



National Park Service Southeast Region Long Range Transportation Plan **Needs Assessment Report**



U.S. Department of Transportation
Federal Highway Administration

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1 Introduction

This Needs Assessment report is the third in a series of interim deliverables that inform the development of the Long Range Transportation Plan for the Southeast Region of the National Park Service. This report expands upon the existing circumstances and trends identified in the Future Conditions Assessment report by documenting associated needs for enhancing and sustaining the Southeast Region transportation networks, systems and assets. The purpose of the Needs Assessment is to define gaps between Baseline Conditions and plan goals, recommend actions that may help close that gap, and identify funding necessary to close that gap. Baseline Conditions were documented in a separate submission. To help define the gap between Baseline Conditions and the vision, goals, and objectives of this planning process a review of those goals and other guiding principles is found below.

Vision, Goals & Objectives

The Vision for the Southeast Region (SER) Long Range Transportation Plan (LRTP) is as follows:

The Southeast Region Long Range Transportation Plan will support the NPS mission by maintaining a regional transportation network that provides access to all users, and positive visitor experiences while minimizing impacts to natural and cultural resources. The tools and principles of asset management, resource protection, safety, visitor experience, and sustainability will be used to achieve this vision, while striving to make wise and effective financial and investment decisions.

The SER LRTP Goals, and Objectives are shown in Table 1-1. The gap between the Baseline Condition and the condition characterized by these goals and objectives are the focus of this report.



Table 1-1: SER LRTP Goals and Objectives

Goal	Objectives
Asset Management Allocate transportation funding to ensure the long term viability of transportation systems.	<ul style="list-style-type: none">● Maintain important transportation assets and services in good operating condition through targeted investment.● Use transportation management systems to assist in decision making for improving the overall condition, utilization, and effectiveness of the transportation asset portfolio over time.● Decommission or dispose of lowest priority transportation assets.● Search for innovative financial resources and partnerships to leverage additional funding for transportation projects.
Sustainable Operations Sustainably manage transportation assets and services.	<ul style="list-style-type: none">● Identify and incorporate climate change mitigation/adaptation strategies into aspects of transportation management, planning, design, construction, maintenance, and operations over time as financially feasible.● Maintain flexible use of transportation funding sources while improving identification of transportation needs and expenditures.● Identify and prioritize investments based on legal requirements, agency mission, anticipated lifecycle costs, and consideration of potential future funding.● Utilize the planning process to strengthen effective regional and community relationships.
Safety Provide a safe transportation system for all users.	<ul style="list-style-type: none">● Maximize safety of all visitors and staff while minimizing negative impact to park resources and values.● Address engineering, education, enforcement, and emergency response as part of the safety initiatives in the region.● Manage visitation and transportation operations to minimize visitor and wildlife incidents and multimodal conflicts.
Visitor Experience, Access and Mobility Maintain and enhance the quality of the park visitor experience.	<ul style="list-style-type: none">● Understand and address impacts of congestion where it interferes with the visitor experience or where it damages resources.● Consider and implement, where feasible, improvements and ease of access to and within national park system units for all park users.● Advocate creating a range of appropriate transportation options that provide a network for seamless connections within each park unit and support, where feasible, extending that seamless connection into surrounding communities.● Support, improve or provide, where feasible, traveler information and wayfinding initiatives and, where appropriate, support interpretation and education opportunities that complement transportation.
Resource Protection Protect and preserve natural and cultural resources.	<ul style="list-style-type: none">● Incorporate natural and cultural resource considerations into transportation decision making.● Support the protection and enhancement of cultural transportation resources.



OTHER GUIDANCE DOCUMENTS

The National Park Service and the Federal Highway Administration (FHWA) each provide some guidance on planning for the National Park Service and for transportation in general. In addition to the Southeast Region goals and objectives, the NPS LRTP Elements and the FHWA Planning Factors are both taken into consideration when assessing the gap between Baseline Conditions and Future Conditions. The Southeast Region goals and objectives were developed with the intent of aligning with these guidance documents as well.

NPS LRTP ELEMENTS

The Washington Service Office (WASO) has established high-level planning elements for long range transportation planning. By considering these elements in long range planning the Southeast Region is ensuring that their goals and objectives align with those being adopted nationally. The NPS LRTP Elements are as follows:

1. Asset Management and Facility and Operations Conditions
2. Climate Change and Adaptive Management
3. Resource Stewardship
4. Visitor Experience
5. Funding and Financing
6. Livability
7. Sustainability

FHWA PLANNING FACTORS

Long range transportation planning has been taking place at the state and metropolitan levels for several years and has been guided by the Federal Highway Administration Planning Factors. These planning factors provide guidance that could be considered for any transportation network of any scale.

Table 1-2: Southeast Region Preliminary Vision, Goals and Objectives

FHWA Planning Factors
<ul style="list-style-type: none">● Economic Vitality – Support the economic vitality of the United States, the states, metropolitan areas, and nonmetropolitan areas, especially by enabling global competitiveness, productivity, and efficiency● Safety – Increase the safety of the transportation system for motorized and nonmotorized users● Security – Increase the security of the transportation system for motorized and nonmotorized users● Mobility/Accessibility – Increase the accessibility and mobility of people and freight● Environment – Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns● Connectivity – Enhance the integration and connectivity of the transportation system, across and between modes throughout the state, for people and freight● Efficiency – Promote efficient system management and operation● Preservation – Emphasize the preservation of the existing transportation system

Types of Needs

Southeast Region needs cover a wide scope of issues and vary greatly. Asset needs, for example, are supported by data management systems and historic project funding values, while resource protection needs are unique from one individual park to the next with little detailed historic tracking. In an effort to assess needs that are both quantitative, such as funding and asset condition, and needs that are qualitative, such as resource protection or user experience, these needs will be assessed separately. Financial need in areas lacking data will be presented as approximations only.



2 Asset Management and Investment

This section documents, quantitatively, the full extent of needed investments that would benefit transportation in the Southeast Region and allow the region to maintain assets at the desired condition. Needs are focused on achieving condition targets and the dollar values and funding sources associated with that investment. The identification of need is initially unconstrained so as to not limit the perspective on types and amounts of need in each category. Where possible, needs are put into the context of forecasted funding and a funding gap is derived.

Summary of Financial Forecast

The SER LRTP Future Conditions Assessment report presented the forecast of available transportation funding for the Southeast Region. That forecast is summarized here for reference. It is not an assessment of need; rather, it presents the resources available to the region to address all identified (i.e., unconstrained) needs, and provides the foundation for identifying a funding gap. Table 2-1 provides that summary of anticipated available funds by fund source. The two primary sources are referred to by their authorizing legislation, United State Code Title 54 and Title 23. Title 54 (previously Title 16) covers legislation for the National Park Service; Title 23 governs the Federal Highway Administration (FHWA).

The fiscal forecast is based on historical figures from 2006 through 2013 and has been adjusted for recent or pending changes to those funding titles and their programs. Figure 2-1 shows how those fund sources are expected to be applied in terms of three targeted investment outcomes: improves condition of the portfolio, maintains its condition, or supports portfolio planning and administration.

In brief, the region forecasts \$69.3 million in annual available funding for its transportation systems. The region anticipates, based on historic funding trends, that \$6.7 million of the annual funding will be needed for the ongoing operations and preventive maintenance needs of those transportation systems. Another \$0.9 million will be needed for the planning and administrative costs necessary to manage a regional transportation program. What remains—\$61.7 million—can be invested in transportation-related capital improvements, component renewal and other rehabilitation projects.

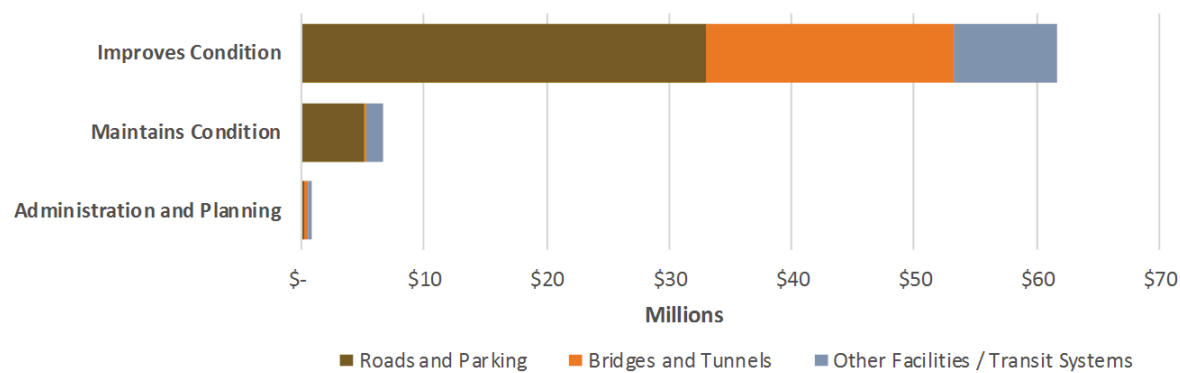
Table 2-1: Southeast Region Funding Forecast

Funding Title	Historic Average Annual Spending (2006-2013)	Forecasted Annual Available Funding	Difference	Percent Difference
Title 54 (NPS managed)	\$16.4	\$20.7	\$4.3	+ 26%
Title 54 Non-Fee	\$15.1	\$18.2	\$3.1	+ 21%
Title 54 Fee	\$1.3	\$2.5	\$1.2	+ 92%
Title 23 (FHWA managed)	\$54.5	\$48.4	-\$6.1	- 11%
Other/External	\$1.0	\$0.3	-\$0.8	- 80%
Grand Total	\$71.9	\$69.3	-\$2.6	- 4%

Note: All dollar amounts shown are in millions.



Figure 2-1: Southeast Region Forecast of Transportation Funding by Project Type and Asset Type



Other Facilities: All other transportation assets found in the FMSS database such as unpaved facilities, trails, non-motorized systems, transit infrastructure, water systems and infrastructure.

Unconstrained Financial Need

The Southeast Region LRTP will present a recommended set of investment strategies for addressing identified, priority transportation needs. An important step to arriving at that strategy is to first define the comprehensive set of needs facing the region by goal area. Here, investment need is identified and discussed. Investment needs represent the unconstrained amount of fiscally derived funding that would be required to bring the Southeast Region's transportation assets to a state of good repair and sustain them at that level in perpetuity.

Because investment need is focused on the asset management principle of facility condition, repair and sustainability, other programmatic needs such as safety needs and resource protection needs are captured in later chapters of this technical report. Needs associated with those goal areas may overlap with the needs identified here or could represent additional commitment needs not captured in this preliminary funding gap.

