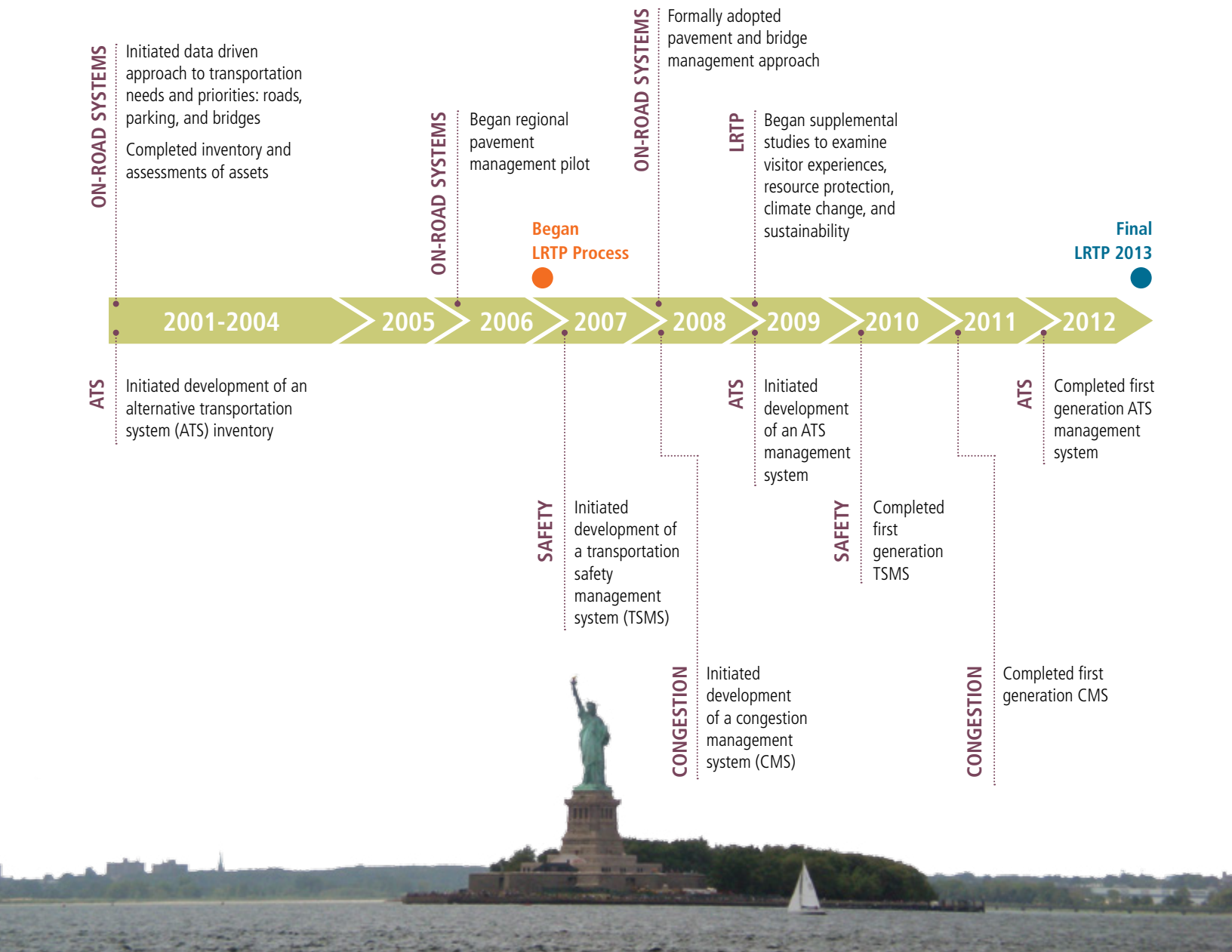
In addition to defining an overall strategy for transportation investment, long range transportation plans are an important tool for outreach and coordination with federal, state, and local government agencies and non-governmental transportation partners.

By presenting the National Park Service's goals for transportation in the region, this LRTP will aid in identifying areas of common interest and ultimately lead to better coordinated transportation investments benefiting visitors to all National Park Service units.

A draft and final version of this LRTP was shared with each superintendent in the Northeast Region. Park superintendents were encouraged to share this plan with their transportation partners and stakeholders in order to facilitate coordination at all levels of the National Park Service.

A coordinated effort will be made in future updates of this plan to include superintendents and their transportation partners.

Figure 1-3: NER Transportation Planning Towards a LRTP



CHAPTER 2 | Purpose of the LRTP

VISION

Ever mindful of visitor needs and vigilant about resource stewardship, the Northeast Region wisely invests in transportation infrastructure and services to maintain and enhance public access to its parks, and achieve a 21st century multimodal transportation system that is safe, efficient, and financially and environmentally sustainable.

Blackstone River Bikeway, Blackstone River National Heritage Corridor. Photo by VHB

Goals:

- **Manage Assets Wisely**
- **Ensure Access, Safety, & Mobility**
- **Enhance Visitor Experiences**
- **Protect Resources**
- **Ensure Sustainable Operations**

The NER Long Range Transportation Plan establishes a structure for sound transportation planning and decision making and serves as a guide to ensure that transportation investment supports the vision, goals, and objectives of the Northeast Region. In embracing the future and confronting the number of transportation challenges and opportunities facing the National Park Service, the LRTP is beneficial to the Northeast Region because it:

- enables the National Park Service to make informed decisions based on a transportation vision, goals and performance measures for public access
- provides a more holistic view of transportation needs in relation to core operations, asset management, visitor services and experiences, and resource stewardship
- provides current data on multimodal transportation issues and needs across the region
- empowers leaders to program funding to the most beneficial transportation projects
- allows the National Park Service to better coordinate transportation planning with other park planning, state and metropolitan planning, local community planning, and stakeholder agencies
- broadens opportunities for the Northeast Region and park units to partner, leverage funds and discuss areas of mutual interest with public and regional entities
- addresses what the Northeast Region can do within the forecasted funding levels, and
- enhances performance measurement

2.1 Goals and Objectives

Transportation infrastructure plays a vital role in supporting NPS goals by connecting people with nature, enhancing visitor experiences supporting recreation, cultural and historical education, and allowing public access to America's treasures. The five main goals identified for the region as part of the LRTP include:

Manage Assets Wisely

Ensure Access, Safety, & Mobility

Enhance Visitor Experiences

Protect Resources

Ensure Sustainable Operations

Key transportation challenges that lie ahead for the National Park Service, in general, and the Northeast Region, in particular, related to each of these goals include:

Manage Assets Wisely

- addressing the deferred maintenance backlog of road, parking, and bridge facility needs
- sustaining and enhancing alternative transportation assets, including docks, marinas, and trails, in good condition

Ensure Access, Safety & Mobility

- improving safety and reducing severe crashes and injuries on park transportation facilities
- advancing strategies to mitigate congestion in the park units and their gateway communities
- incorporating the security, emergency response, and law enforcement needs of the park units

Enhance Visitor Experiences

- improving overall visitor experiences through investment in multimodal transportation and accessibility
- meeting the needs of a changing demographic that is aging, becoming more diverse, and more technologically focused

Protect Resources

- maintaining historical and culturally significant transportation resources in good condition
- assessing and responding to the implications of climate change (in particular, severe weather and sea level changes)
- reducing greenhouse gas emissions

Ensure Sustainable Operations

- matching funding sources with identified transportation system maintenance needs
- responding to the national call for NPS leadership in sustainable transportation and operations
- broadening partnerships and cooperative planning to fully integrate park service access needs at the community, regional, state, and federal levels

These goals, along with the objectives that define how they will be achieved, are provided in Table 2-1. Transportation investment policies and decision making in the region moving forward will be guided by and benchmarked against these goals and objectives.

Table 2-1: Northeast Region LRTP Vision, Goals, and Objectives

VISION

Ever mindful of visitor needs and vigilant about resource stewardship, the Northeast Region wisely invests in transportation infrastructure and services to maintain and enhance public access to its parks, and achieve a 21st century multimodal transportation system that is safe, efficient, and financially and environmentally sustainable.

Goals	Objectives
Manage Assets Wisely Sustain all high priority transportation assets within the region at their desired condition to ensure their protection and availability for future generations.	▪ Maintain high priority transportation system assets in good condition ▪ Collect data and use performance goals and management systems to improve the overall condition, utilization, and effectiveness of the asset portfolio over time ▪ Decommission or dispose of low priority assets
Ensure Access, Safety, & Mobility Provide a safe and efficient multimodal park transportation system with seamless connections within each park and to surrounding communities (where opportunities exist).	▪ Protect the health and safety of visitors and employees ▪ Provide multimodal options to ensure access, relieve congestion, reduce resource impacts, and reinforce sustainable practices ▪ Enhance accessibility to the broadest diversity of visitors ▪ Improve intermodal connectivity (address gaps in access between modes)
Enhance Visitor Experiences Support rewarding visitor experiences by maintaining high priority transportation assets in good condition, improving trip planning resources, and better integration of transportation within the park interpretive experience.	▪ Maintain high priority transportation system assets in good condition ▪ Provide trip planning resources and travel information to access the parks ▪ Integrate effective visitor information systems within park transportation system ▪ Address transportation congestion and the impacts of non-park traffic that impede park access and/or the enjoyment of parks
Protect Resources Protect cultural and natural resources for the enjoyment of future generations and promote environmental sustainability.	▪ Maintain culturally significant transportation assets in good condition ▪ Manage visitation and access to avoid and/or minimize adverse impacts to park resources ▪ Adapt park transportation resources to increase resilience to climate change and manage park transportation systems to mitigate the effects of climate change and other stressors ▪ Incorporate green principles into the planning, design, construction, and operation of park transportation systems
Ensure Sustainable Operations Advance planning and programming in the Northeast Region to ensure the long-term financial, partnership, and operational sustainability of its transportation system.	▪ Achieve a financially sustainable portfolio of transportation assets ▪ Improve the identification and programming of operations and maintenance needs ▪ Strengthen regional, community, and private partnerships ▪ Establish organizational capacity to plan, implement, and monitor the LRTP recommendations and outcomes

2.2 Relationship to National Policies and Guidance

The motivation and approach to transportation planning for a federal land management agency, such as the National Park Service, is different than for a typical transportation planning agency in that it is framed by the visitor and resource-centric mission statement of the agency and recreational use patterns. Importantly, each individual park unit is further guided by the enabling legislation that established the property as a national resource.

Within the National Park Service, transportation investments are guided at a national level with Management Policies and Director's Orders. Management Policies "set the broad framework, provide direction and prescribe parameters for making management decisions" for all NPS issues, including transportation planning and investment.[1] Director's Orders provide interim guidelines for new and revised policies in between NPS Management Policies publication dates.[2] The Director's Orders also provide detailed interpretation of Management Policies and set specific authorities and responsibilities. The goals and objectives for this Long Range Transportation Plan are aligned with these and other key national policies and planning guidance documents, as illustrated in Table 2-2.

1 NPS *Management Policies 2006.* (See Section 9.2)

2 Available on-line at nps.gov/applications/npspolicy/DOrders.cfm.

Table 2-2: Comparison of LRTP Goals to National Policies

NORTHEAST REGION LRTP	STRATEGIC PLANS AND OTHER TRANSPORTATION GUIDANCE				
GOALS & OBJECTIVES	DOI STRATEGIC PLAN 2011-2016	NPS GREEN PARKS PLAN	CLIMATE CHANGE RESPONSE STRATEGY	PARK ROADS AND PARKWAYS HANDBOOK 2008	MOVING AHEAD FOR PROGRESS IN THE 21ST CENTURY (MAP-21)
Manage Assets Wisely					
Maintain high priority transportation system assets in good condition	Mission 1, Goal 2	Be Climate Friendly and Climate Ready	Goal 5	✓	National Goal 2
Collect data and use performance goals and management systems to improve the overall condition, utilization, and effectiveness of asset portfolio over time	Mission 4		Goal 3	✓	Sec. 1203
Decommission or dispose of low priority assets				✓	
Ensure Access, Safety & Mobility					
Protect the health and safety of visitors and employees	Mission 1, Goal 3			✓	National Goal 1
Provide multimodal options to ensure access, relieve congestion, reduce resource impacts, and reinforce sustainable practices	Mission 1, Goal 3	Be Climate Friendly and Climate Ready		✓	National Goal 3 National Goal 4 National Goal 6
Enhance accessibility to the broadest diversity of visitors	Mission 1, Goal 3				National Goal 5
Improve intermodal connectivity (address gaps in access between modes)					National Goal 4

Table 2-2: Comparison of LRTP Goals to National Policies (continued)

NORTHEAST REGION LRTP	STRATEGIC PLANS AND OTHER TRANSPORTATION GUIDANCE				
GOALS & OBJECTIVES	DOI STRATEGIC PLAN 2011-2016	NPS GREEN PARKS PLAN	CLIMATE CHANGE RESPONSE STRATEGY	PARK ROADS AND PARKWAYS HANDBOOK 2008	MOVING AHEAD FOR PROGRESS IN THE 21ST CENTURY (MAP-21)
Enhance Visitor Experiences					
Maintain high priority transportation system assets in good condition	Mission 1, Goal 2	Be Climate Friendly and Climate Ready	Goal 5	✓	National Goal 2
Provide trip planning resources and travel information to access the parks	Mission 1, Goal 3	Foster Sustainability Beyond Our Boundaries			
Integrate effective visitor information systems within park transportation system	Mission 1, Goal 3			✓	
Address transportation congestion and the impacts of non-park traffic that impede park access and/or the enjoyment of parks	Mission 1, Goal 3			✓	National Goal 1 National Goal 2 National Goal 3 National Goal 4
Protect Resources					
Maintain culturally significant transportation assets in good condition	Mission 1, Goal 2	Be Climate Friendly and Climate Ready	Goal 5	✓	National Goal 2
Manage visitation and access to avoid and/or minimize adverse impacts to park resources	Mission 1, Goal 1		Goal 7	✓	National Goal 6
Adapt park transportation resources to increase resilience to climate change and manage park transportation systems to mitigate the effects of climate change and other stressors	Mission 1, Priority Goal Mission 2, Goal 1	Be Climate Friendly and Climate Ready	Goal 3 Goal 6 Goal 7	✓	
Incorporate green principles into the planning design, construction and operation of park transportation systems	Mission 2, Goal 1	Buy Green and Reduce, Reuse, and Recycle Green Our Rides	Goal 8	✓	National Goal 6
Ensure Sustainable Operations					
Achieve a financially sustainable portfolio of transportation assets	Mission 5	Be Climate Friendly and Climate Ready	Goal 5	✓	National Goal 4 National Goal 5
Improve the identification and programming of operations and maintenance needs				✓	
Strengthen regional, community, and private partnerships	Mission 3	Foster Sustainability Beyond Our Boundaries	Goal 2	✓	
Establish organizational capacity to plan, implement and monitor the LRTP recommendations and outcomes	Mission 5			✓	

Two new policy directives that were anticipated and strongly frame this long range planning effort are the National Park Service Capital Investment Strategy, scheduled to be rolled out for fiscal year 2015 (FY 15), and *A Call to Action: Preparing for a Second Century of Stewardship*, first released in August 2011 and updated in August 2012. An overview of each policy and their intended purposes are highlighted below. The alignment of LRTP goals and objectives with the key tenets of these policies is presented in the tables that follow.

Capital Investment Strategy (CIS)

The Capital Investment Strategy is intended to replace the Department of Interior's Attachment G for use in assessing and prioritizing major capital investments for funding in FY 15 and beyond. The CIS framework brings life-cycle cost considerations and NPS mission-related benefits into the investment decision-making. The four key elements, strategic goals, and anticipated activities that will result from implementation of the CIS are highlighted below.[3]

Financial Sustainability emphasizes: build only what can be maintained; right-size the portfolio; reduce liabilities; and eliminate non-essential development in parks in order to emphasize the park's natural and cultural significance.

Activities that rank high in this area include: the investment in high priority, mission critical assets; disposition of non-essential facilities; and, actions that reduce operating and maintenance liabilities.

Visitor Use advises parks to prioritize investments in facilities that primarily serve visitors, are primary points of recreation, and encourage users to spend more time outdoors.

Beneficial activities include investments that directly enable outdoor recreation, and investments that are primary touch points for visitors to the park.

Resource Protection seeks to prioritize investments that preserve and protect valuable and unique natural and cultural resources.

Activities that rank high in this area include investments in the preservation and repair of historic (List of Classified Structures) assets, and environmental and cultural restoration.

Health and Safety adds priority to investments that correct facility or site related deficiencies and hazards that may cause injury or harm to the public, staff, or the environment.

Beneficial activities include the correction of identified unsafe or hazardous conditions on NPS facilities.

Ultimately, the National Park Service will develop processes and procedures to use this framework to assess and prioritize all of its major capital investments. The Northeast Region LRTP goals and objectives are well aligned to the philosophy and goals embodied by the Capital Investment Strategy, as highlighted in **Table 2-3**.

3 Drawn from "National Park Service FY 15 Capital Investment Strategy," presentation by Tim Harvey, Chief, Park Facility Management Division, May 17, 2012.

Table 2-3: Comparison of LRTP Goals to Capital Investment Strategy

NORTHEAST REGION LRTP GOALS & OBJECTIVES	CAPITAL INVESTMENT STRATEGY: ELEMENTS AND GOALS			
	FINANCIAL SUSTAINABILITY	VISITOR USE	RESOURCE PROTECTION	HEALTH AND SAFETY
Manage Assets Wisely				
Maintain high priority transportation system assets in good condition	✓	✓	✓	✓
Collect data and use performance goals and management systems to improve the overall condition, utilization, and effectiveness of asset portfolio over time	✓	✓	✓	✓
Decommission or dispose of low priority assets	✓			✓
Ensure Access, Safety & Mobility				
Protect the health and safety of visitors and employees	✓	✓		✓
Provide multimodal options to ensure access, relieve congestion, reduce resource impacts, and reinforce sustainable practices		✓	✓	✓
Enhance accessibility to the broadest diversity of visitors		✓		✓
Improve intermodal connectivity (address gaps in access between modes)		✓	✓	✓
Enhance Visitor Experiences				
Maintain high priority transportation system assets in good condition	✓	✓	✓	✓
Provide trip planning resources and travel information to access the parks		✓		
Integrate effective visitor information systems within park transportation system		✓	✓	
Address transportation congestion and the impacts of non-park traffic that impede park access and/or the enjoyment of parks		✓	✓	✓
Protect Resources				
Maintain culturally significant transportation assets in good condition	✓	✓	✓	✓
Manage visitation and access to avoid and/or minimize adverse impacts to park resources		✓	✓	
Adapt park transportation resources to increase resilience to climate change and manage park transportation systems to mitigate the effects of climate change and other stressors	✓		✓	
Incorporate green principles into the planning design, construction and operation of park transportation systems	✓		✓	
Ensure Sustainable Operations				
Achieve a financially sustainable portfolio of transportation assets	✓			
Improve the identification and programming of operations and maintenance needs	✓	✓	✓	✓
Strengthen regional, community, and private partnerships	✓	✓	✓	✓
Establish organizational capacity to plan, implement and monitor the LRTP recommendations and outcomes	✓	✓	✓	✓

A Call to Action: Preparing for a Second Century of Stewardship and Engagement

As the National Park Service prepares for its 100th anniversary in 2016, *A Call to Action* lays outs a vision, goals, and actions to help the NPS prepare for the challenges of the 21st century. *A Call to Action* is organized around four themes, as presented below, each with their own goals and actions. Those specific actions that relate to transportation planning and programming are highlighted below.

Theme: Connecting People to Parks

DEVELOP and nurture life-long connections between the public and parks—especially for young people—through a continuum of engaging recreational, educational, volunteer, and work experiences.

CONNECT urban communities to parks, trails, waterways, and community green spaces that give people access to fun outdoor experiences close to home.

EXPAND the use of parks as places for healthy outdoor recreation that contributes to people's physical, mental, and social well-being.

WELCOME and engage diverse communities through culturally relevant park stories and experiences that are accessible to all.

Transportation-related Actions:

- *In My Back Yard:* Improve urban residents' awareness of and access to outdoor and cultural experiences close to home by promoting national parks in urban areas and ensuring safe and enjoyable physical connections from parks to a variety of sustainable transportation options aligned with urban populations' needs.
- *Parks for People:* Enhance the connection of densely populated, diverse communities to parks, greenways, trails, and waterways to improve close-to-home recreation and natural resources conservation.
- *Focus the Fund:* Increase the benefits of NPS community assistance by strategically focusing on the difference Land and Water Conservation Fund projects make in meeting outdoor recreation needs, especially close to where people live, for under-served communities and protecting lands, trails, and waterways.
- *Follow the Flow:* Support communities' efforts to expand access to water-based recreation and to protect and restore waterways across the country by establishing a national system of water trails.

Theme: Advancing the NPS Education Mission

STRENGTHEN the Service as an education institution and parks as places of learning that develop American values, civic engagement, and citizen stewardship.

USE leading-edge technologies and social media to effectively communicate with and capture the interest of the public.

COLLABORATE with partners and education institutions to expand NPS education programs and the use of parks as places of learning.

Transportation-related Actions:

- *Go Digital:* Reach new audiences and maintain a conversation with all Americans by transforming the NPS digital experience to offer rich, interactive, up-to-date content from every park and program.
- *Ticket to Ride:* Expand opportunities for students to directly experience national parks, where natural and historic settings inspire powerful learning
- *Out with the Old:* Engage national park visitors with interpretive media that offer interactive experiences, convey information based on current scholarship, and are accessible to the broadest range of the public.
- *Scholarly Pursuits:* Sponsor excellence in science and scholarship, gain knowledge about park resources, and create the next generation of conservation scientists.

Theme: Preserving America's Special Places

MANAGE the natural and cultural resources of the National Park System to increase resilience in the face of climate change and other stressors.

CULTIVATE excellence in science and scholarship as a foundation for park planning, policy, decision-making, and education.

ACHIEVE a standard of excellence in cultural and natural resource stewardship that serves as a model throughout the world.

COLLABORATE with other land managers and partners to create, restore, and maintain landscape-scale connectivity.

Transportation-related Actions:

- *Revisit Leopold:* Create a new basis for NPS resource management to inform policy, planning, and management decisions and establish the NPS as a leader in addressing the impacts of climate change on protected areas around the world.
- *Go Green:* Further reduce the NPS carbon footprint over 2009 levels, and widely showcase the value of renewable energy.
- *Invest Wisely:* Focus investments from all maintenance fund sources on high priority national park assets to address critical deferred maintenance and code compliance needs.
- *What's Old is New:* Modernize historic preservation methods and technologies, show how historic structures can be made sustainable, and support efforts to rebuild the economic vitality of rural and urban communities.
- *Posterity Partners:* Engage the power of philanthropy and volunteerism to provide legacy support for the NPS, both nationwide and at the individual park level.

Theme: Enhancing Professional and Organizational Excellence

DEVELOP and recruit NPS leaders at all levels with the skills to lead change, work with partners, ensure employee safety, and seek new ways to accomplish goals.

BUILD a more flexible and adaptive organization with a culture that encourages innovation, collaboration, and entrepreneurship.

RECRUIT and retain a workforce that reflects the diversity of the nation, from entry level employees to senior leaders.

MODERNIZE and streamline NPS business systems and use leading-edge technology to enhance communication.

Transportation-related Actions:

- *Destination Innovation:* Accelerate the spread of ideas, encourage innovation, and inspire peer-to-peer collaboration across the Service.
- *Team Buyin':* Create contracting solutions better oriented to customer needs by designing, implementing, and evaluating a streamlined contracting and cooperative agreements process.
- *Lead the Way:* Engage our workforce by leveraging strong employee commitment, exceptional leadership, and improved management practices.

The Northeast Region LRTP goals and objectives are well aligned to the goals and actions of *A Call to Action*, as highlighted in **Table 2-4**.

A Call to Action rallies employees and partners to advance a shared vision toward 2016. It describes specific goals and measurable actions that chart a new direction for the National Park Service as it enters its second century.

Table 2-4: Comparison of LRTP Goals to *A Call to Action*

NORTHEAST REGION LRTP	*A CALL TO ACTION:* THEMES AND GOALS			
GOALS & OBJECTIVES	CONNECTING PEOPLE TO PARKS	ADVANCING THE NPS EDUCATION MISSION	PRESERVING AMERICA'S SPECIAL PLACES	ENHANCING PROFESSIONAL AND ORGANIZATIONAL EXCELLENCE
Manage Assets Wisely				
Maintain high priority transportation system assets in good condition			Action 24 Invest Wisely	Action 39 Lead the Way
Collect data and use performance goals and management systems to improve the overall condition, utilization, and effectiveness of asset portfolio over time			Action 24 Invest Wisely	Action 39 Lead the Way
Decommission or dispose of low priority assets			Action 24 Invest Wisely	
Ensure Access, Safety & Mobility				
Protect the health and safety of visitors and employees	Action 4 In My Backyard Action 5 Parks for People Action 11 Focus the Fund		Action 24 Invest Wisely	
Provide multimodal options to ensure access, relieve congestion, reduce resource impacts, and reinforce sustainable practices	Action 5 Parks for People			
Enhance accessibility to the broadest diversity of visitors	Action 4 In My Backyard Action 5 Parks for People Action 11 Focus the Fund	Action 18 Ticket to Ride Action 19 Out with the Old	Action 23 Go Green	
Improve intermodal connectivity (address gaps in access between modes)	Action 5 Parks for People Action 11 Focus the Fund		Action 23 Go Green	
Enhance Visitor Experiences				
Maintain high priority transportation system assets in good condition			Action 24 Invest Wisely	
Provide trip planning resources and travel information to access the parks	Action 4 In My Backyard	Action 17 Go Digital Action 18 Ticket to Ride		
Integrate effective visitor information systems within park transportation system	Action 4 In My Backyard Action 11 Focus the Fund	Action 17 Go Digital Action 19 Out with the Old Action 20 Scholarly Pursuits	Action 25 What's Old is New	
Address transportation congestion and the impacts of non-park traffic that impede park access and/or the enjoyment of parks	Action 5 Parks for People Action 11 Focus the Fund		Action 23 Go Green Action 24 Invest Wisely Action 25 What's Old is New	

Table 2-4: Comparison of LRTP Goals to *A Call to Action*

NORTHEAST REGION LRTP	*A CALL TO ACTION:* THEMES AND GOALS			
GOALS & OBJECTIVES	CONNECTING PEOPLE TO PARKS	ADVANCING THE NPS EDUCATION MISSION	PRESERVING AMERICA'S SPECIAL PLACES	ENHANCING PROFESSIONAL AND ORGANIZATIONAL EXCELLENCE
Protect Resources				
Maintain culturally significant transportation assets in good condition		Action 20 Scholarly Pursuits	Action 27 Starry, Starry Night	
Manage visitation and access to avoid and/or minimize adverse impacts to park resources		Action 20 Scholarly Pursuits	Action 23 Go Green	
Adapt park transportation resources to increase resilience to climate change and manage park transportation systems to mitigate the effects of climate change and other stressors		Action 20 Scholarly Pursuits	Action 21 Revisit Leopold	
Incorporate green principles into the planning design, construction and operation of park transportation systems		Action 20 Scholarly Pursuits		
Ensure Sustainable Operations				
Achieve a financially sustainable portfolio of transportation assets	Action 11 Focus the Fund		Action 24 Invest Wisely Action 29 Posterity Partners	Action 34 Team Buyin'
Improve the identification and programming of operations and maintenance needs			Action 24 Invest Wisely	Action 31 Destination Innovation
Strengthen regional, community, and private partnerships	Action 11 Focus the Fund Action 12 Follow the Flow	Action 20 Scholarly Pursuits	Action 29 Posterity Partners	Action 31 Destination Innovation
Establish organizational capacity to plan, implement and monitor the LRTP recommendations and outcomes				Action 31 Destination Innovation

2.3 Roadmap to the Long Range Transportation Plan

This LRTP summarizes several years of multi-modal transportation planning and technical studies, as highlighted in Chapter 1. As shown in Table 2-5, the chapters of this LRTP document are organized around the plan goals and their objectives, followed by a summary of recommendations. For those who wish to delve into more background data and the analysis that went into this planning process, please refer to the Compendium of Technical Studies.

Table 2-5: A Reader's Roadmap to this LRTP Document

Manage Assets Wisely	**Chapter 3** discusses the portfolio of transportation assets in the region, their current conditions, forecasted needs across asset types, and the gap between needs and anticipated funding. Findings and strategies within this chapter focus on how the region will sustain high priority transportation assets within the region at acceptable conditions to ensure their protection and availability for future generations.
Ensure Access, Safety, & Mobility	**Chapter 4** discusses safety and congestion issues within the region that can impact resources and jeopardize the quality of the visitor experience. Findings and strategies within this chapter focus on how the region will work to provide a safe and efficient multimodal park transportation system with seamless connections within each park unit and to surrounding communities.
Enhance Visitor Experiences	**Chapter 5** presents visitor use and characteristics, addresses the relationship of transportation to overall visitor experiences, and discusses trends that may influence future use and experiences within the Northeast Region. Findings and strategies within this chapter focus on ensuring that transportation investments support rewarding visitor experiences with infrastructure and services in good condition, a choice of modes where appropriate, accessible trip planning resources, and better integration of transportation within park interpretive experiences.
Protect Resources	**Chapter 6** discusses key resource issues as they relate to transportation including historic and culturally significant transportation assets, air quality in the region, wildlife crossings, and climate change. Findings and strategies within this chapter focus on maintaining high priority transportation resources for the enjoyment of future generations, encouraging strategies to enhance air quality and protect wildlife, promote environmental sustainability, and adapt to climate change.
Ensure Sustainable Operations	**Chapter 7** advances planning and programming strategies to ensure the long-term financial, partnership, and operational sustainability of the Northeast Region's transportation system. Findings and strategies within this chapter focus on investing wisely in transportation; strengthening regional, community, and private partnerships; and establishing a plan to implement and monitor the LRTP recommendations and outcomes.
Summary of Findings and Recommendations	**Chapter 8** provides an overall implementation plan for the recommendations of this LRTP; presents key lessons learned through the process and future planning efforts; and provides benchmarks for transportation plan progress and updates.

CHAPTER 3 | Manage Assets Wisely

The vision for asset management within the National Park Service is to sustain all high priority, mission critical transportation assets at their desired conditions today and for future generations. Use of data-driven processes to ensure wise investments, and continual enhancements of those processes, is at the core of the Northeast Region's strategy to meet this vision.

Carriage road and bridge, Acadia National Park. Photo by VHB.

Goal **Sustain all high priority transportation assets within the region at acceptable condition to ensure their protection and availability for future generations**

Objectives

1. **Maintain high priority transportation system assets in good condition**
2. **Collect data and use performance goals and management systems to improve the overall condition, utilization, and effectiveness of asset portfolio over time**
3. **Decommission or dispose of low priority assets**

The Northeast Region is responsible for the operation and upkeep of over 875 centerline miles of roads, more than 150 bridges and tunnels, some 600 acres of parking, approximately 150 miles of transportation trails, and alternative transportation shuttle and ferry boat systems at 23 parks. Some of these transportation assets are cultural assets to be protected and enjoyed. All of the transportation assets support the mission of enabling visitors to experience the national park system.

As is true throughout the National Park Service, funding constraints make it difficult for the Northeast Region to maintain the entire transportation inventory in the desired condition. Accordingly, the Northeast Region developed policies and programs designed to prioritize investments and to minimize project costs. Most of the initial efforts focused on roads and bridges since they are used by the majority of visitors, comprise the largest share of transportation investments, and are critical safety concerns.

The Northeast Region strives to continually refine the investment practices for roads and bridges to make them more cost effective, and has expanded the data-driven investment policies towards other transportation elements such as alternative transportation systems, safety, and congestion. All of these efforts align well with the *A Call to Action* goal of Invest Wisely and the prioritization objectives of the Capital Investment Strategy.

This chapter discusses the portfolio of transportation assets in the Northeast Region, their current conditions, forecasted needs across asset types, and the gap between needs and anticipated funding.

Findings and strategies in the last section of this chapter focus on how the region will sustain all high priority transportation assets at an acceptable condition to ensure their protection and availability for future generations. For those who wish to delve into more background data and analyses on this subject matter, please refer to the Compendium of Technical Studies.

3.1 Existing NER Transportation Conditions

The NPS Facility Management Software System (FMSS) database provides an extensive inventory of NPS assets, their characteristics, and their conditions.[1] For this LRTP, the FMSS transportation assets are categorized as follows:

- **On-road systems** are comprised of roads, bridges, and parking lots, including associated assets such as lighting, signs, and traveler information.
- **Non-motorized systems** include walkways, trails, multiuse paths, wayfinding and other assets related to pedestrian and bicycles. The non-motorized transportation routes discussed in this report are those that are integral to or support a park's multimodal network.[2]
- **Transit systems** include buses, trains, trolleys and related assets such as bus stops and maintenance facilities. In the Northeast Region, there are railroad assets at one park and trolley assets at one park, and the remaining transit assets are for shuttle bus and van services.
- **Water systems** include waterways, boat transportation, loading areas, and maintenance facilities. The majority of these assets in the Northeast Region are related to several passenger ferry systems.

Table 3-1 and Figure 3-1 provide a summary of the transportation assets in the Northeast Region. The NER transportation assets have a total current replacement value (CRV) of $2.8 billion. Those assets supporting motor vehicle travel are the predominant type and comprise $2.4 billion (88%) of current replacement value. The balance of the transportation asset inventory is among non-motorized systems (5%), transit systems (3%), and water systems (4%). The Northeast Region has no aviation assets.

1 The FMSS database was edited for the purposes of this plan to include additional transportation assets and to reflect realistic investment practices for assets such as the runway and taxiway network at Floyd Bennett Field. Full details of the adjustments are provided in white papers prepared by Booz Allen.

2 The determination of applicable trail assets is discussed in the Booz Allen white papers.

Table 3-1: Northeast Region Transportation Asset Portfolio

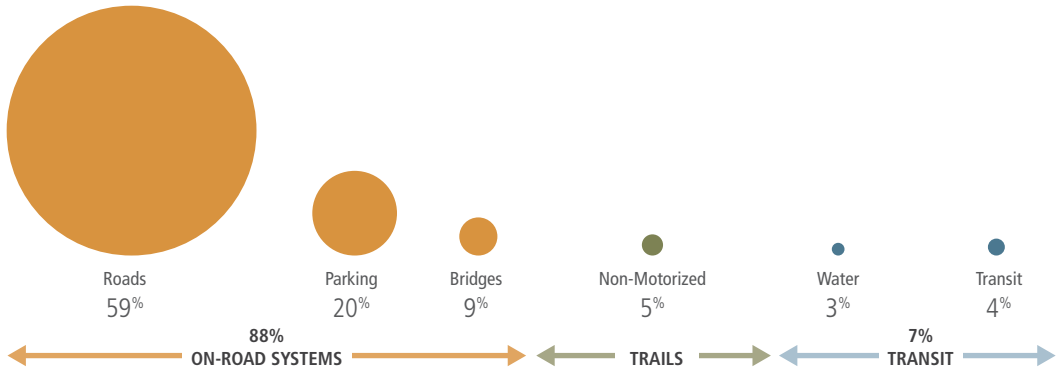
ASSET TYPE	NUMBER OF ASSETS	CURRENT REPLACEMENT VALUE	DEFERRED MAINTENANCE	FACILITY CONDITION INDEX	AVERAGE ASSET PRIORITY INDEX
On-road Systems					
Roads	1,106	$1,635,316,276	$292,169,161	0.18	67
Parking	1,267	$537,967,554	$124,914,006	0.23	60
Bridges	156	$255,467,174	$25,390,015	0.10	82
Non-Motorized Systems	208	$146,749,553	$18,584,174	0.13	72
Water Systems	65	$90,324,896	$11,457,656	0.13	74
Transit Systems	96	$107,638,375	$17,639,904	0.16	83
Total	**2,898**	**$2,773,472,828**	**$490,154,916**	0.18	

Source: Analysis of NER transportation assets in FMSS database (March 2012)

FCI < 0.10 = "Good" condition. FCI > 0.10 and ≤ 0.15 = "Fair" condition. FCI > 0.15 and ≤ 0.50 = "Poor" condition. FCI > 0.50 = "Serious" condition.

Assets with API > 75 are considered critical to the mission of a park. Assets with an API between 21 and 74 are considered mission dependent. Assets with an API of 20 or less do not impact the mission of a park.

Figure 3-1: Northeast Region Transportation Asset Portfolio, by Percentage of Current Replacement Value



Source: Analysis of Northeast Region transportation assets in FMSS database (March 2012)

Table 3-1 also shows that there is approximately $490 million in deferred maintenance for Northeast Region transportation assets. Although transportation assets represent only 12 percent of the CRV of all Northeast Region assets, transportation assets account for 25 percent of the total deferred maintenance for all types of assets. This indicates that, on average, transportation assets tend to be in poorer condition than other assets. On-road system assets account for more than 90 percent of the deferred maintenance.

The FMSS also contains a facility condition index (FCI), which is a measure of the costs necessary to bring an asset to full repair. The FCI is defined as the value an asset's estimated deferred maintenance cost expressed as a percentage of the asset's current replacement value. Based on FMSS data, road bridges in the Northeast Region are the only asset category averaging good condition. Non-motorized transportation system assets and water transportation system assets average fair condition. All other system categories average poor condition, with the average for parking assets being the lowest of all categories.

The Asset Priority Index (API) reflects the importance of an asset to the National Park Service. The API is measured on a scale from zero to 100 with 100 being the score for the most mission critical, irreplaceable assets. In the Northeast Region, surface transit assets and road bridge assets have the highest average API, while roads and parking have the lowest.

The API and FCI concepts are used Service-wide for prioritization of assets. The optimizer band metric is illustrated in Figure 3-2. All assets are classified in one of five priority band categories. Assets in these priority bands are characterized by the following:

- **Priority Band 1:** Highest Priority Assets. Assets are highly important to park mission, have high visitor use, and/or are critical systems.
- **Priority Band 2:** High Priority Assets. Assets are important to the park mission.
- **Priority Band 3:** Medium Priority Assets. Assets where only some essential operations are important.
- **Priority Band 4:** Low Priority Assets. Assets are important but not critical to park operations or do not require much maintenance funding.
- **Priority Band 5:** Lowest Priority Assets. These assets may not be required for the operations and mission of a park.

3.1.1 On-road System Assets

The Northeast Region's on-road system assets of roads, parking lots, and road bridges represent the vast majority of current replacement value and deferred maintenance. The on-road system assets account for some 88 percent of total transportation asset CRV. Roads alone account for 59 percent of the total CRV, with parking being 19 percent and bridges being 9 percent. Deferred maintenance of on-road system assets is $442.4 million, which is 90 percent of all transportation-related deferred maintenance. Roads account for 60 percent of all deferred maintenance, parking accounts for 25 percent, and bridges account for 5 percent.

As shown in Table 3-2, the Northeast Region has 875 centerline miles of paved and unpaved roads. Seventy percent of the paved roads are public primary roads. The Northeast Region has 609 acres of parking, of which 523 are paved. Paved parking amounts to about one-third the total of all paved areas (roads and parking) in the Northeast Region. The on-road system

Figure 3-2: Optimizer Banding of Assets by API and FCI

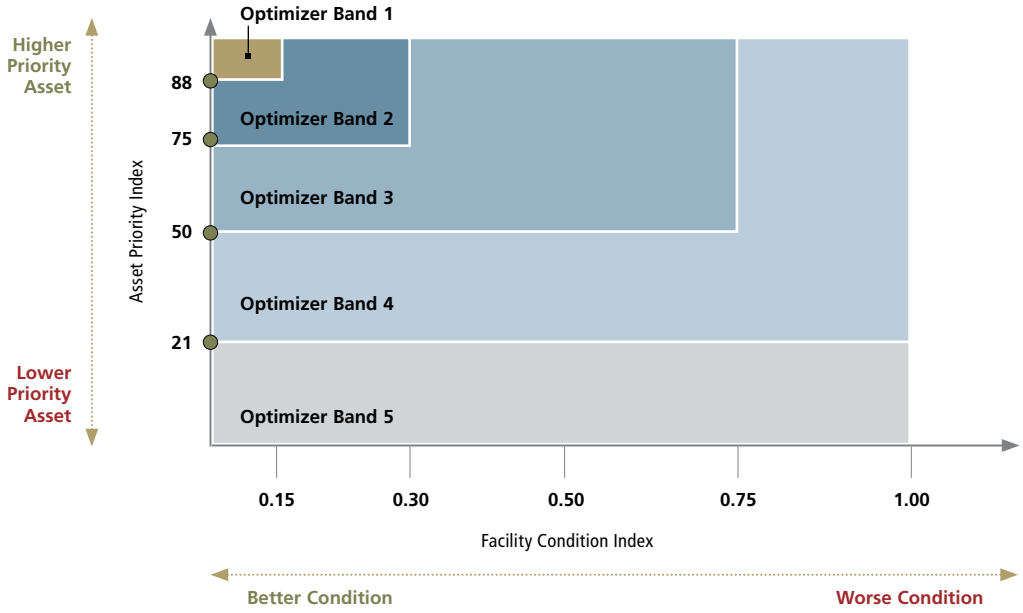


Table 3-2: Northeast Region Road Inventory

	PAVED MILES	PERCENTAGE	UNPAVED MILES	PERCENTAGE	TOTAL MILES	PERCENTAGE
Public Primary	363	70%	31	9%	394	45%
Other Public	78	15%	115	32%	193	22%
Administrative	19	4%	144	41%	164	19%
Not Classified	60	12%	66	18%	126	14%
Total	519		356		875	

Source: Analysis of NER transportation assets in FMSS database (March 2012)

assets in the Northeast Region also include 128 bridges and five tunnels.

Among the Northeast Region's on-road systems assets, bridges are in the best condition and parking lots are in the worst condition. Some 70 percent of bridge assets are in good condition resulting in average FCI of 0.10. Approximately 54 percent of roads and 42 percent of parking are in good condition. Half of the parking and 40 percent of the roads are in poor or serious condition.

3.1.2 Non-Motorized System Assets (Trails)

The non-motorized system assets in the Northeast Region are predominately trails, along with a few associated trail bridges and culverts. Transportation trails serve a purpose of providing alternative connections to or between resources as opposed to being solely a source of recreation like hiking or backcountry trails. There are a total of 156 miles of transportation trails in the Northeast Region. Some notable resources are the Arrowhead Trail at New River Gorge National River, Cliff Park and McDade Trails at Delaware Water Gap National Recreation Area, carriage roads in Acadia National Park, and Province Lands Trail within the Cape Cod National Seashore.

The current replacement value of non-motorized system assets is $146.7 million, comprising five percent of the current replacement value of all transportation assets in the Northeast Region. The deferred maintenance is about $18.6 million, some four percent of the total for all transportation assets. The FCI for the entire non-motorized system inventory is 0.13. This is considered "fair" but is better than the overall average of 0.18 for the NER transportation asset portfolio. Among all transportation asset categories, non-motorized system assets have the highest percentage in good condition (72%).

3.1.3 Transit and Water System Assets

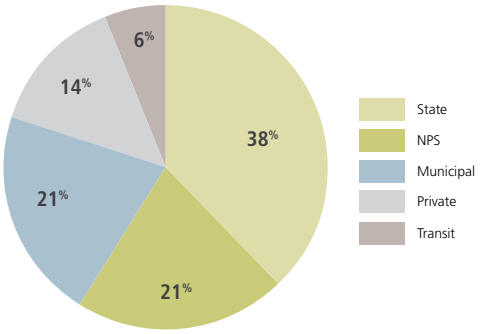
Over the past decade the National Park Service has been promoting the use of alternative transportation systems (including walking, bicycling, transit, and water modes) and management strategies including travel information and other intelligent transportation systems (ITS) to better manage visitor access to the parks. Transit and water transportation systems have a current replacement value of $198.0 million (seven percent of total). The deferred maintenance is $29.1 million, about six percent of all transportation-related deferred maintenance. The FCI for transit system assets is 0.16 (poor) and for water system assets is 0.13 (fair). Both are slightly better than the overall average of 0.18 for all NER transportation assets.

As shown in Table 3-3, the Northeast Region currently has 27 transit services or other type of multi-passenger visitor transportation systems operating among 23 parks. These alternative transportation systems (ATS) include passenger ferries, shuttles and transit buses, and historic trolleys and trains. Alternative transportation systems help reduce the number of vehicles circulating through parks, provide access for disabled individuals, provide interpretive opportunities, and demonstrate examples of historic transportation.

Many of the alternative transportation services are operated by partners, at little or no cost to the Northeast Region. The operation of some other ATS is fully covered by user fees; often the systems fully covered by user fees are associated with concession contracts or commercial use authorizations. These services include the passenger ferries to Statue of Liberty National Monument, Governor's Island National Monument, Fire Island National Seashore, Boston National Historical Park, and the Sandy Hook and Riis Park areas within Gateway National Recreational Area. They also include the Provincetown shuttle and FLEX transit services at Cape Cod National Seashore.

Not only are much of the operating costs for ATS in the Northeast Region covered by other non-NPS partners, most of the capital costs are as well. A recent inventory of ferry and shuttle systems at Northeast Region park units showed that only 21 percent of ATS-related assets are owned by the Northeast Region. The finding is illustrated in Figure 3-3.

Figure 3-3: NER Ownership of Surface and Water Transit Assets



Source: Tom Crikelair Associates, "Northeast Region of the National Park Service Alternative Transportation Management System Phase 1 Final Report," September 2011. White Paper.

Table 3-3: Existing NER Alternative Transportation Systems

PARK	ATS	OPERATOR	SERVICE TYPE
Acadia NP	Island Explorer	Public Transit Agency	Public Transit
Adams NHP	Adams Trolley	NPS Contractor	Shuttle Service
Allegheny Portage Railroad NHS	Van Tours	NPS	Interpretive Tour
Boston Harbor Islands NRA	Island Ferries	Public Transit Agency	Commercial Passenger Ferry
Boston NHP	Charlestown Water Shuttle	Public Transit Agency	Public Passenger Ferry
Cape Cod NS	Coast Guard Beach Trams	NPS	Shuttle Service for Restricted Access Area
Cape Cod NS	Provincetown Shuttle	Public Transit Agency	Public Transit
Cape Cod NS	FLEX	Public Transit Agency	Public Transit
Colonial NHP	Historic Triangle Shuttle	Public Transit Agency	Shuttle Service
Eisenhower NHS	Eisenhower Shuttle	NPS Contractor	Shuttle Service for Restricted Access Area
Home of Eleanor Roosevelt NHS	Val-Kill Tram	NPS Contractor	Mobility Service
Fire Island NS	Island Ferries	Private	Commercial Passenger Ferry
Fort McHenry NM & HS	Charm City Circulator	Regional Transit	Public Transit
Gateway NRA	Sandy Hook Ferry	Private	Commercial Passenger Ferry
Gateway NRA	Riis Park Ferry	Private	Commercial Passenger Ferry
Gettysburg NMP	Freedom Shuttle	Regional Transit	Public Transit
Governor's Island NM	Island Ferry	State	Public Passenger Ferry
Home of FDR NHS	Roosevelt Ride	NPS Contractor	Shuttle Service
Home of FDR NHS	FDR Tram	NPS Contractor	Mobility Service
Johnstown Flood NM	Lakebed Tours	NPS	Interpretive Tour
Johnstown Flood NM	Path of Flood Tours	NPS	Tour
Lowell NHP	Electric Trolley	NPS	Feature Related to the Park Mission
Marsh Billings Roosevelt NHP	Full Circle Trolley	Regional Transit	Public Transit
Shenandoah NP	Camp Rapidan Tour	NPS	Shuttle Service for Restricted Access Area
Steamtown NHS	Live Steam	NPS	Feature Related to the Park Mission
Statue of Liberty NM	Liberty Ferries	NPS Concession	Commercial Passenger Ferry
Valley Forge NHP	Revolutionary Shuttle	NPS Contractor	Shuttle Service

Source: Tom Crikelair Associates, "Northeast Region of the National Park Service Alternative Transportation Management System Phase 1 Final Report," September 2011.

3.1.4 Operations and Maintenance

Proper investment in operations and maintenance (O&M) activities is a fundamental tenet of a good asset management system. This is emphasized by the NPS's Capital Investment Strategy, which seeks to have a full accounting of the total cost of facility ownership (TCFO) and to align capital funding with commitments to O&M (to only invest in facilities that it can afford to operate and maintain). Under investment in O&M is reflected nationwide in the deferred maintenance backlog.

It is difficult to quantify operation and maintenance expenditures or needs for transportation assets since much of the effort is inadequately accounted for. Several methods were explored including a review of work orders in FMSS, Federal Real Property reported O&M, Park Asset Management Plans (PAMP) data, as well as O&M data collected for ATS systems and national standard proxies for roads, bridges and parking.[3]

As shown in Table 3-4, operations and maintenance needs for the Northeast Region transportation assets are estimated at approximately $14 to $17 million annually. The actual expenditures of ONPS, Regular Cyclic, and Transportation Fee Authority funds used for the operation and maintenance on transportation assets in FY 11 are estimated to be upwards of $13 million.[4] With "required" needs for

3 For more details see "Estimating Total Funds Spent for Operations, Maintenance, and Capital Projects on the Northeast Region's Transportation Asset Inventory." Booz Allen, August 2012.

4 See Funding and Financial Subject Area Memorandum.

Table 3-4: Summary of Required Transportation-Related Operations and Maintenance Funding

TRANSPORTATION O&M ESTIMATES	OPERATIONS	MAINTENANCE		TOTAL O&M
	FACILITY	RECURRING	PREVENTATIVE	
PAMP Required (Inflated)	$7,491,357	$6,626,082	$3,329,301	$17,446,741
Real and Proxy Data Estimates				$14,400,000

Source: Booz Allen Hamilton, "Estimating Operations & Maintenance Costs for the Northeast Region's Transportation Asset Inventory," 2012. White Paper.

operations and maintenance between $14 million and $17 million there is a budget shortfall of between $1 million and $4 million dollars annually. This shortfall poses yet another challenge to the Northeast Region when planning for future projects and investments.

3.2 Future Trends

The future trends facing the Northeast Region transportation system are dominated by an increasing gap between available funding and the monies required to maintain and enhance the NER transportation system. The funding gap highlights the need for the Northeast Region to continue to refine its asset management strategies, and align those regional strategies with national strategies.

3.2.1 Northeast Region and National Asset Management Strategies

Significant research and effort have been directed toward improvements in asset management by the National Park Service since the late 1980s, stemming from the 1986 National Park Service Maintenance Management System. This management philosophy was further codified in the policies and requirements outlined in Director's Order 80: *Real Property Asset Management*, in November 2006. The NPS *Management Policies 2006* states:

In protecting the park resources and values, the Service will demonstrate environmental leadership and a commitment to the principles of sustainability and asset management in all facility developments and operations.

The vision for asset management within the National Park Service is to sustain all high priority, mission critical transportation assets at acceptable conditions today and for future generations.

The National Park Service continues to refine and enhance its asset management strategies. The National Park Service has developed the Capital Investment Strategy to help prioritize investments and ensure that the greatest impact can be made with available capital funds. The Capital Investment Strategy uses a scoring strategy to evaluate projects on a number of different criteria. The scores prioritize project investments in four elements: Financial Sustainability, Visitor Experience, Resource Protection, and Health & Safety. The four elements are then weighted to provide an overall scoring and prioritization.

The Capital Investment Strategy scoring supports an asset management approach that emphasizes maintaining key assets and reducing deferred maintenance. Some of the key objectives in the financial sustainability element of the CIS are to build only what can be maintained, right-size the asset portfolio, reduce liabilities, and eliminate non-essential development in parks in order to emphasize the natural and cultural experience.

The Northeast Region transportation asset management strategies are well aligned with the Service-wide asset management policies in regards to assessing needs and making effective investments. The Northeast Region has consistently prioritized its funding towards sustaining assets at acceptable conditions. Right-sizing the asset portfolio has been a strategy and using a data-driven process to ensure wise investments is at the core of the Northeast Region's strategy. The prioritization of investments is exemplified by the region's roadway projects currently under design. About 85 percent of the investments are in optimizer band 1 and 2 projects, and the other projects are generally bundled projects for which it is more cost-effective to do them along with the other work rather than postpone them until later years.

3.2.2 Northeast Region Current Asset Investment Program

The overall Northeast Region transportation asset management strategy is currently a data-driven process to develop silo-driven priorities. It is an ongoing process of the Northeast Region to refine and improve the investment strategies. The better use and collection of data continues to be high priority, and the focus of transportation assets continues to be expanded. A few years ago the investment strategies targeted only roadway pavement, bridges, and alternative transportation systems. Now the investment strategies include congestion, safety, and parking.

Pavement: Roadways and Parking

The largest transportation investments in the Northeast Region are roads and parking. The NER's approach to pavement management is one of extensive data collection, validation, and analysis prior to program formulation. The data collection process and condition modeling is provided by the Federal Highway Administration, Federal Lands Highway Program (FLHP) through the Eastern Federal Lands Highway Division. Those services include:

- **RIP Data Collection.** The Roadway Inventory Program (RIP) is a cyclic data collection program done by FHWA for all NPS roadways. Data are collected every four years for parks with more than 10 miles of roadway and every eight years for remaining parks. A Pavement Condition Rating (PCR) is calculated for every segment of every NPS road. The PCR is zero to 100 where roads rated at 100 are in perfect condition. Currently, roads have an average PCR of 85 while parking has an average PCR of 65.[5]
- **HPMA Modeling.** The Highway Pavement Management Application (HPMA) is a model used to project pavement conditions in future years given different levels of maintenance and rehabilitation. The model uses pavement condition data from the Roadway Inventory Program, data from the roadway construction history, and deterioration models to project future roadway conditions. Additionally, outcomes for various Maintenance and Rehabilitation (M&R) strategies can be modeled. M&R strategies include preventive maintenance, Light 3R, Heavy 3R, and 4R.[6] The program is particularly useful for the Northeast Region in that it can assess trends in PCR based on different levels of investment.

The Northeast Region adopted the Roadway Objective Score Evaluation Model (ROS), first completed in 2005, to help move from the HPMA modeling to a multiyear list of prioritized pavement projects. Under the ROS process, the Northeast Region supplements condition information received from the Federal Highway Administration pavement management systems with:

- survey data received from the parks on their top priorities
- park comments on the HPMA outputs
- traffic demands and vehicle classification data for facility, where available
- safety history of facility
- drainage conditions
- relationship to other planned projects

A key element of the ROS process is validation of proposed projects. During the past year, this validation process has been strengthened with a 100 percent field validation of all proposed projects to provide an up-to-date evaluation of pavement condition. Recent projects not captured by the cyclic data used in the HPMA were identified and pavement conditions at parking lots, which the HPMA models less accurately than roadway pavement conditions, were specifically reviewed. The field validation was also used to refine cost estimates to specific park locations (rather than the averages used in HPMA) and to identify projects appropriate to be bundled in a single year rather than having separate but similar projects in a park addressed in different years.

The existing multiyear plan for roadways and parking is fiscally constrained. During the past five years, and excluding one-time monies from the American Recovery and Reinvestment Act (ARRA), funding allocated for roadways and parking has averaged about $12 million annually.

Because of the constrained funding, multiyear plans for pavement projects in the Northeast Region have been guided by several principles to help make the most effective use of the available monies. These include:

5 PCR≥95 = "Excellent" condition, PCR≥85 and <95 = "Good," PCR≥60 and <85 = "Fair," and PCR<60 = "Poor."

6 Light 3R generally involves milling and overlays of pavement. Heavy 3R generally involves full depth reconstruction in the existing alignment. 4R projects are total reconstruction, often with changes in alignment.

- Minimize design and supervision costs. One means of making the best use of the project funds is to be as effective as possible in how much is spent on construction supervision and design rather than construction. Every year since 2005, the Northeast Region has spent less than other NPS regions on construction supervision as a percentage of net construction costs.
- Focus on primary roads. The Northeast Region roadway investments have in past years been focused on those roads most used by visitors. Roads that are used by at least 80 percent of park visitors are typically given the highest priority for pavement investments, while other roads may be allowed to deteriorate to a lower PCR.
- Stay between the white lines. The Northeast Region's expenditures on roadway projects are limited to the roadway surface itself, and do not routinely include other work such as revegetation.
- Decommission assets. When practical to do so, the Northeast Region decommissions duplicative or non-performing roadway and parking assets. In the past five years the Northeast Region has eliminated more than 1,200 parking spaces. These 1,200 eliminated parking spaces represent about 10 acres of parking, or 1.5% of parking assets.

One policy of the constrained funding environment that the Northeast Region is modifying is the past decision to minimize investment in parking lots. Roadways were always prioritized ahead of parking lots, and thus few parking lot projects were implemented, but the current multiyear plan includes some investments in parking lots. Each park was asked to recommend their highest-priority parking lot projects and that work was included in the multiyear plan. Doing so in a cost-effective manner was facilitated by the field verification of the parking lot conditions. The parking projects recommended by the parks were not always those parking lots most important to visitors, but rather were more oriented towards a "worst-first" evaluation. The Northeast Region is currently investigating means of standardizing the prioritization of parking lots so that future investments in parking lots can move away from the worst-first strategy, just as has been done with roadways. The region is also evaluating the implications of using a lower target PCR for parking lots than for roadways.

The investment strategy for the latest multiyear roadway and parking project list also elevated the importance of two strategies. The first was to bundle projects when appropriate. The field validation results allowed for a better understanding of when to advance projects to an earlier year. For example, small parking lot jobs originally anticipated for FY 15 might be advanced to FY 13 in conjunction with a similar pavement project on a roadway. The other key principal was to protect prior investments through industry-proven pavement preservation strategies. During the past few years extensive roadway investments have been made in the Northeast Region through the ARRA program and among the Northeast Region's highest priorities is to ensure that those investments are protected. Among the later years of the multiyear plan are several pavement preservation projects for those roadways.

Bridges

The Northeast Region's asset management approach and strategies for bridge assets is similar to that for roadways with the notable exceptions that (1) more of the process is undertaken by the FHWA through its Federal Lands Highway Bridge Office (FLHBO) and (2) safety is a more prominent factor in prioritizing the work.

All National Park Service road bridges are inventoried through the Bridge Inspection Program (BIP) established by the Federal Highway Administration. The Federal Highway Administration developed the Pontis software system as part of an overall bridge management system that provides a systematic process for collecting and analyzing bridge data to make forecasts and recommendations for bridge maintenance, rehabilitation, and replacement programs and policies. As with the HPMA system for pavements, the Pontis software can be used to evaluate funding scenarios.

The success of the Federal Highway Administration bridge management system relies in part on the Pontis software program and its ability to be used for forecasting and budgeting. However, at the core of the bridge management system are FLHBO bridge inspectors and bridge designers. Not only does the FLHBO conduct a two to four year cyclic inspection program of all National Park Service vehicular bridges, the FLHBO is directly involved in design, rehabilitation, construction support, routine safety inspections, and other technical assistance for the National Park Service. The

FLHBO also provides the National Park Service with routine maintenance work recommendations that are included in the inspection reports and which can be used directly by parks. The FLHBO bridge management system provides bridge-level and network-level recommendations to the National Park Service for consideration.

The Pontis software uses a Health Index to rate bridges as "good", "fair" and "poor"; "good" is the goal condition for bridge maintenance. A health index of 92% is the lower limit of "good" and is effectively the same as an FCI of 0.08. Similar to the Northeast Region's use of field validations of the HPMA pavement recommendations, the FLHBO's bridge management system performs significant post-processing of inspector work recommendations, particularly those of a non-routine nature.

The ongoing investment strategy for bridges follows the recommendations of the FHLBO for rehabilitation and replacement, as well as preventive maintenance. Consistent with current Service-wide standards, approximately 25 percent of annual bridge funding is targeted to preventive maintenance on structures which are assessed as being in good condition. The remaining funding is prioritized based on three factors – the structural condition of critical bridge systems, scour, and the rate of deterioration. BCI ranks bridges in categories A to D. Critical (A) is a bridge in poor condition and will soon be closed. Serious (B) is a bridge in serious condition, is structurally deficient, and major actions are required to prevent closure within 10 years. Moderate (C) is a bridge in fair condition or with a moderate safety issue, and which needs some repairs or rehabilitation. Minor (D) is a bridge in fair or good condition that needs only preventive maintenance. About two-thirds of bridges in the Northeast Region are of a Minor priority of improvement and the rest are of a Moderate priority of improvement.

Alternative Transportation Systems

Over the past decade the NPS has been promoting the use of alternative transportation systems (including walking, bicycling, transit and water modes) and management strategies including travel information and other intelligent transportation systems (ITS) to better manage visitor access to the parks. The Northeast Region currently has 27 ATS transit services or other type of multi-passenger visitor transportation system.

The general approach for the ATS management strategy has always been a competitive application process and screening, supplemented by an aggressive pursuit of partnership support. The Northeast Region petitions its member parks to propose ATS initiatives for funding consideration. The parks provide a description of the proposed project, its intent, and the potential for support by partners beyond the federal government. These initial candidates are screened by committee and shortlisted. Proponents of shortlisted candidate projects are then asked to submit more details on their project including projected use and cost information. These proposals are reviewed and ranked by committee and designated for Category III funding from the NER allocation or designated for submittal to the Paul S. Sarbanes Transit in the Parks Program (TRIP). Many of those submitted to the TRIP program are partnership projects for which the Northeast Region provides assistance to those partners in developing their grant application.

The asset management strategies for expanded or new transit projects have been strengthened by an inventory and total cost of facility ownership study conducted in 2011.[7] The work included the development of an evaluation matrix and performance metrics to use in determining effective transit investments. The system can be used to compare options for modifying an existing service as well as evaluate proposed services. The evaluation matrix scores existing and proposed transit services based on the following nine factors.

- critical access
- resource protection
- safety
- visitor experience
- visitor diversity & car-free travel
- regional economy & partnerships
- recreation & education
- ridership & productivity
- cost effectiveness

7 Tom Crikelair Associates, "Northeast Region of the National Park Service Alternative Transportation Management System Phase 1 Final Report," September, 2011.

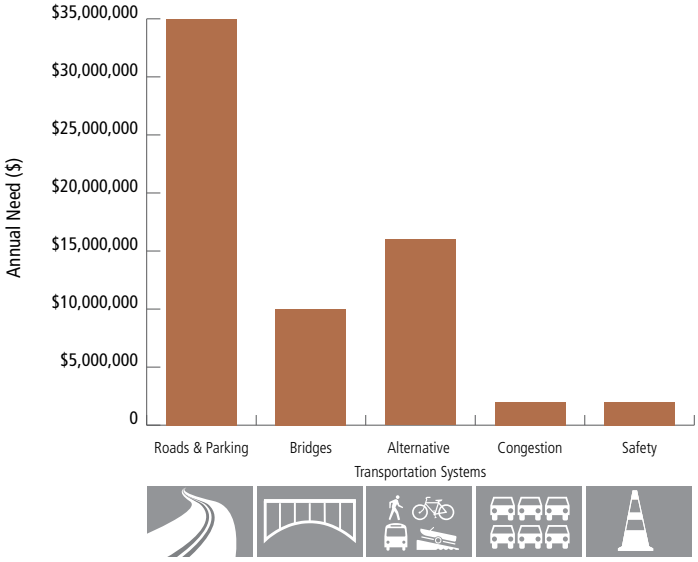
The ATS study also provided the Northeast Region with a better understanding of the cost and role of each of the systems, and this information provides the principal guidance for the Northeast Region's investment strategy in transit systems. The most important systems are those such as at Boston Harbor Islands NRA, Statue of Liberty NM, and Eisenhower NHS that provide the only visitor access to the park. There are some systems that provide the only access to a destination within a park, usually to manage the carrying capacity of that site. There are also systems that provide interpretive experiences for visitors, many of which are operated at a low cost to the National Park Service.

It is important to note that the ATS study work done to date focuses on shuttle bus and ferry systems and does not address the other non-motorized asset systems such as transportation-related trails. It continues to be a goal of the Northeast Region to develop data-driven metrics and evaluation criteria for those assets as well.

3.2.2 Future Capital Needs Assessment

The Northeast Region has forecast annual capital investment needs of $65 million for its transportation assets. As illustrated by Figure 3-4, the majority of this need is related to roads and parking. The $65 million needs is based on a mix of modeling to achieve target performance metrics, and trend estimates based on current multiyear project planning. The $65 million estimate does not factor in any additional needs or direct costs associated with new climate change, sustainability, or resource protection/restoration initiatives. Further discussion of the forecasts for each asset category follows.

Figure 3-4: Annual Capital Funding Need for Northeast Region Transportation Assets

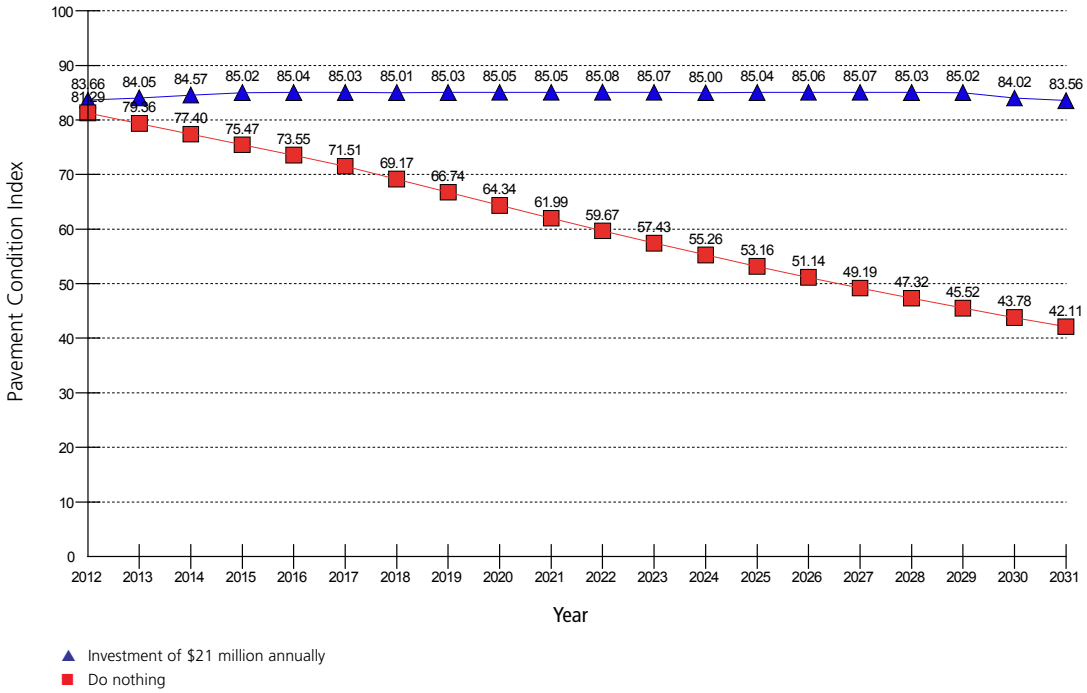


Roads and Parking

HPMA models are used to establish the current and potential future condition of paved roadways and parking areas in the Northeast Region of the National Park Service. With a goal Pavement Condition Rating (PCR) of 85, the necessary level of annual investment can be determined. Figure 3-5 and Figure 3-6 show the results of HPMA modeling of NER roadways and parking areas, respectively, for the current 20 year planning horizon.