METHODOLOGY

The National Park Service has developed a servicewide methodology for establishing financial need for long range transportation plans.¹ The Southeast Region has adopted that methodology with a few adjustments to better accommodate regional knowledge and data.

Financial need is identified for all transportation asset types by work type. Because the National Park Service has different data systems of record for transportation, a rubric has been developed that shows how best to apply each dataset when estimating need for a particular asset type (Figure 2-2).²

Need is defined in terms of the various work types that a park would carry out to improve and maintain the transportation systems at a target, good condition in perpetuity. These are the same work types used to plan and track work for any asset in the NPS portfolio, transportation or otherwise: planning (PL), capital improvement (CI), facility operations (FO), preventive maintenance (PM), recurring maintenance (RM), component renewal (CR), administration (AD), deferred maintenance (DM) and programmatic need (PN) (i.e., legislated requirements)³.

In the rubric, note especially that paved roads and parking have data different than what is used for

¹ For methodology specifics, reference section 5.0 of the draft document: "White Paper: Financial Baseline Methodology for the National LRTP", NPS Park Facility Management Division, Facility Planning Branch (2015).

² For explanations of each data source used in the rubric, see also section 5.0 of the draft: "White Paper: Financial Baseline Methodology for the National LRTP", NPS Park Facility Management Division, Facility Planning Branch (2015).

³ Beyond the work types listed, the life cycle of an asset ends with demolition, which is not addressed here.



unpaved roads and parking. For example, FHWA provides a model for paved roads and parking (the Highway Pavement Management Application or HPMa) that can calculate costs needed to achieve a targeted condition levels. In HPMa, that condition metric is the pavement condition rating (PCR). FHWA also provides a bridge model (PONTIS) that calculates need in terms of the bridge health index (BHI). All other assets in any NPS transportation portfolio, including unpaved roads and parking, rely on work orders in the NPS Facility Management Software System (FMSS) to identify need as informed by the facility condition index (FCI).

Figure 2-2: NPS Data Sources Used to Establish Financial Need by Work Type and Asset Type

	PL	CI	FO	PM	RM	CR	AD	DM	PN
Roads (Paved)	HPMA/Pontis Models		Consolidated Master Reoptimization Sheet		Consolidated Master Reoptimization Sheet and HPMA/Pontis Models	HPMA/Pontis Models		None	
Parking (Paved)									
Bridges & Tunnels									
Roads (unpaved), Parking (unpaved) Trails, Buildings, Marinas, Other	(Legacy Projects) PMIS	FMSS Work Order Report				FMSS Component Renewal Profile Report	None	FMSS Work Order Report	
Transit	HPMS/Pontis Models		AFS Historical ATS Trends			HPMA/Pontis Models		None	
			ATS Financial Analysis						

Source: "Historical, Forecasted, and Transportation Funding Needs of SER – Initial Analysis" John A. Volpe National Transportation Systems Center. August 2015, Draft.

With these three models in mind, to arrive at estimated investment need, the Southeast Region applied targets of PCR 85, BHI 92 and assets in 'Good' condition (FCI 0.000-0.109). This approach is consistent with that of the NPS National LRTP. All three targets represent a state of good repair or better.

To simplify the discussion of need and, in turn, the development of the LRTP's strategic investment scenarios, calculated need can be grouped in terms of needed work that:

- Improves condition (Capital Improvement, Component Renewal, Recurring Maintenance, Deferred Maintenance, and Programmatic Need)
- Maintains condition (Facility Operations and Preventive Maintenance)
- Provides Administration (AD) and Planning (PL) support.

All work types in these three groups are vital to sustaining a transportation inventory over time.



FINDINGS

Summary of portfolio deferred maintenance and programmatic need

When documenting portfolio needs, the place to start is existing backlogged work. Better known as deferred maintenance, it is defined as “maintenance that was not performed when it should have been or was scheduled to be and which, therefore, is put off or delayed for a future period.” Continued deferment of required maintenance will result in impaired asset and potential risks to safety, hence, transportation network performance.

The Southeast Region documents a current deferred maintenance backlog of \$1.36 billion. Applying forecasted available annual funding of \$69.3 million (which includes \$47.7 million in Capital and Component Renewal) to deferred maintenance alone, it would take 19 to 20 years to eliminate the DM backlog, without even considering future deterioration and existing backlogs of programmatic (legislatively mandated) portfolio requirements such as accessibility upgrades.

To effectively assess total transportation portfolio needs this deferred maintenance is combined with identified future investment, operations, maintenance and supporting activity requirements needed to repair, enhance or otherwise sustain the condition of the regional transportation portfolio.

Summary of annualized needs for overall transportation portfolio

For planning purposes, investment need going forward is discussed in terms of annual funding amounts. The Southeast Region has estimated annual transportation investment needs of \$204.4 million, including annualizing and incorporating the prior discussed deferred maintenance backlog.

The Southeast Region has broken that need into three groups of intended investment outcomes, an investment that “improves condition”, “maintains condition” or supports “planning and administration” of transportation projects. Improves condition needs comprise \$187.2 million or 92 percent of the total, yearly \$204.4 million in need. Another \$15.7 million in annual need is just to maintain condition (e.g., ongoing operations) of the transportation infrastructure. Less than one percent (\$1.5 million) goes to those annual planning and administrative activities.

Need can be further broken down by funding source, asset type, work type and asset priority needs. Each of these breakdowns will be helpful in the eventual development of LRTP investment strategies.

Needs by Funding Title/Program

Using a combination of planned project data, open work orders and other asset management information, investment needs were tied to each funding title and program. This approach sheds some light on the relative importance of different programs to the overall regional transportation portfolio health.

In order to meet its needs, the Southeast Region can expect to rely on Title 54 for 46 percent of funding requirements, and Title 23 for 54 percent (Table 2-2). Funding sources outside of Title 54 and 23 are expected to be marginal. In other words, the region will need to focus equally on NPS funding sources (Title 54) and FHWA funding (Title 23) when planning an investment strategy. Within Title 54, it is expected that non-fee sources or programs will be more heavily relied upon (\$73.5 out of \$94.5 million) than fee sources, although a greater percentage of that fee funding will go directly into improving condition.



Table 2-2: Southeast Region Transportation Needs by Funding Title

Funding Title	Improves Condition	Maintains Condition	Administrative and Planning	Total Need	Percentage of Grand Total Need
Title 54 (NPS)	\$79.3	\$15.0	\$0.2	\$94.5	46.2%
Title 54 Non-Fee	\$59.9	\$13.5	\$0.1	\$73.5	35.9%
Title 54 Fee	\$19.4	\$1.5	\$0.1	\$21.0	10.3%
Title 23 (FHWA)	\$108.0	\$0.5	\$1.3	\$109.8	53.7%
Other/External			\$0.1	\$0.1	<1.0%
Grand Total	\$187.2	\$15.7	\$1.5	\$204.4	100%

Note: All dollar amounts shown are in millions.

Needs by Asset Type

Evaluating need in terms of transportation system asset type shows the intense requirements for the existing paved road network. Paved roads alone account for more than half — 57 percent — of total need, or \$117.1 million per year (Table 2-3). Bridges and tunnels make up 21 percent or \$43.0 million of annual need. By comparison, parking and transit systems and other transportation assets each comprise about \$21 million or 10 percent of annual need.

Table 2-3: Southeast Region Transportation Needs by Asset Type

Funding Title	Improves Condition	Maintains Condition	Administrative and Planning	Total Need	Percentage of Grand Total Need
Paved Roads	\$109.9	\$7.2		\$117.1	57.3%
Unpaved Roads	\$1.1	\$1.0		\$2.2	1.1%
Parking	\$17.4	\$2.0	\$0.8	\$21.1	10.3%
Bridges and Tunnels	\$42.0	\$1.0		\$43.0	21.0%
Other Assets	\$16.8	\$3.5	\$0.7	\$21.0	10.3%
Grand Total	\$187.2	\$15.7	\$1.5	\$204.4	100.0%

Note: All dollar amounts shown are in millions.

Table 2-3 splits the data by intended investment outcome for each asset type as an additional reference. Administration and planning needs are minimal, less than one percent of need. Small in nature, some administrative and planning funds would actually be needed for all asset types although Table 2-3 only shows need for parking and other (including multimodal) assets.

Needs by Work Type

Funding needed to bring infrastructure into a state of good condition, \$187.2 million, is 12 times the \$15.7 million needed to maintain portfolio condition (e.g., operations and preventive maintenance). Overall, planning and administrative dollars represent less than one percent of total need, \$1.5 million out of \$204.4 million (Table 2-4).

Breaking down need by work type provides good context for considering how to more precisely direct funding in the LRTP strategies to achieve intended outcomes. For example, component renewal needs represent the largest portion of need that would support improving facility condition. Component renewal can be easily identified using NPS FMSS data to map scheduled replacement dates and costs and mapped to certain fund sources (e.g., Cyclic Maintenance) that target component renewal needs.

**Table 2-4: Southeast Region Transportation Needs by Work Type**

Investment Outcome and Work Type	Total Need	Percentage of Grand Total Need
Improves Condition	\$187.2	91.6%
Capital Improvement (CI) – Title 23	\$54.1	26.5%
Recurring Maintenance (RM) – Title 54	\$40.4	19.8%
Component Renewal (CR) – Title 23	\$92.7	45.3%
Maintain Condition	\$15.7	7.7%
Facility Operations (FO) – Title 54	\$10.9	5.4%
Preventive Maintenance (PM) – Title 54	\$4.8	2.3%
Planning and Administrative	\$1.5	0.7%
Planning (PL) – Title 23	\$1.5	0.7%
Grand Total	\$204.4	100.0%

Note: All dollar amounts shown are in millions.

Needs by Project Priority

Needs have also been determined in terms of priority. The infrastructure deemed most critical to mission and operations typically is grouped or banded into a Highest priority category for project funding. The next most critical assets are grouped into a High project priority category. The rest of the portfolio is grouped as an Other (lower) priority. This prioritization approach is rooted in the NPS Capital Investment Strategy and the use of roadway functional classifications and asset Optimizer Bands (i.e., priority rankings); however, several standards are used in the Southeast Region's LRTP to determine priority (Table 2-5).

Table 2-5: Priority Level Groupings for Southeast Region Transportation Assets and Projects

Priority Level	Roads and Parking	Bridges	All Other Assets
Highest	Functional Class 1, 2, & 7	All Bridges	Optimizer Band 1
High			Optimizer Band 2
Other	Functional Class 3, 4, 5, 6, & 8		Optimizer Band 3, 4, 5

Note: All parking areas are grouped as Functional Class 9. To proxy for functional class priority, each parking area was assigned the same functional class as the primary park road leading to that parking area.