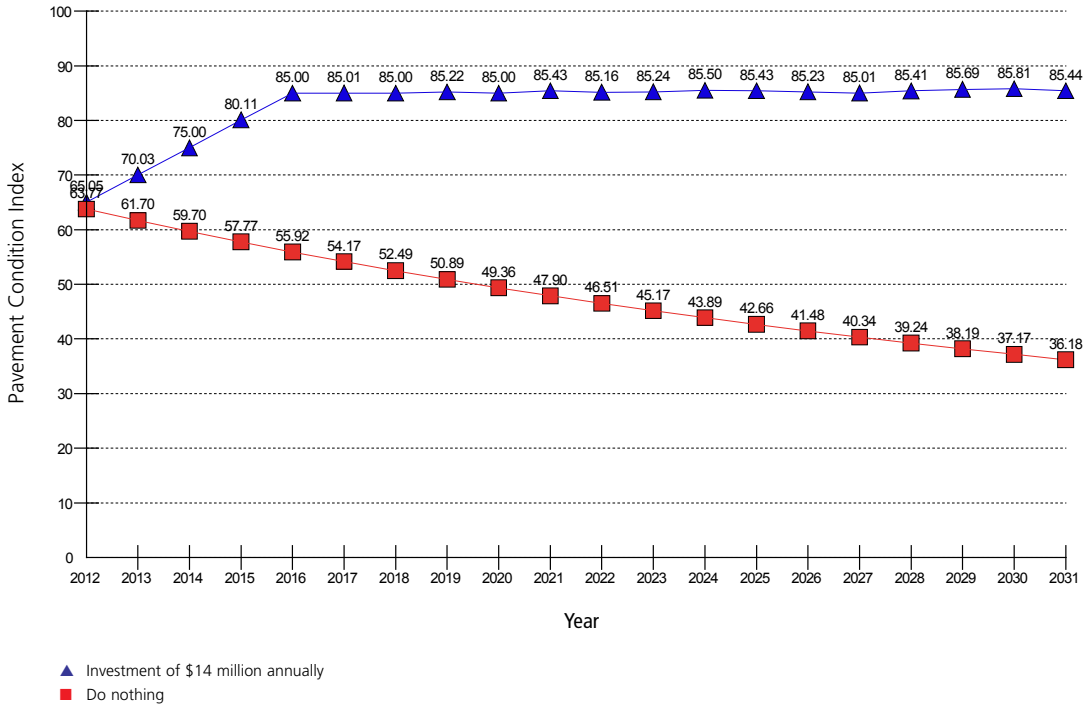
The HPMA analyses estimates that approximately $21 million is needed annually to maintain the roadway system in order to achieve the goal of an 85 PCR. An additional $14 million annually would be required to maintain the region's parking facilities at a PCR of 85. The historical expenditure level of $12 million annually represents only about one-third of the estimated annual total of $35 million required to achieve the region's 85 PCR goal for roads and parking.

Figure 3-5: HPMA Modeling for NER Roads



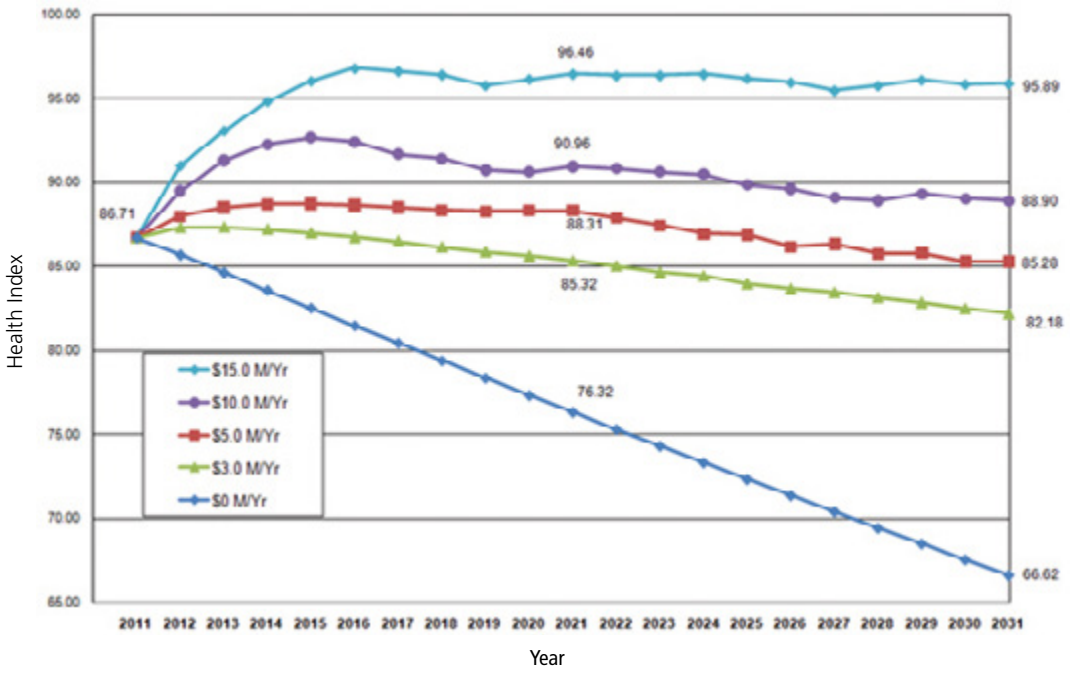
Source: Federal Highway Administration, Highway Pavement Management Application model analysis, September 2012.

Figure 3-6: HPMA Modeling for NER Parking



Source: Federal Highway Administration, Highway Pavement Management Application model analysis, September 2012.

Figure 3-7: Pontis Modeling for NER Bridges



Source: Federal Highway Administration, Pontis software model analysis, 2010.

Bridges

Funding in transportation bridge assets is based on Pontis modeling describing current and potential future conditions. The goal of the modeling effort is to determine the appropriate level of funding necessary to maintain bridges at a health index of 92 or higher. The results of the current modeling effort are shown in Figure 3-7 and illustrate the costs required to obtain a range of health index scores.

The impacts of funding constraints for bridges are similar to those for roadways. During the past five years bridge funding has averaged roughly $3 million per year and thus investments have been focused on only the highest priority bridges. In general, this means focusing on those bridges in poor condition. In 2009 the Northeast Region had five of its 128 bridges rated as poor condition. All five have since been rehabilitated or reconstructed and are now in good condition.

The Pontis analysis shows that to achieve the 92 health index goal, an investment of more than $10 million is needed annually. The current multiyear plan includes about $1.1 million annually for capital bridge projects.

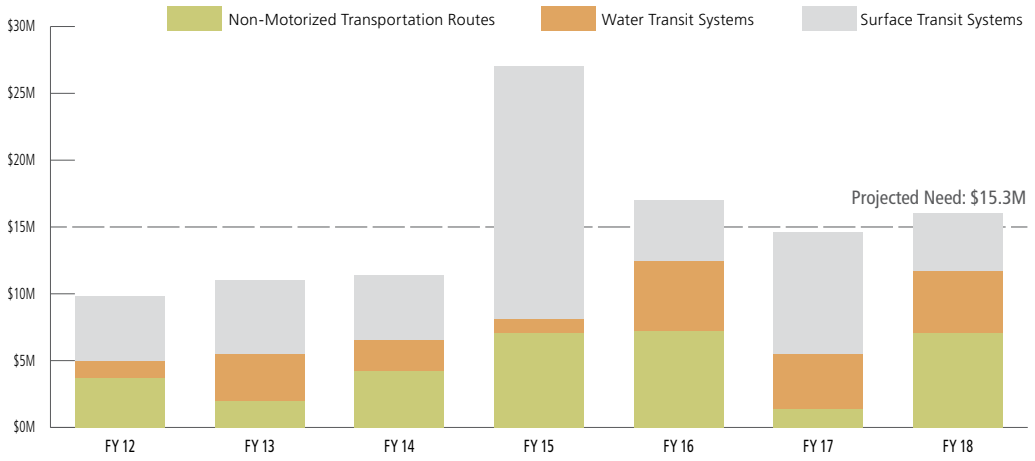
Alternative Transportation Systems

Alternative transportation systems and intelligent transportation systems do not have a specific performance metric or model available to determine an exact level of need. The Northeast Region uses a Transit Evaluation Matrix for evaluating whether or not an individual system may be in need. Through use of this evaluation matrix, the current multiyear plan was developed.

The value of the Northeast Region's current multiyear plan for ATS projects is shown in Figure 3-8. The annual cost for the vetted ATS projects is about $16 million. About half this is for bus and rail projects, including new transportation centers. Some 30 percent is for water transportation systems, and 20 percent is for trails.

The current multiyear plan addresses all alternative transportation system needs. However, it should be noted that funding is not secured for all projects in the current program, particularly with the transition to the MAP-21 transportation bill and phasing out of the TRIP program.

Figure 3-8: ATS Needs in the Northeast Region, Including Trails



Source: Northeast Region, Multiyear Plan FY 12 to FY 18

Safety

The Safety Management System was developed to inventory safety needs and identify solutions. In all, about 350 safety countermeasures were proposed, at a total cost of $16 million. Implementation of the countermeasures is expected to reduce 630 crashes over 10 years at the 10 parks studied. The number of severe (injury or fatality) crashes in the Northeast Region would be reduced by 16 percent and the total number of crashes would be reduced by 11 percent. The Northeast Region goal of reducing vehicle crashes by 20 percent can be achieved through implementation of the countermeasures, and reductions in vehicle-wildlife collisions due to deer management programs.

The total need for safety investments in the Northeast Region is currently estimated at $19 million. This total includes $16 million for the vehicle safety countermeasures and about $3 million in total expenditure across the region to implement FHWA signage retroreflectivity compliance efforts. This LRTP assumes that these projects would be implemented in a ten year period and that the lifetime of these infrastructure investments is about ten years. As such, the annual needed investment in safety is about $2 million annually. As part of its current multiyear plan the Northeast Region allocated approximately $1.5 million annually to address safety projects

Congestion

The Congestion Management System developed for defining and managing congestion in the Northeast Region identified the need for congestion mitigation funding in the region. After eliminating low-benefit, high-cost projects, and accounting for overlaps with programmed safety and ATS projects, there is approximately $20 million of projects that ranked as worthwhile either for implementation or further planning. Further validation of those projects with parks is currently underway by the Northeast Region. The goal is to accomplish these projects in the next ten years. If the approximate life of an investment is ten years then it is assumed that a program of similar value would be implemented to address congestion issues in the following ten years. As such, and at a similar scale to that of safety needs, $2 million in congestion investment funding annually is needed.

3.2.3 Funding Forecasts and Funding Gaps

Funding forecasts were developed to help assess funding gaps and outcomes.[8] The forecasts are based on an analysis of historical data and trends, and discussions with NPS representation from the Washington Support Office and the Northeast Region Office. The most likely funding scenario was determined to be one that generally assumes current growth trends in funding sources. A higher funding scenario was also used to assess opportunities should additional funding be available.

8 Funding and Financial Subject Area Memorandum, VHB, November 2012.

Capital funding for the Northeast Region has averaged about $35 million in recent years. As illustrated in Figure 3-9, annual funding levels are expected to decline sharply from past levels and then recover by 2031 to roughly the historic levels. However, in constant dollars, after accounting for inflation, the funding forecasts are considerably lower than current levels. Forecasted capital funding averages about $25 million annually in constant dollars.

Operations and maintenance (O&M) funding for Northeast Region transportation assets has been about $13 million annually. As shown by Figure 3-10, the funding is expected to remain essentially the same in current dollars, but decline in constant dollars. The forecasted annual O&M funding in constant dollars averages about $11 million.

There is a gap between the annual needs for capital investments in transportation assets and the funding forecasted to be available. The annual need for capital investments in Northeast Region transportation assets is estimated to be about $65 million (2012 dollars) for all NER transportation assets. As shown in Figure 3-11, there is a forecasted gap of $40 million between capital investment needs and capital investment funding. The anticipated funding provides less than 40 percent of the future capital needs.

There is also a gap between the annual needs for O&M and the funding forecasted to be available, as shown in Figure 3-12. The annual transportation-related need for operations and maintenance in the Northeast Region is estimated to be between $14 and $17 million.

Figure 3-9:
Forecasted Capital Funding, FY 12-FY 31

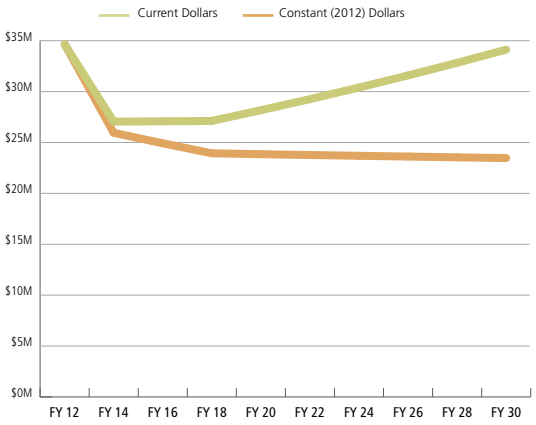


Figure 3-10:
Forecasted O&M Funding, FY 12-FY 31

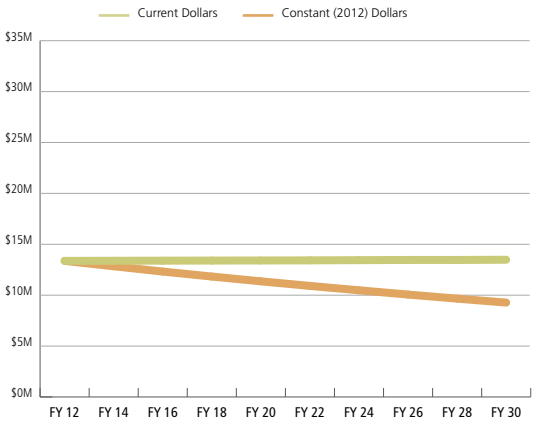


Figure 3-11:
Funding Gap Analysis: Annual Capital Needs

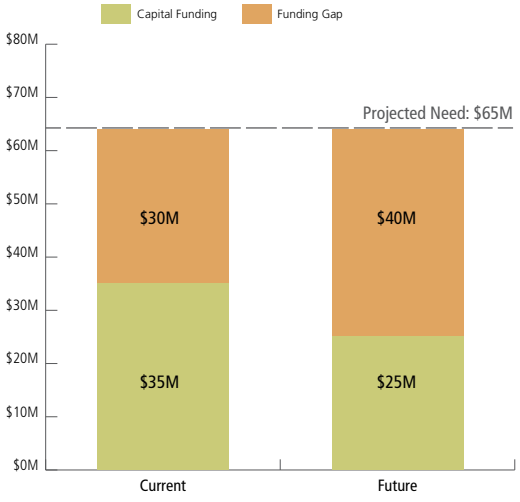
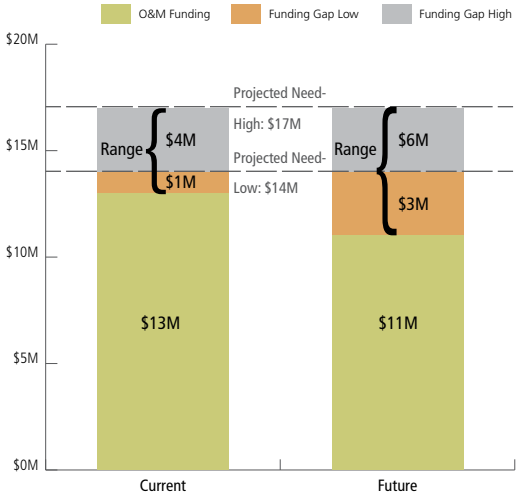


Figure 3-12:
Funding Gap Analysis: Annual O&M Needs



The annualized amount of the likely funding forecasts for operations and maintenance is $11 million. The operations and maintenance funding gap is projected to be between $3 million and $6 million annually.

3.2.4 Funding Outcomes

Four potential investment scenarios, based on the forecasts for capital funding, were developed to assess outcomes of potential funding allocations. The primary forecast of $25 million was used for three of the investment scenarios. The fourth investment scenario was based on a high funding forecast of $32 million. The four investment scenarios are as follows:

1. The Essentials

This investment scenario assumes average annual funding (constant dollars) of $25 million. The funding in this scenario is geared towards meeting the basic transportation operating needs of the Northeast Region. This program maintains the current ATS services, funds bridges at the level necessary to maintain current conditions, and then uses to remaining funds for roads and parking.

2. Current Trends Extended

The Current Trends Extended investment scenario utilizes the existing priorities and initiatives of the Northeast Region to program future years of projects. Annual funding of $25 million is assumed. Current trends focus on 'between the white lines' roadway system investments, maintaining the existing ATS and improving upon critical ATS (those providing the only park access), and beginning to address safety and congestion related projects as identified by the safety and congestion management systems.

3. Broadening Goals & Objectives

This investment scenario considers how the funding of $25 million can be utilized differently to address Long Range Transportation Plan goals and objectives. This scenario focuses on how moving funds from existing initiatives and trends to new initiatives would change outcomes across the various transportation needs.

4. Advancing the LRTP

The Advancing the LRTP investment scenario assumes additional funding totaling $32 million annually. This scenario shows the benefits of investing additional funds into the Northeast Region's transportation system to be able to achieve LRTP goals and objectives through investment in new initiatives and greater ability to invest in maintaining the current transportation system.

Table 3-5 shows the assumed funding allocations for the four investment scenarios and a summary of the outcomes. The table covers five transportation system categories. The five system categories are: On-Road Systems, which includes roads, parking and bridges; Alternative Transportation Systems, including land and water transit, as well as trails; Safety initiatives; Congestion initiatives; and "New Policy Directed Initiatives". The new initiatives reflect investments to specifically address recent priorities and policy directives, including decommissioning assets.

Table 3-6 presents comparative outcome metrics of the various elements of the investment scenarios. Some outcome metrics, such as a pavement condition rating and bridge health index, have long been used as part of the NPS and NER asset management system. Other metrics, such as those applicable to transit systems, have only recently been implemented by the Northeast Region, as an outcome of its recent regionwide inventory and evaluation of alternative transportation systems. Some metrics, such as delay and vehicle hours traveled, used for congestion projects, lack the data necessary to effectively assess outcomes. Accordingly, some of the outcomes of the various investment scenarios supplement available quantitative metrics with some qualitative insights.

Investment Outcomes - Roads

One of the goals for roads is to maintain an average pavement condition rating (PCR) of 85 among the Northeast Region roadway system. Due in large part to substantial American Recovery and Reinvestment Act and other recent investments in roadways, the PCR for all NER roads is currently at 85. HPMA modeling has determined that maintaining the 85 PCR would require an annual investment of about $21 million. None of the investment scenarios provide sufficient funding to meet this goal. The best-case of those scenarios (The Essentials) results in a PCR of 78, a decline in

Table 3-5: Northeast Region LRTP Investment Scenarios: Allocation of Resources

	ON-ROAD SYSTEM (ROADS, PARKING, BRIDGES)	ALTERNATIVE TRANSPORTATION SYSTEM	SAFETY	CONGESTION	NEW POLICY-DIRECTED INITIATIVES
1. The Essentials					
Forecasted Funding $25M	On-Road System: $21.0M Roads: $14.4M Parking: $3.6M Bridges: $3.0M	ATS: $3.7M	Signage: $0.3M		
2. Current Trends Extended					
Forecasted Funding $25M	On-Road System: $18.3M Roads: $12.2M Parking: $3.1M Bridges: $3.0M	ATS: $4.5M	Signage: $0.3M Safety Needs: $0.4M	Congestion Needs: $0.5M	New Initiatives: $1.0M
3. Broadening Goals & Objectives					
Forecasted Funding $25M	On-Road System: $16.4M Roads: $10.7M Parking: $2.7M Bridges: $3.0M	ATS: $4.5M	Signage: $0.3M Safety Needs: $0.8M	Congestion Needs: $1.0M	New Initiatives: $1.5M Decommission Assets: $0.5M
4. Advancing the LRTP					
High Funding Scenario $32M	On-Road System: $20.0M Roads: $13.6M Parking: $3.4M Bridges: $3.0M	ATS: $4.5M	Signage: $0.3M Safety Needs: $1.6M	Congestion Needs: $1.5M	New Initiatives: $2.5M Decommission Assets: $1.6M

Table 3-6: Investment Scenario Outcomes

	ON-ROAD SYSTEM (ROADS, PARKING, BRIDGES)	ALTERNATIVE TRANSPORTATION SYSTEM	SAFETY	CONGESTION	NEW POLICY-DIRECTED INITIATIVES
1. The Essentials					
Forecasted Funding $25M	On-Road System Roads: PCR 78 FCI: 0.26 DM: $422M Parking: PCR 56 FCI: 0.53 DM: $287M Bridges: HI 0.82, None Structurally Deficient	Maintain Existing	Retroreflectivity Program		
2. Current Trends Extended					
Forecasted Funding $25M	On-Road System Roads: PCR 73 FCI: 0.30 DM: $487M Parking: PCR 53 FCI: 0.56 DM: $305M Bridges: HI 0.82, None Structurally Deficient	Maintain Existing Enhance Existing Critical Access	Retroreflectivity Program 4% fewer severe crashes 1.8 B/C ratio	27 mitigation projects 15 enabling projects 25 Studies	New Initiatives: $1.0M annually
3. Broadening Goals & Objectives					
Forecasted Funding $25M	On-Road System Roads: PCR 70 FCI: 0.33 DM: $527M Parking: PCR 51 FCI: 0.58 DM: $315M Bridges: HI 0.82, None Structurally Deficient	Maintain Existing Enhance Existing Critical Access	Retroreflectivity Program 6% fewer severe crashes 1.4 B/C ratio	49 mitigation projects 15 enabling projects 35 studies	Decommissioning Remove 80 acres, >$3M savings New Initiatives: $1.5M annually
4. Advancing the LRTP					
High Funding Scenario $32 M	On-Road System Roads: PCR 76 FCI: 0.28 DM: $452M Parking: PCR 55 FCI: 0.55 DM: $295M Bridges: HI 0.82, None Structurally Deficient	Maintain Existing Enhance Existing Critical Access	Retroreflectivity Program 8% fewer severe crashes 1.2 B/C ratio	81 mitigation projects 15 enabling projects 45 studies	Decommissioning Remove 250 acres (all), >$12M savings New Initiatives: $2.5M annually

pavement condition of about 0.5 percent per year. Under this best-case funding allocation ($14.4 million) deferred maintenance of roads will increase by $130 million and the FCI will worsen to 0.26 (poor) from 0.18 (fair).[9]

Investment Outcomes - Parking

The PCR goal for parking is the same 85 PCR as for roads, but unlike for roads, (which currently are at an 85 PCR) the condition of parking assets must first be improved from their current condition (a PCR of 68) and then maintained at an 85 PCR. HPMA modeling has determined that an average annual investment of $15 million is required to achieve the goal.

None of the investment scenarios provide sufficient funding to meet the PCR goal for parking. The largest investment ($3.6 million) provides less than a quarter of the annual need and results in a PCR of 56. As with roads, the deferred maintenance increases and the FCI worsens for all scenarios. Deferred maintenance for parking assets increases by more than $160 million to $287 million. The FCI for parking assets falls from an average of "poor" to "serious".

Investment Outcomes - Bridges

The goal for the bridge assets is a Health Index (HI) of 0.92 and all bridges in good condition. The funding to achieve these goals is estimated to be $10 million annually. At the present time the bridges have an HI of 0.86, and the only bridge in serious condition is currently programmed for improvements and is under design. Each of the four investment scenarios assume an investment in bridges averaging $3 million annually. This amount is expected to slightly degrade the current health index but will prevent any bridges from becoming structurally deficient.

Alternative Transportation Systems Investment Outcomes

Based on an analysis of the current multiyear program, the annual capital cost to maintain the Northeast Region's 27 existing ATS services is $3.7 million. Another $7.2 million annually is programmed to enhance and expand existing transit systems and trails, with $0.9 million of that for bus and ferry systems that provide the only access to a site. An additional $4.5 million is programmed for piloting of new transit services and planning and implementation of new transit and trails.

The Essentials scenario provides funding to maintain all existing ATS services while the other scenarios also enable enhancements to those that provide the only access to a park or park site. None of the scenarios provide funding for expansion of existing alternative transportation systems or funding for new systems.

Safety System Investment Outcomes

Until recently the Northeast Region had no management system in place to consistently address safety issues in the parks. Safety projects were done in response to specific park requests and primarily in an ad hoc and opportunistic manner as part of roadway projects. The Northeast Region now uses a Transportation Safety Management System (TSMS) developed during the past couple of years. That work identified scores of countermeasure projects to address traffic safety both proactively and reactively. Reactive strategies address an identified safety issue based on crash data. Proactive strategies have the potential to prevent or reduce crashes at sites, even though the location is not (yet) identified as a high crash site.

The cost for the countermeasure projects is estimated to average $1.6 million annually and this is met only under the scenario with additional funding. However, by prioritizing projects with the highest societal benefits (those crash types involving fatalities and injuries), lesser funding amounts can achieve high benefit/cost ratios.

Congestion System Investment Outcomes

The Northeast Region has identified a variety of congestion mitigation project needs, averaging about $1.5 million annually. Many are small projects involving wayfinding, signage, and minor traffic control management. Other potential large projects were identified but many could not be definitively justified due to a lack of supporting data. Accordingly, a primary CMS need is for "enabling" projects to implement data systems at some parking areas, entrance stations, and trails. These projects would also enable monitoring of outcomes of a project. Similar to the enabling projects, a general need for preliminary studies was identified. These studies might be safety audits

9 It should also be noted that even the entire $25-$32 million annual transportation funding budget assumed for the scenarios is insufficient to address "mega-projects" such as the $300 million needed to reconstruct Colonial Parkway or the $90 million needed to reconstruct major roadway connections in Delaware Water Gap National Recreation Area.

of pedestrian crossing locations or charettes to better define initial ideas about more in-depth congestion mitigation projects.

Until data monitoring systems and practices are implemented, it is not possible to quantify many of the typical congestion metrics, most of which are related to visitor delay. The investment scenario outcomes summarized in Table 3-6 instead are based simply on the number and type of project — or congestion hot spot — that the various funding allocations would address.

The Advancing the LRTP scenario funding of $1.5 million annually addresses the entirety of the anticipated congestion project needs. It covers 15 enabling projects to install data systems at entrances stations, parking areas and trails; 71 small projects such as turn lanes, traffic signal upgrades, minor parking expansions, and 10 large projects such as new trails or transit services. In addition, 45 preliminary study efforts could be funded. The number of projects, including studies, averages about three per year.

Policy-Directed Initiatives Investment Outcomes

The Capital Investment Strategy highlights decommissioning of low priority assets as an important strategy in response to the gap between needs and funding available for roads and parking. The Northeast Region has more than 250 acres of roads and parking that are in optimizer band 5. The cost of decommissioning a road or parking asset can vary considerably depending on the level of restoration of the land. A realistic planning estimate is at least $125,000 per acre (about 0.75 lane miles of road) to decommission roads or parking. This reflects a standard restoration that would restore the facility by removing six inches of pavement and replacing it with top soil and native vegetation and plants. Based on those assumptions, the annualized need for decommissioning transportation assets is approximately $1.6 million. The financial benefits of decommissioning include the savings in capital investments and annual operations and maintenance. The HPMA modeling of funds necessary to sustain road and parking assets at an overall PCR of 85 includes about $2 million annually invested in optimizer band 5 road and parking assets.

The investment scenarios (other than The Essentials) provide annual funding of $1 million to $2.5 million for projects that advance new public policy initiatives. This funding could be used in a variety of ways. It might be used to construct new trails to connect to urban communities, provide new or expanded transit access and mobility, or be used to adapt a roadway or parking asset to anticipated climate change impacts.

Because the monies could be invested in many ways there are no precise outcome metrics shown in Table 3-6 for the additional funding for policy-directed initiatives. Among the simplest comparisons are looking at potential multimodal projects. For example, the Advancing the LRTP scenario provides an annual average of $2.5 million which equates to about 55 miles of trails (over 20 years).

Overall Findings of Investment Scenario Analyses

The funding outlook — when compared to regionwide needs — underscores the importance of investing every dollar wisely and ensuring that investment decisions are supported by good data and sound planning. There is a significant gap between the annual needs for capital investment in transportation and the funding forecasted to be available.

The annual need for capital investments in Northeast Region transportation assets is estimated to be about $65 million (2012 dollars). These needs are related to on-road systems (69%), followed by transit and water systems (25%) and safety and congestion needs (3% each). This does not factor any additional, direct costs associated with visitor experience enhancements, climate change adaption or decommissioning of assets. Annual funding is anticipated to decline from the current level of about $35 million to an estimated $25 million. This provides an annual gap of $40 million and a cumulative shortfall of $800 million over this 20-year plan.

There is also a gap ranging from $3 million to $6 million between the annual needs for operations and maintenance (O&M) and spending. The cumulative shortfall over 20 years ranges from $60 million to $120 million. The O&M funding shortfall undermines the effectiveness of an asset management plan and poses yet another challenge to the Northeast Region when planning for future projects and investments.

In general the investment scenario analysis suggests that the Northeast Region:

- continue a strong focus of available funds on roads and parking, and integrate tiered performance metrics to classes of roads/ parking
- maintain bridges in current condition
- fund high priority safety improvement projects
- maintain mission critical and mission priority transit systems
- accelerate decommissioning/disposal of non-performing assets
- maintain a prioritized list of projects should partnership or one-time NPS funding opportunities arise

Advancing the goals and objectives of this Long Range Transportation Plan, consistent with the Capital Investment Strategy and *A Call to Action*, will require a significant infusion of new revenue over the life of this LRTP. If this additional funding is realized it would provide the opportunity to more fully advance other goals and objectives, in particular in the areas of:

- mitigating safety and congestion issues
- decommissioning/disposal of non-essential assets
- enhancing visitor information systems and multimodal options
- resource protection/restoration

Additional funding would also enable the Northeast Region to advance the policy initiatives of the *A Call to Action*, in particular in the areas of:

- broadening non-motorized access options
- improving connections to urban parks and under-represented populations
- enhancing visitor information systems and the use of technology
- resource protection/restoration
- "greening" of park operations

3.3 Strategies for Moving Forward to Manage Assets Wisely

The goal the LRTP for asset management is to sustain all high priority transportation assets within the region at acceptable condition to ensure their protection and availability for future generations. The objectives are to:

- maintain high priority transportation system assets in good condition
- use performance goals and management systems to improve the overall condition, utilization, and effectiveness of asset portfolio over time
- decommission or transfer ownership of low priority assets

Many of these objectives relate to practices that have long been among the Northeast Region's investment strategies. Some of those practices are well established and proven to be effective, but are always subject periodic re-evaluation to ensure they make best use of the available funding. Other practices are currently being piloted and require further refinement to achieve maximum effectiveness. Many other beneficial practices have been identified through this transportation planning effort and the Northeast Region has incorporated them into this LRTP.

A summary of those goals and actions for Managing Assets Wisely in the Northeast Region follows.

3.3.1 Manage Assets Wisely: Roads

The key objectives for managing road assets wisely are to right-size the portfolio of assets, focus on high priority roads that carry the majority of visitors, establish tiered pavement performance metrics, and validate modeling results as part of developing the multiyear plan program of projects.

- Continue to focus on high priority assets -in particular primary roads that are used by at least 80 percent of park visitors. This has been a policy of the Northeast Region for many years and is consistent with a key component of the Capital Investment Strategy.
- Make investments that address documented safety or visitor experiential needs.
- Continue to validate HPMA modeled output to verify need and recommended treatment prior to programming projects. The HPMA modeling is a valued planning tool, but its accuracy is sometimes hindered by the multiyear cycle of data collection. The Northeast Region has found that field verification of the HPMA recommendations, including input from park staff, can achieve project cost savings of 20 percent or more and the savings allow additional projects to be done.

- Define and implement a data collection program to ensure that adequate data exist to prioritize road investments. Pavement asset management modeling will be significantly improved by expanded data collection programs for traffic volumes. In addition, the prioritization of safety projects, and especially congestion projects, can be improved as data systems for those elements are improved.
- Establish new (lower) pavement performance metrics for lower classification and non-FLHP eligible roads (suggest an average PCR of 80). The focus on the highest priority roads, those on which 80 percent of visitors travel, highlights that tiered PCR goals for different types of road are appropriate.
- Develop a transportation asset decommissioning/disposition plan for each park in the region for road assets and pilot plan at individual park(s). The Northeast Region has targeted decommissioning efforts on excess parking facilities, but has not had a regionwide program to address all decommissioning needs. Decommissioning of assets is a cost-effective strategy but funding limits the amount that can be done. The pilot projects will help quantify the decommissioning projects and methods that are most cost effective.

3.3.2 Manage Assets Wisely: Parking

The goals for managing parking assets wisely are the same as those for roads. Because there has been relatively little funding invested in parking in the past and therefore the asset management strategies for parking are not as mature as those for roads, a prioritization process for parking projects will be key.

- Continue to focus on high priority assets - in particular visitor center parking lots and other mission critical parking areas. Fiscal year 2012 was the first year that the Northeast Region made a concerted effort to include a substantial number of prioritized parking projects by a data-driven process.
- Make investments that address documented safety or visitor experiential needs.
- Continue to validate HPMA modeled output to verify need and recommended treatment prior to programming projects. The Northeast Region has found that the benefits of field verification of the HPMA recommendations, including input from park staff, are generally higher for parking than for roads.
- Define and implement a data collection program to ensure that adequate data exists to prioritize parking investments. Utilization data for key parking lots is typically not available currently but is critical for the prioritization of parking projects.
- Establish new (lower) pavement performance metrics for parking lots (suggest an average PCR of 80 for high priority, mission critical facilities and 70 for all the rest).
- Complete and formally adopt a reclassification/stratification of parking assets within portfolio and re-optimize assets within the category. This effort is currently underway.
- Develop a transportation asset decommissioning/disposition or right-sizing plan for each for parking assets in each park in the region and pilot plan at individual park(s). The Northeast Region will continue to focus on decommissioning parking assets, including reducing the size of all parking areas undergoing heavy 3R by at least 10 percent unless the additional capacity can be justified.