With priorities established, need can be apportioned using NPS asset data and project data. Table 2-6 provides the resulting initial assessment of need by priority. The highest priority assets in the transportation portfolio of the Southeast Region represent an annual need of \$162.7 million, or nearly 80 percent of total need.

Table 2-6: Southeast Region Transportation Needs by Priority Grouping

Project Priority	Total Need	Percentage of Grand Total Need
Highest/High	\$162.7	79.6%
Other	\$41.7	20.4%
Grand Total	\$204.4	100%

Note: All dollar amounts shown are in millions.



Funding Gap

Determining a preliminary funding gap is a necessary step for understanding how fiscal constraints might impact strategy development. That gap is defined as the difference between identified need and projected available funding. The Southeast Region has developed a preliminary annualized funding gap assessment, documented here.

METHODOLOGY

The funding gap equals annualized baseline transportation needs minus projected, annualized forecasted funding. Calculation of the gap relies solely, and simply, on the data developed in the funding forecasts and the investment needs assessment.

FINDINGS

Summary of overall gap and drivers of the gap

The Southeast Region forecasts \$69.3 million in annual transportation funding. Stacked up against a \$204.4 million annual need, the resulting annual funding gap is large, \$135.1 million, nearly twice the available budget.

Gap by Funding Title/Program

The projected funding gap for the region looks to be nearly equally split between the two primary funding titles. NPS, Title 54, represents \$73.8 million or 55 percent of the total gap while FHWA, Title 23, captures \$61.5 million of the gap or 45 percent; however, a few aspects of the gap attributable to each title are worth noting as follows:

- Title 54 needs (\$94.4 million) are 85 percent of Title 23 needs (\$109.9 million), but projected available Title 54 funding (\$20.7) is only 22 percent of Title 54 need. Projected available Title 23 funding (\$48.4 million) covers 44 percent of Title 23 need.
- Other FHWA funding programs outside of Title 23 (FTA TRIP/ATPPL, Reimbursable Agreements) do not project to have any impact on either available funding or the funding gap for the region at this time.
- Within Title 54, Non-fee programs are facing large gaps in the Cyclic Maintenance (\$21.8 million), Repair/Rehab (\$20.4 million) and Operational Base (\$9.6 million) programs. These gaps translate to project funds as well as the necessary ongoing operations and maintenance monies needed to sustain infrastructure post investment. Thus the region faces both a substantial gap in project funding and ongoing funding for what should be regularly scheduled component renewal, recurring maintenance, preventive maintenance and operational support.
- The gap in Title 54 funding also becomes a challenge for sustaining infrastructure other than paved assets (roads, bridges, parking and tunnels), which Title 23 primarily funds. With the exception of Federal Lands Transportation Program (FLTP) Category III funds, which are dedicated to alternative transportation system improvements and planning, FLTP funding does not go to support other transportation assets such as buildings, trails, fleet, docks, marinas, etc. The projected availability of FLTP category III funds was not part of modeled data, thus is unavailable.
- Parks collect entrance as well as some transit system user fees that can be used to fund ongoing operations of core visitor transportation systems. However, the projected available funding based on collections falls well short of identified needs. Transportation fees fall \$1.0 million short, a 67 percent gap; Recreation Fee dollars are projected to be \$1.8 million, resulting in a \$17.7 million shortfall or a more than 90 percent gap.



Table 2-7: Southeast Region Transportation Funding Gap, Projected by Funding Title and Program

Funding Title/Program	Forecasted Annual Available Funding	Needs	Gap
Title 54	\$20.7	\$94.4	(\$73.8)
Title 54 Non-Fee	\$18.2	\$73.4	(\$55.2)
Cyclic Maintenance	\$2.7	\$24.5	(\$21.8)
Repair/Rehab	\$4.0	\$24.4	(\$20.4)
Operational Base	\$5.3	\$14.9	(\$9.6)
Line Item Construction	\$4.2	\$5.9	(\$1.7)
Emergency Storm & Flood Damage	\$1.3	\$2.8	(\$1.5)
Other NPS Programs	\$0.7	\$0.9	(\$0.2)
Title 54 Fee	\$2.5	\$21.0	(\$18.5)
Recreation Fee	\$1.8	\$19.5	(\$17.7)
Transportation Fee	\$0.5	\$1.5	(\$1.0)
Concessions Franchise Fees	\$0.2	\$0.1	\$0.1
Title 23	\$48.4	\$109.8	(\$61.5)
Federal Lands Transportation Program	\$47.7	\$109.4	(\$61.7)
Emer. Relief for Federally Owned Roads	\$0.2	\$0.4	(\$0.1)
Other FHWA Programs	\$0.5	\$0.1	\$0.4
Earmarks	\$0.0	\$0.0	\$0.0
Scenic Byways	\$0.0	\$0.0	\$0.0
Public Lands Highway – Discretionary	\$0.0	\$0.0	\$0.0
Other/External	\$0.3	\$0.1	\$0.1
Reimbursable Agreements	\$0.3	\$0.1	\$0.1
Grand Total	\$69.3	\$204.4	(\$135.1)

Note: All dollar amounts shown are in millions.

Gap by Asset Type

Identifying a baseline forecasted gap requires making assumptions about the application of available funding to certain asset types, work types and even asset priorities. To determine an initial gap assessment, estimated forecasted funding by asset type (based on historical spending trends) and estimated need (based on the rubric in Figure 2-2) were compared for five fundamental groups of transportation assets: paved roads, unpaved roads, parking, bridges and tunnels, and transit and other assets.

In absolute terms, paved roads, despite the available FLTP funding being the largest source for the region, faces the largest gap, \$80.1 million (Table 2-8). In other words, another \$80.1 million over forecasted available funding is needed to bring up all paved roads in the region up to, and sustain, a pavement condition rating of 85.

In relative terms, parking faces the largest gap, with only about seven percent of anticipated need covered by projected available funding. Bridges as well as “Other Assets” only are projected to receive a little less than half of needed funding to bring and keep those assets up in good condition.

**Table 2-8: Southeast Region Program Funding Gap, Projected by Asset Type**

Funding Title	Forecasted Annual Available Funding	Total Needs	Gap	Needs met by Forecasted Funding
Paved Roads	\$37.0	\$117.1	(\$80.1)	32%
Unpaved Roads	\$0.3	\$2.2	(\$1.9)	14%
Parking	\$1.4	\$21.1	(\$19.7)	7%
Bridges and Tunnels	\$20.7	\$43.0	(\$22.3)	48%
Other Assets	\$9.9	\$21.0	(\$11.1)	47%
Grand Total	\$69.3	\$204.4	(\$135.1)	34%

Note: All dollar amounts shown are in millions.

Gap by Work Type

The estimated funding gap by work type, again where forecasted available funding by work type is based on historical funding trends and forecast need is based on the need's rubric, reveals that by far the greatest need, \$125.4 million annually, is for funding to address a perceived gap in needed project funding to improve portfolio condition up to good condition. Another \$9.9 million is needed annually to cover project gaps in operations and preventive maintenance needed to sustain good condition in perpetuity; this gap in funding to maintain condition is consistent with the \$9.6 million gap noted in operational base (Table 2-9), the primary funding for facility operations and preventive maintenance.

Table 2-9: Southeast Region Transportation Needs by Work Type

Work Type	Forecasted Annual Available Funding	Total Needs	Gap	Needs met by Forecasted Funding
Improves Condition	\$61.8	\$187.2	(\$125.4)	33%
Capital Improvement (CI)	\$17.7	\$54.1	(\$36.4)	33%
Recurring Maintenance (RM)	\$14.4	\$40.4	(\$26.1)	36%
Component Renewal (CR)	\$29.7	\$92.7	(\$63.0)	32%
Maintain Condition	\$5.8	\$15.7	(\$9.9)	37%
Facility Operations (FO)	\$4.5	\$10.9	(\$6.4)	41%
Preventive Maintenance (PM)	\$1.3	\$4.8	(\$3.5)	27%
Planning and Administrative	\$1.7	\$1.5	\$0.2	113%
Planning (PL)	\$1.7	\$1.5	\$0.2	113%
Grand Total	\$69.3	\$204.4	(\$135.1)	34%

Note: All dollar amounts shown are in millions.

Gap by Project Priority

Using the prioritization schematic and needs presented in Table 2-5 and Table 2-6, respectively, and projecting forecasted available funding to reflect the 98 percent and two percent split consistent with a historical or business as usual approach for the Southeast Region, an estimated gap by project priority has been determined (Table 2-10). Accordingly, a \$94.8 million gap for highest and high priority assets has been identified and represents 70 percent of the total gap.



Table 2-10: Southeast Region Transportation Needs by Priority Grouping

Project Priority	Forecasted Annual Available Funding	Total Needs	Gap	Needs met by Forecasted Funding
Highest/High	\$67.9	\$162.7	(\$94.8)	42%
Other	\$1.4	\$41.7	(\$40.3)	3%
Grand Total	\$69.3	\$204.4	(\$135.1)	34%

Note: All dollar amounts shown are in millions.

Summary

The Southeast Region LRTP will be a fiscally constrained plan. To develop a plan that fits within those constraints, an understanding of total need and funding available to address that need is essential. With an estimated annualized need of \$204.4 million, and a forecast of \$69.3 million in annual available transportation funding, the Southeast faces an annual funding gap of \$135.1 million.

Furthermore, 70 percent of the gap (\$94.8 million) is tied to the region's highest priority assets, a gap that represents nearly one and a half times the available funds (\$67.9 million) for those same assets.

Given the gap size and that it is attributed to the region's highest priority assets, the Southeast Region will have to structure its future investment strategies so that goals can be achieved and progress demonstrated on at least targeted subsets of those highest priority assets. Additional needs such as safety, visitor use and resource protection that fall outside of typical portfolio maintenance and management needs will further constrain the region and complicate the development of those investment strategies.

****UPDATED DATA AS OF SEPTEMBER 2016****

Geared to reflect the principles of both the CIS and TCFO asset management best practices, the SER developed its LRTP investment scenarios in two steps. Initial scenarios used preliminary forecasted funding data and potential investment approaches. With those scenarios built out, the region identified what it believed would be the most optimal strategy, (discussed in more detail in the Funding and Financial Analysis Technical Report). The region then discussed this strategy in greater detail with LRTP stakeholders internal and external to the NPS and updated the analysis using revised estimates of forecasted funding, prioritized project needs, and modeled outcomes (i.e., condition forecasts). This enhanced analysis, and the processes and data used to develop that analysis, are included in the updated information below.

UNCONSTRAINED FINANCIAL NEED (UPDATED)

Investment needs are the unconstrained amount of fiscally-derived funding required to bring SER transportation assets to a state of good repair. Investment needs also include programmatic requirements to address legislated needs such as code compliance, structural fire and accessibility. Other goal area needs such as resource protection may overlap with asset management (TCFO) needs or may be additional, potentially unfunded requirements.

Methodology (Updated)

To arrive at the total annual estimated investment need, the SER applied three condition targets consistent with the National LRTP, each of which represents a state of good repair or better:

- Pavement Condition Rating (PCR) of 85 for all NPS owned and maintained public roadways
- Bridge Health Index (BHI) of 92 percent for all NPS owned and maintained bridges
- Facility Condition Index (FCI) of 'Good' condition (FCI <= 0.109) for all other NPS owned and maintained transportation assets.

Calculated need was then grouped by work type category: Improves Condition, Maintains Condition or Non-condition investment (e.g., planning and administration support).



Need by Asset Category (Updated)

The updated total annual estimated need for the SER is \$182.2 million. Assessing need in terms of transportation system asset category shows intense requirements for the existing paved road network. Paved roads alone account for over half (52 percent) of the total unconstrained need, or \$95.0 million per year (Table 2-11). Bridges and tunnels make up 24 percent or \$43.0 million of annual need. By comparison, parking and transit systems and other transportation assets each comprise about \$21 million or 12 percent of annual need each.

Table 2-11: SER Transportation Needs by Asset Category (\$ in 2014 Millions)

Funding Title	Improves Condition	Maintains Condition	Administrative and Planning	Total Need	Percentage of Total Need
Paved Roads	\$87.7	\$7.2	<\$0.1	\$95.0	52%
Unpaved Roads	\$1.2	\$1.0	<\$0.1	\$2.2	1%
Parking	\$17.4	\$2.9	\$0.8	\$21.1	12%
Bridges and Tunnels	\$42.0	\$1.0	--	\$43.0	24%
Other Assets	\$16.7	\$3.5	\$0.7	\$20.9	11%
Total	\$165.0	\$15.7	\$1.5	\$182.2	100%

Need by Work Type (Updated)

By breaking down the total estimated unconstrained annual need by work type and intended investment outcome, the region found context for more precisely directing funding to achieve intended outcomes. For example, CR represents the largest portion of need that Improves Condition. The total funding of \$165.1 million needed to bring infrastructure into a state of good condition (i.e., CR, RM and CI), is more than 10 times the \$15.7 million needed for Maintain Condition activities (i.e., FO and PM) (Table 2-12). Overall, planning and administrative dollars represent less than one percent of the total estimated annual need, \$1.5 million out of \$182.2 million.

Table 2-12: SER Transportation Needs by Work Type (FY 2016–FY 2020) (\$ in 2014 Millions)

Investment Outcome and Work Type	Total Need	Percentage of Total Need
Improves Condition	\$165.1	91%
Capital Improvement (CI)	\$32.0	18%
Recurring Maintenance (RM)	\$40.4	22%
Component Renewal (CR)	\$92.7	51%
Maintain Condition	\$15.7	9%
Facility Operations (FO)	\$10.9	6%
Preventive Maintenance (PM)	\$4.8	3%
Planning and Administrative	\$1.5	<1%
Planning (PL)	\$1.5	<1%
Total	\$182.2	100%

Need by Priority (Updated)

Needs have also been determined in terms of highest, high and other priority assets (see Table 2-2). The region identified need in terms of these set priorities (Table 2-13) using FMSS and project data. The highest priority SER transportation assets represent an annual need of \$128.3 million, or 70 percent of total need.



Table 2-13: SER Transportation Needs by Priority Group (\$ in 2014 Millions)

Priority	Total Need	Percentage of Total Need
Highest	\$128.3	70%
High	\$12.3	7%
Other	\$41.7	23%
Total	\$182.2	100%

Funding Gap (Updated)

With both forecasted funding and investment need identified, the region next calculated the shortfall in transportation funding to quantify how fiscal constraints will impact strategy development. This estimated funding gap totals \$120.5 million each year, on average, over the period of FY2016 – FY2020. The estimated cumulative gap over this five-year period is thus approximately \$603 million.

Methodology (Updated)

The region calculated its average annual funding gap as the estimated annualized baseline investment needs minus annualized forecasted transportation funding. The gap calculation relied solely, and simply, on the data developed in the funding forecasts and the investment needs assessment. The gap was then broken down in terms of fund sources, work types, asset categories and priority.

Gap by Fund Source (Updated)

The region estimated its average annual funding gap according to the historically observed distribution of primary fund sources (Table 2-14). Of the total \$120.5 million gap, Title 23 represents the bulk, \$77.2 million or 57 percent. Titles 16 and 54 represent nearly the full remainder of the gap: \$47.5 million or 37 percent. Title 16 / 54 Non-fee (versus Title 54 Fee), comprises \$37.4 million of that \$47.5 million shortfall for those funding titles. A few aspects of the gap attributable to each title are worth noting:

- Other FHWA funding programs outside of Title 23 (e.g., Title 49 FTA TRIP/ATPPL and Reimbursable Agreements) do not project to have any impact on either available funding or the funding gap for the region at this time. Title 49 TRIP funding was eliminated with MAP-21. Reimbursable agreements are not predictable or large enough in magnitude to substantially increase expected available funding.
- Within Title 54, Non-fee program gaps in the Cyclic Maintenance, Repair/Rehabilitation and Operational Park Base programs affect not only project planning but ongoing annual maintenance needed to sustain core transportation infrastructure. Ensuring that adequate funding is available to sustain highest and high-priority infrastructure will be an important part of an optimal strategy.
- The gap in Title 54 Non-Fee and Title 16 / 54 Fee program funding also becomes a challenge for sustaining infrastructure other than paved assets (roads, bridges, parking and tunnels), which Title 23 primarily funds. With the exception of FLTP Category III funds, which are dedicated to alternative transportation system improvements and planning, FLTP funding does not go to support other transportation assets such as buildings, trails, fleet, docks, and marinas. Values presented for the Title 23 funds represent available FLTP Category I and Category III funds. Category II funds were not included in the funding forecast, which is in alignment with the regional TIP. There likely will be FLTP funds invested in construction of federally-mandated parkways in the SER.
- Some SER park units collect entrance fees as well as some transit system user fees that can be used to fund ongoing operations of core visitor transportation systems. However, the projected available Title 16 and 54 Fee funding falls well short of identified needs. Transportation and recreation related fees fall \$10.1 million short, a gap that exceeds the forecasted available funding of \$2.5 million by more than four times.



Table 2-14: SER Average Annual Transportation Funding Gap, by Funding Title and Program (FY 2016–FY 2020) (\$ in 2014 Millions)

Funding Title/Program	Forecasted Annual Available Funding	Needs	Gap	Percentage of Total Gap
Title 16 / 54	\$20.7	\$68.2	(\$47.5)	37%
Title 54 Non-Fee	\$18.2	\$55.6	(\$37.4)	31%
Title 16 / 54 Fee	\$2.5	\$12.6	(\$10.1)	8%
Title 23	\$32.4*	\$109.6*	(\$77.2)	57%
Other/External	\$0.3	\$4.5	(\$4.2)	3%
Subtotal – NPS-Owned Assets	\$53.3			
Reallocated Funds - Tamiami Trail	\$8.4			
Reconciled Total Funding	\$61.7	\$182.2	(\$120.5)	100%

*Excludes \$8.4 million of annual available funding planned for the Tamiami Trail, which is included as a separate line item in this table in order to reconcile total identified annual available funding for the region of \$61.7 million.

Gap by Asset Category (Updated)

Identifying a baseline forecasted gap requires making assumptions about the application of available funding to certain asset categories, work types and even asset priorities. Gaps were identified and compared for six groups of transportation assets: paved roads, parking, bridges and tunnels, trails, transit, and other assets (Table 2-15).

In absolute terms, paved roads, despite the available FLTP funding being the largest source for the region, faces the largest estimated annual funding gap, \$59.1 million. In relative terms, parking faces the largest annual funding gap on a percentage basis, with only about four percent of the total anticipated annual need (\$21.1 million) projected to be covered by forecasted available funding (\$0.8 million).

Table 2-15: SER Average Annual Program Funding Gap, by Asset Type (FY 2016–FY 2020) (\$ in 2014 Millions)

Asset Category	Forecasted Annual Available Funding	Total Needs	Gap	Asset Category Needs met by Forecasted Funding
Paved Roads	\$35.0	\$95.0	(\$59.1)	37%
Parking	\$0.8	\$21.1	(\$20.3)	4%
Bridges and Tunnels	\$6.2	\$42.5	(\$36.3)	15%
Trails	\$3.7	\$12.2	(\$8.5)	30%
Transit	\$2.1	\$4.5	(\$2.4)	47%
Other Assets	\$4.6	\$6.9	(\$2.3)	67%
Subtotal – NPS-Owned Assets	\$53.3			
Reallocated Funds - Tamiami Trail	\$8.4*		\$8.4	
Total	\$61.7	\$182.2	(\$120.5)	29%

*Reflects an agreed contribution or commitment to fund the Tamiami Trail project managed by FDOT. This commitment reduces available funds for NPS-owned assets and impacts projected amount of met needs.

Gap by Work Type (Updated)

The region determined its funding gap by work type (Table 2-16) and showed that by far the greatest annual funding gap is for \$118.1 million to address project needs that Improve Condition of the portfolio up to a rating of “good.” Another \$10.0 million is needed annually to cover project gaps in operations and preventive maintenance needed to sustain good condition in perpetuity. This gap in funding to Maintain Condition is consistent with the gap noted in Operational Park Base, the primary funding for FO and PM as documented in the *SER LRTP Needs Assessment technical report, April 2016*.

Despite absolute gaps in funding levels, all three categories of work type need fall substantially short on a



percentage basis. Forecasted funding will cover 28 percent of Improves Condition need, 36 percent of Maintains Condition need and 40 percent of Non-condition planning and administrative needs.