3.3.3 Manage Assets Wisely: Road Bridges

The goals for managing bridge assets wisely focus on ensuring that all structures provide safe access, continued validation of bridge management recommendations, and rightsizing the portfolio when opportunities arise. Overall the goals are more modest than for other assets since the bridge asset management system has been in place for many years and has proven to be effective.

- Maintain bridges at current condition/ ensure that all structures provide safe access.
- Work with the FHWA to formulate a plan to train park staff on bridge maintenance needs and tracking activities. Maintenance practices are critical to achieving a cost-effective program of maintaining bridges in a safe condition. The maintenance plan must be context sensitive in its formulation and must be implemented consistently.
- Make investments that address documented safety or visitor experiential needs.
- Work with the Federal Highway Administration to validate appropriateness/update use of BHI performance metric. The current metric of a 0.92 health index value does not appear to be a realistic goal given anticipated funding availability.

3.3.4 Manage Assets Wisely: Surface and Water Transit

The goals for managing surface and water transit wisely focus on maintaining critical systems and expanding services in an opportunistic manner.

- Continue to focus on maintaining high priority (critical access) transit system assets in good condition with priority based on visitor use and investments that address documented safety or visitor experience needs. As in the past the Northeast Region will use comparative screening, internally and through grant applications processes, to ensure that the most effective transit projects are pursued.
- Sustain critical access surface and water transit systems in good condition. Critical access systems include those that provide the only access to a park; those that provide the only access to an important site within a park, often to help protect that resource; and special needs mobility services.
- Make investments that address documented safety or visitor experiential needs.
- Continue focused investments in alternative transportation system enhancements that provide needed access options, advance connection to urban communities, reduce greenhouse gas emissions, or help achieve the *Green Parks Plan*—where and when additional funding or sustainable partnerships have been identified. The Northeast Region has in the past heavily invested in transit systems and will continue to do so as funding allows.
- Define and implement a data collection and performance monitoring program to ensure that systems remain effective and viable. These data are necessary to ensure that only the most effective services are operated, and operated in an effective manner.
- Replace, restructure or decommission underperforming ATS. All transit systems require periodic evaluation to assess their current productivity and to respond to changing passenger demands. Those without funding to support operations will be discontinued.

3.3.5 Manage Assets Wisely: Non-Motorized Transportation

The goals for non-motorized transportation are similar to those for surface and water transit. With funding expected to be significantly lower than in past years, it will be particularly important to maintain existing trails in a cost effective manner and to leverage partnership opportunities.

- Continue to focus on maintaining high priority transportation trail assets (including water trails) in good condition with priority based on visitor use and investments that address documented safety or visitor experience needs. As in the past, the Northeast Region will use comparative screening, internally and through grant applications processes, to ensure that the most effective trail projects are pursued.
- Make investments that address documented safety or visitor experiential needs.
- Define and implement a data collection program to ensure that adequate data exists to prioritize trail investments and track performance. There is little useful data regarding the use of trails by visitors. A targeted data collection effort will provide a cost effective means of making data-driven investment decisions.
- Improve non-motorized asset inventory and definition of priorities, especially as they relate to safety needs. Trails have the least complete inventory of data among all the Northeast Region transportation assets. Trail utilization data and comprehensive incident data are required to assess safety needs.

Trolly Tour at Valley Forge National Historical Park. Photo by NPS.

CHAPTER 4 | Ensure Access, Safety, and Mobility

National parks represent some of America's most treasured cultural, historical, and recreational destinations — where visitors explore nature and history, recreate, find inspiration, and improve their health and wellness. As stewards, the National Park Service seeks to provide safe and available access to and mobility within these resources for all people.

Dock at Bumpkin Island, Boston Harbor Islands National Recreation Area.
Photo by VHB.

Goal **Provide a safe and efficient multimodal park transportation system with seamless connections within each park and to surrounding communities**

Objectives

1. **Protect the health and safety of visitors and employees**
2. **Provide multimodal options to ensure access, relieve congestion, reduce resource impacts, and reinforce sustainable practices**
3. **Enhance accessibility to the broadest diversity of visitors**
4. **Improve intermodal connectivity (address gaps in access between modes)**

This chapter discusses safety and congestion issues within the region that can impact resources and jeopardize the quality of visitor experiences. Findings and recommendations focus on how the region will work to provide a safe and efficient multimodal park transportation system with seamless connections within each park and to surrounding communities. For those who wish to delve into more background data and analyses on this subject matter, please refer to the Compendium of Technical Studies.

4.1 Existing Access & Mobility Conditions

The predominant access mode for visitors to Northeast Region parks is private automobiles. Visitor Services Project surveys administered by the University of Idaho indicate that about 78 percent of visitors arrive by private automobile. As shown in Table 4-1, the use of private automobile to access parks ranges from about 40 percent in urban Boston to 95 percent or higher in some recreationally oriented park units.

Table 4-1:
Private Automobile Mode Share by Visitors

PARK	PERCENTAGE ARRIVING BY PRIVATE AUTOMOBILE
John F. Kennedy NHS	40%
Boston NHP	41%
Fire Island NS	43%
Independence NHP	46%
Acadia NP	64%
Colonial NHP	84%
New Bedford Whaling NHS	86%
Minuteman NHP	89%
Delaware Water Gap NRA	95%
Gateway NRA (Floyd Bennett Field)	95%
New River Gorge NR	97%
Weighted Average	78%

Source: Visitor Services Project surveys, which included questions about transportation, done in the NER by the University of Idaho between 2000 and 2010. The surveys cover parks that support more than half the annual visitation in the Northeast Region. Note: Average weighted by 2011 annual visitation

For many Northeast Region park units, private automobile will remain the predominant, and sometimes the nearly universal, means of access. There are Northeast Region park units in auto-oriented suburban or rural areas for which there are few or no multimodal alternatives available. At other park units, the type of visitor activity, whether it involves a short visit to a small historic site or a large-group day excursion to a recreation area, will tend to result in automobile use being the most convenient and practical alternative for visitors.

On the other hand, due to the urban context of many park units in the Northeast Region, multimodal transportation and access is important and will remain so. In fact, 56 percent of the park units in the Northeast Region have some level of public transit access and 47 percent of park units are proximate to navigable waterways.[1] Unfortunately, there are limited data available for utilization of these transit opportunities. Only some of the Visitor Service Project surveys ask visitors about transportation, and those that do often ask only about automobile use. Another missing set of data is an inventory of regional trail connections to Northeast Region park units and the utilization of those trails.

Despite the lack of hard data, the Northeast Region recognizes the importance of providing multimodal options and has partnered with gateway communities and regional planning agencies to provide transit and trail connections between parks and their host communities. The Northeast Region has partnered with several agencies to seek grants for projects that enhance connectivity to parks. For example, the region has worked for many years with the Cape Cod Regional Transit Authority to enhance transit service to the Cape Cod National Seashore, and has also worked with the regional planning agency and gateway communities to expand regional trail connections to the seashore. Partnerships at Acadia National Park with the Island Explorer transit system have resulted in a 12 percent share of visitors using transit to access the rural park.[2]

Expanding options for mobility within parks has been a focus of the Northeast Region's investments. Several of the region's alternative transportation systems are oriented to mobility within the park. The trolley at Adams NHP provides visitors with safe and convenient

1 Preliminary results from an analysis of *A Call to Action* policy implications completed by The Volpe Center, 2012.

2 University of Idaho Park Studies Unit, "Acadia National Park Visitor Study," Summer 2009.

access to multiple park sites in a congested urban environment. The tram at Home of Franklin D. Roosevelt NHS provides mobility service for its high percentage of older visitors. The Battle Road Trail at Minute Man NHP links multiple park sites and eliminates the need for visitors to drive from parking lot to parking lot to experience the story of the battle. At Acadia National Park, vans with a bicycle trailer are used to transport bicyclists from the nearby town to a network of carriage roads in a remote area of the park.

4.1.1 Congestion

The National Park Service is concerned that congestion in its parks is negatively impacting visitor experiences and/or impeding visitor access to park resources. The Northeast Region defines congestion within its context as a limitation on the access to or enjoyment of park resources — impaired by the number of people trying to access the resource, their mode of travel, or the carrying capacity of the transportation infrastructure or the park resource itself.

The Northeast Region has been systematically making progress to understand and mitigate congestion issues in the region through its congestion management system (CMS). The Northeast Region was the first to embark on the development of a regional CMS.[3] The overall goals of this Congestion Management System planning process were:

- to define the extent and nature of congestion in the Northeast Region
- to broaden the understanding of the nuances of congestion management in a national park context
- to develop a candidate process for addressing congestion at Northeast Region parks and to test that process through case studies
- to define a strategy for moving forward in the region

Fifty-three of the Northeast Region park units responded to a 2008 congestion survey of all units in the Northeast Region. Additional surveys of some Northeast Region park units, distributed in 2010 as part of a Service-wide congestion management effort (10 Northeast Region park units responded to that survey), supplemented these findings.

Two-thirds of the park units (35 units) in the Northeast Region that responded to the congestion survey indicated that they are experiencing congestion related issues in or adjacent to their parks. Assuming conservatively that congestion is not an issue for the park units that did not respond to the survey suggests that about half of the park units in the region are experiencing occasional to frequent periods of congestion. It was also found that limited data exist to quantify the level of congestion in these parks, meaning much of the information available is experiential or observational.

Of the 35 NER park units which self reported that they were regularly experiencing some degree of congestion, 57 percent responded that congestion is negatively influencing visitor experiences and 40 percent responded that congestion is impacting resources. In addition to visitor demands, about 70 percent of the park units responded that their facilities are being routinely used by non-park uses. Chief among the cited influences of congestion to visitor experience were:

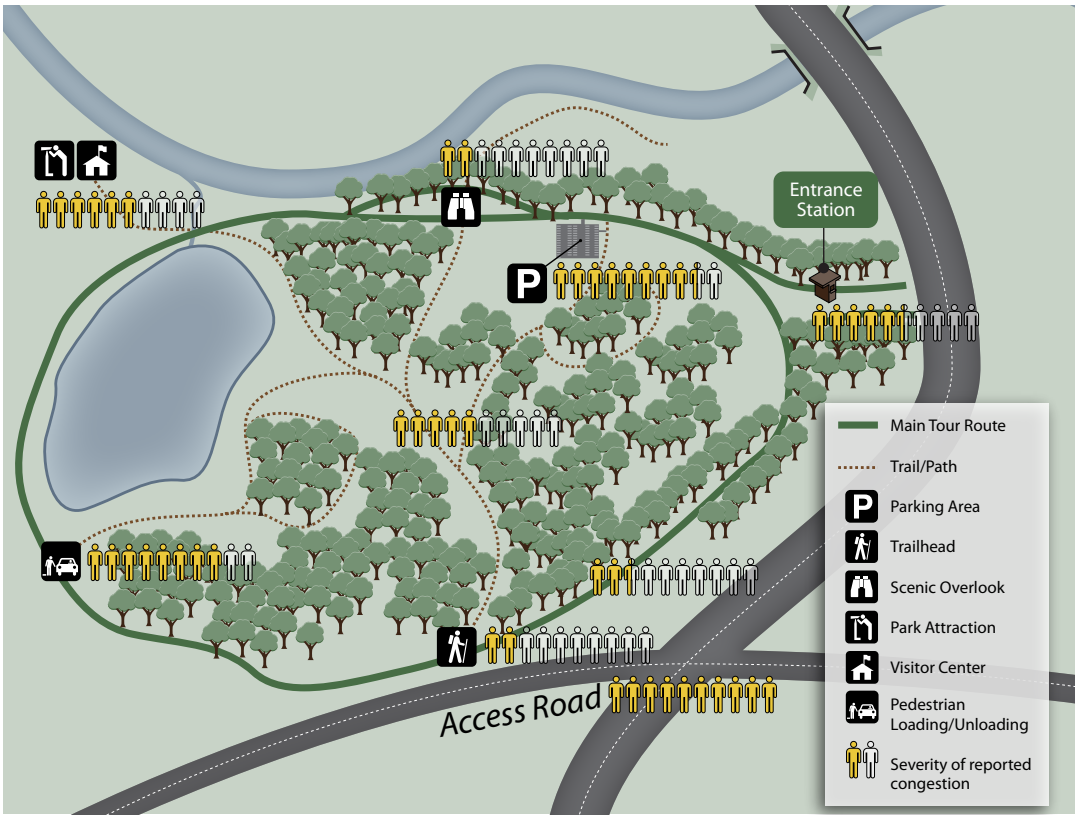
- delays, inconvenience and frustration
- crowding and noise at scenic vistas, historic buildings, and sacred places
- parking facilities and roads detracting from the cultural landscape
- inability to appreciate the cultural and natural experience
- safety conflicts between vehicles and pedestrians
- dissuades future visits

The two congestion surveys focused in on congestion issues that are unique to parks and the park experience. Several congestion "emphasis areas" were evaluated, including park unit access roads, parking areas, entrance stations, trails/paths, and pedestrian loading areas. These emphasis areas provide an organizational framework for the identification of strategies to address congestion within the park units. The severity of the congestion by emphasis area,[4] as reported by the 35 surveyed park units noting some form of congestion, is depicted in **Figure 4-1.** The most frequently congested locations reported are along access roads to the park units, at parking areas, and at pedestrian loading/ waiting areas.

3 Vanasse Hangen Brustlin, Inc. and Eastern Federal Lands Highway Division, "Northeast Region of the National Park Service Long-Range Transportation Planning: Congestion Management System Study," White Paper, 2011.

4 Calculated as a weighted index based on the responses by emphasis area times the frequency of congestion occurrences

Figure 4-1: NER Congestion Survey Results by Emphasis Area



Source: Vanasse Hangen Brustlin, Inc. and Eastern Federal Lands Highway Division, "Northeast Region of the National Park Service Long-Range Transportation Planning: Congestion Management System Study," White Paper, 2011.

About three-quarters of the park units reporting congestion are actively working to manage it through a variety of strategies, as illustrated in Table 4-2. Of those park units that indicated they have congestion within their boundaries, 43 percent are managing congestion through alternative transportation systems, while 37 percent are using park rangers to actively manage traffic. All of these park units reported the need to implement more strategies to address congestion.

4.2 Existing Safety Conditions

Visitor and employee safety is always a top priority of the National Park Service, and the agency has been systematically making progress to improve conditions through its transportation safety management system. The Northeast Region was the first to embark on the development of a regional TSMS.[5] The initial work focused on vehicle safety. Later, and ongoing, efforts address safety issues associated with transit and trails.

5 CH2M Hill, "Northeast Region Transportation Safety Management System – Summary Report", January 2012.

Table 4-2: Strategies Currently Used by Northeast Region Park Units to Address Congestion

STRATEGY USED BY PARK	NUMBER OF PARKS USING THE STRATEGY	PERCENTAGE OF PARKS USING THE STRATEGY
Number of Parks Reporting Congestion	35	
Alternative Transportation System (ATS)	15	43%
Park Ranger Traffic Management	13	37%
Reservation System	10	26%
Traffic Information	7	20%
Variable Message Signs	5	14%
Other	2	6%
Highway Advisory Radio	1	3%

"Other" responses include wayfinding signage and overflow parking.

4.2.1 Vehicle Safety

The Northeast Region established an initial performance metric to reduce severe vehicle crashes in the region, those resulting in fatalities or injuries, by 20 percent. The Northeast Region then conducted a series of studies using a data-driven process to identify prominent crash locations and patterns. Service-wide Traffic Accident Reporting System (STARS) data from 1990 to 2005 were used to identify the number and type of vehicular crashes occurring in the 35 Northeast Region parks with crash data.[6]

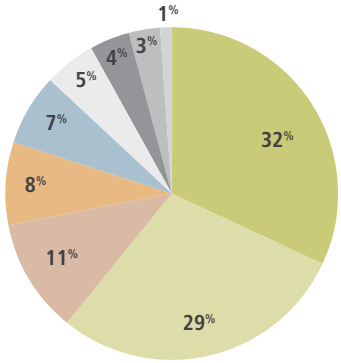
As shown in Table 4-3, the STARS data revealed an average of 586 vehicular crashes annually. An annual average of two fatalities resulted from the crashes, along with another 101 injuries. The societal cost of these crashes is estimated to be $19 million per year.

It was found that 10 parks account for 95 percent of all reported vehicle crashes and 98 percent of all severe crashes in the Northeast Region: Acadia National Park, Assateague National Seashore, Cape Cod National Seashore, Colonial National Historical Park, Delaware Water Gap National Recreation Area, Fredericksburg & Spotsylvania National Military Park, Gateway National Recreation Area, Gettysburg National Military Park, Shenandoah National Park, and Valley Forge National Historical Park. The TSMS development subsequently focused on these 10 parks.

6 2005 is the most recent year for which regionwide crash data are available.

Figure 4-2 depicts the breakdown of the data by type of crash. As shown, 66 percent of vehicle crashes involve a single vehicle; the Service-wide average over the same period for this type of crash was 46 percent. Almost half of the single vehicle crashes were lane departure crashes but, as noted, 29 percent of all crashes in the Northeast Region were due to wildlife collisions. This wildlife related crash experience is considerably higher than the Service-wide average of 10 percent.

Figure 4-2: Northeast Region Crash Collision Types, 1990-2005



Source: CH2M Hill, "Northeast Region Transportation Safety Management System – Summary Report," January 2012.

- Single Vehicle Lane Departure
  - Tree/shrub 8%
  - Other fixed object 5%
  - Guardrail/barrier 4%
  - Other object 3%
  - Rock/stone wall 3%
  - Pole 2%
  - Sign 2%
  - Ditch 1%
  - Boulder 1%
  - Backslope 1%
  - Barricade <1%
  - Culvert end wall <1%
  - Bridge structure <1%
  - Drainage structure <1%
- Single Vehicle Animal
- Multi-vehicle Rear End
- Multi-vehicle Other
- Multi-vehicle Angle
  - Head-on 4%
  - Other 3%
  - Sideswipe-Overtaking 1%
  - Rear-to-Rear <1%
- Multi-vehicle Parked Vehicle
- Single Vehicle Not Categorized
- Unknown
- Single Vehicle Bike/Pedestrian

May not add up to 100% due to rounding

Table 4-3: Northeast Region Average Annual Vehicle Crashes 1990-2005

	NUMBER OF CRASHES	PERCENTAGE OF CRASHES	SOCIETAL COST PER CRASH	TOTAL
Property Damage Only	483	82.4%	$6,500	$3,139,500
Injury	101	17.3%	$38,500	$3,888,500
Fatality	2	0.3%	$6,000,000	$12,000,000
All Crashes	586	100.0%		$19,028,000

Source: National Park Service, STARS database, 1990-2005.

Note: Societal costs include the monetary losses accounted with medical care, emergency services, property damage, lost productivity, etc., based on research conducted by the FHWA. The values are from the 2009 memorandum to secretarial officers from the Assistant Secretary of Transportation Safety regarding Treatment of the Economic Value of a Statistical Life in Departmental Analysis.

The review of crash patterns in Northeast Region parks helped identify emphasis areas appropriate for a systematic approach that is consistent with US DOT and state DOT strategic highway safety plans. The emphasis areas are as follows:

- keeping vehicles on the roadway and minimizing the consequences of leaving the road
- improving the design and operation of highway intersections
- reducing head-on and across-median crashes
- reducing driveway access crashes
- reducing parking lot crashes
- reducing animal crashes
- reducing crashes resulting from human factors (for example, aggressive driving, impaired driving, and inattentive driving)

The focus on reducing vehicle crashes resulted in a regionwide set of reactive and proactive safety countermeasures (or "safety needs") as discussed further in Section 4.4.1.

4.2.2 Non-motorized Transportation Safety

In 2012, the Northeast Region expanded its safety program by turning its attention to safety issues related to non-motorized travel and transit. The region conducted a pilot safety study of one of the most heavily used bicycle trails in Cape Cod National Seashore.[7] The 7-mile Province Lands Trail has been averaging 38 bicycling injuries annually and bicycling injuries typically account for more than half of all visitor injuries reported at the seashore. Of the bicycling injuries, about 41 percent required transport to a medical facility and the others received minor medical treatment from park personnel.

The study noted excessive speed and distractions (texting) as significant contributors to bicycle crashes. A low use of helmets was noted, with 58 percent of bicycling injuries involving bicyclists not wearing helmets. Some nonstandard geometric design elements of the 1960s era trail were also identified. Of the seven high crash locations, four were located along sections with difficult geometries. The study also highlighted the success of the seashore's maintenance efforts to keep the trail free of sand since few bicycle crashes were related to trail maintenance issues.

Recommendations to mitigate safety concerns at this location include expanding safety messaging, a comprehensive evaluation of all signs and markings, reviewing in greater depth high crash sites, and constructing rest area landings on sections of the trail with steep gradient. The region is also currently designing a replacement for one of the trail's two tunnel culverts that will be taller and wider to more safely accommodate bicyclists.

As a follow up to the bicycle safety pilot, the Northeast Region will assess the options for applying the bicycle safety assessment process to other trails and other park units to broaden its understanding of safety issues related to transportation trails in the region. At Cape Cod National Seashore, recommended countermeasures for the Province Lands Trail are being considered in two other trail projects under design.

4.2.3 Alternative Transportation Systems Safety Pilots

The Northeast Region conducted two pilot ATS safety studies in 2012. One was at Acadia National Park which is served by the Island Explorer regional transit system and also has two private operators providing scheduled guided tours. The other was at Gettysburg National Military Park which runs a shuttle to the adjacent Eisenhower National Historic Site, has a battlefield bus tour, and partners with the local transit agency for service to the visitor center.

The study objective was originally oriented towards those park units in the Northeast Region operating alternative transportation systems directly or through partnerships. Based on the results of those studies it was identified that it is equally important to assess the safety of charter bus and other tour practices, like the Segway.

There was little or no history of shuttle vehicle collisions or visitor injuries associated with ATS found at either park, so the pilot studies focused on congestion mitigation. The studies' findings also noted a need to better incorporate ATS considerations in the design of visitor centers and within parking areas that are part of shuttle routes. In addition to understanding pedestrian patterns to/from the route, the design of bus stops and loading areas should take into account the different operational needs of scheduled versus chartered bus services.

7 CH2M Hill and Integrated Strategic Resources LLC, "Multi-use Trail Evaluation and Recommendations: Province Lands Trail at Cape Cod National Seashore," September 4, 2012.

4.3 Future Trends and Considerations

There are several trends and other factors that are relevant to planning for transportation access, safety, and mobility, as briefly discussed in the next sections of this report.

4.3.1 Growth in Visitation

Although no formal visitor forecast was done as part of this LRTP, visitation to park units of the Northeast Region is expected to grow in the future (see also discussion in Chapter 5). This growth can be related to:

- population growth in and around parks
- increased land development near parks and historical sites
- growth in the older age groups that are most likely to visit parks
- trends in shorter, more frequent, close to home vacations
- demand for passive recreational opportunities
- upcoming special events and park anniversaries

This increase in visitor demands will increase visitor exposures to safety issues within the park units and will likely worsen the congestion issues facing the Northeast Region in the future.

4.3.2 Transportation Management Considerations in a Park Context

An effective approach to managing transportation within a park must consider the contextual relationships between the strategy and visitor experiences, resource protection, livability, and sustainability. Transportation management considerations for the Northeast Region are summarized in Table 4-4.

Visitor Experiences - Unmitigated safety issues or congestion at parks can impact visitor experiences. Congestion can limit the access to or enjoyment of park resources simply by the sheer number of people trying to access those resources. Visitor expectations can vary widely depending on the context of the park and purpose of the visit (recreational, cultural, historic, scenic, wilderness, etc.). For example, visitors may expect larger crowds and longer wait times at Independence Hall and are less likely to feel that their visit was negatively impacted by the typical congestion of its urban setting. Conversely, if visitors seek a remote hike through a wilderness area and encounter overcrowding along the trail, the visitor experience falls short of expectation. Some congestion issues also may create safety problems, for example, increased vehicle traffic limits the visitor's ability to cross a road or access a park resource. The delays, inconvenience, and frustration caused by safety issues and congestion can dissuade people from ever visiting the parks, or from making return trips.

Resource Protection - Unmanaged transportation can also degrade natural and cultural resources in a park. Unsanctioned parking can destroy the area where the cars are parked and create farther reaching issues from stormwater runoff and uncontrolled pollutants. General unmanaged use in crowded walking or bicycling areas can lead to damage of vulnerable native habitat or disturbance of wildlife. Vehicle

Table 4-4: Key Transportation Management Considerations for the Northeast Region

EFFECTS ON VISITOR EXPERIENCE	EFFECTS ON RESOURCE PROTECTION
• Delays, inconvenience and frustration • Crowding and noise at scenic vistas, historic buildings, and sacred places • Parking facilities and roads detracting from the cultural landscape • Inability to appreciate the cultural and natural experience • Safety conflicts between vehicles and pedestrians • Dissuades future visits	• Physical imprint of facilities • Unmanaged access, unsanctioned parking, informal trails • Destruction of flora and fauna • Stormwater runoff • Air quality • Greenhouse gases • Noise • Wildlife kills and disturbance
LIVABILITY	**SUSTAINABILITY**
• Park's function within community/region • Recreational access • Unmanaged growth or land use threats near park boundaries • Regional congestion	• Contribution to energy use reductions • Alternative modes/fuels • Climate benefits/GHG reductions • Financial

traffic contributes to air quality problems and greenhouse gas emissions, as well as to the more visible wildlife collisions. Furthermore, and in many cases, unmanaged access can overload the carrying capacity[8] of a resource impacting both the resource and the visitor experience.

Livability - Park resources are critically important to their neighboring communities and contribute to local and regional quality of life. The treasured natural, cultural, and historic resources inherent in these parks are intrinsically linked to the identity and fabric of the community that surrounds them and contributes to the economic vitality of the state and region where they reside. In addition, these resources often provide valued recreational and educational opportunities for local citizens and visitors alike. Congestion, particularly in the densely populated northeast region of the US, can also be caused by external factors such as the setting of the park resource (urban versus rural), cut-through traffic, and development near the park boundaries.

Sustainability - A fourth important aspect of managing congestion in the parks is consideration of recent NPS policy directives to manage and operate the national park system in a more sustainable manner. Sustainability does not define congestion in the parks today but helps shape the toolbox of safety and congestion mitigation strategies and priorities in the future.

4.3.3 Health and Obesity

National health trends also have the potential to influence park visitation and the role of our parks in our people's wellbeing. Over the last twenty years, there has been a significant increase in rates of obesity across the United States. As cited in the Journal of the American Medical Association (January 2010), approximately one-third of the US population is obese. Figure 4-3 illustrates the change in the prevalence of obesity by state in 1990, 2000, and 2010.

While there is a national effort to lower obesity prevalence for each state below 15 percent (Healthy People 2010), no state was able to meet this goal. In fact, no state had a prevalence of obesity less than 20 percent in 2010. Thirty-six states had a prevalence equal to or greater than 25 percent; 12 of these states had prevalence equal to or greater than 30 percent.[9]

The National Park Service has a role in helping to reverse this serious health trend by promoting and facilitating access to the national park system and increasing connections — particularly walking, hiking and bicycling connections — to nature and passive recreation. In April of 2010, President Obama launched the America's Great Outdoors Initiative[10] and in August of 2011 the National Park Service issued *A Call to Action.* Both initiatives give special attention to engaging young Americans in conservation, outdoor education, and recreation. This issue and these initiatives open up a wide new set of potential partnerships for the National Park Service.

4.3.4 Transportation Technology

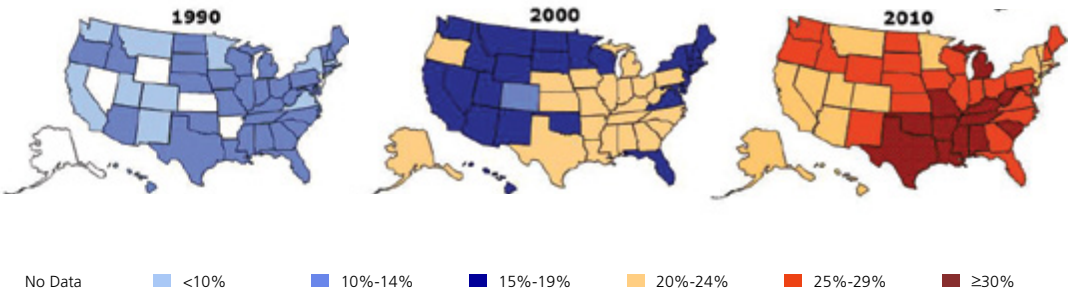
In this digital age, technological advancement is rapid, continuous, and widespread. Any plans for reducing congestion in and around parks, improving safety, enhancing visitor experiences, and attracting new visitors must take into

8 As it applies to the parks and according to the *Visitor Experience and Resource Protection (VERP)* Framework published by the NPS, 1997, "carrying capacity is the type and level of visitor use that can be accommodated while sustaining the desired resource and social conditions that complement the purpose of a park unit and its management objectives".

9 Sherry B. Blanck HM, Galusk DA, Pan L, Dietz WH. *Vital Signs: State-Specific Obesity Prevalence Among Adults* – United States, 2009. *Morbidity and Mortality Weekly Report.* August 6, 2010 / 59(30); 951-955.

10 The Department of the Interior formalized their response to the initiative in September 2012 through Secretarial Order 3323.

Figure 4-3: U.S. Obesity Trends from 1990 to 2010
Source: Center for Disease Control Behavioral Risk Factor Surveillance System



account the influences of new technologies and ways to leverage these technologies for the benefit of the National Park Service and park visitors. Today, the use of intelligent transportation systems (ITS) and new communication technologies are often central to managing congestion. *A Call to Action* also states that the National Park Service must use leading-edge technologies and social media to effectively communicate with and capture the interest of the public. As visitor experiences often begin long before a visitor steps foot in a park, dissemination of valuable visitor information — from early travel planning to engagement along the journey — is a critical component of transportation planning for parks.

The Volpe Center conducted studies of intelligent transportation systems in the National Park Service in 2005 and 2011. Some of the ITS functions being deployed in the region included:

- on-line reservations systems
- automated entrance traffic volume recording
- automated shuttle passenger boarding and alighting counting
- traveler information systems
- parking lot and entrance monitoring
- GPS-based vehicle location systems
- real-time shuttle information and management systems

Comparison of the two studies confirmed the increasing use of ITS in the Northeast Region and also the rapid development in social media applications of ITS. Social media applications are becoming a popular form of real-time communication that is portable and therefore very beneficial for travelers (see Chapter 5 for further discussion).

The National Park Service already maintains individual websites for each of its parks, with each site containing rich content on getting to and around the resource, cultural and historic resources, activities for families, and nearby lodging and attractions. A number of NPS resources among the Northeast Region park units require advanced reservations to visit and/or stay. With the increased use of online travel booking websites, there may be opportunities to partner with those websites to increase visibility of NPS resources and better manage congestion through advance reservation systems.

ITS also can assist in safety and congestion related to emergency management by providing visitors with advance warning of emergencies or severe weather events, and by providing information to guide vehicles and individuals to NPS facilities that may be used as shelters or staging areas in emergencies.

4.4 Access, Safety, & Mobility Needs

Through the transportation safety management system and congestion management system planning processes, the Northeast Region has identified a number of safety, congestion, and access-related needs to meet its stated goal to provide a safe and efficient multimodal transportation system with seamless connections within each park and to surrounding communities. These needs represent essentially prioritized projects that would be programmed, subject to available funding, through the established six-year transportation improvement program.

4.4.1 Identified Safety Needs

Safety needs in the Northeast Region were determined by identifying specific safety improvements focused on critical routes and locations within the ten parks experiencing the most crashes. In total, these selected routes and locations account for two-thirds of all severe crashes, including three-quarters of all fatal crashes, in the Northeast Region. Initially, a parkwide study was conducted at the park with the most crashes (Delaware Water Gap NRA) to pilot how best to conduct a vehicle safety study in the balance of the parks.

From the vehicle crash studies in the targeted parks, a list of more than 600 safety countermeasures or proactive safety strategies were initially identified. They ranged from enforcement/education actions to intersection realignment projects. There are four categories of implementation approaches for the countermeasures:

- parks implement safety recommendations with their own staff
- develop standalone safety projects
- safety strategies to be incorporated into programmed paving and bridge projects
- coordinate with non-NPS agency to implement safety countermeasures

The evaluation of potential safety projects was done using a benefit-cost economic appraisal that quantified societal benefits against the implementation cost. Crash reduction benefits

were calculated using national standard crash reduction factors for implementation of various reactive countermeasures. Societal benefits were calculated using national standards for monetizing the cost of injuries, fatalities, and vehicle damage.

A critical aspect in the development of the TSMS and the park-level safety analysis was the participation by park staff to validate the analysis, identify crash locations and issues not apparent from the available data, and provide important feedback on how to ultimately make the recommended countermeasures more context sensitive.

The recommended projects include both reactive and proactive countermeasures. Reactive strategies address an identified safety issue based on crash data. Proactive strategies have the potential to prevent crashes at sites with no reported crashes or reduce crashes at sites where crashes may be under reported, and were developed for locations identified by the project team and park staff.

Application of the transportation safety management system process resulted in the identification of 343 recommended safety actions (165 reactive and 178 proactive measures), at an estimated total cost of $16 million. The roadway safety components of the TSMS program are expected to reduce 630 crashes over 10 years following implementation of the recommendation at the highest 10 parks studies. This equates to a 16 percent severe crash reduction and an 11 percent total crash reduction of the crashes that occurred regionwide. A minimum 5 percent (regionwide) severe crash reduction is expected as an indirect benefit from a deer culling program at Valley Forge National Historical Park. Thus, the region's goal of a 20 percent reduction in severe crashes will be met.

Total societal cost savings (benefits) anticipated to result from the crash reductions are estimated to exceed $46 million. The resulting benefit to cost ratio of the $16 million investment would thus be about 2.9.