Table 2-16: SER Transportation Needs, by Work Type (\$ in 2014 Millions)

Work Type Grouping	Forecasted Annual Available Funding	Total Needs	Gap	Needs met by Forecasted Funding
Improves Condition	\$47.0	\$165.1	(\$118.1)	28%
Capital Improvement (CI)	\$2.2	\$32.0	(\$29.8)	7%
Recurring Maintenance (RM)	\$27.3	\$40.4	(\$13.1)	68%
Component Renewal (CR)	\$17.5	\$92.7	(\$75.2)	19%
Maintain Condition	\$5.6	\$15.7	(\$10.0)	36%
Facility Operations (FO)	\$4.4	\$10.9	(\$6.5)	40%
Preventive Maintenance (PM)	\$1.2	\$4.8	(\$3.5)	25%
Non-condition (Planning and Administrative)	\$0.6	\$1.5	(\$0.8)	40%
Planning (PL)	\$0.6	\$1.5	(\$0.8)	40%
Subtotal – NPS Owned Assets	\$53.3			
Reallocated Funds - Tamiami Trail	\$8.4*		\$8.4	100%
Total	\$61.7	\$182.2	(\$120.5)	29%

*Reflects an agreed contribution or commitment to fund the Tamiami Trail project managed by FDOT. This commitment reduces available funds for NPS-owned assets and impacts projected amount of met needs.

Gap by Priority (Updated)

Table 2-17 and associated graphic summarizes the identified gaps by asset priority. This summary reflects the previously identified needs and funding anticipated for the SER's highest, high and other priority assets. It is consistent with a historical or business as usual approach for the SER in terms of how it has allocated funding to priority assets in the past. The estimated gap by project priority shows a \$90.7 million annual gap for just the highest priority assets by themselves, representing 70 percent of the total gap. The \$8.4 million of FLTP funds the region will contribute to the state of Florida to support the Tamiami Trail construction projects affects the region's ability to further address the funding gap on its highest priority transportation assets.

Table 2-17: Funding Gap Summary for the SER Transportation Portfolio, by Priority (\$ in 2014 Millions)

Priority Grouping	Available Annual Funding	Funding Gap	Total Needs
Highest	\$37.5	(\$90.7)	\$128.3
High	\$3.6	(\$8.7)	\$12.3
Other	\$12.2	(\$29.5)	\$41.7
Subtotal – NPS Owned	\$53.3		
Non-NPS (Tamiami Trail)	\$8.4	\$8.4	
Total	\$61.7	\$120.5	\$182.3



While this dollar amount and relative size of the gap for highest priority assets might seem large, it is expected:

- Thirty-nine percent of SER paved roads are classified as highest priority, by quantity that amounts to 81 percent of the region's paved road network. Parkways such as Natchez Trace Parkway and Blue Ridge Parkway are large contributors to this count-quantity dichotomy.
- The SER maintains more bridges than any other NPS region. Consistent with the National LRTP, the SER classifies all bridges as highest priority.
- All transit systems, which require intensive operational support, are designated highest priority.

The types and quantities of transportation assets that are of the highest priority are critical to the safe and enjoyable visitor experience of and access to SER parks. It would be unreasonable to expect many, if any, of these highest priority assets to be lowered in priority for the sake of trying to balance the distribution of asset priorities across the highest, high and other priority groups.



3 Transportation Network Needs

This section documents, qualitatively, the needed investments that would benefit transportation in the Southeast Region. Needs are identified in terms of the LRTP goal areas: sustainable operations; safety; user experience, mobility and access; and resource protection. The identification of need is an approximation that assumes an unconstrained funding source. Given the reality of constrained funding sources, needs described here could be bundled with other projects, addressed with the help of an internal or external partner, or funded through other funding grants.

Data Needs and Gaps

As part of the survey of SER park units conducted in 2015 for this LRTP, park staff were queried about the importance and adequacy of transportation information provided to visitors by the park. The Figure 3-1 matrix summarizes the results based on importance and adequacy. The top half of the matrix are those information sources most frequently deemed of high importance and the right half of the matrix are those information sources that are provided adequately.

Almost every SER park unit (96%) reported that static wayfinding or directional signs leading to their unit is important to visitors, although over half (52%) reported that these signs were not adequate, and a small proportion (7%) reported that their park unit did not have these signs. Additionally, over half of SER park units (58%) reported that a smartphone app was important for providing transportation information to visitors, although a large majority of park units (81%) reported that they did not have a smartphone app. This indicates that two areas of need within SER park units exist to provide transportation-related information to visitors via these two information sources. Specifically, to help visitors find their unit, SER park units need more, updated static wayfinding or directions signs leading to their unit. Additionally, there is a need within SER park units to develop smartphone apps that visitors could use to get transportation-related information. These smartphone apps could additionally be used to provide visitors with onsite information about park resources, including interpretive programming.

Figure 3-1. Importance and Adequacy of Transportation Information Provided to Visitors

HIGHER IMPORTANCE / INADEQUATE AVAILABILITY Smartphone app Static wayfinding to Unit	HIGHER IMPORTANCE / ADEQUATE AVAILABILITY Unit website Social media NPS Visitor Center Telephone information line Tourist information center NPS printed materials Static wayfinding within Unit
LOWER IMPORTANCE / INADEQUATE AVAILABILITY Wayside exhibits on approach to Unit Highway Advisory Radio Variable message signs on approach to Unit Variable message signs within Unit	

Source: NPS Southeast Region LRTP Transportation Survey Results. RSG, February, 2015.



As part of the LRTP survey of SER park units, park staff were also asked about the importance and acceptability of transportation-related data for the management of their park units. Figure 3-2 displays the importance/ acceptability of transportation-related data for managers in the Southeast Region.

Figure 3-2. Importance and Acceptability of Transportation Data in the SER

HIGHER IMPORTANCE / INADEQUATE AVAILABILITY Traffic counts on roads within Unit Transportation-related visitor experience impacts Transportation-related resource impacts Visitor's use of trip planning information sources Visitor travel patterns to and within Unit Vehicle occupancy rates Parking lot occupancy and turnover data Safety data (e.g., crash data, road safety audits)	HIGHER IMPORTANCE / ADEQUATE AVAILABILITY Traffic counts at entrance stations/access points Parking inventory
LOWER IMPORTANCE / INADEQUATE AVAILABILITY Non-visitor (e.g., commuter) traffic counts Transit/shuttle ridership counts Wait times at entrance stations	

Source: NPS Southeast Region LRTP Transportation Survey Results. RSG, February, 2015.

The majority of SER park units report that almost all (10 of 13) of the transportation data sources listed in the survey were perceived to be important to management of their unit. Yet the majority of SER park units report that over half (7 of 13) of the transportation data listed within the survey were perceived to be important for the management of SER park units, and were perceived to be of unacceptable quality or not available by the majority of SER park staff. Specifically, traffic counts on roads within SER park units was the second most important piece of transportation data, although almost two-thirds (64%) of SER park units reported that their traffic count data on roads within their unit were unacceptable or that these data were not available. The next most important piece of transportation data that was perceived to be unacceptable or not available is transportation-related visitor experience impacts.

This indicates that while the large majority of transportation related data are important for the management of SER park units, a large proportion of these data sources (7 of 13) are perceived to be of unacceptable quality to SER park units, or not available to these units. This information highlights a need within the Southeast Region to provide higher quality transportation-related data to SER park units, particularly related to visitors' use of the transportation network (e.g., count data on roadways, visitor travel patterns) or visitor experience or resource impacts related to transportation.



Sustainability

Sustainable operations is a three-part concept, all of which are reflected in the objectives for this goal area. Sustainability can be viewed as financial, social, or environmental.

FINANCIAL SUSTAINABILITY

Identification of funding for financially sustainable investments was discussed in the prior section. The financial analysis work quantifies funding needs to achieve the condition goals for the transportation system. The funds needed to maintain the current system were projected under the assumption that investments will be made efficiently with a focus on bundling projects to reduce design and construction costs and that appropriate planning measures will be taken to ensure effective investing. Financially sustainable strategies and practices include:

- Bundling projects to reduce costs and make more efficient use of funding,
- Considering the Total Cost of Facility Ownership (TCFO) including operations and maintenance of assets and systems, and
- Making life-cycle cost estimates rather than simple project cost estimates to ensure that sufficient funding can be allocated over the lifetime of an asset.

The Southeast Region, like the entirety of the National Park Service, will continue to be challenged to find the funding necessary to sustain its transportation asset portfolio at an acceptable condition. Maintaining the subset of Highest Priority assets for the region at acceptable condition levels will be challenging over the next six years, and into the future.

In this era of tightening budgets and increasing DM backlogs, it is critical that the SER try to be as nimble as possible in investing in its transportation network. To do so, the region needs to be able to identify areas of greatest need and apply scarce resources to those needs in a relatively timely and efficient manner. The region will need to continue its efforts to identify, obtain, and use the best available data to support its investment decisions.

The SER should work with its stakeholders, regional and national, to look for other ways to fund transportation needs. Options such as tapping new or different funding sources and engaging in public-public or public-private partnerships should be further investigated.

****UPDATED DATA AS OF SEPTEMBER 2016****

The Fixing America's Surface Transportation (FAST) Act may offer additional funding opportunities, as it features increased FLTP funding for the National Park Service and a pair of new programs—the Nationally Significant Federal Lands and Tribal Transportation Project Program, and the Nationally Significant Freight and Highway Project Grant Program—that have the potential to assist the region in funding some of its larger infrastructure needs.

ENVIRONMENTAL SUSTAINABILITY

Climate Friendly Parks

The NPS Climate Friendly Parks Program has been growing over the last several years. The purpose of this program is to give park units the knowledge and tools to make decisions across all of their operations that can reduce energy consumption and emissions to air and water. Ultimately, each park unit in the Southeast Region should participate in and complete the Climate Friendly Parks program to increase awareness for green practices and to establish an emissions and air quality baseline.



Climate Change and Vulnerability

The dangers of climate change to the Southeast Region have been well documented, and nationally, the National Park Service has acknowledged the importance of planning for climate change.

In order to stay ahead of the threat of climate change, the Southeast Region needs to monitor the changes in the environment at individual park units and be cognizant of the threats of sea level rise and extreme weather events on transportation assets. Action should be taken to adapt or decommission assets before they become critically threatened where the loss of an asset causes large issues of access or connectivity for a park unit. From the standpoint of long range transportation planning, climate change and extreme weather events must play an important role in transportation investments and decision-making.

A May 2015 study titled *Adapting to Climate Change in Coastal Parks* completed an inventory of transportation assets at coastal parks in four regions including the Southeast Region. Thirteen coastal parks in the Southeast Region were inventoried, and all were found to have significant numbers of assets with high exposure to sea level rise of one meter. Those park units and the number of assets with high exposure to sea level rise are listed below. Note that the asset analysis includes all asset types, not exclusively transportation assets.