The total need for safety investments in the Northeast Region is currently estimated at $21 million. Total safety needs include:

- $3 million regionwide to comply with FHWA signage retroreflectivity requirements
- $18 million for proposed safety countermeasures at the parks studied, of which $2 million are on roadways controlled by other agencies

It is assumed that these projects would be implemented over a ten year period and that the lifetime of these infrastructure investments is about ten years; thus, the investment need in safety is approximately two million dollars annually. This annual need is carried over the life of this LRTP, assuming that some of the early actions will involve renewed investment, new needs in parks that have yet to be studied and for non-motorized and transit facilities will be identified, and that new safety hotspots may emerge over time.

The implementation of the vehicle safety recommendations began in FY 11 with low cost safety projects that could be either done by park staff or incorporated into programmed paving and bridge projects. By the end of the FY 12, approximately 20 percent of the measures have been completed (43 projects) or were underway (26 projects).

As part of its multiyear plan the Northeast Region dedicated approximately $1.5 million annually to address safety projects. This includes about $1.0 million to implement the recommended reactive and proactive safety countermeasures, with the balance for signage retroreflectivity compliance efforts.

The Northeast Region is committed to actively update, expand, and monitor safety needs and issues in the region through its transportation safety management system. Strategies and recommendations for continuing this effort are presented in Section 4.5.

4.4.2 Access & Mobility Needs

The congestion management system for the Northeast Region seeks to manage access to and around its parks in a way that:

- improves mobility, safety, and community connections
- protects/improves the visitor experiences of the park
- preserves the natural, historic, and cultural resources
- acknowledges and protects park resources with carrying capacity limitations
- expands the role and partnerships with gateway communities to preserve parks' value and access for future generations
- rationalizes how to invest in strategies to address congestion needs on a regular basis

Through outreach and field validation, the Northeast Region amassed a list of over 100 project concepts that could address a wide variety of congestion-related "needs". These initial concepts were assessed, screened, and prioritized toward the development of a recommended set of actions for implementation within a multiyear transportation improvement program.

The fundamental framework for the evaluation and screening of project concepts was 20 criteria intended to answer the two overarching questions:

- How serious is the congestion issue that a candidate project seeks to address?
- How effectively does a candidate project mitigate impacts of the specific congestion issue it is intended to address?

The initial evaluation and prioritization of the potential congestion management projects at Northeast Region park units was completed in 2011.[11] After eliminating low-benefit, high-cost projects, and accounting for overlaps with programmed safety and ATS projects, approximately $20 million of congestion-related projects were ranked as worthwhile for either implementation or further planning. Further validation of these projects, including outreach to the parks, is underway by the Northeast Region.

It is assumed that these projects would be implemented over a ten year period and that the lifetime of these infrastructure investments is about ten years; thus, the investment need to address congestion in the region is approximately two million dollars annually. This annual need is carried over the life of this LRTP, assuming that some of the early actions will involve renewed investment, new needs in parks that have yet to be studied will be identified, and that new congestion hotspots may emerge over time.

Some key findings about the types of projects assessed and the outcomes of the CMS include:

- There is often lack of hard data regarding the magnitude and duration of congestion at a park. As a result, several early projects involve data collection to enable a more in depth assessment of larger, high-cost projects.
- Wayfinding signage, in particular, was identified as a relatively simple, low cost means of reducing visitor frustration, and it was noted that the lack of wayfinding was in part because wayfinding was typically excluded or given low priority for available funding programs.
- Much of the congestion is experienced outside of the park boundaries on key routes at or key intersections leading to the park. Northeast Region park units need to work with the gateway communities, regional planning agencies, and state DOTs to address the problems.
- Several projects to reduce congestion involve increasing options for non-automobile access to the park units. Most of the currently planned projects to improve access focus on providing alternative transportation options to or within park units for improved mobility and better community connections. These projects include walking and bicycle trails, gaps in multimodal connections, and coordination with local transit agencies and are included in the Northeast Region's current alternative transportation program.
- Several transportation information systems are proposed to help manage visitor use. The congestion study highlights the need to first carefully study the influence that these systems would have on visitor experiences to determine both how well they might be accepted by visitors and to identify opportunities to enhance those systems with interpretive experiences.

4.5 Strategies for Moving Forward to Ensure Access, Safety, & Mobility

There are a number of strategies and actions that the Northeast Region can implement to address access, safety, and mobility needs within the region. The Northeast Region transportation investments remain focused on providing positive visitor experiences for the broadest range of visitors to park units in the region while remaining steadfast in its stewardship of the protected resources under its care. These recommendations, oriented by each stated LRTP objective, are briefly described below.

11 Vanasse Hangen Brustlin, Inc. and Eastern Federal Lands Highway Division, "Northeast Region of the National Park Service Long-Range Transportation Planning: Congestion Management System Study," White Paper, 2011.

4.5.1 Protect the Health and Safety of Visitors and Employees

Addressing safety for visitors and employees through the development and implementation of a TSMS is a federal requirement of the National Park Service (23 Code of Federal Regulations, Part 970.212) and a central tenet of the NPS's Capital Investment Strategy. To address identified needs and improve transportation safety in the region, the Northeast Region will:

- fund high priority roadway safety improvements at those locations that are experiencing the highest occurrence of severe crashes
- formally incorporate safety and congestion factors into its prioritization of roadway projects
- undertake appropriate proactive safety investment strategies
- complete additional safety assessments for trails and ATS facilities and prioritize recommendations for implementation

It is important to recognize that the constrained funding availability to the region will limit the pace by which the safety program can be implemented. As such, the Northeast Region will continue to work cooperatively with parks and partners to advance safety engineering, education, and enforcement programs and will seek opportunities for the region to tap into other funding sources through MAP-21 to accelerate its progress in addressing its safety-related needs.

Finally, the Northeast Region is committed to monitoring and reporting on its progress as the safety program moves forward.

4.5.2 Provide Multimodal Options to Ensure Access, Relieve Congestion, Reduce Resource Impacts, and Reinforce Sustainable Practices

The Northeast Region will continue to work with parks on an ongoing basis to solicit input on congestion-related needs and opportunities and in the near term will carefully invest in proven technologies to improve access to and operations within its park units. In particular, the Northeast Region will:

- seek low cost opportunities to modernize wayfinding signage and other visitor information through ongoing investments in roads, parking, and alternative transportation systems/amenities.
- collaborate with partners to broaden park access information and conditions reporting within local and regional traveler information systems.
- increase options for non-automobile access to the park units, such as bicycle trails, gaps in multimodal connections, and coordination with local transit agencies. To advance these strategies in the parks and gateway communities, it is recommended that:
  - local park leadership become more engaged in regional planning activities, including being active with the appropriate Metropolitan Planning Organization (MPO) or regional planning agencies.
  - the Northeast Region pursue highway safety improvement, federal land access, transportation alternatives, congestion mitigation and air quality, or other discretionary funding programs by working closely with planning partners.

Additional opportunities for connectivity between the parks and neighboring communities, beyond those identified as part of the CMS process, are desirable. However, there is a lack of inventory on regional trails providing access to parks and of available public transit routes and schedules. The Northeast Region will collect these data, in conjunction with MPOs and local planning agencies, on its urban parks.

4.5.3 Enhance Accessibility to the Broadest Diversity of Visitors

In addition to the recommendations highlighted above which will provide benefits to all visitors and employees of the region, the Northeast Region will:

- consider the accessibility needs of all users with every transportation investment
- complete an inventory of all priority trails in parks, including evaluations of accessibility using Universal Trail Assessment Process (UTAP) standards
- continue to incorporate safety and congestion into project prioritization
- incorporate urban demographics and accessibility goals into project prioritization

4.5.4 Improve Intermodal Connectivity (address gaps in access between modes)

As previously discussed, several recommended projects within the ATS program address gaps in multimodal connections; however, many of these actions are beyond the current level of available funding. To increase connectivity between park units and gateway communities, it is recommended that:

- local park leadership become more engaged in regional planning activities, including being active with the appropriate metropolitan planning organization or regional planning agencies.
- the Northeast Region, with its planning partners, pursue highway safety improvement, federal land access, transportation alternatives, congestion mitigation and air quality, or other discretionary funding programs to address gaps in non-motorized connections and between modes in the region.

The Northeast Region is committed to monitoring and reporting on its progress on addressing congestion and mobility and enhancing access as these programs move forward. To accomplish this, the Northeast Region will define data needs and a performance monitoring program to ensure that investments are achieving their intended results and systems remain effective and sustainable.

Multiuse path at Assateague Island National Seashore. Photo by NPS/Tracey Ammeron.

CHAPTER 5 | Enhance Visitor Experiences

Providing positive visitor experiences is at the core of the National Park Service mission and is inextricably linked to the transportation system that visitors use to access and travel within the park units of the Northeast Region. Through its investment in transportation, the Northeast Region strives to maintain, in good condition, transportation facilities and services that are most used by its visitors. Furthermore, the Northeast Region seeks to enhance visitor experiences, where opportunities exist, by improving the availability of advance trip planning information, addressing in-park visitor information and travel needs, and eliminating transportation barriers impeding park access and enjoyment.

Trolley bus at The Old House, Adams National Historical Park.
Photo by NPS/Keinath.

Goal **Support rewarding visitor experiences by maintaining high priority transportation assets in good condition, improving trip planning resources, and better integration of transportation within the park interpretive experience**

Objectives

1. **Maintain high priority transportation system assets in good condition**
2. **Provide trip planning resources and travel information to access the parks**
3. **Integrate effective visitor information systems within park transportation system**
4. **Address transportation congestion and the impacts of non-park traffic that impede park access and/or the enjoyment of parks**

5.1 Visitor Use and Characteristics

Understanding the influences that visitor use, visitor characteristics, and visitor experiences might have on transportation (and vice versa) first requires a definition of terms.

- **Visitor use** is defined as the physical, human presence in an area for recreational, educational, inspirational, or scientific purposes.[1]
- **Visitor use characteristics** are defined as the levels of use, timing and distribution of use, and activities and behaviors of visitors.[2]
- **Visitor experience** is the perceptions, feelings, and reactions a person has before, during, and after a visit to a park site.[3]

All of these components are relevant to transportation and transportation planning for the Northeast Region; however, the complexity, dimensions, and subjectivity increases significantly as one moves from visitor use (quantitative and fairly straightforward), to visitor use characteristics (more dimensions, with both quantitative and qualitative information generally available), to visitor experiences (complex, multidimensional, and highly subjective). This chapter highlights visitation to Northeast Region park units and visitor characteristics and experiences relevant to future transportation investment in the region. For those who wish to delve into more background data and analyses on this subject matter, please refer to the Compendium of Technical Studies.

Consider for a moment that there are more than 50 million different visitor experiences in the Northeast Region every year!

1 Source: Interagency Visitor Use Management Council

2 Ibid.

3 Visitor Experience Technical Report for the Golden Gate National Recreation Area, Muir Woods National Monument, and Fort Point National Historic Site Long-range Transportation Plan, Denver Service Center, March 2012, Draft.

5.1.1 Regional Visitation

Data on visitor use and visitor use trends in the Northeast Region are helpful to understand the demands for transportation in the region and in the systemwide assessment and prioritization of potential investments in transportation facilities and services. As examples, the Northeast Region uses visitor use of roads and parking facilities as a factor in prioritizing its on-road system investments and uses visitor demands as one indicator in assessing the effectiveness of alternative transportation systems.

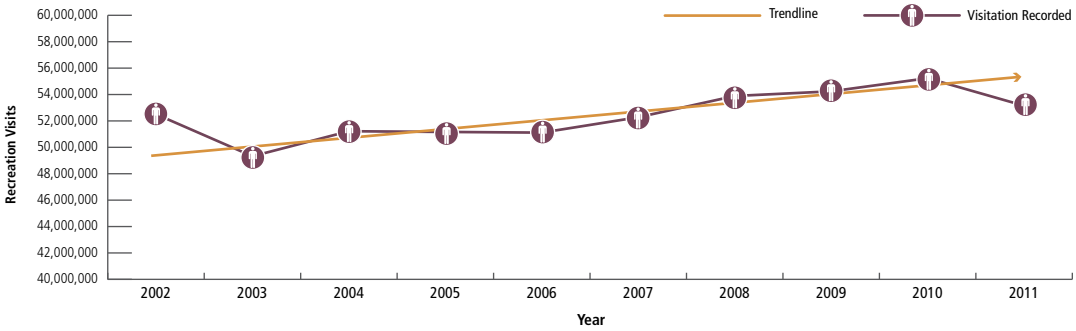
Figure 5-1 shows Northeast Region annual visitation for the past 10 years.[4] In 2011, there were more than 53 million visits to park units of the Northeast Region. Over the last decade, visitation to the region has generally grown after a dip in 2003. The 2011 visitation is up about 4 million visitors (8%) from the 10-year low of 49 million visitors in 2003.

5.1.2 Northeast Region Visits by Park Type

The purpose of a visit to a park unit and its context may influence visitors' choice of transportation mode, length of stay (for example, visiting a national historic site is typically a shorter length of visit than visiting a national recreation area), and transportation requirements within the park unit. The annual visitation data for the Northeast Region can be generally grouped into two park type categories: ***Cultural/Historical*** and ***Recreational.***

4 For the purposes of this document, visitation data refers to "recreation visit" data for the NPS Public Use Statistics Office for the 71 Northeast Region park units for which such data are available.

Figure 5-1: Northeast Region Visitation (2002–2011)

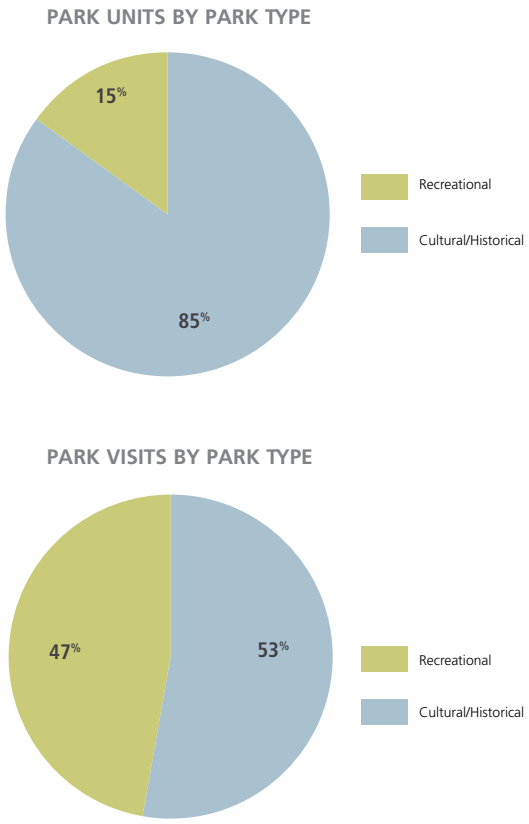


Source: National Park Service Public Use Statistics Office, "Annual Recreation Visits Report" Note: Data presented for the 71 park units for which data are available.

The Cultural/Historical category is comprised of national battlefields, national battlefield parks, national historic sites, national historical parks, national memorials, national military parks, and national monuments. There are 60 such park units in the Northeast Region for which visitation data are available. The Recreational category is comprised of national parks, national recreation areas, national rivers, and national seashores. There are 11 such park units for which visitation data are available. Figure 5-2 summarizes the breakdown of park units and annual visitation between the two categories of park units.

Cultural/Historical park units accounted for 53 percent of the regionwide visitation in 2011 while Recreational park units accounted for 47 percent, despite making up only 15 percent of all parks.

Figure 5-2: Park Units and Visitation by Park Type in Northeast Region (2011)



Source: National Park Service Public Use Statistics Office, "Annual Recreation Visits Report" Note: Data presented for the 71 park units for which data are available.

Visitation to Recreational park units has remained relatively flat over the past decade despite notable fluctuations in overall NER visitation year to year, while visits to Cultural/Historical park units have been growing at an average rate of 1.3 percent per year. These data could reflect a trend away from nature-based recreation activities.

A 2006 study by the University of Illinois at Chicago noted a universal decline in nature-based recreation activities, most notably among younger people.[5] The study found that the 20-year decline in national park unit visitation rate per capita is significantly correlated with a number of electronic entertainment indicators, including hours of television, movies, video games, and internet use. Other research indicates that people's favorite leisure-time interests as an adult are most often learned as a child.[6] The National Park Service's recent efforts through *A Call to Action* to leverage technology to appeal to a wider audience – particularly children and young adults – could be key to promoting outdoor recreation and learning, and sustaining or increasing visitation numbers, in the future.

5.1.3 Seasonality of Visitation

Visitation to park units of the Northeast Region varies significantly by season with the heaviest visitor demands in the summer. The summer months (June, July, and August) comprise more than 45 percent of total annual visitation to Recreational park units, peaking in the month of July when 17 percent of annual visits occur. By comparison, the summer months comprise about 39 percent of annual visits to Cultural/Historical park units with spring and fall each accounting for about 25 percent of all visits and winter months (December, January, and February) contributing only 11 percent of annual visitation.

Examining the changes in visits by month and season over the past decade (2002 to 2011) shows some increases in visitation during the shoulder months, particularly in the spring when trips to Recreational park units grew by more than six percent in the month of May and in the fall where visitation to Cultural/Historical park units grew by more than eight percent in

5 Pergrams, Oliver, and Patricia Zaradic, "Is Love of Nature in the U.S. Becoming Love of Electronic Media?" Journal of Environmental Management 80(4), September 2006.

6 Place, Greg. "Youth Recreation Leads to Adult Conservation: Outdoor Playtime Integral During Childhood Development." Parks & Recreation. February 2004.

September. With respect to transportation planning and the provision of services, this information is instructive because, as examples:

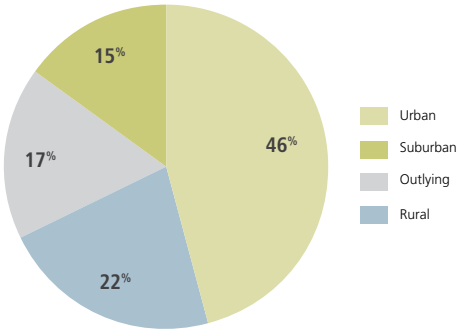
- It can guide where and when more aggressive traffic management and demand management should be focused.
- It deepens the understanding of how and for what duration transportation facilities (e.g., parking lots) should be actively managed.
- It instructs the schedules and capacities for alternative transportation systems.
- It informs planning by providing a statistical basis for factoring seasonal transportation data and as input to the benefit/cost analysis associated with various transportation strategies as they are explored.

5.1.4 Regional Visitation by Area Classification

The Northeast Region is comprised of parks that are classified by the National Park Service as Urban, Suburban, Rural, and Outlying. The location of a park unit can affect not only the availability of travel modes for visitors but also visitors' expectation of multimodal transportation strategies. These area classifications are useful as park units with similar contexts often face common transportation issues, needs, and opportunities for improvements.

Of those park units in the Northeast Region with recorded visitation data, 27 are classified as Urban, 14 as Suburban, 16 as Rural, and 15 as Outlying. The percentage of annual visitation among the categories of park unit area classification is illustrated by Figure 5-3.

Figure 5-3:
Northeast Region Distribution of Park Unit Visitation by Area Classification (2011)



Source: National Park Service Public Use Statistics Office, "Annual Recreation Visits Report" Note: Data presented for the 71 park units for which data are available.

The highest share of visitation comes from park units in urban areas. While the 27 Urban parks represent 38 percent of park units, they account for about 46 percent of the annual visitation in the Northeast Region.[7]

Many of the parks of the Northeast Region are "in the back yard" of large and small urban communities and would benefit from national initiatives to better connect urban communities to "their" parks. Urban centers tend to have better developed bicycle and pedestrian networks and a segment of the local visitor population that is comfortable with, and often even prefers, the use of travel modes other than private automobiles. Due to the urban context of many park units, multimodal transportation and access is an important aspect of visitor experiences in the Northeast Region.

Park access by transit, walking, and bicycling are important considerations to achieve the *A Call to Action* goal to connect urban communities to parks and can help reach ethnically and culturally diverse communities and those potential park users who are transit dependent.

5.1.5 Transportation Mode Use

The Northeast Region is responsible for the operation and upkeep, often in partnership with others of not only a large system of roads and parking, but also a network of trails and a variety of shuttle and passenger ferry services. These facilities, as well as the transportation systems within gateway communities, provide countless ways for visitors to experience the vast resources of the Northeast Region.

The most common form of transportation used to get to and from park units remains the private automobile. Transit occurs in several different forms in the Northeast Region such as shuttle, tram, bus, rail, ferry boat, or trolley. Transit tends to provide two distinct roles affecting visitor experiences at a park unit. Public or private transit services can provide travel to and from a national park unit while park-related transit provides mobility within a park unit, particularly larger park units that have multiple sites. Several major park units and/or park sites in the region are only accessible by transit with the Statue of Liberty being the most prominent among these. Transit systems within a park unit are also used to

7 Analysis of NPS Public Use Statistics Office, 2011 Region Report, present in the "Northeast Region Visitor Experience Subject Area Memorandum," VHB, August 2012.

enhance visitor experiences by adding interpretive education to the transit trip through an on-board park ranger, guide, or other medium.

The Northeast Region offers many opportunities for walking and bicycling within its park units. Prime examples include visitors walking the Freedom Trail in the Boston National Historical Park and the extensive cycling opportunities on both the carriage and park roads in Acadia National Park.

5.1.6 Top 20 Most Visited Parks

Twenty park units in the Northeast Region account for 90 percent of visitation in the region, as shown in Figure 5-4. The top three park units for visitation are Gateway National Recreation Area, Delaware Water Gap National Recreation Area, and Cape Cod National Seashore – again demonstrating the importance of Northeast Region park units as recreational resources for the urban populations of the New England and mid-Atlantic states.

As one might expect, these are also generally the parks with the most transportation assets and greatest need for transportation investment.

5.1.7 Visitor Origins

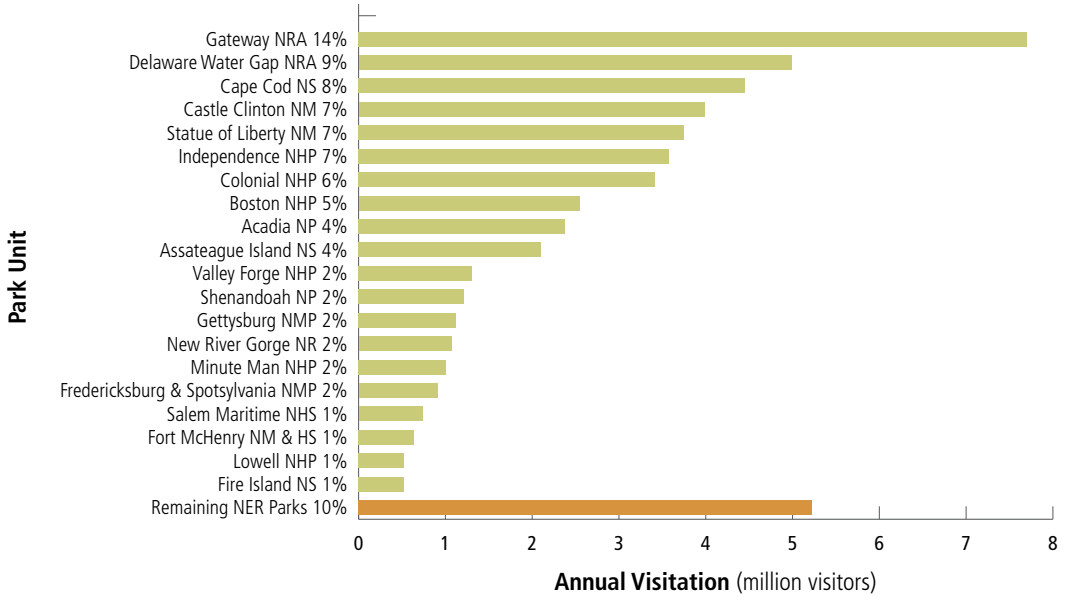
The Northeast Region enjoys a broad geographic visitor base. Analysis of visitor surveys from 15 park units in the Northeast Region provided some insight on the geographic reach of visitors to Northeast Region park units. Recreational park units (such as New River Gorge National River and Delaware Water Gap National Recreational Area) attract the highest percentage of local visitors (40%). Conversely, several of the better known "destination" parks, including and Shenandoah National Park and the Statue of Liberty National Monument, attract more than 83 percent of their visitors from out-of state (75%) or international origins (8%).[8]

5.2 Visitor Experiences and Transportation

Visitor experiences are the perceptions, feelings, and reactions a person has before, during and after a visit to a park site. Transportation, and the quality of the transportation experience itself, contributes to a visitor's lasting impression of their overall park experience.

8 Analysis of NPS Public Use Statistics Office, 2011 Region Report, present in the "Northeast Region Visitor Experience Subject Area Memorandum," VHB, August 2012.

Figure 5-4: Northeast Region Visitation by Park (2011)



Source: National Park Service Public Use Statistics Office, "Annual Recreation Visits Report" Note: Data presented for the 71 park units for which data are available.

5.2.1 Relationship of Visitor Experiences and Transportation

The potential of transportation systems to either enhance or detract from visitor safety, satisfaction, understanding, and appreciation of the park unit resources is broad and extends from pre-trip planning, to the experience within the park unit, the journey home, and visitors' memories of the trip.

Visitor experiences begin prior to the trip with time spent planning how to travel to and within the park unit. Visitors generally look for information about the range of transportation options available to allow them to customize their trips to suit their needs. Visitors may also plan in advance how they intend to circulate through the park to most efficiently access the resources they are coming to experience. A poor experience planning for a park unit could, among other things, cause visitors to spend a disproportionate amount of time traveling within the park instead of experiencing the resources; lead to visitors getting lost enroute to the park unit; or even discourage potential visitors from visiting at all.

Transportation strategies within a park unit that can have a **positive** influence on visitor experiences include:

- accurate, reliable, and accessible information on how to access and travel within the park unit
- transportation facilities in good condition
- transportation facilities that feel (and are) safe, and are free of congestion
- clear wayfinding signage or guidance
- a choice of modes that are aligned with the desired park experience
- transportation connections that facilitate the visitor's planned itinerary
- interpretation of resources integrated with transportation

Transportation strategies within a gateway community adjacent to a park unit that can have a **positive** influence on visitor experiences include:

- accurate, reliable, and accessible information on how to access the park unit, and real-time traveler information
- safe and congestion-free regional connections to the park unit by both private automobile and transit
- non-motorized connections to the park
- nearby traveler amenities (such as gas, provisions, restrooms, etc.)

5.2.2 Influence of Transportation Mode on Visitor Experiences

The multimodal transportation system provided by the Northeast Region, as well as the transportation connections and services provided by others, to park units offer many ways for visitors to experience the vast resources of the Northeast Region. The choice of transportation mode made by the visitor directly influences their experiences arriving at and traveling within the park units. **Table 5-1** describes the influence of travel mode on visitor experiences in Northeast Region park units.

5.2.3 Ongoing Visitor Experience Research

Transportation related visitor experience research efforts are currently underway that will continue to refine the policy and frame planning guidance to ensure that transportation systems in the national park system contribute positively to visitor experiences, and inform future LRTP efforts. As an example, groups of subject matter experts from across the National Park Service, including a visitor experience subject area team, were formed to support the the National Long Range Transportation Plan. The subject area teams were created to incorporate Service-wide views and expectations for transportation into the National Long Range Transportation Plan process.

5.3 Future Trends and Considerations

There are a number of trends and considerations that may influence visitor use and the visitor characteristics previously described. These influential factors are helpful to assess how transportation needs might change in the future and where opportunities might exist for enhancements to visitor transportation systems.

Table 5-1: Influence of Mode Choice on Visitor Experience*

	BENEFITS TO VISITOR EXPERIENCE	DETRIMENTS TO VISITOR EXPERIENCE
Private Automobile	**Degree of choice** – includes such factors as choosing travel companions, in-vehicle climate, ability to listen to music, how much and what can be packed, what route to take, and what intermediate stops can be made. **Flexibility** – refers to the fact that visitors traveling in their own automobile do not have to conform to a required timetable and can vary their course, time of travel, or sequence of park facilities visited as they please. **Driving for Pleasure** – recognizes the visual stimulation which vehicle drivers and passengers receive from observing the surroundings and areas which differ from those which they normally encounter in their daily activities (Skyline Drive is a notable example of a roadway which someone may choose to drive for pleasure).	**Automobile Filter** – reflects that studies have found that traveling in an automobile dilutes the travel experience for passengers by placing a filter between passengers and the surrounding environment (especially in contrast to walking or bicycling through natural and historic surroundings). **Facility Condition** – automobile travel is subject to the condition of roads and parking areas – something that national park units cannot always control due to lack of ownership or limited funds – and studies have found that poorly maintained facilities (or unsafe or congested facilities) can detract from visitors' appreciation for scenic views and landscapes.** **Parking** – parking availability can be a challenge for visitors traveling in their own vehicle, especially for those traveling in recreational vehicles or with a trailer in tow.
Bicycling and Walking	**Level of Access** – reflects that visitors can have closer, more personal interactions with park resources when on foot or by bicycling, and at their own pace. **Scale** – visitors can enjoy resources in greater detail and utilize more of their senses while using non-motorized travel modes rather than traveling by automobile or transit. **Health and Wellness** – walking and bicycling modes offer a form of healthy outdoor recreation and contribute to visitor health and wellness.	**Level of Physical Effort** – bicycling and walking are active forms of transportation and are more physically demanding than automobile or transit options. **Park Coverage** – the physical demands and slower pace of travel by foot or bicycle reduces the distance or park coverage that can be accomplished during a visit. **Facility Condition** – poorly maintained trails and pedestrian or bicycle amenities can detract from visitor experiences for travelers by these modes. **Vulnerability to Weather** – poor weather conditions more directly impact visitors who are walking or bicycling and can be limiting factors for these modes.
Transit Systems	**An Added Attraction** – the transit trip itself can enhance visitor experiences, particularly services such as ferry boats that provide entertainment and pleasant views during travel, or excursions on a historic train. **Reduced Stress** – leaving the driving to others and eliminating the stress of driving, wayfinding, and parking can improve visitor experiences, especially in congested park environs or park units with remote or limited parking. **Interpretive Services** – friendly and knowledgeable bus drivers or tour operators can enhance transit travel by providing additional interpretive information on the park unit and its resources.	**Service Quality** – the quality of the transit service being provided to visitors – for which the National Park Service often has little if any control – including frequency of service, duration of travel time, and cleanliness of the vehicle can influence visitor experiences. **Advance Trip Planning** – using transit to access and travel within a park unit often requires an additional level of advancing planning for visitors (such as acquiring transit schedules and stop locations) and this can detract from the pure spontaneity of park unit exploration.

* Text adapted from information provided in the "Visitor Experience Technical Report for the Golden Gate National Recreation Area", Denver Service Center, Draft, March 2012.

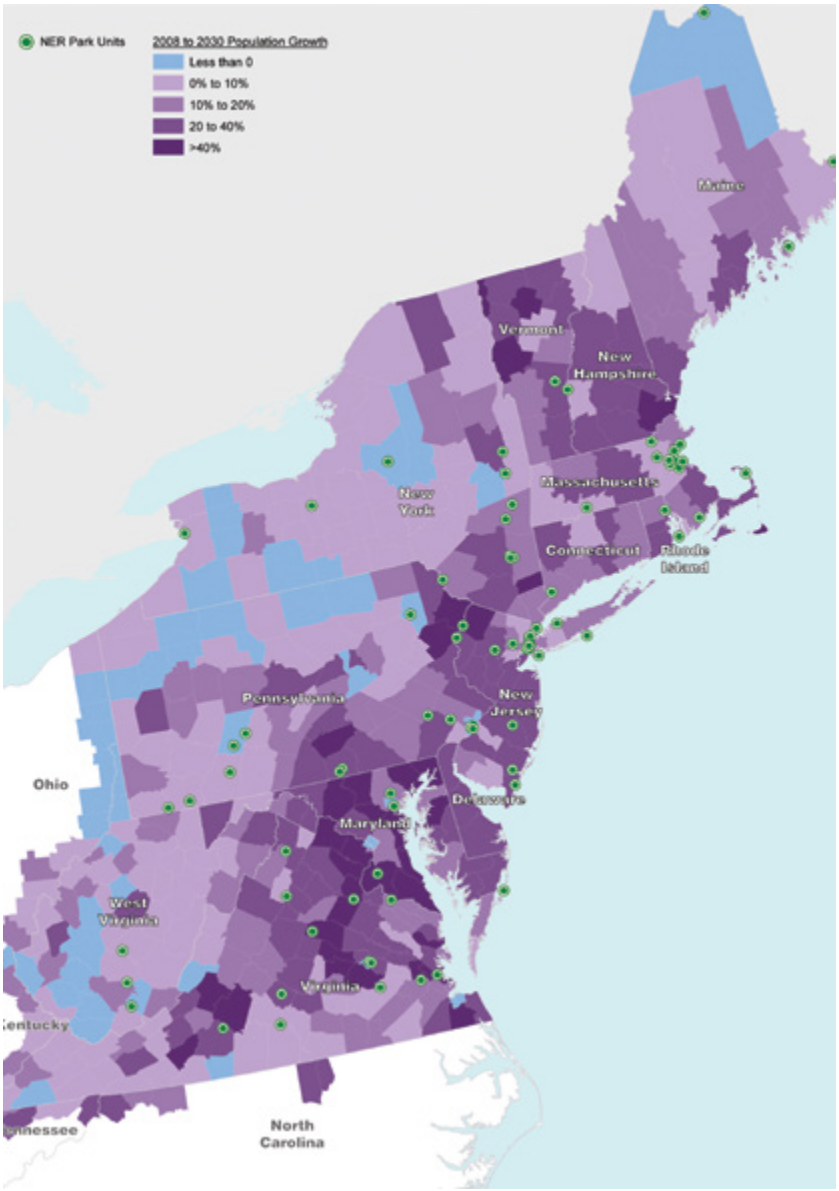
** Iverson Nassauer, Joan, et al. "Aesthetic Initiative Measurement System". Final Report. Center for Transportation Research and Education. Iowa State University. Prepared for the Minnesota Department of Transportation. March 2001

5.3.1 Regional Growth

Visitation to parks in the Northeast Region is expected to be influenced by growth in population in the region. Figure 5-5 presents population growth forecasts for the Northeast Region through 2030, approximately the end of the LRTP planning horizon. The population of the region as a whole is projected to grow about 15 percent, with many areas surrounding park units forecast to grow more than 20 percent, and some by more than 40 percent over this time period, as shown in the figure.

In addition to population growth, national initiatives to better connect residents, specifically under-represented populations, with federal lands and the great outdoors will likely increase visitation. Although no long-term forecasts of visitation to the Northeast Region is available, these data likely suggest a modest increase in visitation over time and, accordingly, an increase in demand for transportation.

Figure 5-5:
Population Growth Forecast in the Northeast Region (2008-2030)



Source: US Census, Woods & Poole, 2007

5.3.2 Aging Population

The implications of these growth forecasts in the near term are strengthened by the aging of the U.S. population. Visitors to national park units, in the Northeast Region and nationally, tend to be older than the national median; the percentage of park unit visitors age 45 and above is greater than their representation in the U.S. population as a whole.[9] Furthermore, the number of Americans age 65 and older in the U.S. is expected to more than double by the year 2050. In the short term to medium term, the aging of the Baby Boomers (people born between 1946 and 1964) and the resultant substantial growth in the demographic group most likely to visit national park units (older, non-Hispanic whites) could translate to increased visitation.

With respect to the transportation implications of this demographic shift, data suggest that older visitors, possibly with a disability or special need, have different expectations, preferences, and needs than younger visitors.[10]

Older visitors may be more likely to visit parks that have greater accessibility for persons with disabilities; park units that include interpretive tours; and park units that feature landmarks, viewsheds, and facilities accessible with limited walking. Accessibility, convenience, and level of exertion required to explore a park unit's resources seem to be key considerations in the older visitors' advanced trip planning and, ultimately, choice of modes.

The near-term "boom" in visitation to park units of the Northeast Region by older Americans, however, could be offset over the longer term by a decrease in visitation by younger people. Between 1989 and 2004, visitors in their mid-teens to mid-thirties dropped from 27 percent to 19 percent of all park unit visitors, a level well below this age group's corresponding representation (28 percent) in the U.S. population.[11] Without intervening action by the National Park Service, this trend is likely to continue.

9 See data presented in the "Northeast Region Visitor Experience Subject Area Memorandum," VHB, August 2012.

10 Statement of Marcia Blaszak, Regional Director, Alaska Region, National Park Service, Department of the Interior, before the Subcommittee on National Parks, House Committee on Resources, regarding trends in visitation to the national park system. April 6, 2006.

11 Ibid.

5.3.3 Growing Diversity

Another factor that will potentially affect future park unit visitation is the growing diversity of the United States population.[12] The Northeast Region should reconsider visitor needs and expectations to account for the perspectives of a diverse population. The need for a collective response to these changing demographics and other challenges facing the future of the park system in part led to the development of *A Call to Action*.

5.3.4 Visitor Use of Technology

Advances in consumer, transportation and travel-related technologies have greatly influenced the way visitors use technologies to plan and manage their travel. The internet, smartphone technologies and mobile applications, global positioning satellite mapping units, and social media are all growing outlets that are routinely used by visitors for pre-trip planning, en-route travel, and to explore park resources in the Northeast Region.

The National Park Service takes advantage of technology in numerous ways to share information with visitors and enhance the overall visitor experience. Prior studies completed for the National Park Service have demonstrated the value of intelligent transportation system (ITS) applications in a national park environs to improve information to visitors and visitor engagement.[13] Opportunities to enhance visitor experiences through technologies are discussed further in Section 5.4.

5.3.5 Changing Travel Patterns

In general, Americans' travel behavior has changed significantly over the past few decades, most notably in the length of trips. Due in part to increased work demands, difficulty in coordinating vacation schedules in two-income families, and higher fuel costs, Americans are taking less vacation time and are making shorter trips in terms of time duration.[14] As a result of this trend toward shorter vacations, the number of overnight stays in national park units has decreased over the last decade.[15] With these time pressures, a growing number of people now fly to jumping off points, then either rent a vehicle or take a charter bus or cruise ship to tour a circuit of attractions that often includes national park units. This, when combined with the aging population, are likely significant factors in the increase in day trips and decrease in overnight stays in national park units, in particular for camping.

In addition, increases in fuel costs may result in lower visitation in the long term to park units that are more isolated and located farther from population centers. The Northeast Region is unlikely to experience the same impact from these travel shifts as other regions in the country due to its population density and relatively smaller geographic size. Most of the park units within the Northeast Region are within a several hours drive of a major metropolitan area, which fits with the trend toward shorter but more frequent vacations and the trend of travelers visiting multiple park units during a single trip. In fact, Northeast Region park units may actually benefit from increases in fuel costs due to their close proximity to major population centers along the east coast.

Local visitors' transportation needs, regardless of mode, tends to focus more on day-of-trip and enroute trip planning (e.g., traffic conditions, parking availability, transit schedules). Out-of-state and international travelers require more advanced trip planning and can be influenced by travel advice, including the use of alternative modes, by internet websites and travel guides.

5.4 Visitor Needs and Opportunities

The condition, safety, and efficient operation of all transportation assets in the Northeast Region contribute to the overall quality of the visitor experiences; however, there is another level of investment that is needed to enable these systems to evolve in response to changing visitor needs and desires. These additional visitor needs are best captured in *A Call to Action*.

5.4.1 *A Call to Action* Policy Guidance

The National Park Service is preparing to celebrate its 100th anniversary in 2016. To renew its course for moving forward and stay relevant with changing visitor desires and demographics, the National Park Service issued *A Call to Action*. In this document, the National Park Service lays out its Vision and Goals.

12 See data presented in the Northeast Region Visitor Experience Subject Area Memorandum, VHB, August 2012.

13 The Volpe Center, Intelligent Transportation Systems (ITS) in the NPS: 2005 Baseline Inventory and Preliminary Program Assessment, January 2006.

14 Expedia.com and Harris interactive. "Expedia.com.2008 International vacation Deprivation Survey Result."

15 National Park Service and analysis presented by USA Today, July 12, 2012.

This policy document reinforces the National Park Service's commitment to providing positive visitor experiences through a broad array of actions. A number of the goals and their actions highlight the important relationships between transportation and visitor experiences as discussed in Chapter 2.

The Northeast Region is engaged in ongoing planning to embrace and integrate these *A Call to Action* themes and actions into its transportation program. Transportation needs related to further enhancing visitor experiences and project opportunities to incorporate new technologies and information systems into the transportation systems of the Northeast Region are briefly highlighted in the following sections of this chapter.

5.4.2 Transportation Assets Condition Needs

Every visitor to the Northeast Region comes in contact with some aspect of the NER's transportation system – be it a road, a parking lot, a sidewalk or trail, or a transit service. While limited quantitative data exist that link the condition of transportation assets with visitor experiences in a national park setting, regional staff consider maintaining its transportation assets in good condition as their most important means to contribute positively to visitor experiences. There are several factors to consider that could influence a visitor's experience that are related to an asset's condition including the asset's function, aesthetic, and quality.

An asset's function is whether or not the asset accomplishes its intended purpose. Examples would be a road that connects to a parking lot that serves a visitor center. If either of these facilities is closed due to condition problems, it will negatively impact the visitor experience by disrupting their itinerary or cutting into their time to explore the resources of the park unit.

The aesthetics of a transportation asset – like a road that is freshly paved, smooth, and well marked – also influences visitor experiences, although this is highly subjective. As an example, passenger surveys of the Island Explorer in Acadia indicate that visitors place a high value on the cleanliness of the vehicle. Visitors make value judgments about the quality of an asset by how the asset looks and feels. These judgments can often be engrained in their memories of a particular park experience.

Finally, the quality of roads and parking facilities can have an economic impact on the visitor. Many technical studies by road and highway agencies have sought to quantify the added user costs in terms of safety, reduced fuel economy, added vehicle maintenance, and wear and tear due to poor road conditions.

5.4.3 Travel Planning Needs

For many park units, particularly those that are historic sites in auto-oriented areas and which tend to have low repeat visitation, the park unit's standard NPS website is usually adequate for travel planning. But for other park units, those that may have high, concentrated visitation or are large in size, visitor experiences can be enhanced by an advanced travel planning system. Among the types of park units where enhance travel planning systems are likely to be most beneficial are:

- large park units that have multiple destination sites within the park unit
- park units that are located in a vacation area where visitors are often staying in the area multiple days and which the park unit is a destination on one of those days
- park units near others that share a common interpretive theme and which might be visited by the same person on the same day
- park units that are part of "trails" that share similar subjects (e.g., Civil War parks) and which might attract visitors to different park units over several days
- park units offering, or even requiring, multiple modes of transportation
- park units that require a fee for the required mode of transport (e.g., a ferry boat ride)

The use of transportation technologies in the Northeast Region and their expansion into social media applications is developing rapidly. Several park units in the Northeast Region, in particular, have documented ITS needs: Cape Cod National Seashore, Gateway National Recreational Area, and New River Gorge National River as well as the multi-unit park organization National Parks of New York Harbor.[16]

5.4.4 Travel Engagement Opportunities

Within the theme of Advancing the NPS Education Mission, *A Call to Action* states that the NPS must use leading-edge technologies and social media to effectively communicate with and

16 The Volpe Center, "Intelligent Transportation Systems in the National Parks and Federal Public Lands - 2011 Update," September 2011.

capture the interest of the public. As visitor experiences often begin long before a visitor steps foot in a park, this theme relates to transportation with the dissemination of valuable visitor information for advanced travel planning online and then with en-route traffic information. Today, the use of new communication technologies and intelligent transportation systems are often central to the delivery of this information.

Mobile Applications

Smartphone technology provides an opportunity for the Northeast Region to enhance visitor experiences by presenting natural, historical, and cultural context directly to visitors. According to Nielsen, over half of mobile phone users own smartphones and two-thirds of new mobile device sales are smartphones.[17] Many cultural, historical, and natural resource managers now cater to smartphone users, developing applications (apps) that provide content directly to the smartphone users.

In May 2012, Boston National Historical Park released the first park-developed smartphone app in the Northeast Region. This app allows users to retrieve traveler information for Boston NHP, and background information for other Massachusetts national park system units. The information includes maps, site descriptions, directions, and tours. Because the Boston National Historical Park consists of a series of sites and attractions throughout the City of Boston, a smartphone app is an ideal solution for guiding visitors and providing interpretive information. Visitors can use a smartphone to guide them through Boston NHP using predefined tours, or customized tours allowing them to travel at their own pace. This is a model smartphone application in the Northeast Region and offers great potential for other park units in the region.

Similarly, third parties have developed apps for popular national park system units. Chimani LLC, a developer of apps for the outdoors, provides travel guides and content for park visitors such as audio tours, sunrise/sunset data, and information about ranger-led events for parks in the Northeast Region such as Acadia National Park and Cape Cod National Seashore. The National Parks Conservation Association has developed a field guide app for the iPhone for fifty National Parks around the country. Information such as native plant and animal species that a visitor would encounter at each park unit is provided in the app. The Northeast Region should encourage and collaborate with, where appropriate, partnerships to advance these types of visitor engagement tools in the future.

Social Media

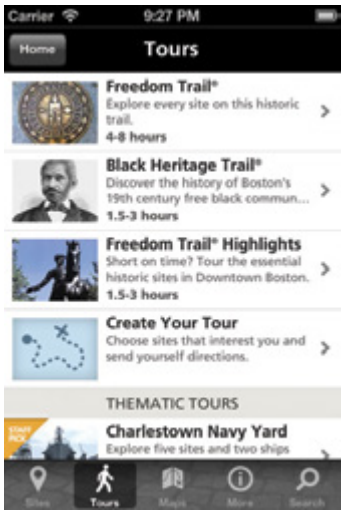
Social media applications have become a popular form of internet based, real time, interactive communication. Mobile social media applications further enhance the potential benefits for traveler information and guidance. The use of social media in a national park context is viewed as a particularly important strategy to re-connect younger visitors, who as previously discussed are less likely to visit national parks on their own, with the vast resources and recreational opportunities within the park units of the Northeast Region.

At this time, Facebook and Twitter are common, highly utilized social media applications. A 2011 inventory[18] of the use of social media applications as a new medium for providing traveler information in the Northeast Region found that 30 park units, one national heritage corridor, and two multi-unit park organizations (National Parks of New York Harbor and National Parks of Massachusetts) are using social media to communicate with and among their constituents. Twitter appears to be the dominant social media being used to convey information, with 25 units in the Northeast Region having accounts. Gettysburg National Military Park is using Facebook to share information and allows visitors to access an automated reservation system through Facebook to simplify their visit.

It is important to note that almost none of these park units are using social media to disseminate traveler information. As such, there appears to be a broad opportunity in the future to leverage these technologies for this purpose.

5.5 Strategies for Moving Forward to Enhance Visitor Experiences

There are a number of strategies and actions that the Northeast Region can implement to advance transportation investments that focus on providing positive visitor experiences for the broadest range of visitors to park units in the region. These recommendations, oriented by each stated LRTP objective, are briefly described below.



Boston NHP introduced the first NPS developed smartphone app in the Northeast Region in May 2012. This app helps visitors navigate the many park sites scattered throughout the City of Boston.

17 Entner, Roger, "Smartphones to Overtake Feature Phones in U.S. by 2011," March 26, 2010. Retrieved from NielsenWire on October 14, 2011.

18 The Volpe Center, "Intelligent Transportation Systems in the National Parks and Federal Public Lands - 2011 Update," September 2011.

5.5.1 Maintain High Priority Transportation System Assets in Good Condition

The most important strategy to provide for quality visitor experiences is to deliver on the LRTP's goal to *Manage Assets Wisely*. In this way, the Northeast Region will use its constrained financial resources to provide transportation facilities and services in a state of good repair to the greatest number of visitors. This strategy is consistent at its core with Capital Investment Strategy and supportive of the tenet of *A Call to Action* to invest wisely.

Prioritization of investments, regardless of mode, will be weighted toward those transportation facilities and systems that contribute most to the park's mission and serve the most visitors. To accomplish this objective, the Northeast Region needs to define and implement a data collection program to ensure that adequate data exists to understand and assess visitor use across all modes (private automobile, non-motorized, and transit) and the values that visitors place on transportation facilities and services. Overall transportation data needs are further discussed in Chapters 7 and 8.

5.5.2 Provide Trip Planning Resources and Travel Information to Access the Parks

The Northeast Region should continue to carefully invest in proven technologies to provide travel information and improve visitor experiences and engagement within the park. In particular:

- work with parks on an ongoing basis to solicit input on visitor information needs and opportunities
- collaborate with partners to broaden park access information and conditions reporting within local and regional traveler information systems

5.5.3 Integrate Effective Visitor Information Systems within Park Transportation System

The fast growing field of internet and mobile -based software applications offer great potential to deliver visitor interpretation that is highly customizable and individualized. Growth in this activity will be largely market driven, primarily by individuals and the private sector. Beyond project level efforts to modernize wayfinding and visitor information kiosks, as discussed above, the Northeast Region should:

- seek low cost opportunities to modernize wayfinding signage and other visitor information through ongoing investments in roads, parking, and alternative transportation systems/amenities
- encourage public/private partners in the deployment of mobile applications and interactive travel planning tools
- explore opportunities, either through routinely scheduled visitor surveys or other means, to build a body of data on visitors' satisfaction/response to the transportation system and services provided by the National Park Service and others

These improvements will help to advance the Go Digital and Out with the Old actions within *A Call to Action* by replacing older forms of interpretive media with new technologies that can provide visitors with real-time data and information.

5.5.4 Address Transportation Congestion and the Impacts of Non-Park Traffic that Impede Park Access and/or the Enjoyment of Parks

An important strategy to provide for quality visitor experiences is to deliver on the LRTP Goal to *Ensure Access, Safety, & Mobility*. In this way, the Northeast Region will protect the health and safety of visitors and employees by investments to provide a safe and efficient multimodal park transportation system. Toward this goal, the Northeast Region will:

- strategically target financial resources to address the highest priority safety and congestion-related projects
- consider the accessibility needs of all users with every transportation investment

CHAPTER 6 | Protect Resources

The relationship between transportation and protecting resources is complex. Many transportation assets in the Northeast Region are themselves historic resources and must be maintained in a context-sensitive manner while remaining serviceable as the infrastructure necessary for visitors to access and enjoy the park. Additionally, the transportation system must balance facilitating visitor access with the potential threats that visitor access can sometimes pose to a park's natural and cultural resources. Finally, many transportation resources in the region are vulnerable to the effects of climate change. Strategies to mitigate the impacts of and adapt to climate change are important aspects of long range transportation planning.

Roundhouse and turntable, Steamtown National Historic Site. Photo by VHB.

Goal **Protect cultural and natural resources for the enjoyment of future generations and promote environmental sustainability**

Objectives

1. **Maintain culturally significant transportation assets in good condition**
2. **Manage visitation and access to avoid and/or minimize adverse impacts to park resources**
3. **Adapt park transportation resources to increase resilience to climate change and manage park transportation systems to mitigate the effects of climate change and other stressors**
4. **Incorporate green principles into the planning, design, construction, and operation of park transportation systems**

6.1 Existing Resource Protection Issues

Resource protection is at the core of the National Park Service mission. This chapter addresses key issues related to transportation and resource protection. These issues include: the role of historic transportation assets as significant cultural and natural resources to manage, the potential for transportation and visitor-related impacts to wildlife within the park units, and external threats posed by air quality and climate change that the National Park Service can mitigate and adapt to over the longer term through strategic planning and management. For those who wish to delve into more background data and analyses on this subject matter, please refer to the Compendium of Technical Studies.

6.1.1 Significant Cultural and Natural Transportation Assets

Many of the transportation assets in the Northeast Region are not only part of the transportation infrastructure, but are themselves historic resources to be enjoyed by park visitors. As shown by Figure 6-1, historic assets comprise nearly half of the total current replacement value of Northeast Region transportation assets.

The historic transportation assets in the Northeast Region cover the full range of transportation modes. They include Colonial Parkway in Colonial National Historical Park, the parking lot at Jacob Riis Park in Gateway National Recreation Area, the carriage roads in Acadia National Park, the paved walkway blocks at Independence National Historical Park, the White Bridge in Vanderbilt Mansion National Historic Site, and seawalls at Fort McHenry National Monument & Historical Shrine. This relationship between historic factors and the total Northeast Region transportation asset inventory is summarized in Table 6-1.

Table 6-1: Historic Northeast Region Transportation Assets

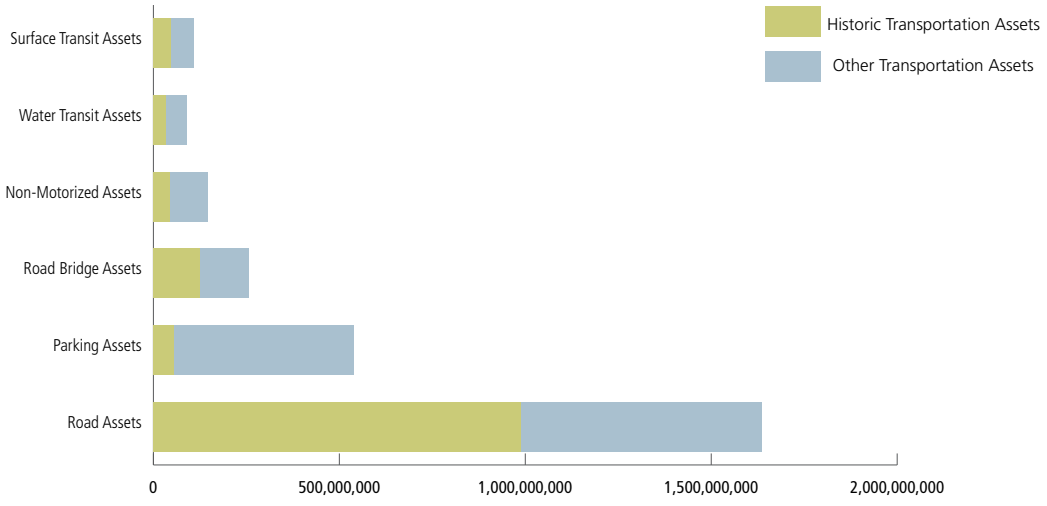
	TOTAL NER INVENTORY	HISTORIC NER INVENTORY
Roads	875 miles	396 miles (45%)
Parking	610 acres	99 acres (16%)
Trail	156 miles	38 miles (24%)
Bridges	196	87 (44%)

Source: NER Transportation Asset Inventory in FMSS, as of 3/27/12. With refinements by NER, Booz Allen, and VHB as of 5/21/2012.

Transportation assets can be primary features of a park. Many of the historic roads, such as Skyline Drive in Shenandoah National Park, are integral to visitor experiences in the park. More to the point, the active rail assets at the Steamtown National Historic Site are at the core of that park's mission.

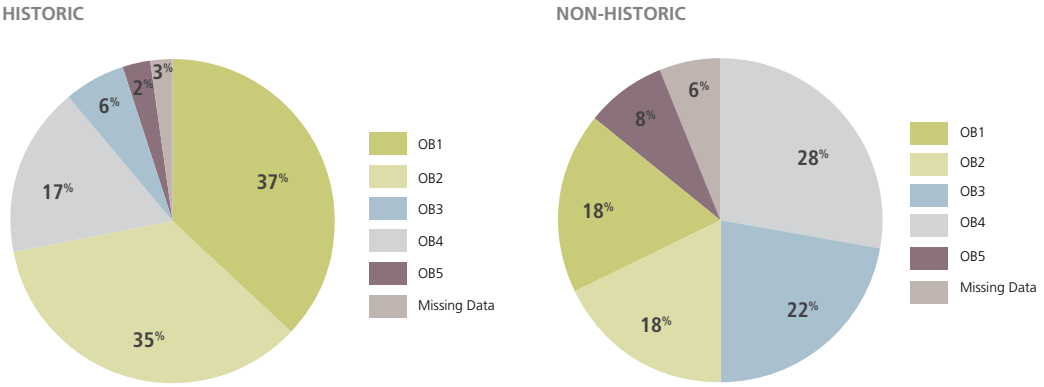
The condition of all transportation assets is important to understand due to its impact on access and mobility, safety, and visitor experience. Because of their importance, historic transportation assets tend to be highly ranked within the NPS optimizer band

Figure 6-1: Northeast Region Historic Transportation Assets, by Current Replacement Value



Source: NER Transportation Asset Inventory in FMSS, as of 3/27/12. With refinements by NER, Booz Allen, and VHB as of 5/21/2012.

Figure 6-2: Optimizer Banding of Historic and Non-Historic Assets



Source: NER Transportation Asset Inventory, FMSS as of 3/27/12. With refinements by NER, Booz Allen, and VHB as of 5/21/2012.

Table 6-2: Percentage of Transportation Assets in Good Condition

	PERCENTAGE IN GOOD CONDITION*		FACILITY CONDITION INDEX (DM/CRV)	
TRANSPORTATION ASSET TYPE	HISTORIC	NON-HISTORIC	HISTORIC	NON-HISTORIC
Road System Assets	62.0%	41.3%	0.17 (poor)	0.21 (poor)
Parking Assets	5.9%	46.6%	0.51 (serious)	0.20 (poor)
Road Bridge Assets	64.6%	74.2%	0.09 (good)	0.11 (fair)
Non-Motorized Assets	52.2%	79.7%	0.25 (poor)	0.08 (good)
Water Transit System Assets	51.1%	72.9%	0.17 (poor)	0.10 (good)
Surface Transit System Assets	72.7%	53.5%	0.12 (fair)	0.20 (poor)
All Assets	59.6%	50.3%	0.17 (poor)	0.18 (poor)

Source: NER Transportation Asset Inventory, FMSS as of 3/27/12. With refinements by NER, Booz Allen, and VHB as of 5/21/2012.
* This percentage is calculated using the Current Replacement Value

methodology. Figure 6-2 shows that 72 percent of historic assets are ranked in the highest optimizer bands, 1 and 2, as compared to 50 percent for non-historic transportation assets.

As shown in Table 6-2, in general historic transportation assets have been kept in better condition than non-historic assets. More historic assets than non-historic assets are in good condition, and the overall FCI of historic assets is slightly better than that for non-historic assets. There are, however, differences among categories of assets. The facility condition index for historic roads, bridges, and surface transit is better than for those categories of non-historic assets, and the FCI of parking, non-motorized, and water system assets is better for non-historic assets.

These differences are largely due to investment choices that are made due to limitations in financial resources. At times it may be more advantageous to prioritize investments in non-historic transportation assets from an economic, safety, or access and mobility standpoint. For example, if a connecting access road is impassable, unsafe, or deterring visitation then it would receive funding over a lesser used, less important historic asset.

When investments in historic assets can be made, projects carry the unique natural and cultural significance of assets into the final design. Such context-sensitive decisions include utilizing historic design styles specific to the asset or adapting to the natural landscape by leaving it undisturbed by infrastructure changes. Developing and implementing such

thoughtful designs can result in a higher cost than more standard designs used for non-historic assets.

Prioritizing among types of transportation projects is demonstrated by the conditions of the historic bridges and roads. The Northeast Region's American Recovery and Reinvestment Act spending focused on bridges and primary roads rather than trails and transit assets since it is paramount that all bridges be kept in safe condition and because primary roads are traveled and experienced by the vast majority of visitors.

Another issue related to financial constraints is simply the magnitude of some of the projects. The Northeast Region benefited greatly from the use of these ARRA funds and was able to spend considerable sums on large projects such as the loop road at Acadia National Park and Skyline Drive in Shenandoah National Park. However, even the ARRA funding was not enough to address mega-projects such as the need for upwards of $300 million of work on Colonial Parkway in Colonial National Historical Park. Further, future pavement preservation spending on the roads rehabilitated with ARRA funds will be necessary to protect those large investments.

It is the mission of the National Park Service to protect significant cultural and natural transportation assets. As such, the Northeast Region aspires to maintain if not improve upon the current approach to caring for historic assets. Currently, parks are prioritizing historic assets over others and have been able to find a balance between caring for historic assets and critical transportation assets, without which park unit transportation systems would not function properly. The primary challenge will be in continuing to strike this balance with constrained funding. Other challenges to work towards resolving include:

- completing the inventory of historic transportation assets across all asset types
- need for funding to maintain historic assets
- finding new opportunities to fund historic transportation asset projects, specifically larger capital projects such as Colonial Parkway

6.1.2 Visitation Impacts to Resources

This section highlights the potential impacts that unmanaged visitor access might have on resources.

Direct Impacts on Resources

The mission of the National Park Service is not limited to protecting the nation's unique resources, but also aims to share them with visitors. However, visitors themselves can negatively impact NPS resources. The potential of visitation to impact resources is not a new issue and has been addressed proactively throughout the region for many years. Transportation is an important tool for managing visitation and preventing visitation from exceeding the carrying capacity of the resource.

Transit systems can provide an opportunity to regulate visitation to park sites or park units. Shuttles or buses can operate on a schedule, therefore, only allowing a fixed number of visitors at a time to access a park site. Examples of such services in the Northeast Region include Top Cottage at the Home of Franklin D. Roosevelt National Historic Site, Rapidan Camp in Shenandoah National Park, and Eisenhower National Historic Site.

In the cases of Top Cottage and Rapidan Camp, both are small building sites with low carrying capacities. At both sites, shuttles are used to manage the number of visitors on site at one time. In the case of Eisenhower NHS, transit is being used to preserve the cultural landscape of the park. Building a parking lot to accommodate existing and future visitation would strain the cultural landscape of Eisenhower's farm and degrade the visitor experience. The solution has been to run a shuttle to Eisenhower NHS from the nearby Gettysburg National Military Park Visitor Center and Museum.

Another example is the implementation of the Island Explorer at Acadia National Park. Park officials have been able to eliminate much of the informal, unsanctioned parking along the loop road that was formerly impacting resources.

Each example highlights the ability of transit systems to better manage visitation. Unmanaged use of sensitive resources can result in loss or damage. As these situations can be anticipated, proactive strategies should be put in place to prevent unnecessary loss. The Northeast Region believes that many of these

resource management issues can and should be handled through operational, not physical, solutions.

Wildlife Mortality by Motor Vehicles

Wildlife impact is one of the areas where transportation access can have environmental and social consequences. A 2004 survey of national parks found that almost half of the respondents indicated that road mortality "greatly" affected wildlife populations and more than half indicated that wildlife habitats had been fragmented by roads.[1] The negative impacts to wildlife posed by motor vehicle collisions in the Northeast Region are not fully understood due to a lack of systematic record keeping about such incidents. There is also a socioeconomic cost associated with personal injury and property damages caused by these crashes. As noted in Chapter 4, 29 percent of all reported vehicle crashes in Northeast Region park units involve collisions with wildlife, a figure that is significantly higher than the Service-wide average of 10 percent. It is speculated that most of the crashes involve white-tailed deer since the majority of wildlife-vehicle crashes occur in parks known to have an overpopulation of deer. It would be a benefit for future vehicle crash reporting system to routinely record information about the species of wildlife involved so that suitable solutions can be implemented as needed.

Another potential wildlife impact that is not quantified but recognized is road casualties of amphibian and reptile populations that breed in wetlands in close proximity to heavily trafficked roads. Monitoring and temporary road closures (especially during rainy nights) is often used to prevent occurrences of high mortality. Where applicable, roadway projects incorporate designs to provide safer wildlife crossings. For example, during the replacement of culverts in Acadia National Park a couple of years ago, several culverts were widened to better accommodate wildlife crossings.

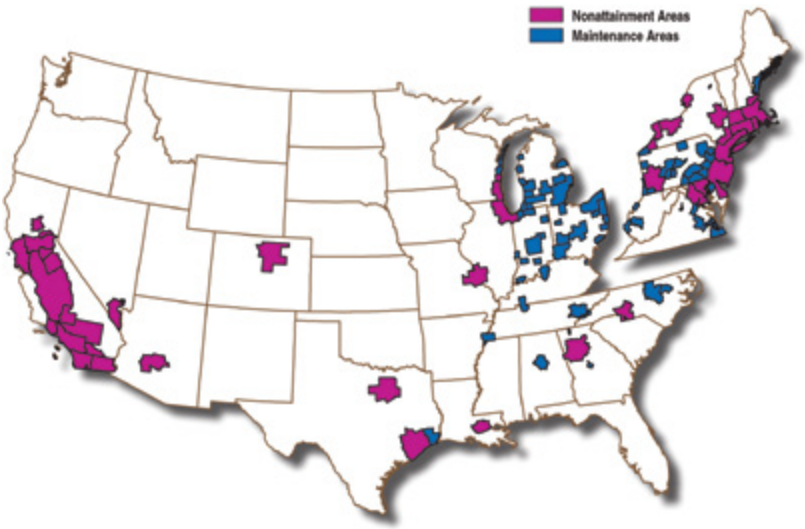
6.1.3 Environmental Threats on Resources

It is now broadly accepted that air quality and climate change over time need to be considered in our day-to-day and long-term transportation decision making.

Air Quality

Shifts in air quality are largely due to fossil fuel combustion which is part of everyday life in the United States. The Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for ground level ozone and other air pollutants. Those areas in the country that historically fail to achieve the standards are designated by the EPA as "nonattainment" or "maintenance" areas. High levels of air pollutants leave nonattainment areas unable to attain the air pollutant levels established by NAAQS. Maintenance areas may currently be in compliance with NAAQS, but struggle to maintain the low levels of air pollutants necessary to remain so. **Figure 6-3** highlights nonattainment and maintenance areas nationwide and in the Northeast Region.

Figure 6-3: 8-Hour Nonattainment and Maintenance Areas



Source: Environmental Protection Agency, "Greenbook", April 2011.

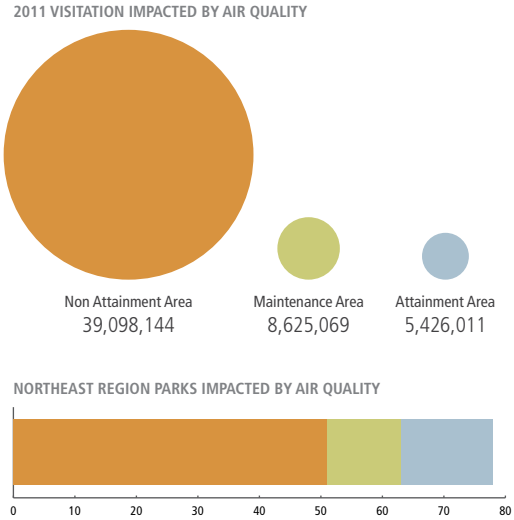
In 2010, the transportation sector was responsible for 27 percent of U.S. greenhouse gas emissions

1 Ament, Rob, Anthony P. Clevenger, Olivia Yu, and Amanda Hardy, "An Assessment of Road Impacts on Wildlife Populations in U.S.," April 10, 2007.

Exposure to poor air quality can have real impacts on quality of life, specifically though adverse impacts to human health. Direct impacts of exposure to greenhouse gas (GHG) include reduced lung function, chronic lung disease, and lower resistance to lung infections.

It should be noted that the majority of parks in the Northeast Region are impacted by degraded air quality. Figure 6-4 illustrates the number of park units, and their visitation, in areas affected by poor air quality.

Figure 6-4: Northeast Region Parks and Visitation, by Air Quality Attainment



Source: VHB analysis of April 2011 EPA data

Air quality nonattainment presents a challenge and provides a unique opportunity for additional project funding through the Federal Highway Administration. The Congestion Mitigation and Air Quality (CMAQ) Improvement Program provides funding to agencies to make transportation improvements that will improve air quality in nonattainment and maintenance areas. CMAQ funding provides an opportunity for park units to partner with local transportation agencies to advance mutually beneficial transportation improvements that address regional air quality issues. By forming partnerships with local planning agencies, the National Park Service can better position itself to impact real change and improvements to air quality within and outside of park units.