- Big Cypress National Preserve – 210 assets
- Biscayne National Park – 68 assets
- Cape Hatteras National Seashore – 559 assets
- Cape Lookout National Seashore – 289 assets
- Canaveral National Seashore – 167 assets
- Castillo de San Marcos National Monument – 54 assets
- Cumberland Island National Seashore – 33 assets
- De Soto National Monument – 10 assets
- Everglades National Park – 493 assets
- Fort Pulaski National Monument – 52 assets
- Fort Sumter National Monument – 38 assets
- Gulf Islands National Seashore – 355 assets
- Timucuan Ecological and Historic Preserve – 42 assets

These 13 park units in particular should consider monitoring climate conditions and evaluating the function of assets at high exposure to sea level rise. Adaptation or decommissioning could be considered for those assets with high exposure. Since the completion of this study, additional park units have been surveyed.

Coastal park units are not the only park units that are affected by extreme weather events. Inland parks can be impacted when the surrounding water systems are subject to extreme conditions. A recurring problem that was discussed during focus park visits and discussions with the advisory board is the damaging cycle of drought and extreme rains that overwhelms culverts and roadway drainage systems and leads to sections of roadways being washed out. Additional transportation-related climate change impacts include the undermining of the roadway surface from runoff and the destabilization of ditches, shoulders, and mountain cut slopes and overhangs.

In order to prepare for inland flooding, an inventory of roadway drainage systems, including culverts specifically, is important to planning for an adapting inland road networks. Such an inventory would include as-built details about each structure to help identify undersized culverts and prevent damage due to extreme weather events in the future. Furthermore, when culverts are replaced, consideration should be given to the potential need for upsizing or relocating culverts.



SOCIAL SUSTAINABILITY AND LIVABILITY

Social sustainability focuses on the importance of forming strong partnerships with other agencies, being a transportation partner in forming livable communities through active transportation, and helping to foster stronger communities as a recreational and educational resource.

Fostering social sustainability requires partnerships. Moving forward, park units in the Southeast Region should continue to form and build networks of partners. Partnerships at the federal, state, and local levels can help identify new or leverage existing funding opportunities, and are vitally important to helping bridge the substantial gap between the anticipated needs of the region's transportation system and the projected available funding to meet those needs.

Partnerships do not have to be limited to transportation partners such as Departments of Transportation or public works agencies, however. They should also incorporate community groups, natural/cultural protection groups, and youth groups. These groups all represent transportation network users whose needs should be understood and incorporated into transportation planning and projects.

The Southeast Region should continue to form and build networks among community-based organizations to support the region's outreach efforts to traditionally underserved populations. The region should also continue to pursue partnership opportunities to enhance multimodal connections between park units and gateway communities, particularly in urban and suburban contexts. A number of park units in the Southeast Region are well positioned to further engage urban and suburban gateway communities and attract new visitors to recreate where they live, in keeping with the NPS *Urban Agenda*—for example, Kennesaw Mountain National Battlefield Park and Martin Luther King Jr National Historic Site in metro Atlanta; portions of the Blue Ridge Parkway near Asheville and Boone, North Carolina, and Roanoke, Virginia; New Orleans Jazz National Historical Park; and Stones River National Battlefield in the Nashville metro area.

In addition to the substantial contributions to research and guidance on transportation-related climate change impacts, the Southeast Region also should look to build on the work of internal and external partners to better understand those impacts, and identify effective and feasible adaptation and mitigation solutions.

Safety

One of the goals of the Southeast Region is to provide a multimodal transportation network that keeps visitors and staff safe. In the past, and undoubtedly in the future, there were very few standalone safety projects and most safety issues have been addressed as part of a larger project. Nonetheless, there are some specific policies, studies and projects that will be needed to support the safety goals of the LRTP.

DATA NEEDS

A key need for the Southeast Region transportation safety program is historic crash data. Identifying transportation safety needs and countermeasures is often thought of with a two stage approach: reactive countermeasures and predictive countermeasures. The reactive approach uses historic crash data to identify critical locations and develop countermeasures while the predictive approach uses a combination of historic data and network characteristics to predict what locations may have critical safety needs.

At this point, the Southeast Region does not have a comprehensive database of current crash information. Developing such a database is necessary to begin properly identifying critical crash locations. A crash database should include factors such as crash location, manner of collision, type of crash, crash severity, and roadway conditions. Such a database can be used to identify safety needs, incorporate needs into a program of projects, and take advantage of opportunities to bundle safety need with other on-going projects. Development of a comprehensive crash database cannot be completed by the Southeast Region alone, rather, this will require coordination between the region, the Washington Service Office (WASO), individual park units, and, sometimes, local law enforcement officials.



Crash databases have typically focused on motor vehicle crashes along roadways and in parking lots. Another perspective on crashes to be cognizant of is multimodal crashes—crashes on transit vehicles or on non-motorized trails. The first need in addressing transit or non-motorized trail safety needs would be to identify the magnitude of this safety concern and determine an appropriate response. If a crash database is not appropriate, then localized safety studies may be a better approach.

Without comprehensive crash data, identifying specific safety needs or trends is difficult. Nationally, the National Park Service is recognizing the value of completing planning-level safety studies at appropriate locations to better understand safety needs in the transportation network. WASO is encouraging regions to invest in more such safety studies, approximately two to four studies per year. Locations with an ongoing safety need that are identified through best available crash data and observed deficiencies from local staff would be candidates for a planning-level safety study. Such a study would likely include a corridor or intersection review at relevant locations, detailed review of all available crash data, input from local stakeholders, and possibility a Roadway Safety Assessment if that is viewed as appropriate. The outcomes from such safety studies would be a program of specific projects that will include implementation of targeted countermeasures to reduce crashes.

STAFFING NEEDS

Staffing represents another safety need for the region. Staff at every SER Focus Park cited understaffing as a major impediment to the parks' ability to conduct business. These staffing shortages are particularly acute in regard to safety, and impact parks' data collection and enforcement efforts. Additional staff would enable parks to better leverage IMARS in aggregating and analyzing crash data to identify safety hotspots and crash trends.

Additional law enforcement staff would enhance parks' ability to both enforce the rules of the road and respond to emergency situations. Several SER parks maintain memorandums of understanding (MOUs) with local municipalities for law enforcement; however, local police often aren't able to enforce Code of Federal Regulations (CFR) statutes.

SYSTEMIC COMPLIANCE NEEDS

Other safety measures that should be considered that do not require crash data so much as an inventory of existing assets are systemic compliance needs. Two areas in particular that may require attention are signage retroreflectivity and Architectural Barriers Act (ABA) compliance. Both of these safety issues should be inventoried and addressed through incorporation into other transportation projects. To encourage enhanced transportation safety throughout the National Park Service, WASO is able to provide a "fair share" of funding for such efforts where there is a demonstrated need.

Current directives require that a plan for management or assessment of regulatory and warning signage retroreflectivity be adopted by agencies. The goal of this program is to ensure that signs meet the current standards for retroreflectivity to ensure greatest visibility for drivers. Deficient retroreflectivity could result in signs that are not clearly legible to drivers during dark conditions or poor weather.

ABA requires that certain minimum design standards be achieved in order to accommodate users with disabilities. Common deficiencies include insufficient sidewalk width, lack of wheel chair ramps, and lack of accessible pedestrian travel ways. This is not only a concern for user safety, but also from the standpoint of park unit access and mobility. Insufficient travel ways or unnecessary barrier can limit an individual's ability to travel in a park.



Visitor Experience, Access and Mobility

In the SER Transportation Survey, park staff were asked how they would expect their unit's visitation trend over the next 10 years to impact transportation needs within their unit (Figure 3-3). As reported in the SER LRTP Future Conditions Assessment report, the majority of SER park units indicated that visitation trends in the next 10-years would increase the need for operations, maintenance, and facility improvements (e.g., parking, trails, and paved roadways). These operations and facility improvement needs are represented by almost every SER park unit (89%), and are clearly a high funding priority need within these park units. Operations and facility improvements will directly impact the quality of the transportation-related visitor experience. The majority of the needs identified by SER park staff related to transportation facilities within their park unit.

Also within the survey of SER park units, staff were also asked about how visitation trends may impact the need for potential management actions related to transportation-related issues within their park. Over half (52%) of SER park units indicated that visitation to their park unit would increase the need to limit use to protect resources and visitors' experiences. This indicates that while visitation is expected to increase (some significantly) over the next 10 years, limiting this use could be used as a management technique to help reduce the potential impact on resources and visitors' experiences. At this time, the National Park Service is developing their understanding of congestion in park units, identifying the carrying capacity of park resources, and understanding the impacts that growing congestion can have on park unit resources. A Congestion Management System is being piloted for potential use throughout the National Park Service.

The survey also asked about the need to shift use to off-peak times to protect resources and visitors' experiences. While only one-third (32%) of SER park units felt that visitation to their park over the next 10 years would increase the need to shift use to off-peak times, this management approach may be more well received by managers and park visitors than limiting use all together. Almost half of SER park units also indicated that visitation trends over the next 10 years would increase the need for new alternative modes of transportation within their unit (48%) and for shuttle bus service (42%). While introducing shuttle bus service or new alternative modes of transportation could help reduce congestion on park roadways and in parking lots, this may have little to no impact on crowding along trails and at attraction sites, or could lead to even more crowded trails/attractions sites if shuttle service is demand-driven.

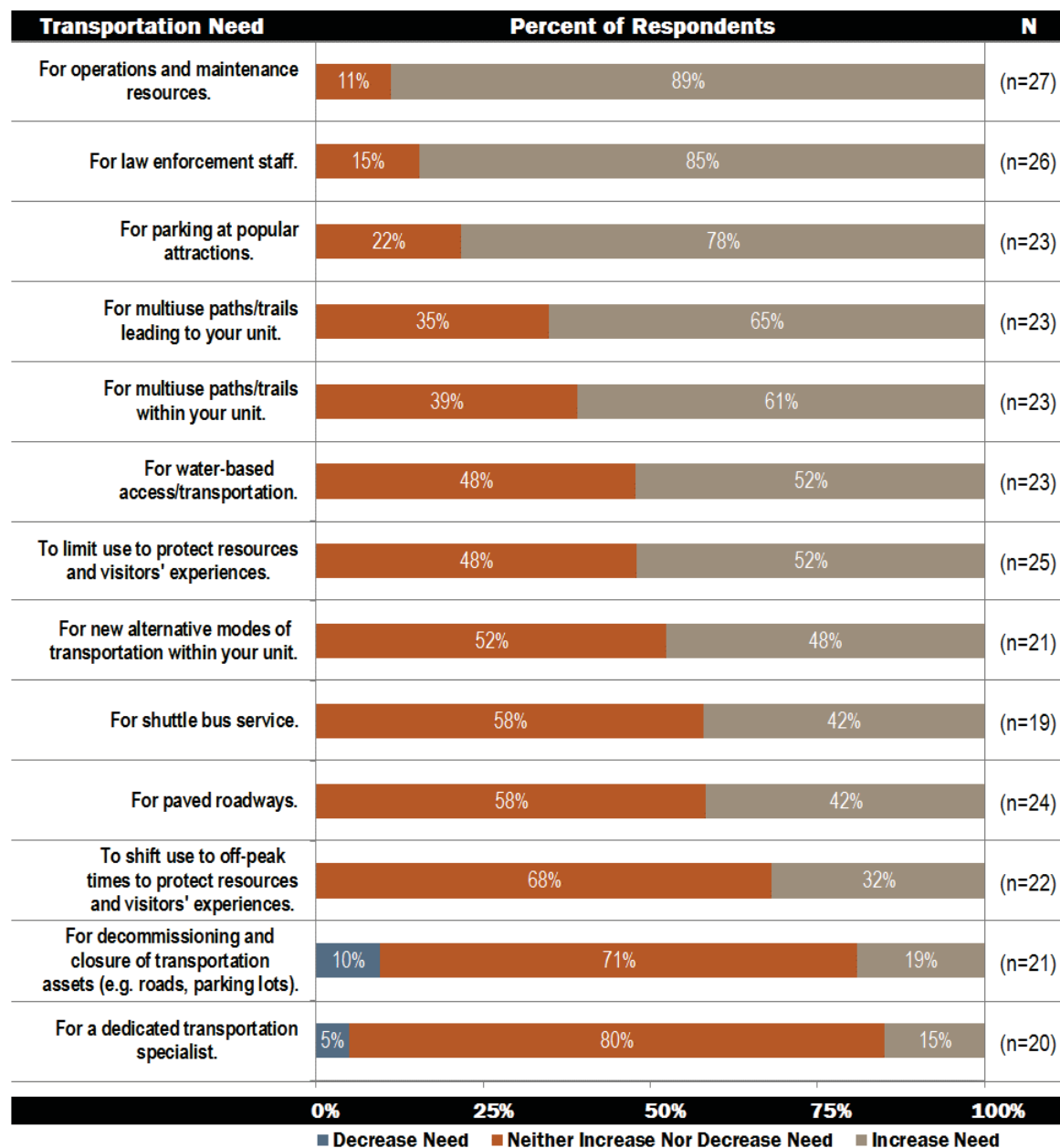
Very few park units indicated that visitation trends in their park would decrease the need for any transportation service or potential management action, although 10 percent of SER park units indicated that visitation trends would decrease the need for decommissioning and closure of transportation assets. Additionally, few SER park units (5%) indicated that visitation trends would decrease the need for a dedicated transportation specialist.

VISITOR ACCESS, MOBILITY, AND TRIP PLANNING NEEDS WITHIN THE SOUTHEAST REGION

Within the SER Transportation Survey, close to half (48%) of SER park units indicated that accessibility barriers for people with disabilities negatively impact visitors' experiences within their unit on peak days and times, or most of the time; over 40 percent of SER park units indicated that accessibility barriers negatively impacted visitors' experience most of the time. As mentioned within the Baseline Conditions Assessment report, close to half (47%) of SER park units indicated within the survey that transportation improvements related to accessibility for people with disabilities were of their highest funding priority level, and almost all other SER park units (48%) indicated that these improvements were of high funding priority level. Almost all (93%) of SER park units indicated that accessibility transportation improvements would address a visitor experience-related need within their unit. While the importance of accessibility of SER park units' facilities to visitors has been proven, only 15 percent of SER park units indicated that they had completed a Self-Evaluation and Transition Plan (SETP) to assess the accessibility of their programs, policies, and practices. An additional 11 percent indicated that they were in the process of performing a SETP.



Figure 3-3 How Visitation Trends in the Next 10 Years Will Impact Transportation Needs within the Southeast Region



Source: NPS Southeast Region LRTP Transportation Survey Results. RSG, February, 2015.

In addition, as mentioned in the SER LRTP Future Conditions Assessment report, the proportion of the US population (and the proportion of NPS visitors) that is over the age of 65 has increased in recent years and is expected to continue to increase in the future. This information indicates that accessibility is not only already a concern for quality visitor experiences within SER park units, but will become even more of an issue of concern in the future. There is an opportunity within the SER to perform SETP's within a large majority of SER park units that have not done so already, and more fully assess accessibility of the transportation system within these park units. There also is a need to provide additional funding necessary to make the transportation system within the SER more accessible to visitors with disabilities. As indicated, this information and potential accessibility improvements will have a significant impact on visitors' experiences in SER park units.

As mentioned within the SER LRTP Future Conditions Assessment report, for the first time in many decades, the proportion of the US population living in a household without a personal vehicle has



increased, indicating that these populations rely on alternative modes of transportation. Presumably, these populations of visitors and potential visitors rely on alternative modes of transportation to access SER park units. There is a need within the SER to better understand what proportion of their potential visitor population requires alternative modes of transportation, and to identify what specific alternative transportation modes are needed for visitors to access their units. Additionally, there is an opportunity to assess the potential impact these alternative modes of transportation will have on the visitor experience within SER park units, including any unintended consequences of delivering visitors to SER park units via these modes.

Trip planning resources are needed to guide visitors with mobility or accessibility issues. Trip planning resources can aid in guiding visitors' expectations about the park and transportation visitor experience (TVE), as well as prepare visitors for transportation within SER park units. Many SER park units have a "Planning your trip" section of their website, although consistency of available information across park units is needed to make navigating these sites and finding necessary information easier for visitors. As the National Park Service as a whole approaches its Centennial, guidance has been provided to park units to facilitate updating this information. Topics addressed in the national guidance include:

- Description of transportation experience
- Driving directions
- Alternative transportation
- Parking
- Congestion
- Travel distances and time to key sites
- Accessibility of transportation systems
- Alternative fueling stations

Communication & Wayfinding

The communication and wayfinding factors of the transportation visitor experience (TVE) are experienced in every phase of the visitor experience (e.g., travel planning through recollecting) and offer many opportunities to impact the TVE. Park units within the SER have many methods, modes, and ways to influence these TVE factors including the park unit's website, printed materials, visitor centers, and even smartphone applications (apps). There is a need within the Southeast Region to make communication mechanisms uniform, consistent, and informative to all visitors to SER park units. With changing demographics within the US (and among park visitors), SER park units will need to utilize all mechanisms to communicate with park visitors, including social media and ITS. This information will need to be communicated through multiple venues in all phases of the transportation visitor experience. As mentioned within the Baseline Conditions Assessment, close to one-third (30%) of park units within the region report that the lack of advance trip planning information at their park unit negatively impacts visitor experiences, and 64% report that transportation and trip planning information improvements were their "highest" or a "high" priority funding level.⁴ Communication and wayfinding within SER park units is a clear need, and will provide for higher quality visitor experiences.

⁴ Source: NPS Southeast Region LRTP Transportation Survey Results. RSG, February, 2015.



ADDITIONAL VISITOR EXPERIENCE-RELATED RESEARCH NEEDS

Based on analysis of the Baseline and Future conditions of the Southeast Region, the following additional visitor experience-related research needs were identified. This list is by no means exhaustive, but a starting point for future research opportunities and needs within the Southeast Region.

1. Research to determine who is and isn't visiting SER park units. Specifically – understanding socioeconomic characteristics of visitors and non-visitors (both local and non-local user types).
 - a. Research to understand demographics of local visitors compared to demographics of the surrounding community and/or region – to see if visitation is representative of the community.
 - b. Research to identify any potential barriers to visitation of SER park units, either for local or non-local users.
 - c. Research to identify park unit management strategies that better meet the needs of underrepresented populations/cultures that may not be fully accessing park units today.
2. Research to understand trip motivations and travel characteristics of visitors and non-visitors of SER park units. This information can be used to identify communication strategies to relay necessary information to park visitors, as well as identify potential management actions that could be taken to encourage visitation from non-visitor groups.
3. Examine existing and explore the feasibility of potential transportation-related partnerships with the local communities, surrounding region, and transportation organizations. This information can be used to provide additional or better transportation-related visitor experiences, both getting to and traveling within SER park units.
4. Research to understand the quality of the transportation-related visitor experience within SER park units. Particularly, what transportation visitor experiences are visitors getting within the Southeast Region, and what improvements could be made to provide higher quality transportation visitor experiences.
5. Research to understand any potential visitor crowding, congestion, or capacity issues within SER park units. The research should also provide insight on how the transportation network is potentially contributing to these issues (e.g., buses dropping off more visitors to a site that parking allowed). The research will also allow SER park units to understand how to use the existing and future transportation network to help manage any potential crowding, congestion, or capacity issues.
6. Research to understand potential impacts of climate change on the transportation network and transportation-related visitor experience.



Resource Protection

In addition to the vision, goals and objectives of the Southeast Region LRTP, additional guidance documents have been taken into consideration to help identify needs to bridge the gap between Baseline and Future Conditions. Given that resource protection is a fundamental aspect of the National Park Service mission, an additional guidance document has been developed to guide the vision for the Future Condition for resource protection in the Southeast Region specifically.

At the highest level, the basic transportation need from the perspective of resource protection is to continue to incorporate natural and cultural resource protection principles into transportation planning and design. Although this is not a new concept, it continues to be a need.

The most straightforward intersection of transportation and natural resources is wildlife-vehicle collisions. In the most severe cases, in which a vehicle collides with a large animal, wildlife and vehicle occupants can be severely or fatally injured. In the most common cases, vehicles come into contact with smaller fauna with habitats proximate to the roadside. Many of these instances may go unnoticed. Wildlife-vehicle collisions resulting in a loss of wildlife are a natural resource threat, threatened and endangered species impacts are of critical concern. At this time, data concerning wildlife-vehicle collisions is a known data gap that the NPS is working to address on a national level. Building a database of known wildlife-vehicle collision locations and species impacts will be the first step toward identifying and implementing solutions.

As the National Park Service is working through the long range transportation planning process regionally and nationally, two guidance resources have been developed to facilitate planning for resource protection through long range transportation planning.

The *Natural and Cultural Resource Guidance for Long Range Transportation Planning in the National Park Service* report provides some background on the need for incorporating resource protection into transportation planning, while the Resource Stewardship Guidance Tool (RSGT) provides more specific measures to be taken in the Southeast Region. RSGT was piloted on the nine Southeast Region focus parks for this LRTP. The purpose of the tool is to identify transportation strategies that can be aligned with fundamental natural and cultural resource protection principles with the intent of incorporating resource protection into transportation planning and decision-making.