Climate Change

"The management implications for protecting species, biological communities, and physical resources within finite land management boundaries in a rapidly changing climate are complex and without precedent". [2] These remarks by NPS Director Jonathan Jarvis were made six months prior to Hurricane Sandy's devastation to Northeast Region park units all along the eastern seaboard.

The Federal Highway Administration and National Park Service both acknowledge that climate change is occurring and cannot be halted in the near future regardless of actions taken to slow or eliminate human contributions to greenhouse gases in the atmosphere. Recent studies published by the Transportation Research Board states that the effects of climate change would continue even if there were to be a dramatic stabilization or reduction in GHG

2 National Park Service. "NPS Response to Climate Change," April 22, 2012. www.nature.nps.gov/climate change/response.cfm

Tropical Storm Irene caused $16 million in damage to Northeast Region assets. The hardest hit parks were Delaware Water Gap NRA and Marsh-Billings-Rockefeller NHP.

Damage caused by Tropical Storm Irene at Marsh-Billings-Rockefeller NHP in 2011. Photo by NPS.

emissions[3] As a result, the consequences of climate change are expected to be ongoing threats to vulnerable transportation infrastructure in the region.

For the Northeast Region, changes in precipitation intensity and patterns, storm surge, and sea level rise are the most significant climate change concerns related to transportation infrastructure.

High winds are associated with most extreme weather events, be it a tropical storm, hurricane, tornado, or snowstorm. High winds pose a danger when objects, most often fallen tree limbs, knock down power lines, obstruct roadways and trails, and damage infrastructure and assets. All parks are subject to damage from high winds. Damage can be further complicated with the loss of power.

Changes to the intensity and pattern of precipitation can come in different forms such as inland storms, hurricanes, or tropical storms. All of these events result in extremely high levels of precipitation over a period of time that overwhelm existing drainage infrastructure resulting in high volumes of runoff.

Hurricanes and tropical storms may also lead to storm surges that pose a serious threat to coastal Northeast Region parks. As sea levels rise the magnitude of storm surges increase as well. A number of the region's greatest natural resources can be found along the New England and mid-Atlantic coastline: Acadia NP, Cape Cod NS, Boston Harbor Islands NRA, Fire Island NS, Statue of Liberty NM, and Assateague Island NS, to name a few. An analysis of the vulnerabilities of Northeast Region parks to the effects of climate change is provided in the Compendium of Technical Studies that supports this LRTP.

Monitoring severe storm events and other climate change indicators continues in the region. Within a span of 14 months, the Northeast Region was hit by two significant storm events. Tropical Storm Irene in 2011 was extremely damaging to coastal communities and inland communities that suffered from extensive flooding, erosion, and ultimately huge infrastructure losses. The Delaware Water Gap NRA, where roadways were washed out, and bridges and culverts were destroyed, was among the hardest hit in the Northeast Region. At Marsh-Billings-Rockefeller NHP the runoff from the heavy rains damaged much of the park's carriage road network.

In the fall of 2012, Hurricane Sandy battered the eastern coast of the United States from North Carolina to Massachusetts, the largest Atlantic hurricane on record. This storm brought about storm surges up and down the coast maxing out over 13 feet in New York City. Extensive coastal infrastructure damage was found from Rhode Island to Virginia including most national seashores and the National Parks of New York Harbor. Hardest hit were the New York and New Jersey coastlines. Parks that were severely impacted include Castle Clinton NM, Statue of Liberty NM, Gateway NRA, and Fire Island NS.

Emergency Relief for Federally Owned Roads (ERFO) funding is an essential source of funding to restore park infrastructure damaged from storms.

3 Transportation Research Board. "Potential Impacts of Climate Change on U.S. Transportation, Special Report 290." Washington, DC: 2008.

Damage from Hurricane Sandy at Statue of Liberty National Monument. Photo by NPS/Rannow.

Erosion, another potential impact of climate change, is both a long-term and a near-term concern. This slow loss of coastline occurs naturally but, is greatly accelerated when extreme weather events such as Hurricane Sandy occur. As a result of Hurricane Sandy, the coastline of Fire Island has moved back an average of 72 feet, and four new breaches have formed in the barrier island.

6.1.4 Sustainability

The National Park Service is committed to being a sustainable organization in every facet of its operation. Sustainability is not limited to carbon dioxide and greenhouse gas emissions reduction initiatives. Rather, to be sustainable means to achieve a good balance between economic, environmental, and social needs. These needs are often interconnected — a strategy that supports one often supports or brings value towards another. Pursuing sustainable transportation systems means offering transportation services that provide equitable access to destinations, contribute to improved quality of life (or visitor experiences), and avoid or minimize environmental impacts. Guidance documents such as *A Call to Action, Green Parks Plan, Climate Change Response Strategy,* and the Capital Investment Strategy all have elements that support sustainable decision-making across all components of sustainability.

At this time, the region lacks a uniform approach to addressing sustainability in its transportation program, although many of the regions' activities contribute broadly to sustainable operations. As an example, the Northeast Region incorporated green pavement techniques into its most recent multiyear program of pavement projects. As the Northeast Region organizes its approach to sustainability at the regional and park levels, it will be necessary to establish goals and develop a more cohesive plan towards achieving a more sustainable region.

6.2 Future Resource Protection Trends

The following section describes how areas of resource protection have been growing or changing and what to expect in the future.

6.2.1 Wildlife Crossings

Without management, the potential for wildlife/vehicle collisions is likely to increase due to increases in traffic and overall activity at parks. More research is needed to better understand the trends and patterns of species that may be vulnerable to increased exposure to vehicular traffic in the future.

6.2.2 Climate Change

With the growing body of research surrounding climate change, it is becoming more apparent that specific measures must be taken to adapt to climate change and mitigate further impacts.

To adapt to climate change risks, the Northeast Region needs to rethink how investments are made in at-risk assets. Table 6-3 shows potential threats to transportation assets and outcomes of environmental changes caused by climate change.

Table 6-3: Potential Threats Posed by Climate Change

WEATHER EVENT	ASSETS IMPACTED	EXAMPLES OF PARKS
Near Term		
Storm Surge	Fixed transportation assets: roads, bridges, trails, parking near ocean and inlets	Assateague Island NS Gateway NRA Statue of Liberty NM
Inland Storm Events	Critical fixed transportation assets: roads, bridges, trails, parking	Delaware Water Gap NRA Upper Delaware S&RR Marsh-Billings-Rockefeller NHP
High Winds	All assets	All parks
Long Term		
Erosion	Fixed transportation assets along shore lines	Cape Cod NS Assateague Island NS Fire Island NS
Sea Level Rise	Fixed transportation assets near ocean: roads, bridges, trails, parking	Assateague Island NS Gateway NRA Statue of Liberty NM

At this time, the National Park Service is developing a risk screening tool to help identify park assets at risk to climate change impacts. The tool will consider the vulnerability and exposure of assets, based on scientific data. National Oceanic and Atmospheric Administration. and other agencies have developed tools to assist with identification of other climate change impacts, as well.

Mitigating the effects of climate change requires the Northeast Region to focus in on the source of climate change, greenhouse gas emissions, and fossil fuel combustion. As stated previously, air quality and climate change are not issues that can be resolved from inside of the National Park Service alone. However, by mitigating greenhouse gas emissions within Northeast Region parks, energy costs can be reduced, conformity with national policies such as the *Green Parks Plan* and the *Climate Change Response Strategy* can be achieved, and a positive example is set for the community.

6.3 Resource Protection Needs and Opportunities

Key resource protection issues have been highlighted in previous sections of this chapter. There are several recent and important NPS guidance policies that guide how the region responds to the challenges described, as summarized below. Much of the current NPS guidance highlights the importance of resource protection and environmental consciousness. These various guidance documents present an opportunity for the Northeast Region to integrate resource protection, climate change planning, and GHG emissions reductions into future transportation planning.

6.3.1 A Call to Action

A Call to Action is the NPS vision for the coming years that is intended to prepare the National Park Service for continued growth as it approaches its 100th anniversary.

This policy document reinforces the National Park Service's commitment to protecting valued resources through a broad array of actions, which were described in Chapter 2.

6.3.2 The Climate Change Response Strategy

The *Climate Change Response Strategy* (CCRS) is an NPS guidance document outlining principles and goals to manage the impacts of climate change on the National Park Service. This policy promotes and integrated approach that highlights the importance of science, adaptation, mitigation, and communication to manage the impacts of climate change on the National Park Service. This LRTP promotes activities that support the CCRS adaptation and mitigation strategic components.

- Adaptation: Develop the adaptive capacity for managing natural and cultural resources and infrastructure under a changing climate. Inventory resources at risk and conduct vulnerability assessments. Prioritize and implement actions, and monitor the results. Explore scenarios, associated risks, and possible management options. Integrate climate change impacts into facilities management.
- Mitigation: Reduce the carbon footprint of the NPS. Promote energy efficient practices, such as alternative transportation. Enhance carbon sequestration as one of many ecosystem services. Integrate mitigation into a business practices, planning and the NPS culture.

This policy documents some of the areas in which transportation can be utilized as a tool to address the impacts of climate change and some of the areas in which transportation resources could be threatened by the changing climate.

6.3.3 The Green Parks Plan

The *Green Parks Plan* focuses on strategic goals that can be applied throughout the National Park Service to improve the relationship between the National Park Service and the environment. The *Green Parks Plan* sets forth nine goals to help parks make greener decisions and improve operations. Specific goals that the Northeast Region LRTP can help to achieve are:

- Buy Green and Reduce, Reuse, and Recycle: The NPS will purchase environmentally friendly products and increase waste diversion and recycling.
- Be Climate Friendly and Climate Ready: The NPS will reduce GHG emissions and adapt facilities at risk from climate change.

This objective sets ambitious goals, in accordance with Executive Order 13514 for GHG emission reductions.

This policy document presents a framework with measurable goals that the National Park Service can achieve in coming years while striving to protect resources.

6.3.4 Climate Friendly Parks

The Climate Friendly Parks program fosters communication, provides guidance, and promotes scientific information to support stewardship for the country's natural and cultural heritage in the face of climate change. The program provides a framework for reducing greenhouse gas emissions and introducing climate friendly practices into a park. NPS units participating in the Climate Friendly Parks program receive technical support and guidance while achieving milestones including:

- completing a GHG inventory
- hosting a climate workshop or training
- developing an action plan or comprehensive environmental management system

Action plans help parks to identify their carbon footprints through the development of a park specific Climate Action Plan focused on energy usage, transportation management (including fleets and fuels) and waste management, as well as providing education on climate change to staff and visitors. Action plans also include a park-level GHG inventory. Once an implementation plan is in place the park becomes a certified member of the program. To retain certification, parks must participate in ongoing activities such as implementing their plans and conducting follow up GHG inventories.

The Northeast Region of the National Park Service currently has 16 parks participating in the program with seven certified Climate Friendly Parks.

6.4 Strategies for Moving Forward to Protect Resources

This long range transportation plan seeks to enable change and enhancements in the way the Northeast Region considers resource protection within its program. The following strategies, organized around LRTP objectives, are intended to provide the direction necessary to achieve this LRTP goal.

6.4.1 Maintain Culturally Significant Transportation Assets in Good Condition

This LRTP stresses the importance of maintaining assets in good condition consistent with the mission of the National Park Service and its policies.

Maintaining historic assets in good condition will continue to require smart and efficient use of funds to make the necessary investments in historic assets. Such projects will require thoughtful use of funds and timeliness due to the sensitive nature of historic resources and the unique restoration challenge they present. Furthermore, ambitious and much needed historic asset projects, such as for the rehabilitation of the Colonial Parkway in Colonial National Historical Park, will require foresight in planning and funding allocation to be completed successfully.

6.4.2 Manage Visitation and Access to Avoid or Minimize Resource Impacts

Two important strategies have been identified to address the issue of vehicle collisions with wildlife. First is to systematically improve data available for understanding the species, location, and extent of wildlife being impacted by such collisions. The Northeast Region has begun to explore a process by which to identify and catalog critical concerns regarding wildlife crossings at the park level. Secondly, as critical locations are identified by the parks, the Northeast Region will focus on operational and/or low cost strategies to address these needs.

The Northeast Region has taken a proactive approach to monitoring and managing visitation at critical locations. Chapter 4 highlights some of the congestion-related needs of the Northeast Region. As bottlenecks or over capacity sites are identified, the full resource implications of these locations should be explored and addressed. Alternative transportation systems, including both transit and non-motorized transportation, are viewed as valuable tools in resolving congestion issues, minimizing resource impacts, and ultimately contributing to a more sustainable transportation system.

6.4.3 Manage Transportation Resources to Adapt to and Mitigate Climate Change

In order to adapt to climate change and the associated extreme weather events that threaten Northeast Region resources, measures should be taken to identify and assess at-risk resources, and ultimately adapt at-risk resources in an effective way that best utilizes available funding.

When ready, the Northeast Region should use the NPS risk screening tool to help identify park assets at risk to climate change impacts. The tool will consider the vulnerability and exposure of the assets, based on scientific data. Tools developed by other agencies can also assist with identifying other types of climate change impacts in the region.

Adaptation to climate change can be achieved by addressing assets at risk for climate change impacts in a smart and efficient way. More planning is needed to have a clear outlook on climate change risks, an inventory of assets at risk to climate change, and a plan to proactively address such issues. Issues can be addressed through relocation, adaption, or decommissioning assets vulnerable to the effects of climate prior to investing in assets. Additionally, the Northeast Region should consider transportation asset's role in protecting adjacent cultural or historic resources as part of this assessment.

At this time, ERFO monies are dedicated to funding infrastructure after it has been damaged to return the asset to pre-disaster condition. These funds do not support adaptation of resources during the reconstruction. Though these funds are necessary and welcome at the time of a disaster, they do little to encourage smarter planning and prevent further reconstruction with each extreme weather event. In cases where an asset is chronically damaged due to common weather events, such as hurricanes on the East Coast, decommissioning may be a more appropriate measure for long-term fiscal sustainability.

6.4.4 Incorporate Green Principles into Transportation Planning and Design

The Climate Friendly Parks program should be promoted as a resource providing a framework for parks to develop strategies for addressing climate change and reducing GHG emissions. This program also helps parks perform a GHG inventory which is necessary for tracking progress in the program over time. This program could encourage more parks to make climate conscious decisions in planning and operations.

Congestion Mitigation and Air Quality (CMAQ) program funding should be pursued to mitigate congestion or address gaps in non-motorized connections (see Chapters 3 and 4), improve air quality, and reduce greenhouse gas emissions. CMAQ funding is also an opportunity to form a partnership with the local Metropolitan Planning Organization (MPO) or other planning body to have a positive impact on the community.

Beyond establishing baseline GHG emissions reductions, strategies should be put in place such as:

- increasing the use of high-efficiency and low-GHG emitting vehicles in ATS vehicles and boats
- maximizing energy efficiency and fossil fuel consumption during design and construction of park transportation systems

Incorporating sustainability practices into the full life cycle of a project (planning through construction) is key to achieving a truly green transportation program. The Northeast Region should take the lead in sustainability by developing a regional sustainability guidebook to provide leadership, educate and promote sustainable transportation and operations, incorporating such strategies as right-sizing portfolio, green road initiatives, and wildlife operational strategies, among others.

Park Tour Boat, Pawtucket Canal, Lowell National Historical Park. Photo by NPS/Jim Higgins.

CHAPTER 7 | Ensure Sustainable Operations

Ensuring sustainable operations is a basic tenet of the National Park Service and is demonstrated by the Northeast Region in its data-driven transportation investment policies and practices. Ensuring sustainable operations is also essential to the success of this Long Range Transportation Plan. The limited financial resources available to the National Park Service and the Northeast Region must be used wisely to ensure that the goals and objectives are not only reached in the short term, but maintained long term.

Bicycle parking at Cape Cod National Seashore. Photo by VHB.

Goal **Advance planning and programming in the Northeast Region to ensure the long-term financial, partnership, and operational sustainability of its transportation system**

Objectives

1. **Achieve a financially sustainable portfolio of transportation assets**
2. **Improve the identification and programming of operations and maintenance needs**
3. **Strengthen regional, community, and private partnerships**
4. **Establish organizational capacity to plan, implement, and monitor the LRTP recommendations and outcomes**

The Northeast Region must advance planning and programming to ensure the long-term financial, partnership, and operational sustainability of the transportation system. The Northeast Region has already made considerable progress through partnership efforts at some parks and with the development of data-driven investment strategies regionwide, but more can be done. More can be done to expand partnerships and more can be done to collect the data necessary to identify more cost-effective ways to invest in the transportation system. Ensuring sustainable operations also requires that there be the organizational capacity to implement, measure, and monitor the LRTP recommendations.

7.1 Financially Sustainable Portfolio of Assets

Achieving a financially sustainable portfolio of transportation assets is fundamental to the ability of the Northeast Region to provide a transportation system that effectively supports the vision, goals, and objectives of the region and the National Park Service. To do so the programming priorities of the Northeast Region must be consistent with the Capital Investment Strategy and the goals and objectives of the Northeast Region Long Range Transportation Plan.

The Capital Investment Strategy framework brings life-cycle cost considerations and NPS mission-related benefits into the investment decision-making. The key goals of the CIS are:

- **Mission Goal I, Financial Sustainability:** Repair and improvement of assets that parks commit to maintain in good condition, typically those that are considered mission critical as indicated by the Asset Priority Index; disposition of nonessential facilities in order to reduce operations and maintenance requirements, as well as deferred maintenance and code compliance liabilities; reduction of resource consumption to conserve operational funds and promote sustainability; focus on core resources.
- **Mission Goal II, Resource Protection:** Preservation and repair of historic and iconic assets, cultural landscapes and natural resources; environmental and cultural restoration.
- **Mission Goal III, Visitor Use:** Investment in facilities that directly enable outdoor recreation; investment in facilities that are primary touch points for park visitors, including interpretive media.
- **Mission Goal IV, Health and Safety:** Correction of existing and identified unsafe and hazardous conditions at NPS facilities.

The Northeast Region transportation asset management strategies are well aligned with the Capital Investment Strategy and other Servicewide asset management policies in regards to assessing needs and making effective investments. The Northeast Region has consistently prioritized its funding towards sustaining high priority, mission critical transportation assets at acceptable conditions. Right-sizing the asset portfolio has been a strategy and using a data-driven process to ensure wise investments is at the core of the Northeast Region's strategy. For example, approximately 85 percent of pavement management investments in FY 12 were for optimizer band 1 and 2 asset projects, and the other projects were generally bundled projects for which it is more cost effective to do them along with the other work rather than postpone them until later years.

The assessment of the investment scenarios in Chapter 3 demonstrates that as (constant dollar) funding for transportation declines, the need to make careful decisions in allocating the reduced funding in the most effective manner increases. In general, the investment scenario analysis suggests that the Northeast Region:

- continue a strong focus of available funds on roads and parking, and integrate tiered performance metrics to classes of roads and parking
- maintain bridges in current condition
- fund high priority safety improvement projects
- maintain mission critical and mission priority transit and trail systems
- accelerate decommissioning/disposal of nonperforming assets
- maintain a database of ranked, unfunded projects that could be moved forward should one-time funding or partnership opportunities become available

Because of the reduced funding, not all objectives of the LRTP can be achieved to the extent desired. In some cases target performance metrics might have to be reduced to meet goals. In other cases compromises may need to be made in prioritizing objectives. In all cases there needs to be a strong project validation effort to ensure maximum effectiveness of each investment.

Most of the funding will still need to go towards on-road systems assets since they comprise nearly 90 percent of the Northeast Region transportation inventory and because they are used by the vast majority of visitors to Northeast Region park units. These investments will remain focused on the highest priority roads and parking, defined as those used by at least 80 percent of visitors.

Decommissioning low priority roads and parking is important to ensuring sustainable operations. The Northeast Region has in recent years decommissioned more than 1,200 parking spaces. The region has generally not invested in parking projects since 2006, but if a priority parking project requiring 3R work is identified, the capacity of the parking area will be reduced unless there is justification to keep the current capacity. Perhaps more so than for other asset management strategies, validation of assets to decommission would ensure a high return on the investments by identifying low cost opportunities for decommissioning those optimizer band 5 assets that would alternatively require significant investments to keep functional and safe.

The Northeast Region has heavily invested in alternative transportation systems in past years and the decrease in available funding for those projects is expected to be particularly sharp. Existing systems could be continued, but expansion of existing trail and transit systems and implementation of new systems would be done on an opportunistic basis as partnership opportunities arise or as one-time NPS funding became available.

In addition to the prioritization of project investments among the various transportation asset categories, proper planning and design strategies can stretch available funding. Strategies to do more with the available funding include:

- consideration of the Total Cost of Facility Ownership in project prioritization and design
- consideration of climate change adaptation in project prioritization and design
- validation of pavement and bridge modeling, including participation by park staff
- reliance on tested methods and technologies for transportation services and management.

Consideration of TCFO is essential in order to minimize future costs for operations and maintenance and thus avoid long-term capital shortfalls arising from a lack of routine maintenance. For roads and parking, the current modeling and validation program provides a good indicator of capital needs. A more systematic approach to accounting for O&M expenditures is needed. Annual operating costs are best managed by right-sizing the portfolio through disposal of underutilized assets. For transit services, the region has found that ongoing operational costs are essentially self-balancing, that is, if funding is not available the service is reduced or discontinued and there is no ongoing liability. However, consideration of re-occurring capital investments is critical and needs to be accounted for in program planning.

The need to consider the implications of climate change continues to be tragically apparent from storm events such as Hurricane Sandy. Adaptation of assets at high-risk ensures that future funding can be targeted towards new initiatives rather than repeatedly repairing/replacing assets chronically damaged by storm events.

The Northeast Region has made substantial efforts to validate bridge and pavement investment model outputs. In-field validation before finalizing a multiyear plan provides opportunities to adjust the modeled programs to account for updated condition data and the current priorities of the park.

A reliance on tested methods and "off-the-shelf" technologies important for ITS and ATS system investments, and data collection is essential. Proprietary systems may not be supported long term by the vendor. Complex systems may be costly to maintain, particularly given existing workloads on park staff.

7.1.2 Data and Performance Metrics

Monitoring the progress of LRTP recommendations and outcomes across all of the goals and objectives presented will be crucial to the success of this LRTP and is consistent with the directives issued under MAP-21. Setting achievable, measurable goals that utilize performance metrics throughout the monitoring will allow the Northeast Region, the National Park Service, and partner organizations to readily understand the successes and weaknesses of the plan, and ultimately make effective investments.

The effectiveness of investment decision-making relies in large part on the availability, accuracy, and completeness of data about existing conditions and performance. The key data used for this plan's performance metrics are summarized in Table 7-1.

The data most readily available relate to the condition of parking, road and bridge assets, and the operations of transit services. Data used to measure pavement condition rating, bridge health index, facility condition index, and deferred maintenance are available from the FMSS, Pontis, and HPMA systems. The effectiveness of the data can be improved by enhancing FMSS data to more accurately reflect assets which are only partially transportation related. In addition, the region is currently working on an effort to provide a better inventory of primary trails in park units. The inventory work done for the ATMS provides comprehensive knowledge of ridership and costs, and there needs only to be a procedure established for the consistent reporting of these data by parks.

Although a number of performance metrics can be used to measure progress on the goals and objectives presented, there are certain data gaps that prevent clear and measurable LRTP monitoring. The following are key data gaps that should be addressed to greatly improve the ability of the region to monitor LRTP progress. The Northeast Region is conducting a study of how to obtain and use these data in the most cost effective manner.

- **Traffic Volumes** – Traffic volume data is crucial to many facets of the LRTP programs and metrics, including pavement design, roadway and parking prioritization, crash rates, greenhouse gas emissions, visitation counts and visitor use patterns, and evaluation of decommissioning opportunities. Permanent vehicle count stations are in place in some parks, but a regionwide assessment of how best to expand the collection of traffic data is needed.
- **Operations and Maintenance Spending** – O&M spending was the focus of studies by Booz Allen for this LRTP. One of the important findings of their white paper was that there are many data gaps surrounding O&M spending. Moving forward, understanding how O&M funding is used to maintain the Northeast Region transportation system will be important for making wise and effective capital investments that account for O&M needs.
- **Crash Data** – Databases necessary to assess safety issues are no longer available or have never existed. The STARS database does not have information about vehicle crashes past 2005. There is no database regarding incidents involving trail and transit use, or adequate data on midlife mortality due to collision. There is also insufficient data available about vehicle volumes and trail utilization to use in the development of performance metrics.
- **Visitor Satisfaction** – Data about visitor experiences in the Northeast Region and how they relate to transportation are limited, in large part because of the extensive effort necessary to capture data about visitor perceptions. Visitor use surveys have been conducted for relatively few park units in the region and transportation issues are generally not the primary focus of the surveys. As regular visitor surveying is completed, questions specific to transportation and visitor experiences should be asked to begin establishing a baseline of data.
- **Mode Share** – A number of the goals and objectives in this LRTP focus on shifting visitor travel from private automobiles to other modes (transit, cycling, walking). There is limited baseline information available on visitor mode shares accessing parks and within parks. Expanded counts of transit, trail, and vehicle use at park entrance points are needed. In addition, visitor surveys can be used to gather this information.
- **Inventory of Primary Trails** – Data regarding non-motorized systems is notably incomplete. There is no reliable inventory of transportation trails. Most importantly, there is little data available about the utilization of trails and without that it is difficult to determine how much to spend maintaining trails and which new trails are cost effective in advancing the goals of the LRTP.

Table 7-1: Status of Key Performance Metric Data

	GOALS WITH PERFORMANCE METRICS USING THE DATA				
	MANAGE ASSETS WISELY	ENSURE ACCESS, SAFETY, & MOBILITY	ENHANCE VISITOR EXPERIENCE	PROTECT RESOURCES	ENSURE SUSTAINABLE OPERATIONS
Data Most Readily Available					
Pavement Condition Rating	☑	☑	☑	☑	☑
Bridge Health Index	☑	☑	☑	☑	☑
Number of structurally deficient bridges	☑	☑	☑	☑	
Facility Condition Index (roads, parking, bridges)	☑	☑	☑	☑	☑
Deferred Maintenance (roads, parking, bridges)	☑	☑	☑	☑	☑
Asset Priority Index (being updated)	☑		☑	☑	☑
ATS transit ridership	☑		☑		
NPS cost per ATS transit rider	☑		☑		☑
Parks accessible by regional transit			☑		
Visitation	☑		☑	☑	☑
Incomplete Data					
Inventory/condition of transit and water transportation assets	☑		☑		☑
Vehicle traffic volumes and vehicle miles traveled	☑	☑	☑	☑	☑
Data Substantially Unavailable (Today)					
Inventory/condition of trail assets	☑	☑	☑		☑
Quality of regional transit connections		☑	☑	☑	
Inventory of regional trail connections		☑	☑	☑	
Parking utilization	☑		☑	☑	☑
Congestion delay	☑	☑	☑		
Trail utilization	☑	☑	☑		☑
Assets at-risk from climate change impacts	☑	☑	☑	☑	☑
Current vehicle crash information database		☑	☑		
Transit and trail safety incident information database		☑	☑		
Visitor mode share (non-automobile)	☑	☑	☑	☑	☑
User demographics	☑	☑	☑		
Visitor satisfaction			☑		
Repeat visitation			☑		

7.2 Identification and Programming of Operational and Maintenance Needs

Proper investment in operations and maintenance activities is a fundamental tenet of a good asset management system. This is highlighted by the National Park Service in the Capital Investment Strategy and its emphasis on aligning capital funding towards projects whose operations and maintenance can be financially sustained. Unfortunately, it appears that there is no easy way to quantify operations and maintenance needs and expenses for transportation assets.

There are fundamental issues with the categorizing of transportation assets in FMSS and other accounting systems that will need to be addressed Service-wide and the solutions to which are likely outcomes of the NPS's ongoing national long range transportation planning efforts. The Northeast Region will work with the national team to help identify and implement the solutions.

In the meantime, there are other options that can be pursued at the region and park level to help better understand and quantify operational and maintenance needs. The work done by the Northeast Region on the existing surface and water transit systems operating in Northeast Region park units is a good example of the value of gaining a better understanding of actual operations and maintenance spending and needs. A contractor coordinated a detailed review of each transit system with Northeast Region staff, park staff, and the transit operators. The findings more accurately quantified the cost of operating and maintaining those systems than could be done from existing records. The study provided the means to establish performance metrics for the transit systems and it provided a better understanding of how much of the support of transit systems is attributable to partners.

The Northeast Region is currently working on several other projects to help better understand operations and maintenance costs of other transportation programs. In particular, the Northeast Region is trying to quantify the cost of operating and maintaining transportation trails and low priority road and parking assets that are candidates for decommissioning.

7.3 Regional, Community, and Private Partnerships

Partner organizations are a valuable resource to the National Park Service and the Northeast Region. Partnerships can be beneficial in direct ways such as in program cost sharing and indirect ways such as the improved air quality benefits that are derived from a more robust transit system. There are many partnerships being maintained among the park units in the Northeast Region but there are opportunities for more.

7.3.1 Existing Impacts of Partnerships on the Northeast Region

As described in Chapter 2, there are more than 50 million visits to Northeast Region park units annually and the resulting economic activity generates $1.8 billion in spending from non-local visitors and supports over 30,000 local jobs. The existing transportation partnerships focus broadly on policies and practices that encourage visitation at all Northeast Region parks, and specifically on financial support of certain transportation systems in some parks. The Northeast Region benefits from financial support to implement and operate transportation systems, and the gateway communities and the region benefit from the visitation to the parks.

Transit systems, specifically, have benefited financially from partnership support in the Northeast Region. Transit systems often require large initial capital investments and ongoing operations and maintenance funding to sustain effective, quality services. Partnerships can be utilized to jointly apply for funding to make the large capital investment, or could be used to ease the sustained O&M investment necessary over the lifetime of the system. Among the NER transit partnerships are those at Acadia National Park and Gettysburg National Military Park.

The Island Explorer transit system at Acadia National Park is a fare-free regional public transit service that helps provide connectivity over the 40,000 acres of lands that comprise Acadia National Park. The Island Explorer service was established in 1999 and has become a robust and effective transit system for park visitors as well as local residents. This partnership has many participants including: Maine Department of Transportation, Mount Desert Island League of Towns, Friends of Acadia, Downeast Transportation, local

businesses, the Federal Highway Administration, the Federal Transit Administration, and L.L.Bean. All of the partners have played some role in planning, operations, and procuring funding to support the Island Explorer.

Gettysburg National Military Park has a newly established partnership with the local transit agency. The Adams County Transit Authority operates Freedom Transit in Gettsyburg. Two of the public bus routes include stops at the Gettysburg NMP visitor center and this provides park visitors with expanded transportation options. The bus service also provides connectivity with park sites located in downtown Gettysburg. These downtown sites are often difficult for park visitors to access by automobile due to congestion and a lack of convenient parking.

Not all transportation partnerships involve transit operations. For example, Acadia National Park has also been able to leverage partnership funding in caring for its historic carriage road network. The centerpiece of the park is a system of 45 miles of carriage roads and 17 stone-face bridges developed by John D. Rockefeller, Jr. The carriage roads were extensively reconstructed in the early 1990s with federal funds along with matching funds from local partners. Most importantly, at that time, the Friends of Acadia established an endowment to help protect the carriage roads in perpetuity. About $200,000 from that fund is used annually for maintaining these roads. In addition, each year volunteers work under the guidance of the Friends of Acadia cleaning ditches and culverts, clearing brush, and assisting with other restoration projects. Without the partnership the system could not be economically sustained. Furthermore, the current visitation of over two million annually, and support of the local economy, would likely not be realized.

7.3.2 Partnership Opportunities

The Northeast Region should maintain and broaden partnerships and cooperative planning to fully integrate park service access needs at the community and regional levels. The Northeast Region should develop a consistent approach to working in support of or in partnership with local planning bodies to better develop and fund projects in adjacent communities – particularly as they relate to congestion management, air and noise quality, and stormwater management/water quality.

As discussed in Chapter 6, the Congestion Mitigation and Air Quality (CMAQ) Improvement Program presents a funding opportunity that is especially relevant to the Northeast Region since most NER park units are located in areas of air quality concerns. The region has in the past used CMAQ funding in a few projects, for example, to purchase buses for regional transit service serving a park and to construct trails providing regional connection to a park; however, there is no consistent effort to take advantage of the CMAQ program and there is little familiarity regionwide with the program. The Northeast Region should actively work with regional planning agencies in their process of creating transportation improvement plans. Each park should develop and maintain contacts with the local and regional planning organizations so that potential CMAQ-eligible projects can be jointly pursued.

The benefits of parks participating more directly with local and regional planning agencies extends beyond the CMAQ program. Transit funding is part of state transportation improvement plans and the new MAP-21 Federal Lands Access Program provides funds for states to spend on projects that improve access to federal lands. Perhaps more importantly, participation by parks with planning agencies enables conversations about mutual transportation needs and can lead to other partnership opportunities.

7.4 Organization Requirements

There needs to be organizational capacity to plan, implement, and monitor recommendations and outcomes of the Northeast Region LRTP. This long range transportation plan has introduced new strategies and initiatives to the Northeast Region that are not present in the current system. To implement new strategies and initiatives while continuing to maintain those systems that are already in place presents an organizational challenge.

At the regional level, this LRTP recommends many new strategies that promote improved asset management, greater focus on ATS, safety, and congestion issues, enhanced visitor experience tools, and new climate change and environment focused resource protection initiatives. In order to plan for, develop, and implement a number of new strategies, the regional level needs to be provided the professional staff capacity to effectively plan, execute, and monitor the overall transportation program.

As new strategies and initiatives are developed, it will eventually come to the parks to implement and monitor the outcomes of such programs. This could result in expanded data collection efforts, a greater need for park level interactions with visitors, and continued feedback from the park level to assess the impact that new policies may have on operations. Specific park level staffing needs may not be apparent at this time but there should be some expectation that additional staff may be needed for smooth implementation and overall success.