The tool was developed using vetted national databases that were verified and refined at the park unit level in the Southeast Region. This process resulted in a list of eight goals, 29 objectives, and 132 strategies that inform transportation planning, management, operations, design, and maintenance to encourage an integrated approach to transportation and resource protection.

Table 3-1 summarizes the goals and objectives of the RSGT. Not every goal, objective, or strategy is intended to apply to every park unit or every case where a transportation-resource protection conflict exists. Rather, this comprehensive list is intended to be used as a library of strategies to help provide guidance to most conflicts. This Needs Assessment hopes to identify how these goals and objectives differ from the Baseline Condition.



Table 3-1: NPS Resource Stewardship Guidance Tool Goals and Objectives

Context: Protect and enhance natural and cultural resources through the environmentally responsible context sensitive design and integration of transportation systems.
<ul style="list-style-type: none">Protect, preserve, and enhance aesthetic and visual qualities from within the park.Ensure compatibility with the natural and cultural environment through context sensitive design.
Natural: Maintain a high standard of natural resources by identifying, interpreting, protecting, and mitigating impacts to natural resources.
<ul style="list-style-type: none">Manage the transportation system to ensure protection of wildlife populations, wildlife habitat, and the processes and components of the park's natural ecosystem.Manage the transportation system to ensure protection of big game and its critical habitats and movement corridors.Preserve, restore, and enhance sensitive bird habitat.Maintain native vegetation in a mosaic of habitats and vegetation types.Control existing non-native plant species and minimize the introduction of invasive species.Preserve the integrity and intent of wilderness areas.Preserve, restore, and enhance existing or potential habitat for threatened and endangered species. Where possible enhance habitat for targeted species.Protect, preserve, and restore existing natural flood control systems.Protect water quality in streams and wetlands.Take into consideration seasonal changes in management.Minimize adverse impacts to soils from erosion.
Cultural: Maintain a high standard of cultural resource stewardship by finding, interpreting, protecting, and mitigating impacts to all cultural resources.
<ul style="list-style-type: none">Incorporate and complete cultural resource inventories, evaluations, and studies prior to or as part of transportation planning early in the process.Provide appropriate access to and interpretation of cultural resources.Protect the character defining features that represent the activities that shaped the historic landscape, while simultaneously allowing contemporary uses to continue.Mitigate negative impacts and provide appropriate access to cultural resources.
Natural Setting: Protect the natural setting of cultural and natural resources.
<ul style="list-style-type: none">Protect the natural environment by limiting light pollution.Ensure visitors have opportunities in most parts of the park to hear natural sounds.
Regional Stewardship: Support local and regional efforts to preserve natural and cultural resources.
<ul style="list-style-type: none">Maintain and improve air quality and the natural environment by limiting automobile trips and reducing air emissions.Protect regional watersheds.Coordinate among parks, regions, and agencies to set priorities, exchange data, and encourage cooperation in the planning and execution of transportation projects.
Community: Connect people to parks and help communities protect what is special to them, highlight their history, and retain or rebuild their economic and environmental sustainability.
<ul style="list-style-type: none">Coordinate with gateway communities to recognize and interpret important natural and historic resources in the setting of the park.Connect gateway communities to parks by planning for public access points.Consider impacts and access to subsistence or ethnographic resources in transportation planning and policy development.
Climate Change and Sustainability: Plan for the impacts of climate change and transportation actions to cultural and natural resources through science, adaptation mitigation, and communication.
<ul style="list-style-type: none">Manage the natural and cultural resources to increase resilience in the face of climate change and other stressors.Enhance environmental stewardship and energy efficiency in transportation planning to reduce greenhouse gas emissions.Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.
Leadership: Provide leadership in protecting and enhancing natural and cultural resources in transportation planning for other agencies.
<ul style="list-style-type: none">Protect the exceptional condition of the park's resources and values through informed, proactive, and transparent transportation planning.



At this time, the RSGT pilot reviewed nine park units in the Southeast Region. Moving forward, the remaining park units in the region should be reviewed and incorporated into the pilot database to provide a comprehensive resource for the Southeast Region that can be used for transportation decision-making. This step will improve the understanding of the Baseline Condition.

Using the information that is currently available, the following themes are common to many of the recommended strategies for incorporating resource protection into transportation planning and design.

- Preserving natural and cultural viewsheds and soundscapes, and minimizing light pollution
- Providing context sensitive transportation improvements
- Reduce animal exposure to vehicles by providing sufficient passage and avoiding known habitats
- Remain conscious of the risk of invasive species and mitigate the potential spread of such species
- Utilize visitor management and traffic management practices (such as transit services) to manage impacts to natural and cultural resources
- Consider climate change adaptation and resiliency in transportation planning and design
- Consider opportunities to reduce air emissions, specifically through reduced automobile use or use of alternative fuels or zero-emissions vehicles
- Always consider potential project partners that can help bring additional information, perspective, and funding (non-federal) to a project

In order to achieve the goals of the Long Range Transportation Plan for Resource Protection, the Southeast Region should continue working to grow the RSGT for additional park units in the region. The strategies found in the RSGT may be consulted during planning, design, and construction of any transportation projects to ensure that the natural and cultural environment is preserved for future generations of park visitors. Integrating resource protection into projects from an early stage will be the most cost effective approach to adapting the transportation system to its surroundings.

In terms of reducing greenhouse gas emissions, the Southeast Region has begun to apply strategies that can reduce emissions generated on park lands through park transportation operations. One such example is the NPS partnership with the Department of Energy Clean Cities program. The purpose of the Clean Cities program is to support local actions that can reduce the nation's petroleum use in transportation. One of the many partnerships that the Clean Cities program has formed to help them achieve their goal is the National Park Service. The National Parks Initiative supports transportation projects, educates visitors, and reduces emissions. Several park units in the Southeast Region have participated in this program including Mammoth Cave National Park, Great Smoky Mountains National Park, and Blue Ridge Parkway. Most park units are able to replace older gasoline burning vehicles and maintenance equipment with newer propane, hybrid, or electric powered vehicles, and associated fueling or charging stations. Great Smoky Mountains National Park specifically used the program to install the first pair of direct current (DC) electric vehicle charging stations in the National Park Service.



****UPDATED DATA AS OF SEPTEMBER 2016****

Transportation Resource Stewardship Planning Tool

The RSGT described above has been renamed the Transportation Resource Stewardship Planning Tool (TRSPT). What makes this tool particularly unique and valuable to the Southeast Region is that an early version of the tool was built using data sources for Southeast Region states and park units. In the current version of the tool, the strategies and outputs could be viewed as “calibrated” to the Southeast Region.

Clean Cities National Parks Initiative

Tracking greenhouse gas emissions resulting from transportation and other park unit functions began through the *Green Parks Plan*. The National Park Service has been tracking greenhouse gas emissions since 2008 and is observing a downward (reduction) trend.

The region will continue to support this trend through changing their vehicle fleet and advocating for mode shifts by visitors and staff, and reducing vehicle miles traveled. These changes can be facilitated by programs such as the Clean Cities program.

As part of the Clean Cities National Parks Initiative, Great Smoky Mountains National Park has installed DC fast and Level II charging stations for electric-powered public vehicles, and has replaced older, less efficient trucks in its fleet with neighborhood electric vehicles. Mammoth Cave National Park has converted four of its eight buses and both of its ferry boats to propane from diesel. Blue Ridge Parkway and Christiansted National Historic Site also have “greened” their fleets through the Clean Cities Initiative.

Transportation Network Needs Assessment

A comprehensive database of transportation assets and historic project spending was utilized to develop a financial needs assessment to achieve asset condition goals set by the LRTP. This resulted in the estimate of \$204 million in needs described in Chapter 2. This \$204 million annual need estimate overlaps and includes many of the investment needs related to the transportation network elements of sustainability, resource protection, safety, and user experience/access/mobility, but, as described in this chapter, there are some broader program needs.

Table 3-2 summarizes the funding requirements for the items identified in the transportation network needs assessment. A range of funding requirement is provided since no specific implementation plan has been developed. The annualized funding needs range from \$6 million to \$16 million, bringing overall transportation-related funding needs to \$210 million to \$220 million.



Table 3-2: Transportation Network Needs Assessment

Need Area	Needs	Estimated Annual Funding Requirement
Sustainability	Continue to build a network of local transportation and community partners at each park unit Consider livability in all transportation projects Use available NPS sustainability and climate change guidance to inform decision-making and investment Identify all climate change impacts to transportation assets using available vulnerability assessment data Inventory roadway culvert and drainage systems throughout the region to better prepare for inland flooding events Conduct slope stability studies at inland parks in vulnerable areas	\$2.0 - \$5.0 million
Resource Protection	Continue to populate the Resource Stewardship Guidance Toolbox with Southeast Region park units Consult the goals, objectives, and strategies provided by the RSGT when completing any transportation project Continue efforts to identify wildlife-vehicle collisions and impacted threatened & endangered species	\$0.5 - \$1.0 million
Safety	Develop a crash database Complete 2 to 4 safety projects annually Compliance with federal transportation guidance Aid individual park units in completing self-evaluations and transition plans for compliance with the Architectural Barriers Act	\$2.5 – 5.0 million
Visitor Experience, Access, and Mobility	Compliance with federal transportation guidance Enhance multimodal access and connectivity Enhance Trip Planning Resources Enhance communications and wayfinding Continue to build background and understanding of visitor experiences	\$1.0-\$5.0 million
Estimated Transportation Network Need		\$6.0-\$16.0 million

****UPDATED DATA AS OF SEPTEMBER 2016****

The updated total annual estimated need for the SER transportation system, as detailed in the updates to Chapter 2, is \$182.2 million. Based on this updated total need, the broader program needs of \$6 million to \$16 million, detailed above and summarized in Table 4-1, bring the region's overall annual transportation-related funding needs to \$188 million to \$198 million.



4 Next Steps

This Needs Assessment report is the third in a series of interim deliverables that will inform the development of the SER LRTP. Subsequent interim deliverables will include:

- A **Strategies Analysis**, which will be conducted to examine a range of investment strategies for the SER transportation system. The Funding and Financial Analysis Technical Report will document this process, along with the identified preferred investment strategy for the SER LRTP.

The SER LRTP will use the findings in this Needs Assessment to develop strategies for how the Southeast Region can move forward and efficiently achieve the goals and objectives described while working within a financially constrained environment.