Ultimately, adequate regional and park level staffing will be key to the tracking and reporting of progress on this LRTP's goals and objectives, and ensuring that the long range transportation plan can be effectively updated in the future.

CHAPTER 8 | Summary of Recommendations

Transportation infrastructure plays a vital role in supporting the National Park Service's mission and initiatives by connecting people with nature, enhancing visitor experiences, supporting cultural and historical education, and allowing public access to America's treasures. This Long Range Transportation Plan represents the long-term vision for transportation in the Northeast Region of the National Park Service, shaped by five overarching goals: Manage Assets Wisely; Ensure Access, Safety, & Mobility; Enhance Visitor Experiences; Protect Resources; and Ensure Sustainable Operations.

Walkway at Castle Williams, Governor's Island National Monument. Photo by VHB.

Goals:

- **Manage Assets Wisely**
- **Ensure Access, Safety, & Mobility**
- **Enhance Visitor Experiences**
- **Protect Resources**
- **Ensure Sustainable Operations**

The Northeast Region's vision for transportation is:

Ever mindful of visitor needs and vigilant about resource stewardship, the Northeast Region wisely invests in transportation infrastructure and services to maintain and enhance public access to its parks, and achieve a 21st century multimodal transportation system that is safe, efficient, and financially and environmentally sustainable.

This chapter provides a summary of the implementation plan and subsequent steps necessary to bring the region closer to its vision.

8.1 Implementation Plan

The long-term vision for transportation in the Northeast Region of the National Park Service will be achieved through progress on five overarching goals:

- **Manage Assets Wisely**
- **Ensure Access, Safety, & Mobility**
- **Enhance Visitor Experiences**
- **Protect Resources**
- **Ensure Sustainable Operations**

The following pages and subsequent tables summarize the recommendations and strategies of this Northeast Region LRTP for each of these goals.

8.1.1 Manage Assets Wisely

Chapter 3 discusses the portfolio of transportation assets in the region, their current conditions, forecasted needs across asset types, and the gap between needs and anticipated funding. Findings and strategies within this chapter focus on how the region will seek to sustain all high priority transportation assets within the region at acceptable condition to ensure their protection and availability for future generations. A summary of the recommendations and anticipated performance metrics for Managing Assets Wisely in the Northeast Region are provided in Table 8-1. These recommendations are consistent with the framework for investment outlined by the Capital Investment Strategy.

Many of the asset management practices and systems are well established and have proven to be effective. Other beneficial refinements of the region's practices have been developed during the course of this long range planning process or are currently being piloted and require further planning. The Northeast Region is committed to monitoring and reporting on its progress in asset management using the data and performance metrics defined.

8.1.2 Ensure Safety, Access & Mobility

Chapter 4 discusses access, safety and congestion issues within the region that can impact resources and jeopardize the quality of the visitor experience. Findings and strategies within this chapter focus on how the region will work to provide a safe and efficient multi-modal park transportation system with seamless connections within each park unit and to surrounding communities. The region's transportation investments remain focused on providing positive visitor experiences for the broadest range of visitors while remaining steadfast in its stewardship of the protected resources under its care. The recommendations and performance metrics to Ensure Access, Safety, and Mobility in the Northeast Region are summarized in Table 8-2.

To ensure progress on addressing congestion and mobility and enhancing access as these programs move forward, the Northeast Region will define data needs and use the performance metrics identified to ensure that safety investments are achieving their intended results and alternative transportation systems remain safe, effective, and sustainable. It is acknowledged that, as of today, limited data are available to quantify many aspects of safety congestion and mobility. It is hoped that many of these gaps can be addressed as the region begins to implement the recommendations of this plan and through periodic updates of it safety, congestion, and ATS management systems.

8.1.3 Enhance Visitor Experiences

Chapter 5 presents visitor use and characteristics, addresses the relationship of transportation to overall visitor experiences, and discusses trends that may influence future use and experiences within the Northeast Region. Findings and strategies within this chapter focus on ensuring that transportation investments support rewarding visitor experiences with infrastructure and services in good condition, a choice of modes where appropriate,

accessible trip planning resources, and better integration of transportation within park interpretive experiences. The recommendations and identified performance metrics for transportation investments that enhance visitor experiences for the broadest range of visitors to park units in the region are presented in Table 8-3.

The Northeast Region is committed to monitoring and reporting on its progress to provide for positive visitor experiences, as it relates to transportation, through the use of the performance metrics identified. It is acknowledged that many of the objectives within this goal are difficult to measure and that available data are limited. The region will continue to rely on national research and ongoing visitor surveys to enhance and enrich their approach and the information available at the regional level.

8.1.4 Protect Resources

Chapter 6 discusses key resource issues as they relate to transportation including historical and culturally significant transportation assets, air quality in the region, wildlife crossings, and climate change. Findings and strategies within this chapter focus on maintaining high priority transportation resources for the enjoyment of future generations, encouraging strategies to enhance air quality, protect wildlife, promote environmental sustainability, and to mitigate and adapt to climate change. The recommendations and performance metrics to Protect Resources in the Northeast Region through sound transportation investments are summarized in Table 8-4. Again, it is acknowledged that many of the objectives within this goal are difficult to measure and that available data are limited.

The recommendations identified reinforce the need for more planning to define a more comprehensive strategy by which the Northeast Region will mitigate and, more importantly, adapt to the anticipated effects of climate change. Recent severe weather events in the region underscore the urgency of this need.

8.1.5 Ensure Sustainability

As demonstrated by this LRTP, the Northeast Region faces tremendous challenges to meet its varied transportation needs within a fiscally constrained environment.

Chapter 7 advances planning and programming strategies to ensure the long-term financial, partnership, and operational sustainability of the Northeast Region's transportation system. Findings and strategies within this chapter focus on investing wisely in transportation and strengthening regional, community, and private partnerships. Its recommendations are summarized in Table 8-5.

Table 8-1: Northeast Region LRTP Recommendations and Performance Metrics—Goal: Manage Assets Wisely

Manage Assets Wisely:
Sustain all high priority transportation assets within the region at acceptable condition to ensure their protection and availability for future generations

	ROADS	PARKING	ROAD BRIDGES	NON-MOTORIZED TRANSPORTATION	TRANSIT AND WATER TRANSPORTATION	OTHER
Objective: Maintain all high priority transportation assets in good condition						
RECOMMENDATIONS						
Continue to focus on high priority assets utilized by the majority of visitors.	☑	☑	☑	☑	☑	
Maintain bridges at current condition/ensure that all structures provide safe access.			☑			
Work with FHWA to formulate a plan to train park staff on bridge maintenance activities.			☑			
Sustain critical access alterative transportation system assets in good condition.				☑	☑	
Make investments that address documented safety or visitor experiential needs.	☑	☑	☑	☑	☑	
Prior to programming projects, validate pavement and bridge management system modeling output to verify need and recommended treatment.	☑	☑	☑			
Continue focused ATS enhancements that provide access options, advance urban community connections, reduce GHG emissions, or help achieve the Green Parks Plan - where funding or sustainable partnerships have been identified.				☑	☑	
Incorporate safety, historic resource status, natural resource conflicts, and congestion into project prioritization.						☑
PERFORMANCE METRICS						
Percentage of assets in good condition	■	■	■	■	■	
Pavement Condition Rating	■	■				
Bridge Health Index			■			
Facility Condition Index	■	■	■	■	■	
Number of structurally deficient bridges			■			
Reduction of deferred maintenance	■	■	■	■	■	
Objective: Collect data and use performance goals and management systems to improve the overall condition, utilization, and effectiveness of asset portfolio over time						
RECOMMENDATIONS						
Define and implement a data collection and performance monitoring program to ensure that adequate data exists to prioritize investments and monitor outcomes	☑	☑	☑	☑	☑	☑
Establish new pavement performance metrics including a lower pavement performance metric for lower classification and non-FLHP eligible roads and parking lots (suggest an average PCR of 80 for roads and high priority parking, and 70 for the remaining). Re-run and recalibrate pavement needs assessment, as required.	☑	☑				
Complete and formally adopt a reclassification/stratification of parking assets within portfolio and re-optimize assets within the category.		☑				
Improve non-motorized asset inventory and definition of priorities, especially as they relate to safety needs.				☑		
Using data and management systems to ensure that only effective services are operated, in an efficient manner.					☑	
PERFORMANCE METRICS						
Number of goal and objective metrics monitored	■	■	■	■	■	
Increased percentage of assets in good condition	■	■	■	■	■	
Higher Pavement Condition Rating	■	■				
Higher Bridge Health Index			■			
Lower Facility Condition Index	■	■	■	■	■	
Fewer structurally deficient bridges			■			
Higher ATS transit ridership and trail utilization				■	■	
Lower NPS cost per ATS transit rider					■	
Vehicle miles eliminated	■			■	■	

Table 8-1: Northeast Region LRTP Recommendations and Performance Metrics—Goal: Manage Assets Wisely

Manage Assets Wisely: Sustain all high priority transportation assets within the region at acceptable condition to ensure their protection and availability for future generations	ROADS	PARKING	ROAD BRIDGES	NON-MOTORIZED TRANSPORTATION	TRANSIT AND WATER TRANSPORTATION	OTHER
Objective: Decommission or dispose of low priority assets						
RECOMMENDATIONS						
Develop a transportation asset decommissioning/disposition plan for each park in the region for road assets and pilot plan at individual park(s). Update HPMA model and FMSS databases to reflect this plan and ongoing re-optimization efforts.	☑	☑	☑			
Replace, restructure or discontinue underperforming ATS.				☑	☑	
PERFORMANCE METRICS						
Number and size of decommissioned assets	■	■	■	■	■	
Reduction of deferred maintenance	■	■	■	■	■	
Reduction of O&M costs	■	■	■	■	■	

Cadillac Mountain Road, Acadia National Park. Photo by VHB.

Table 8-2: Northeast Region LRTP Recommendations and Performance Metrics—Goal: Ensure Access, Safety, & Mobility

Ensure Access, Safety, & Mobility: Provide a safe and efficient multimodal park transportation system with seamless connections within each park and to surrounding communities (where opportunities exist)	ROADS	PARKING	ROAD BRIDGES	NON-MOTORIZED TRANSPORTATION	TRANSIT AND WATER TRANSPORTATION	OTHER
Objective: Protect the health and safety of visitors and employees						
RECOMMENDATIONS						
Fund high priority roadway safety improvements at those locations that are experiencing the highest occurrence of crashes.	☑	☑	☑	☑	☑	
Complete pilot safety assessments for trails and ATS facilities and incorporate recommendations into programming.				☑	☑	
Continue to work cooperatively with parks and partners to advance safety E's.	☑	☑	☑	☑	☑	
Undertake appropriate proactive safety investment strategies.	☑	☑	☑	☑	☑	
Define data needs and performance monitoring program to ensure that systems remain effective and viable.	☑	☑	☑	☑	☑	
Complete ongoing deer management plans and prioritize strategies for implementation.	☑				☑	
Seek opportunities for the region to access other funding sources through MAP-21 to accelerate its progress in addressing its safety-related needs.	☑	☑	☑	☑	☑	
PERFORMANCE METRICS						
Reduced number of severe automobile crashes	■	■	■			
Reduced automobile crash rates	■	■	■			
Number of high crash/incident locations mitigated	■	■	■	■	■	
Number of pilot safety studies completed				■	■	
Objective: Provide multimodal options to ensure access, relieve congestion, reduce resource impacts, and reinforce sustainable practices						
RECOMMENDATIONS						
Exploit low cost opportunities to modernize wayfinding signage and other visitor information systems through ongoing investments in roads, parking, and alternative transportation systems.	☑	☑		☑	☑	
Collaborate with partners to broaden park access information and conditions reporting within local and regional traveler information systems.						☑
Carefully invest in proven transportation technologies to improve operations.						☑
Advance strategies to improve access, ensure safety, and mitigate congestion in the parks and gateway communities through local (park leadership) engagement in regional planning activities, including:						
• Become active with the appropriate MPO or regional planning agencies.						☑
• Pursue Transportation Alternatives, CMAQ Program, and other discretionary funding for multimodal projects that benefit the park and its neighboring community	☑	☑		☑	☑	
PERFORMANCE METRICS						
Number of new/enhanced traveler information systems	■	■	■	■	■	
Number of parks with new/improved public transit access					■	
Number of parks with new/improved access via regional trails				■		
Number of parks with car-free access and mobility						■
Percentage of visitors arriving via non-automobile modes				■	■	
Reduction in percentage of visitors using automobiles to explore within park				■	■	
Number of congestion hotspots mitigated	■	■		■	■	
Number of resource threat locations mitigated	■	■		■	■	

Table 8-2: Northeast Region LRTP Recommendations and Performance Metrics—Goal: Ensure Access, Safety, & Mobility

Ensure Access, Safety, & Mobility: Provide a safe and efficient multimodal park transportation system with seamless connections within each park and to surrounding communities (where opportunities exist)	ROADS	PARKING	ROAD BRIDGES	NON-MOTORIZED TRANSPORTATION	TRANSIT AND WATER TRANSPORTATION	OTHER
Objective: Enhance accessibility to the broadest diversity of visitors						
RECOMMENDATIONS						
Incorporate safety and congestion into project planning and prioritization.	☑	☑	☑	☑	☑	
Consider the accessibility needs of all users with every transportation investment.	☑	☑	☑	☑	☑	
Incorporate urban demographics and accessibility goals into project prioritization.	☑	☑	☑	☑	☑	
PERFORMANCE METRICS						
Number of projects in targeted urban areas	■	■		■	■	
Broadening demographics of users						■
Number of accessibility barriers removed	■	■	■	■	■	
Objective: Improve intermodal connectivity (address gaps in access between modes)						
RECOMMENDATIONS						
Advance strategies to improve access, ensure safety, and mitigate congestion in the parks and gateway communities through local (park leadership) engagement in regional planning activities, including:						
• Become active with the appropriate MPO or regional planning agencies.						☑
• Pursue Transportation Alternatives, CMAQ Program, and other discretionary funding to address gaps between modes, providing access to and mobility within the park.		☑		☑	☑	
PERFORMANCE METRICS						
Number of projects addressing gaps between parks and public/regional transportation		■		■	■	
Number of projects addressing gaps between parks and regional trails		■		■	■	
Increase in visitor use of non-automobile modes due to connectivity projects				■	■	

Sykes Avenue at Little Round Top, Gettysburg National Military Park. Photo by VHB.

Table 8-3: Northeast Region LRTP Recommendations and Performance Metrics—Goal: Enhance Visitor Experiences

Enhance Visitor Experiences:
Support rewarding visitor experiences by maintaining high priority transportation assets in good condition, improving trip planning resources, and better integration of transportation within the park interpretive experience

	ROADS	PARKING	ROAD BRIDGES	NON-MOTORIZED TRANSPORTATION	TRANSIT AND WATER TRANSPORTATION	OTHER
OVERALL VISITOR EXPERIENCE PERFORMANCE METRICS						
Increase in visitation						■
Increase in repeat visitation						■
Objective: Maintain high priority transportation system assets in good condition						
RECOMMENDATIONS						
Deliver on Manage Assets Wisely goal to provide transportation facilities and services in a state of good repair to the broadest level of visitors.	☑	☑	☑	☑	☑	
PERFORMANCE METRICS						
High visitor satisfaction with transportation asset conditions	■	■	■	■	■	
Pavement Condition Rating	■	■				
Bridge Health Index			■			
Facility Condition Index	■	■	■	■	■	
Number of structurally deficient bridges			■			
Percentage of physical assets in good condition	■	■	■	■	■	
Reduction of deferred maintenance	■	■	■	■	■	
Objective: Provide trip planning resources and travel information to access the parks						
RECOMMENDATIONS						
Work with parks on an ongoing basis to solicit input on visitor information needs and opportunities.						☑
Collaborate with partners to broaden park access information and conditions reporting within local and regional traveler information systems.						☑
PERFORMANCE METRICS						
Number of new/expanded regional traveler information system partnerships						■
Increased percentage of visitors using trip planning resources						■
High visitor satisfaction with amount and ease of use of information provided						■
Objective: Integrate effective visitor information systems within park transportation system						
RECOMMENDATIONS						
Seek low cost opportunities to modernize wayfinding signage and other visitor information through ongoing investments in roads, parking, and alternative transportation systems and amenities.	☑	☑		☑	☑	
Encourage public/private partnerships in the deployment of mobile applications and interactive travel planning tools						☑
Explore opportunities, through visitor surveys or other means, to build a body of data on visitors' satisfaction/response to the transportation system and other services provided by the NPS.						☑
PERFORMANCE METRICS						
Increased percentage of park visitors utilizing information systems	■	■		■	■	
High visitor satisfaction with amount and ease of use of information provided						■

Table 8-3: Northeast Region LRTP Recommendations and Performance Metrics—Goal: Enhance Visitor Experiences

Enhance Visitor Experiences:
Support rewarding visitor experiences by maintaining high priority transportation assets in good condition, improving trip planning resources, and better integration of transportation within the park interpretive experience

	ROADS	PARKING	ROAD BRIDGES	NON-MOTORIZED TRANSPORTATION	TRANSIT AND WATER TRANSPORTATION	OTHER
Objective: Address transportation congestion and the impacts of non-park traffic that impede park access and/or the enjoyment of parks						
RECOMMENDATIONS						
Strategically target financial resources to address the highest priority safety and congestion-related projects	☑	☑		☑	☑	
Consider the accessibility needs of all users with every transportation investment.	☑	☑	☑	☑	☑	
PERFORMANCE METRICS						
Number of projects that reduced visitor delay at congestion hotspots	■	■	■		■	
Number of projects that reduced visitor density at congestion hotspots				■	■	
Number of projects that reduced non-park traffic	■	■				
Number of projects that reduced vehicle speeds	■	■				
Number of accessibility barriers removed	■	■	■	■	■	

Skyline Drive, Shenandoah National Park. Photo by VHB.

Table 8-4: Northeast Region LRTP Recommendations and Performance Metrics—Goal: Protect Resources

Protect Resources:
Protect cultural and natural resources for the enjoyment of future generations and promote environmental sustainability

	ROADS	PARKING	ROAD BRIDGES	NON-MOTORIZED TRANSPORTATION	TRANSIT AND WATER TRANSPORTATION	OTHER
Objective: Maintain culturally significant transportation assets in good condition						
RECOMMENDATIONS						
Maintain historic and culturally significant transportation assets in good condition.	☑	☑	☑	☑	☑	
PERFORMANCE METRICS						
Pavement Condition Rating	■	■				
Bridge Health Index			■			
Facility Condition Index	■	■	■	■	■	
Number of structurally deficient bridges			■			
Percentage of physical assets in good condition	■	■	■	■	■	
Reduction of deferred maintenance	■	■	■	■	■	
Objective: Manage visitation and access to avoid or minimize adverse impacts to park resources						
RECOMMENDATIONS						
Continue to take a proactive approach to gauging the need for and implementation of visitor management projects or operational strategies	☑	☑	☑	☑	☑	
Identify and catalog at the park level, critical concerns regarding wildlife crossings and promote operational and/or low cost strategies to address these areas.	☑		☑			
PERFORMANCE METRICS						
Number of targeted visitation management projects/operations strategies implemented	■	■	■	■	■	■
Number of wildlife crossing enhancements	■					
Objective: Adapt park transportation resources to increase resilience to climate change and manage park transportation systems to mitigate the effects of climate change and other stressors						
RECOMMENDATIONS						
When available, use the NPS risk screening tool to help identify park assets at risk to climate change impacts.	☑	☑	☑	☑	☑	
Assess risk and options to relocate, adapt, or decommission assets that have been identified as being vulnerable to the effects of climate change (severe weather, storm surges, erosion, and sea level changes) prior to investing in assets. Consider transportation asset's role in protecting adjacent cultural or historic resources as part of this assessment.	☑	☑	☑	☑	☑	
Advocate that the ERFO program accommodate resource adaptation design changes for assets chronically damaged due to weather events.						☑
PERFORMANCE METRICS						
Percentage of assets screened for risk to climate change impacts	■	■	■	■	■	
Percentage of studies on at-risk assets prior to investment	■	■	■	■	■	

Table 8-4: Northeast Region LRTP Recommendations and Performance Metrics—Goal: Protect Resources

Protect Resources: Protect cultural and natural resources for the enjoyment of future generations and promote environmental sustainability	ROADS	PARKING	ROAD BRIDGES	NON-MOTORIZED TRANSPORTATION	TRANSIT AND WATER TRANSPORTATION	OTHER
Objective: Incorporate green principles into the planning, design, construction, and operation of park transportation systems						
RECOMMENDATIONS						
Promote more parks in the region to become Climate Friendly Parks: complete GHG inventories, host climate workshops, and develop action plans or environmental management systems.						☑
Pursue CMAQ Program funding to mitigate congestion or address gaps in non-motorized connections to improve air quality and reduce greenhouse gas emissions.	☑			☑	☑	
Maximize energy efficiency and fossil fuel consumption during design and construction of park transportation systems.	☑	☑	☑	☑	☑	
Increase the use of high-efficiency and low-GHG emitting ATS vehicles and boats.					☑	
Develop regional sustainability guidebook to provide leadership, educate and promote sustainable transportation and operations, incorporating such strategies as right-sizing portfolio, green road initiatives, wildlife operational strategies, etc.						☑
PERFORMANCE METRICS						
Number of new Climate Friendly Parks						■
Percentage of new/reconstructed transportation assets incorporating green infrastructure principles/strategies	■	■	■	■	■	
Improvements in air quality						■
Reductions in greenhouse gas emissions	■	■	■	■	■	

Battle Road Trail, Minute Man National Historical Park. Photo by VHB.

Table 8-5: Northeast Region LRTP Recommendations and Performance Metrics—Goal: Ensure Sustainable Operations

Ensure Sustainable Operations: Advance planning and programming in the Northeast Region to ensure the long-term financial, partnership, and operational sustainability of its transportation system	ROADS	PARKING	ROAD BRIDGES	NON-MOTORIZED TRANSPORTATION	TRANSIT AND WATER TRANSPORTATION	OTHER
Objective: Achieve a financially sustainable portfolio of transportation assets						
RECOMMENDATIONS						
Set programming priorities consistent with the Capital Investment Strategy and the goals and objectives of this LRTP.	☑	☑	☑	☑	☑	
Establish performance metrics; define and implement a data collection program to ensure that adequate data exists to prioritize investments.	☑	☑	☑	☑	☑	
PERFORMANCE METRICS						
Decrease in capital funding gap						■
Decrease in O&M funding gap						■
Reduction in deferred maintenance	■	■	■	■	■	
Consideration of TCFO in all transportation investments	■	■	■	■	■	
Completion of study assessing data availability, needs, and collection methods						■
Use caution with respect to investing in pilot projects without a long-term financial plan				■	■	
Performance metrics for which sufficient data are available	■	■	■	■	■	
Objective: Improve the identification and programming of operations and maintenance needs						
RECOMMENDATIONS						
Work with national and regional leadership to strengthen programming and accounting of operations & maintenance activities.	☑	☑	☑	☑	☑	
PERFORMANCE METRICS						
Improved categorization of transportation assets in management systems	■	■	■	■	■	
Improved tracking of transportation-related O&M expenditures	■	■	■	■	■	
Quantification of O&M costs for trails				■		
Quantification of O&M costs of low priority assets targeted for decommissioning	■	■	■			
Objective: Strengthen regional, community, and private partnerships						
RECOMMENDATIONS						
Maintain and broaden partnerships and cooperative planning to fully integrate park service access needs at the community and regional levels	☑	☑	☑	☑	☑	
PERFORMANCE METRICS						
Increased involvement with MPO, FHWA, and DOT planning agencies						■
Number of partnership projects initiated	■	■	■	■	■	
Objective: Establish organizational capacity to plan, implement, and monitor the LRTP recommendations and outcomes						
RECOMMENDATIONS						
Provide the professional staff capacity at the regional level to effectively plan, execute, and monitor the overall transportation program						☑
Track and report progress on regional goals and objectives through periodic updates of this LRTP						☑
PERFORMANCE METRICS						
Percentage of projects obligated						■
Number of goal and objective metrics monitored						■

8.2 Key Findings and Future Planning Efforts

When the Northeast Region and Washington Support Office-Facilities Planning Branch of the National Park Service, in partnership with the Federal Highway Administration's Eastern Federal Lands Highway Division, undertook this pilot long range transportation planning process, they understood that there would be value in the both the plan product and the planning process itself. For the benefit of future long range planning processes, this section highlights some key findings through the development of this plan. This section also identifies some ongoing planning needs.

8.2.1 Key Findings from the LRTP Process

The following paragraphs highlight the key findings through this pilot long range planning process.

Value of LRTP Planning Process

- Forced a region to be organized and methodical about assessing needs and defining what they want to accomplish — vision, goals, and objectives.
- Informed the region on what it did and did not know about its transportation system.
- Verified the value of management system processes and tools (pavement, bridge, safety, ATS, and congestion); confirmed need to prioritize across asset portfolio.
- Validated value of planning, field validation, and pilot projects in informing investments.
- Confirmed that "mega-projects" (e.g., the reconstruction of the Colonial Parkway) are beyond region's ability to fund.

LRTP's Relationship to National Transportation Policy and Guidance

- The Capital Investment Strategy presents a new framework to quantitatively prioritize capital investment decisions. Planning activities and management systems related to the long range planning process can supplement weaker transportation related data elements within FMSS that are necessary for implementing the CIS (specifically Health and Safety, Visitor Use, and Resource Protection).
- *A Call to Action* ushers in a renewed focus on addressing deferred maintenance and funding high priority assets, as well as renewing the NPS mission to resource protection and visitor experiences. The LRTP process confirmed that the Northeast Region's current planning and programming processes are well aligned with *A Call to Action*.
- *A Call to Action* features a number of broad actions (e.g., connections to urban parks, tapping into new park users, and enhancing visitor information systems) that may influence future investment priorities that still need to be analyzed and incorporated into the various transportation planning processes.

Overall Technical Challenges

- It is difficult to complete a regional LRTP amidst evolving policies and ahead of national guidance — best to start a plan after national guidance documents are drafted and when the availability of data, scope, and desired outcomes are well understood by all.
- Confirmed need to engage subject area expertise at the regional level, draw on best practices by others, and get park input at the local level.
- Confirmed the need for better transportation data for planning and performance monitoring across all modes and correlated to LRTP goals.
- Requires extensive communication and coordination among agencies and with stakeholders which, although time consuming, is beneficial to the planning and decision making processes.

8.2.2 Ongoing Planning Investments and Needs

There are a number of ongoing or soon to be initiated planning activities in the Northeast Region that could benefit future transportation planning and programming efforts. These include:

- Safety Management Tier 2 Parks (Phase 2)
- Safety Management ATP Safety Survey and Pilots (Phase 3)
- Safety Management Sign Retroreflectivity (Phase 4)
- bridge validation and Pontis modeling scenario performance testing
- visitor experiences outreach (related to congestion, alternative transportation systems, etc.)
- FY 12 to FY 18 Service-wide Comprehensive Call re-assessment using Capital Investment Strategy evaluation framework
- geospatial modeling of *Call to Action* themes and strategies
- parking prioritization/classification study

- decommissioning case studies
- assessment of data availability, needs and collection methods

Other Identified Planning Needs/Actions: Asset Management

- Build in system updates and means to address data gaps in FMSS, including the changes made to the data for the analyses in this LRTP.
- Develop a method for recording transit system asset condition, deterioration, importance, etc. within FMSS.
- Improve accounting processes or adopt new methodology/guidance for considering operations and maintenance costs related to transportation (across all funding categories).
- Need to develop a more robust investment/policy framework related to this risk assessment that addresses resource adaptation vs. relocation vs. decommissioning/disposal.

Other Identified Planning Needs/Actions: Climate Change

- Future LRTPs should utilize climate data that is better geared towards the National Park Service such as data from the Inventory and Monitoring program, as it becomes available.
- Expand Risk Assessment in future LRTPs to consider climate change scenarios, specifically different intensity storms and various potential levels of sea level rise.
- Expand climate change forecasts to include a greater diversity of factors, such as flooding or extreme heat and cold, as more data become available.
- The Vulnerability Assessment Tool that is currently under development could enhance future LRTP analyses. Functionality of this tool, which allows transportation assets to be analyzed independently, would benefit overall transportation planning and generate results that are relevant to the LRTP process.
- Utilize the risk screening tool being developed by the Office of Federal Lands Highway to better predict the impacts of climate change on transportation assets.

Over the 20-year life of this plan, there is an estimated shortfall in capital to meet needs of about $800 million, and at least $60 million in operating budget shortfall for all NER transportation assets.

Other Identified Planning Needs/Actions: Sustainability

- Establish sustainability "Baseline" in the NER prior to future LRTPs to provide a stronger basis for future planning efforts.
- Incorporate ongoing research (by the NPS and others) on the potential health benefits associated with reduced greenhouse gas emissions and health benefits of increased non-motorized activity.

Other Identified Planning Needs/Actions: Outreach and Partnering

The Northeast Region should develop a plan and approach to working in support of (or in partnership with) local, regional, and state planning bodies to better develop and fund projects in adjacent communities that are consistent with the goals and objectives of this LRTP – particularly as they relate safety, congestion management, regional multimodal and noise quality, and stormwater management/water quality issues.

8.3 Transportation Plan Benchmarks and Updates

The challenges ahead for the Northeast Region to advance the goals and objectives of this LRTP are significant and exacerbated by the gap between the identified needs for capital and operating investment in transportation and the funds available. Over the 20-year life of this plan, there is an estimated shortfall in capital to meet needs of about $800 million (2012 dollars) and similarly of $60 to $120 million in operating budget shortfall for all NER transportation assets. On an annual basis, the estimated needs for capital investment in transportation is about $65 million (2012 dollars) for all NER transportation assets, and the likely funding forecasted to be available is $25 million.

The long-term financial capital forecast reflected in this document represents almost a 30 percent reduction in funding when compared with the average annual capital budget spent on transportation in the Northeast Region over the past decade (about $35 million per year) and without factoring in any additional costs that may be associated with advancing policy directives (visitor experience enhancements, climate change implications, sustainability initiatives, or resource restoration) or adjusting for inflation over the next two decades.

Adding to this deficit is a gap of up to $4 million annually in the operations and maintenance (O&M) budget (needs vs. spending). The O&M funding shortfall undermines the effectiveness of an asset management plan and poses yet another challenge to the Northeast Region when planning for future projects and investments.

The funding outlook — when compared to regionwide needs — underscores the importance of investing every dollar wisely and ensuring that investment decisions are supported by good data and sound planning, as advocated in this LRTP document.

8.3.1 Benchmarking

Through this long range planning process and despite the current gap between needs and funding, the Northeast Region has established an aspirational vision for transportation in the region, with well articulated goals and objectives to serve as a roadmap for the region toward its vision.

The Northeast Region is committed to monitoring and reporting on its progress in advancing the recommendations of this Long Range Transportation Plan. Table 8-6 summarizes the LRTP benchmarks for transportation systems management performance and investment strategies by which the Northeast Region will gauge its success (in the near and longer terms) in achieving sustainable operations.

Table 8-6: Northeast Region LRTP Performance Benchmarks and Summary of Investment Strategies

	Roads	Parking	Bridges	ATS	Safety	Congestion
Overall Transportation Management System Performance Benchmarks	85 PCR (Class 1,2,7) 80 PCR (Class 3,8) 65 PCR (Class 4,5,6) All High Priority Roads (OB 1&2) in Good Condition (FCI<0.10)	80 PCR (High Priority Class 9) 65 PCR (Other Class 9) All High Priority Parking (OB 1&2) in Good Condition (FCI<0.10)	Bridge Health Index 92 None Structurally Deficient	Maintain/Enhance Existing	Reduce severe crashes by 20% Address all identified safety needs within 10 years	Address all identified congestion needs within 10 years
Investment Priorities	All High Priority	All High Priority	All Bridges	Critical Systems	High Priority Safety Improvements	High Priority Congestion Improvements
Current Funding Allocation	67% Decommissioning: 2%		12%	15%	4%	
Opportunities to Advance Other Policy Goals	**Within Forecasted Funding**					
	Incorporate sustainable pavement technologies into programmed projects Decommission some under-performing parking assets Prioritize investments in primary visitor use roads and parking		Improve maintenance procedures Prioritize investment in historic bridge resources	Increase non-automobile access to parks Decommission underperforming ATS	Incorporate as part of on-road investment projects Prioritize high value (benefit-cost) projects Renew and expand crash reporting (multimodal)	Address data needs and low cost projects
	With Additional Funding					
	Address "mega" capital projects			New trails and transit systems Prioritize urban connections Expand high-performing existing ATS	Implement large projects Identify and address trail, transit, and ITS safety projects	
	Decommission all optimizer band 5 assets Adapt assets at-risk to impacts of climate change					

8.3.2 Planning Capacity Moving Forward

This plan has introduced new strategies and initiatives to the Northeast Region that are not present within the current management systems. Additionally, many related planning activities, as described previously, are underway. To implement new strategies and initiatives while continuing to maintain those systems that are already in place presents an organizational challenge and the region needs the professional staff capacity to effectively plan, execute, and monitor the overall transportation program. To be effective, the Northeast Region needs to have the organizational capacity to plan, implement, and monitor LRTP recommendations and outcomes, as well as update the plan over time.

As new strategies and initiatives are rolled out from the regional office, it will eventually come to the individual park units to implement and monitor the outcomes of such programs. This could result in data collection efforts, a greater need for park level interactions with visitors, and continued feedback from the park level to assess the impact that new policies may have on operations. Specific park level staffing needs may not be apparent at this time but there should be some expectation that additional staff may be needed for smooth implementation and overall success. Ultimately, adequate regional and park level staffing will be key to the tracking and reporting of progress on this LRTP's goals and objectives, and ensuring that the many benefits expected from this long range transportation planning process are realized.

National Park Service
U.S. Department of the Interior

Experience Your America™